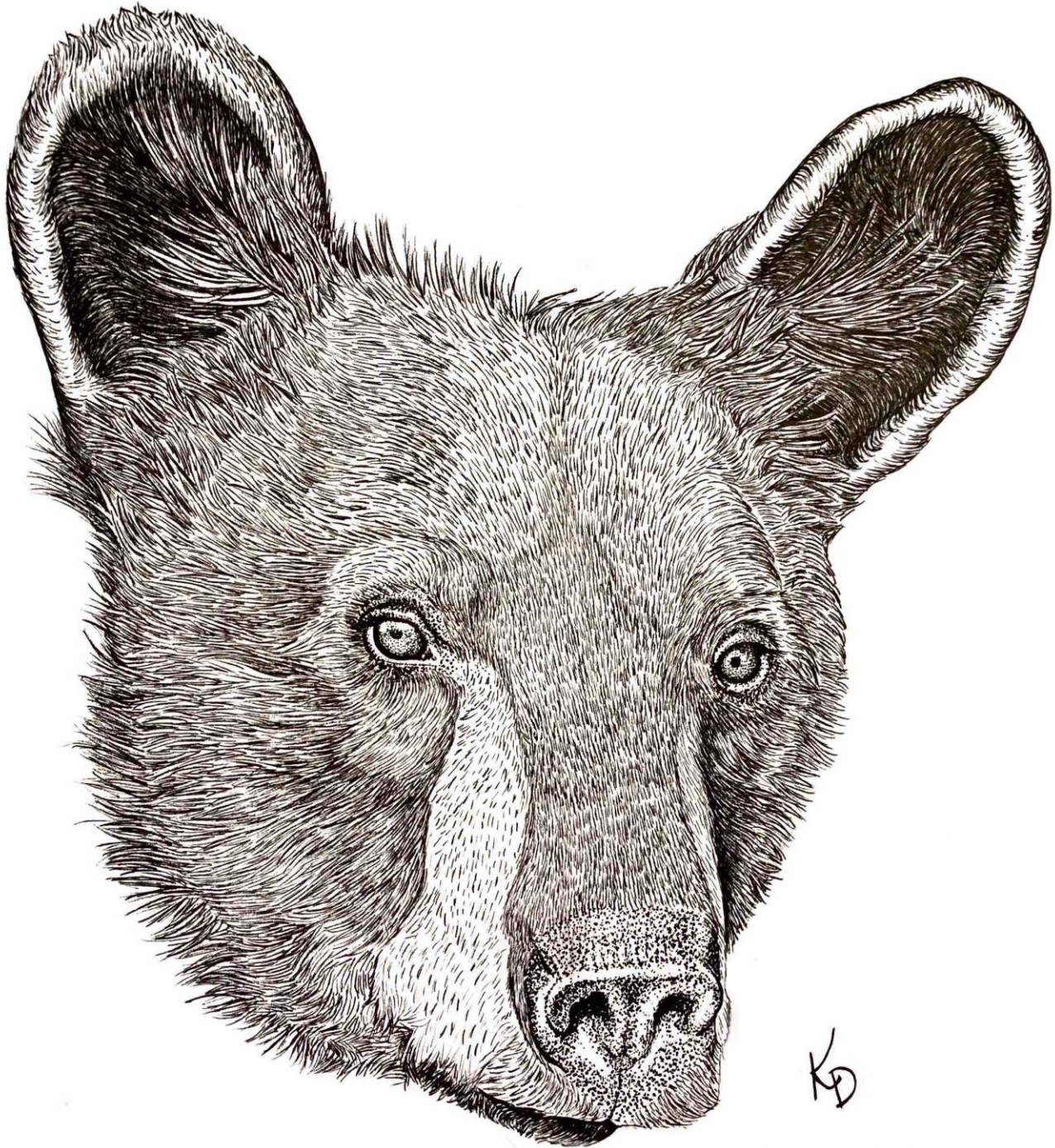


TEXAS SOCIETY OF MAMMALOLOGISTS



PROGRAM, ABSTRACTS, AND NEWSLETTER

41st Annual Meeting
10-12 February 2023

#TSM2023



Texas Society of Mammalogists

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Cover illustration: Black Bear by Krysta Demere.

**Texas Society of Mammalogists
41st Annual Meeting
10-12 February 2023**

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MENU 2023

Friday:

6:00 pm DINNER

Build your own burger, macaroni and cheese, fries, and salad

Saturday:

7:00 am BREAKFAST

Breakfast tacos, hash browns, cinnamon rolls, assorted cereal and fruit

9:35 am Break

Coffee, tea, water, scones, muffins, granola bars, fruit

Saturday:

12:00 pm LUNCH

Potato bar, corn salad, taco salad, salad bar, broccoli spears, cornbread, brownies and ice cream

3:15 pm Break (in Packard Building)

Coffee, tea, water, cookies, trail mix, fruit

Saturday:

5:30 pm BANQUET DINNER

Chicken fried steak, mashed potatoes, cream gravy, green beans, salad bar, wheat dinner rolls, chocolate pie

Sunday:

7:30 am BREAKFAST

Pancakes, bacon, hash browns, blueberry muffins, English muffins, assorted cereals and fruit

RULES FOR USE OF THE TEXAS TECH UNIVERSITY CENTER AT JUNCTION'S LLANO RIVER FIELD STATION

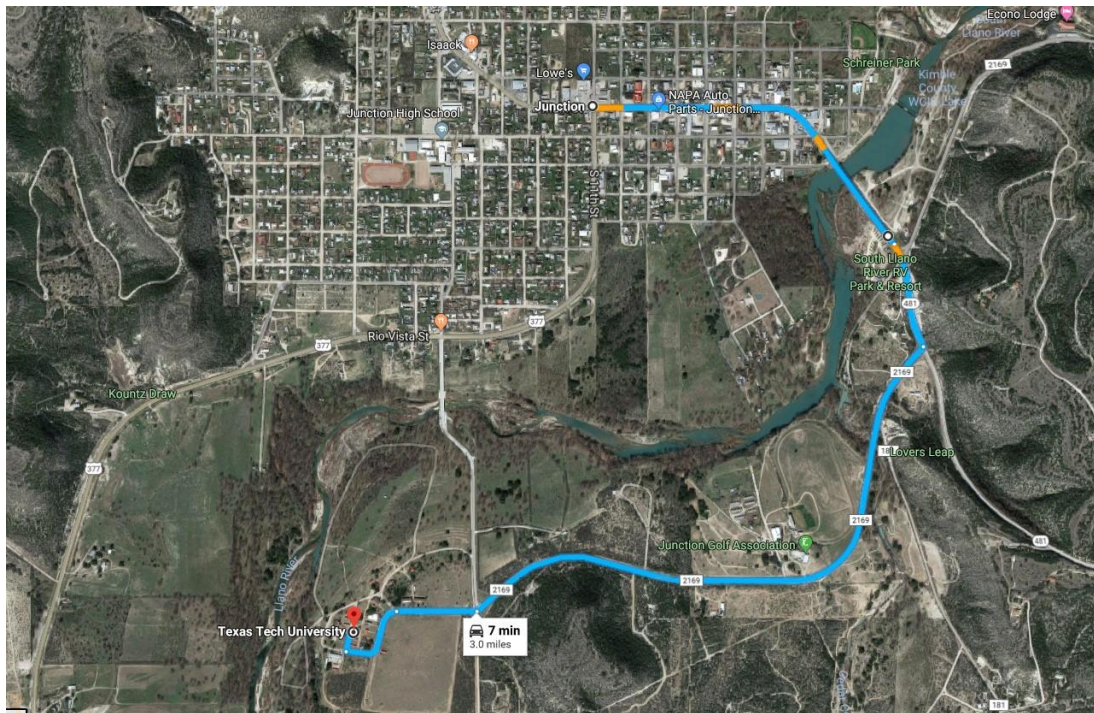
- Drugs and alcohol are strictly prohibited at the center*. Unauthorized use of either will result in immediate eviction with no refund. (*see exception below for TSM social hours)
- Do NOT drive on the grass. Stay on designated roads and out of unauthorized areas.
- Do NOT secure any items to the walls and/or doors without prior approval. This includes the use of tape, nails or screws.
- Do NOT remove or dismantle ANY furniture in the buildings, including beds and mattresses, clocks, other wall hangings or fixtures. DO NOT sit or stand on tables.
- Please remove all your event signs and/or posters before you depart.
- Pets, firearms, and camping are not allowed on campus.
- Fires are allowed ONLY with prior permission and ONLY in designated fire pit areas. The field station adheres to the Kimble County Burn Bans.
- Use of electric skillets, hot plates and other electrical cooking appliances is prohibited in all lodging areas. This also applies to electric heaters.
- Smoking is strictly prohibited inside **any** building.
- All plants and wildlife are protected at the field station and are not to be harvested or removed.
- Use of recreational vehicles is strictly prohibited on center.
- Do not prop open doors in ANY building

Any infractions, disregard, and/or negligent behavior resulting in the damage to the facilities, furniture, or equipment will be assessed a fee of no less than \$500.00. This includes outside areas as well as tampering with thermostats in locked boxes. This damage/tampering fee will to be added to the Society's final bill.

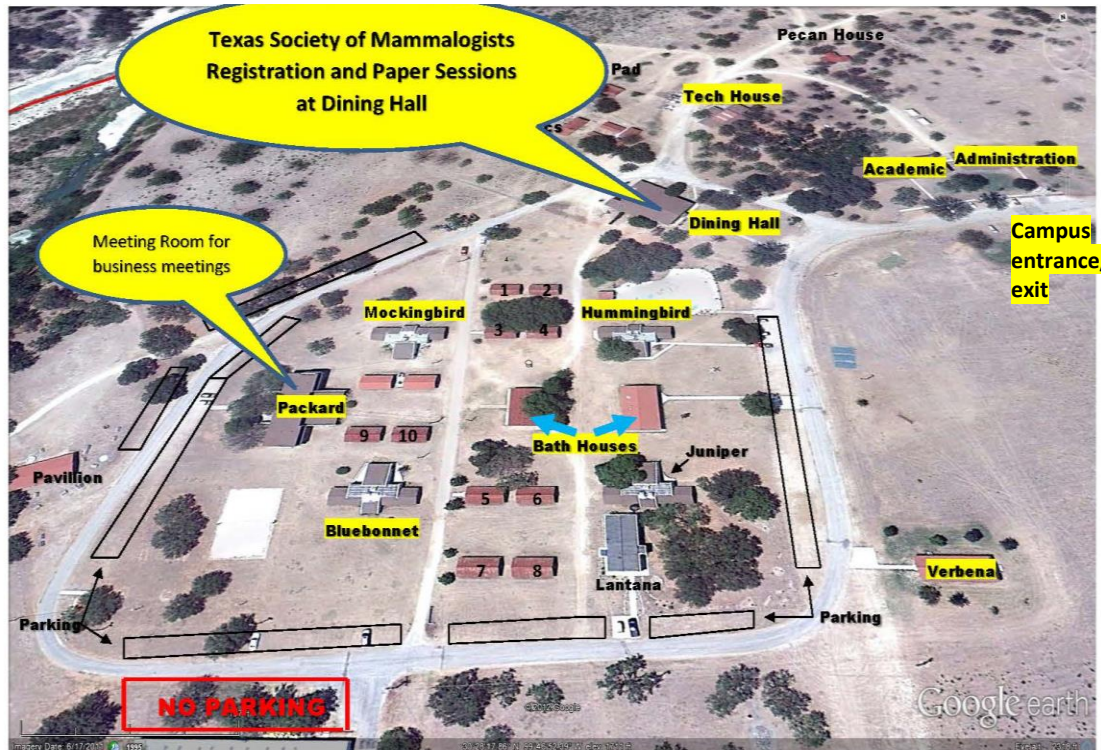
***Alcohol Rules for Texas Society of Mammalogists: Consumption of alcohol by persons over 21 years of age is permitted only in the Dining Hall from 7 pm to 12 midnight Friday and Saturday night. Attendees must show their ID at registration to receive a wrist band that will verify their legal age and two drink tickets. A licensed bartender will be present to distribute up to two alcoholic beverages per attendee wearing a wrist band. A Security Officer will be present on campus to monitor and respond to any illegal activities or safety concerns. Please follow the rules and behave yourselves so TSM can continue to meet at the Junction Center each year! Thank you!**

DIRECTIONS TO TTU LLANO RIVER FIELD STATION FROM JUNCTION

The bridge via the “back way” to campus has not been replaced. Please use the route shown below.



CAMPUS MAP



Note: There are two single-stall restrooms available in the Dining Hall. In the case of long lines, or the restrooms being out of order, the Bath House restrooms are available for use.

2023 Program Schedule

Friday, 10 February

3:00–7:30 pm	Registration	Dining Hall
4:30–6:00 pm	Meeting of the Executive Committee	Packard Building
6:00 pm	Dinner (serving line open 6:00–6:30pm)	Dining Hall
7:00 pm	Announcements/Welcome Address TSM President Ray Willis	Dining Hall
7:30–9:30 pm	Poster Presentations	Dining Hall

Saturday, 11 February

7:00 am	Breakfast and Registration (serving line open 7:00–7:30am)	Dining Hall
8:00 am	Introduction and Announcements TSM President Ray Willis	Dining Hall

PAPER SESSION 1

(Presenters' names are underlined)

Moderator: Caleb Phillips, Texas Tech University

Papers 1–4 are to be considered for the TSM Award.

- 8:05 Paper 1 – **COYOTE POPULATION ESTIMATION IN THE MOJAVE DESERT REGION USING NONINVASIVE GENETIC SAMPLING** Danielle C. Deming, Warren C. Conway, Brian T. Henen, Robert D. Bradley, Emily A. Wright, and Courtney L. Ramsey
- 8:20 Paper 2 – **OF MICE AND MUSEUMS: SPECIES DELIMITATION IN THE *PEROMYSCUS MANICULATUS* SPECIES GROUP USING NATURAL HISTORY COLLECTIONS AND GENOMIC DATA** Natalie M. Hamilton, Sharon A. Jansa, and Jessica E. Light
- 8:35 Paper 3 – **TAXONOMIC REVISION OF THE GENUS *MEGISTOPODA* MACQUART, 1852 (DIPTERA: STREBLIDAE) PARASITES OF NEW WORLD LEAF-NOSED BATS (CHIROPTERA: PHYLLOSTOMIDAE)** Ali Zeltzin Lira-Olguin, Carl W. Dick, and Roxana Acosta-Gutiérrez

- 8:50 Paper 4 – **MOLECULAR SYSTEMATICS OF *SAUROMYS* AND *PLATYMOPS* WITHIN *MOLOSSIDAE*** Will McCoy and Loren K. Ammerman
Papers 5-6 are to be considered for the Robert Packard Award.
- 9:05 Paper 5 – **FROM EXTIRPATION TO RESTORATION: THE GENOMIC STATUS OF TEXAS DESERT BIGHORN SHEEP** Emily A. Wright, Joseph D. Manthey, Michael R. Buchalski, Emma K. Roberts, Rachael C. Wiedmeier, Bonnie R. McKinney, Froylán Hernández, Warren C. Conway, David A. Ray, Caleb D. Phillips, and Robert D. Bradley
- 9:20 Paper 6 – **POPULATION GENETIC STRUCTURE AND DIVERSITY AMONG FRAGMENTED POPULATIONS OF THE LLANO POCKET GOPHER (*GEOMYS TEXENSIS*)** Julia A. Nitschmann and Russell S. Pfau
- 9:35 **15 Minute Break**

PAPER SESSION 2

Moderator: Dianna Krejsa, University of Kansas

Papers 7-10 are to be considered for the Bobby Baker Award.

- 9:50 Paper 7 – **BOWHEAD WHALE POPULATION GENETICS BASED ON MTDNA SEQUENCES** Emily F. Fritsche and Amy Baird
- 10:05 Paper 8 – **GENETIC VARIATION IN *THOMASOMYS FUMEUS* (CRICETIDAE, SIGMODONTINAE)** Claire M. Dunn, Thomas E. Lee, Jr., Joshua M. Brokaw, Jorge Brito, and Santiago F. Burneo
- 10:20 Paper 9 – **DNA BARCODING OF *PEROMYSCUS* FROM THE DAVIS MOUNTAINS IN TEXAS** Halle Summers, Loren Ammerman, Rebecca Scott, and Robert Dowler
- 10:35 Paper 10 – **PRELIMINARY TRENDS IN SMALL MAMMAL POPULATIONS AFTER FIVE YEARS OF MARK-RECAPTURE RESEARCH IN THE GYPSUM HILLS OF WESTERN OKLAHOMA** C. Claire Smith, Francisca M. Mendez-Harclerode, Gloria M. Caddell, Chad B. King, and Michelle L. Haynie

Paper 11 is to be considered for the Rollin Baker Award.

- 10:50 Paper 11 – **MEASURING EFFECTS OF HIBERNATION ON SPATIAL MEMORY IN THIRTEEN-LINED GROUND SQUIRRELS** Adam Myers and Jessica E. Healy

Papers 12-16 are to be considered for the William B Davis Award.

- 11:05 Paper 12 – **ASSESSMENT OF LANDCOVER TYPE AND *IN-SITU* MANAGEMENT ON USE OF SPACE BY PLAINS SPOTTED SKUNKS** J. Clint Perkins, Matthew H. Hamilton, Kamren P. Jefferson, Robert C. Dowler, and Richard D. Stevens
- 11:20 Paper 13 – **THE IMPACT OF A RUN-OF-THE-RIVER HYDROELECTRIC DAM ON A NON-VOLANT SMALL-MAMMAL ASSEMBLAGE IN BRAZILIAN AMAZONIA** Raylenne da Silva Araujo, Paulo Estefano Dineli Bobrowiec, Raquel Teixeira de Moura, and William Ernest Magnusson
- 12:15 **Lunch** (serving line open 12:00–12:30pm)
- 1:15 **Group Photo** behind the Packard Building – All members, please attend and please be on time! ☺

PAPER SESSION 3

Moderator: Dara Orbach, Texas A&M University – Corpus Christi

- 1:45 Paper 14 – **ACTIVITY LEVELS RELATED TO LUNAR BRIGHTNESS AND DIEL ACTIVITY PATTERNS OF TAPIRIDAE AND FELIDAE SPECIES ACROSS NEOTROPICAL SITES** Stefanie Bergmanson
- 2:00 Paper 15 – **EFFECTIVENESS OF SIMULATED WATER AS A LURE FOR BATS IN THE BIG BEND REGION** Alexander Buckel and Loren K. Ammerman
- 2:15 Paper 16 – **BLUBBER HORMONES AND EPIDERMAL INTEGRITY AS INDICATORS OF PHYSIOLOGICAL CONDITION OF BOTTLENOSE DOLPHINS (*TURSIOPS TRUNCATUS*) IN THE HYPERSALINE LAGUNA MADRE, TEXAS** Makayla A. Guinn, Christiana S. Wittmaack-Kumar, Justin Y. Elliott, Carrie Sinclair, and Dara N. Orbach
- 2:30 **30 Minute Break**

3:00 pm

Members Business Meeting
All members, including students, please attend!

Packard Building

5:30–9:00 pm **Annual Banquet and Auction** Dining Hall

5:30–6:30 Dinner (serving line open 5:30–6:00pm)

5:30 Silent Auction opens for bidding

6:30–7:00 Award Presentations

7:00–8:00 Guest Speaker Address:

*Weight- “Bearing” Research: Asking and Answering Questions that
Inform Species Conservation and Management*

**Dr. Dana Karelus
State Mammalogist
Texas Parks & Wildlife**

8:00–9:00 Live Auction
Silent Auction ends 10 minutes after Live Auction

9:00–12:00 pm Socializing and Dancing Dining Hall

Sunday, 12 February

7:30 am Breakfast (serving line open 7:30–8:00am) Dining Hall

Oral Presentation Abstracts

Papers 1–4 are to be considered for the TSM Award.

Paper 1

COYOTE POPULATION ESTIMATION IN THE MOJAVE DESERT REGION USING NONINVASIVE GENETIC SAMPLING Danielle C. Deming¹, Warren C. Conway¹, Brian T. Henen², Robert D. Bradley³, Emily A. Wright³, and Courtney L. Ramsey¹ - ¹Department of Natural Resources Management, Texas Tech University, Lubbock, TX 79409; ²Environmental Affairs, Marine Corps Air Ground Combat Center, Twentynine Palms, CA 92278; ³Department of Biological Sciences, Texas Tech University, Lubbock, TX 79409 (ddeming@ttu.edu)

Since the mid-1900s, coyotes (*Canis latrans*) have expanded their geographic range throughout North America, due in part to anthropogenic influences. The Marine Corps Air Ground Combat Center (MCAGCC) in Twentynine Palms, California has substantial residential zones, and densely populated barracks, where human-coyote conflicts regularly occur. MCAGCC is also intensely involved with the management and recovery of the threatened Agassiz's desert tortoise (*Gopherus agassizii*). Tortoise depredation by canids, most likely coyotes, continues to present wildlife-wildlife conflicts in other desert regions and has potential risks in the Mojave Desert as well. Similarly, no reliable coyote population estimates exist for MCAGCC, but these estimates are crucial for developing management actions for tortoises and coyotes. In 2021, we collected > 2500 canid scat samples at MCAGCC for use in noninvasive genetic sampling to develop spatially explicit mark-recapture population models using mitochondrial cytochrome-b gene amplification and microsatellite locus analysis. Species identification has been confirmed on approximately 150 samples, with a 96% accuracy rate on field identification. Individuals were identified using coyote specific primers and evaluating microsatellite genotypes. This research will inform us of coyote population size and connectivity, as well as their impacts upon tortoises – both of which will be useful for human and coyote management at and outside of MCAGCC.

Paper 2

OF MICE AND MUSEUMS: SPECIES DELIMITATION IN THE *PEROMYSCUS MANICULATUS* SPECIES GROUP USING NATURAL HISTORY COLLECTIONS AND GENOMIC DATA Natalie M. Hamilton¹, Sharon A. Jansa², and Jessica E. Light³ - ¹Department of Rangeland, Wildlife, and Fisheries Sciences, Texas A&M University; ²Department of Ecology, Evolution, and Behavior, University of Minnesota; ³Department of Ecology and Conservation Biology, Texas A&M University (nhamilton@tamu.edu)

The North American deer mouse, *Peromyscus maniculatus*, is one of the most widespread rodent species in North America, with a range extending from Canada across most of the United States and into Mexico. *Peromyscus maniculatus* is a member of the *P. maniculatus* species group, which may include nine or more taxa, including cryptic species within *P. maniculatus sensu lato*. Determining taxon status and evolutionary relationships within the *P. maniculatus* species group is imperative because it is an established model system for various evolutionary and ecological studies, including studies of zoonotic diseases. The goal of this study is to examine species limits and geographic structure within the *P. maniculatus* species group using novel genomic data generated from mitogenomes and thousands of ultraconserved elements (UCEs) sequenced from historic museum samples (102 individuals). Phylogenetic analyses of mitogenomic data (maximum likelihood and Bayesian) support the same species boundaries within the *P. maniculatus* species group as previous studies, but with higher support for relationships among clades. Multivariate DAPC analysis of the UCE data suggests distinct species-level clusters for all but two of the named species (*P. maniculatus sensu stricto* and *P. sonoriensis*). Preliminary morphological analyses of three deeply divergent lineages within *P. maniculatus* also support lack of differentiation between these two taxa. These results support recent findings that more species

should be recognized within *P. maniculatus sensu lato*. Future research focused on the *P. maniculatus* species group should revise geographic limits for each species, determine evolutionary relationships among species, and integrate understanding of adaptive genomic and morphological change along with species-level diversity.

Paper 3

TAXONOMIC REVISION OF THE GENUS *MEGISTOPODA* MACQUART, 1852 (DIPTERA: STREBLIDAE) PARASITES OF NEW WORLD LEAF-NOSED BATS (CHIROPTERA: PHYLLOSTOMIDAE) Ali Zeltzin Lira-Olguin¹, Carl W. Dick², and Roxana Acosta-Gutiérrez³ -

¹Department of Ecology and Conservation Biology, Texas A&M University; ²Department of Biology, Western Kentucky University; ³Museo de Zoología, Facultad de Ciencias, Universidad Nacional Autónoma de México (alizeltzin@tamu.edu)

Bat flies (Diptera: Streblidae and Nycteribiidae) are obligate, blood-feeding ectoparasites of bats, parasitizing only bats. Bat fly species belonging to the genus *Megistopoda* are characterized by presenting the femur III longer, thorax shieldlike, and stenopterous wings. *Megistopoda* species are therefore unable to fly and their ability to move among host individuals is restricted and this lack of flight can lead to strong host associations. The genus *Megistopoda* is composed of three described species *M. aranea*, *M. proxima* and *M. theodori*, each of which has been found to be associated with host species belonging to the New World leaf-nosed bats (Chiroptera: Phyllostomidae) genera *Artibeus* or *Sturnira*. With only three widely distributed species, *Megistopoda* is an understudied genus and species delimitation has not been rigorously assessed. Most of the used characters to identify *Megistopoda* species are ambiguous and intraspecific variation is usually not considered. In this talk, I will present the results obtained during my master's studies, where we analyzed morphological characters and a total of 12 body measures of 852 *Megistopoda* individuals (obtained from museum collections and recent fieldwork) from across their geographic range. We identified nine putative species, six new to science, but describing diagnostic characters. Two analyses (ANOVA and PCA) were performed to recognize significant differences among the quantitative characters. Thorax chaetotaxy, the femur III length, and the wing measures were the most informative to recognize morphospecies. Future research will include phylogenetic analyses using morphological and molecular data to determine relationships, host associations, and geographic distributions among *Megistopoda* species.

Paper 4

MOLECULAR SYSTEMATICS OF *SAUROMYS* AND *PLATYMOPS* WITHIN *MOLOSSIDAE*

Will McCoy and Loren K. Ammerman - Department of Biology, Angelo State University
(wmccoy@angelo.edu)

The family Molossidae is comprised of 16 genera and approximately 100 species, endemic to both the New and Old World. There is a relative consensus of the relationships among New World taxa but the phylogeny lacks consensus for taxa from the Old World. *Sauromys petrophilus* and *Platymops setiger* are two monotypic taxa found in Africa. There have been numerous taxonomic revisions that have shifted their positions within the family, largely based on morphological data and the most recent treatment of this group united *Sauromys* and *Platymops* as sister taxa. A recent molecular phylogeny showed a relationship between *S. petrophilus* and *Tadarida aegyptiaca* resulting in the paraphyly of the genus *Tadarida*, however this analysis did not include *Platymops*. In this project we obtained samples of both *S. petrophilus* and *P. setiger* as well as specimens of 4 other *Tadarida* species that occur in Africa to use molecular techniques to resolve their taxonomic positions. One mitochondrial gene (RAG2) and one nuclear gene (ND1) were amplified for our analysis. Our DNA sequences will be analyzed with reference sequences for RAG2 and ND1 from representatives of the family Molossidae available on GenBank. We will use Maximum Likelihood to test the hypothesis that *S. petrophilus* and *P. setiger* form a sister group within Molossidae.

Papers 5-6 are to be considered for the Robert Packard Award.

Paper 5

FROM EXTIRPATION TO RESTORATION: THE GENOMIC STATUS OF TEXAS DESERT BIGHORN SHEEP Emily A. Wright¹, Joseph D. Manthey¹, Michael R. Buchalski², Emma K. Roberts³, Rachael C. Wiedmeier⁴, Bonnie R. McKinney⁵, Froylán Hernández⁶, Warren C. Conway⁷, David A. Ray¹, Caleb D. Phillips^{1,8}, and Robert D. Bradley^{1,8} - ¹Department of Biological Sciences, Texas Tech University; ²Genetics Research Laboratory, California Department of Fish and Wildlife; ³Climate Science Center, Texas Tech University; ⁴Department of Veterinary and Biomedical Sciences, University of Minnesota; ⁵El Carmen Land & Conservation Co., LLC CEMEX USA; ⁶Texas Parks and Wildlife Department, Alpine, Texas, United States; ⁷Department of Natural Resources Management, Texas Tech University, Lubbock, Texas, United States; ⁸Museum of Texas Tech University, Lubbock, Texas, United States (emily.a.wright@ttu.edu)

In Texas, desert bighorn sheep (DBS, *Ovis canadensis*) historically occupied 16 mountain ranges in the Trans-Pecos Region. Described as *O. c. texiana* in 1912, this subspecies of DBS was extirpated and presumably extinct in the 1960s due to overharvesting, competition, and diseases. Historical restocking efforts have relied on translocating *O. c. mexicana* and *O. c. nelsoni* from Arizona, Nevada, Utah, and Mexico. These efforts allowed populations to increase from <14 to >1,500 individuals across 11 mountain ranges by 2018. The goal of this study was to discern the effects of inter- and intrastate translocations on contemporary populations of *nelsoni* and *mexicana* within Texas. Double digest restriction site-associated DNA sequencing was used to determine the population structure, genetic variation, and relatedness in contemporary populations. Inbreeding and other deleterious mechanisms were not detected in Texas DBS based on the genetic diversity and F-statistic datasets. Three analyses (principal components, maximum likelihood phylogenies, and admixture) demonstrated that DBS west of 104° longitude (Sierra Diablo, Beach, Baylor, and Van Horn Mountains) possessed similar nuclear genomes to populations in Arizona whereas DBS east of 104° longitude (Elephant, Black Gap, Dove, and Bassey Mountains) genomically were similar to populations in Nevada. Consequently, reintroduction efforts from multiple out-of-state sources were successful with evidence of detectable contributions to the nuclear genome. In addition, kinship analyses were indicative of movement between mountain ranges of sheep and possible traces of inbreeding, reproductively successful males, and prolific females. This is the first study to genomically compare several subspecies and the distinction between Rocky Mountain bighorn sheep and desert subspecies of bighorn sheep was evident in all analyses. Distinctions between northwestern and southern populations in Nevada were also detected with an individual from Colorado possessing similar genomic signatures, suggesting a possible corridor from southern Nevada to the four corners region.

Paper 6

POPULATION GENETIC STRUCTURE AND DIVERSITY AMONG FRAGMENTED POPULATIONS OF THE LLANO POCKET GOPHER (*GEOMYS TEXENSIS*) Julia A. Nitschmann and Russell S. Pfau - Department of Biology, Tarleton State University (Julia.nitschmann@go.tarleton.edu)

The Llano pocket gopher (*Geomys texensis*) is a fossorial rodent endemic to central Texas. Two subspecies (*G. t. texensis* and *G. t. bakeri*) are currently recognized and are separated by a distance of nearly 100 kilometers. Within both subspecies, populations are apparently fragmented due to *G. texensis* requiring soil with a high sand content to construct burrows. Soil erosion on the Edwards Plateau, likely caused by climate change in the late Quaternary period, has caused pockets of habitable soils to be separated and surrounded by areas of uninhabitable soils. We sequenced the COIII mitochondrial gene and generated multilocus nuclear data (AFLP) to (1) genetically characterize newly discovered populations of *G. texensis*, (2) to determine the pattern and extent of genetic divergence among populations, (3) to assess the levels of genetic diversity within each population, and (4) to assess whether

hybridization has occurred between *G. t. bakeri* and *G. attwateri* at a potential contact zone. Both datasets demonstrated low overall genetic diversity within populations and low overall levels of divergence among populations. Populations most geographically distant from one another displayed the highest levels of divergence, and populations with larger continuous ranges displayed the most genetic diversity. No evidence of hybridization between *G. texensis* and *G. attwateri* was found. Current subspecies boundaries were not supported by either dataset. The climactic events that led to fragmentation of suitable soils on the Edwards Plateau were likely too recent for substantial genetic divergence to occur among populations of *G. texensis*.

Papers 7-10 are to be considered for the Bobby Baker Award.

Paper 7

BOWHEAD WHALE POPULATION GENETICS BASED ON MTDNA SEQUENCES Emily F. Fritsche and Amy Baird - Department of Biology, University of Houston-Downtown
(e.fritsche00@gmail.com)

The Bowhead whale is one of 16 baleen whale species and lives mostly in the Arctic and subarctic waters. Of particular interest to conservation biologists is the Bering-Chukchi-Beaufort (BCB) stock of bowheads. This stock is of high cultural significance to Alaskan Native tribes, which hunt these whales as part of their subsistence. In our ongoing study, we examine the population genetics of the bowhead whales through mitochondrial DNA (mtDNA) sequences. This work is part of a long-term study monitoring genetic diversity and population structure to inform the International Whaling Commission's management and conservation decisions for this species. We have sequenced three mtDNA genes from bowhead samples that were donated by Alaska Native whalers over the course of the past several decades. We conducted standard population genetic analyses to look for evidence of potential population sub-structuring, to examine the distinction of the BCB stock from surrounding stocks, and characterize the haplotypes present in the population. Results so far indicate that the BCB stock is well differentiated from the Okhotsk Sea stock, but less so from the Eastern Canadian Western Greenland stock. No evidence of sub-structuring of the BCB stock was seen.

Paper 8

GENETIC VARIATION IN *THOMASOMYS FUMEUS* (CRICETIDAE, SIGMODONTINAE)

Claire M. Dunn¹, Thomas E. Lee, Jr.¹, Joshua M. Brokaw¹, Jorge Brito², and Santiago F. Burneo³ -
¹Department of Biology, Box 27868, Abilene Christian University, Abilene, TX 79699; ²Instituto Nacional de Biodiversidad, Rumipamba 341 y Av. De los Shyris, casilla: 17-07-8976, Quito, Ecuador; ³Sección Mastozoología - Museo de Zoología, Pontificia Universidad Católica del Ecuador, Quito, Ecuador (cmd18b@acu.edu)

Thomasomys fumeus is a cricetid rodent endemic to Ecuador. Specimens of *T. fumeus* were collected on Volcán Sumaco, Ecuador in 2007. Volcán Sumaco is a sky island, isolated from the eastern Andes by the Cosanga River Valley. Before the discovery of *T. fumeus* on Volcán Sumaco the species was only known from the type locality (Tungurahua). Since 2007 a number of other locations of *T. fumeus* have been discovered, all located on the eastern slope of the main Andes (the Cordillera Real). We were able to obtain tissue from two of these new locations for genetic comparison. There are two questions about the *T. fumeus* specimens from Volcán Sumaco we would like to answer. First, are these specimens isolated on Volcán Sumaco a different species from the other *T. fumeus* located in the Andes? Second, do these specimens represent a described species, *Thomasomys vulcani* that is morphologically similar. We analyzed CO1 (an mtDNA gene) to check for patterns of similarity within the *T. fumeus* and *T. vulcani*. We examined the morphology to further distinguish these groups.

Paper 9

DNA BARCODING OF *PEROMYSCUS* FROM THE DAVIS MOUNTAINS IN TEXAS Halle

Summers, Loren Ammerman, Rebecca Scott, and Robert Dowler - Department of Biology, Angelo State University (hsummers@angelo.edu)

Mice in the genus *Peromyscus* can be hard to distinguish without taking detailed measurements of the animals. Two species documented from the Davis Mountains of Texas, *P. boylii* and *P. nasutus*, can inhabit similar environments with overlapping elevations. *Peromyscus boylii* has been recorded as low as 1295 m but is more common above 1700 m. *Peromyscus nasutus* has been documented ranging from 1585 m to over 2300 m; however, they are most commonly found above 1900 m. There is slight color variation within the two species. *P. nasutus* has white around its ankles while *P. boylii* does not; other ways to tell them apart are their ear length and other body measurements. However, during juvenile stages, these measurements may not work to positively identify the mice. Due to the habitat overlap and similar appearance of these mice, the possibility of misidentification is an issue. The status of *P. nasutus* in the Davis Mountains has been questioned in recent decades and there was concern that it had been extirpated from the area. By doing DNA barcoding we were able to identify 19 samples collected around 2250 m in the Davis Mountains in 2021 and 2022. The sequences we obtained were aligned with other cytochrome b sequences of *Peromyscus* from Genbank and analyzed with a clustering analysis. These results verified the presence of both species in the Davis Mountains.

Paper 10

PRELIMINARY TRENDS IN SMALL MAMMAL POPULATIONS AFTER FIVE YEARS OF MARK-RECAPTURE RESEARCH IN THE GYPSUM HILLS OF WESTERN OKLAHOMA

C. Claire Smith¹, Francisca M. Mendez-Harclerode², Gloria M. Caddell¹, Chad B. King¹, and Michelle L. Haynie¹ - ¹Department of Biology, University of Central Oklahoma; ²Department of Biology, Bethel College (csmith230@uco.edu)

The purpose of this project is to monitor changes in small mammal populations and communities over multiple generations to determine what factors affect how the populations and communities change over time. In March of 2018, a permanent trapping web was established at the University of Central Oklahoma's Selman Living Lab (SLL). Two additional permanent webs were established in June of 2018. The SLL is located in the gypsum hills of Woodward County in western Oklahoma. Surveys of the 3 webs are conducted for 3 nights, 4 times a year, and include collection of mammalian and vegetation data. Climate data also is obtained for each day of the trip; monthly and yearly climate data also will be assessed. To date, 19 mammalian and vegetation surveys have been conducted. Based on preliminary data, seasonal and habitat trends have been detected in mammalian populations, with the lowest capture numbers occurring in the summer and reaching peak numbers in the spring. The trapping web located on mixed, slightly disturbed habitat has the most diverse community and the most number of captures/recaptures. In the future, the animal, climate, and vegetation data will be used to build mathematical models that can be used to determine which factors have the largest impact on population and community persistence. Additionally, changes in the genomic make-up of the populations over time will be assessed.

Paper 11 is to be considered for the Rollin Baker Award.

Paper 11

MEASURING EFFECTS OF HIBERNATION ON SPATIAL MEMORY IN THIRTEEN-LINED GROUND SQUIRRELS Adam Myers and Jessica E. Healy - Department of Biology, Austin College

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Can mammalian hibernators retain spatial memory post-hibernation? During the active season, hibernators like 13-lined ground squirrels (TLGS, *Ictidomys tridecemlineatus*) cache food and use

primarily spatial memory to recover their caches. These animals feed and fatten during a spring and summer active season, then sequester into burrows, cease food intake, and drop body temperature to ambient temperature in multi-day torpor bouts for several months in the hibernation season. In hibernation, they experience significant neural plasticity and remodeling during torpor bouts and periodic euthermic arousals. There is conflict in the literature as to whether they retain their spatial memories through this extensive remodeling during hibernation. To that end, we have been examining how hibernation affects spatial memory in TLGS by successfully teaching several animals to complete a Barnes maze prior to hibernation. We will test them in the same maze post-hibernation to check for retention of spatial memory. Additionally, we describe an experimental method for non-invasively observing body temperature of hibernating TLGS using an infrared camera and the small and inexpensive Raspberry Pi single board computer.

Papers 12-16 are to be considered for the William B. Davis Award.

Paper 12

ASSESSMENT OF LANDCOVER TYPE AND *IN-SITU* MANAGEMENT ON USE OF SPACE BY PLAINS SPOTTED SKUNKS J. Clint Perkins¹, Matthew H. Hamilton², Kamren P. Jefferson², Robert C. Dowler², and Richard D. Stevens^{1,3} - ¹Department of Natural Resources Management, Texas Tech University; ²Department of Biology, Angelo State University; ³Museum of Texas Tech University (J.Clint.Perkins@ttu.edu)

Examination of spatial resource use of species requires intensive population level monitoring, an inherent understanding of species ecology, and knowledge of *in-situ* changes individuals may encounter. Plains spotted skunks (*Spilogale interrupta*) are currently at-risk with habitat loss and alteration being the leading hypothesized causes of decline. To address fine scale plains spotted skunk landcover use and seasonal variation in home range size, we monitored a population at Warren Ranch in the Katy Prairie region of southeastern Texas. Warren Ranch was a mosaic of rangeland cover types further partitioned by warm season, mechanical manipulation of the landcover unequally applied between the southern portion (annually) and the northern portion (absent) of the ranch. From February 2019 through August 2021, we monitored 38 plains spotted skunks (M:24, F:14) via GPS radio telemetry. To maintain spatial-temporal independence among seasons, we filtered the dataset to exclude any individual with less than 30 days monitored per season resulting in 33 (F) and 43 (M) seasonal home ranges. To assess effects of landcover manipulation, we combined spatial data from all individuals into a global dataset, then partitioned it into northern and southern subpopulations based upon lack of home range shifts between the 2 portions of the ranch. We derived landcover types using the National Landcover Database, further characterized by frequency of manipulation. Next, we analyzed 2nd order habitat use of plains spotted skunks among the landcover types available versus those present at our site. We then analyzed home range characteristics of individual skunks between sexes, among seasons, and between the 2 subpopulations. Our results suggest plains spotted skunks avoided heavily grazed and agricultural landcover types. Moreover, individuals within the southern portion of the ranch exhibited high seasonal variability in home range size that was possibly a result of *in-situ* management.

Paper 13

THE IMPACT OF A RUN-OF-THE-RIVER HYDROELECTRIC DAM ON A NON-VOLANT SMALL-MAMMAL ASSEMBLAGE IN BRAZILIAN AMAZONIA Raylenne da Silva Araujo¹, Paulo Estefano Dineli Bobrowiec¹, Raquel Teixeira de Moura², and William Ernest Magnusson¹ - ¹Graduate Program in Ecology, National Institute of Amazonian Research; ²Calispictus Environmental Consulting (araujo.raylenne@gmail.com)

There are few scientific studies evaluating the impact of loss of wetlands on the banks of tropical rivers on assemblages of small non-flying mammals. To understand the possible deleterious effects of hydroelectric construction in tropical forests on this group of mammals, we used data from two years of

monitoring carried out during the period before the filling of a hydroelectric-plant reservoir in the Brazilian Amazon, and related them to vegetation, soil and topography. We captured 659 individuals of 20 small-mammal species. The species assemblage composition in the flooded areas was a subset of species that occurred in both floodable and non-floodable areas, and only one species was captured exclusively in the flooded area. Species composition was influenced by the proportion of sand, by soil nutrient concentration, and distance from water bodies. We conclude that there is no evidence that the flooding of low-lying areas along the Madeira River would negatively affect the assemblage of non-flying small mammals in the short term, because the remaining areas have similar assemblages of small mammals as those destined for flooding. Whether the area lost will be important for population dynamics will depend on the conservation of the remaining areas.

Paper 14

ACTIVITY LEVELS RELATED TO LUNAR BRIGHTNESS AND DIEL ACTIVITY PATTERNS OF TAPIRIDAE AND FELIDAE SPECIES ACROSS NEOTROPICAL SITES Stefanie Bergmanson - Department of Biology at Texas State University (sb1456@txstate.edu)

Tapirs serve important ecological roles (e.g., as seed dispersers) and have serious conservation and management needs due to anthropogenic influences of their habitats. However, details of their ecology are not well understood as tapirs are difficult to study because of the secretive nature and usually low densities over wide areas. I used circular statistics and a null model approach to analyze a set of camera trap records (N= 8,889) from 16 sites in Central and South America. I examined the diel activity patterns and amount of activity along lunar phases for the Lowland tapir (*Tapirus terrestris*), Mountain tapir (*Tapirus pinchaque*), and Baird's tapir (*Tapirus bairdii*), as well as for their main potential predators Jaguar (*Panthera onca*) and Puma (*Puma concolor*). For all species I used a null model approach to evince highly temporal coincident activity patterns among sites, thus allowing the examination of activity using a wider scope, instead of a site based traditional approach. Most species showed trends for nocturnal activity patterns although they had a heterogenous variation. Pairwise comparisons of activity patterns between *Tapiridae* and *Felidae* species indicated significant temporal partitioning. Baird's and Lowland tapirs showed a preference for activity during relatively bright nights (waxing gibbous for both species) whereas Jaguar and Puma showed preference for the brightest nights in the lunar cycle (full moon in both cases). In conclusion, the high degree of temporal partitioning between *Tapiridae* and *Felidae* species suggests an avoidance of predators regardless of lunar brightness. Results also reveal strong evidence for similar activity patterns across broad geographical scales that allow for more biologically meaningful inferences to be made in relation to wildlife monitoring and conservation in the Neotropics.

Paper 15

EFFECTIVENESS OF SIMULATED WATER AS A LURE FOR BATS IN THE BIG BEND REGION Alexander Buckel and Loren K. Ammerman - Department of Biology, Angelo State University (abuckel@angelo.edu)

Mist netting is the most common method of capturing live bats. Mist nets are often placed over bodies of water to catch bats attempting to drink. In dry areas, finding bodies of water with space for a net can be difficult. Prior research has shown bats in captivity attempting to drink from smooth flat surfaces, as these surfaces reflect echolocation signals similarly to water. It is unknown if bats in the wild respond the same way to a smooth surface, or if similar surfaces could be used as a mist net lure. We used two simulated water surfaces at two state park properties in Presidio County, Texas to test them as a potential novel mist net lure. Each simulated water surface was compared to a negative control, a mist net over bare ground. We conducted the experiment at 11 locations. We also trained a camera on each type of lure to determine if bats behaved differently around simulated water without a mist net. Recordings were made at each mist netting location and an additional 3 locations in Presidio. We captured 14 bats from 3 species (*Antrozous pallidus*, *Parastrellus hesperus*, and *Myotis velifer*) across all netting locations, seven in the control net

and seven between each simulated water surface. Preliminary results indicate neither simulated water surface works as a lure in the wild.

Paper 16

BLUBBER HORMONES AND EPIDERMAL INTEGRITY AS INDICATORS OF PHYSIOLOGICAL CONDITION OF BOTTLENOSE DOLPHINS (*TURSIOPS TRUNCATUS*) IN THE HYPERSALINE LAGUNA MADRE, TEXAS Makayla A. Guinn¹, Christiana S. Wittmaack-Kumar², Justin Y. Elliott¹, Carrie Sinclair³, Dara N. Orbach¹ - ¹Department of Life Sciences, Texas A&M University-Corpus Christi; ²Hydrosphere LLC; ³National Oceanic and Atmospheric Administration, National Marine Fisheries Service (mguinn1@islander.tamucc.edu)

Common bottlenose dolphins (*Tursiops truncatus*) in the Gulf of Mexico are important bioindicators of ecosystem welfare and are subject to frequent extreme environmental perturbations (e.g., adverse tropical weather). Low salinity (< 10 ppt) exposure in dolphins is known to elevate steroid hormones and induce severe potentially fatal skin disorders. Hypersaline environments are rare in nature and it remains unknown how dolphins maintain physiological balance in such conditions. Common bottlenose dolphins are routinely encountered in Laguna Madre (LM), Texas, the only hypersaline (36-40 ppt) lagoon in the USA and one of six in the world, and are managed as a unique stock. We assessed the physiological state of dolphins in LM through: 1) development of a baseline hormone profile from remotely biopsied blubber using high-resolution liquid chromatography-mass spectrometry and 2) measurement of epidermal integrity using photographs collected from a research boat. Genetically distinct dolphins inhabiting a nearby Texas channel with average seawater conditions (27-30 ppt) were sampled for comparison. Preliminary findings indicate detectable levels of steroid hormones including cortisol, cortisone, corticosterone, and aldosterone present in dolphin blubber and a difference in the prevalence of skin disorders between the two stocks. This study is the first to assess the physiological condition of dolphins in a natural hypersaline environment and the first to validate aldosterone, an important regulator of internal salt and water balance, in dolphin blubber. Health data collected can predict dolphin susceptibility to environmental disturbances that alter salinity and induce negative physiological responses, assisting in the conservation of marine life across the Gulf of Mexico.

POSTERS AT-A-GLANCE

Competing for the Vernon Bailey Graduate Award (Posters 1–3):

1 – FUNCTIONAL DIVERSITY OF FOREST INTERIOR INSECTIVOROUS BAT COMMUNITIES DECREASES FOLLOWING FOREST FRAGMENTATION

Isham Azhar

2 – ILLUSTRATED KEY TO THE MAMMALS OF TEXAS

Katelyn M. Albrecht

3 – INFLUENCE OF TRAFFIC VOLUME ON THE VARIATION IN THE MAMMAL COMMUNITY COMPOSITION WITHIN THE ROAD EFFECT ZONE

Thomas J. Yamashita

Competing for the Vernon Bailey Undergraduate Award (Posters 4–8):

4 – WHY BOTTLENOSE DOLPHINS (*TURSIOPS TRUNCATUS*) ORIENT AGAINST THE CURRENT

Emily Cano

5 – CURRENT ESTIMATE OF THE POPULATION ABUNDANCE OF BOTTLENOSE DOLPHINS IN THE TEXAS COASTAL BEND

Allison L. Wilkins

6 – CAMERA TRAPPING SURVEY OF ABILENE STATE PARK IN 2022: THE YEAR OF THE PORCUPINE

Blakely Eller

7 – BIODIVERSITY ASSESSMENT AND ESTIMATION OF POPULATION DENSITY OF RODENTS AT FIREBASE LIBBY, CALLAHAN COUNTY, TEXAS

Luke Marshall

8 – GEOGRAPHIC, SUBSPECIFIC, AND SEXUAL DRIVERS OF PHENOTYPIC VARIATION IN CAVE BATS (*MYOTIS VELIFER*)

Amanda N. Newman

9 – FOX SQUIRREL (*SCIURUS NIGER*) ACORN PREFERENCES AND BEHAVIORS ON A COLLEGE CAMPUS

Madeline LeBlanc

Competing for the Clyde Jones Undergraduate Award (Poster 10):

10 – GENETIC VARIATION IN AN ISOLATED ELK POPULATION IN THE WICHITA MOUNTAINS WILDLIFE REFUGE, OKLAHOMA: A 20 YEAR COMPARISON

Katheryn Gray

Competing for the Clyde Jones Graduate Award (Posters 11-13):

11 – PHYLOGENETIC ANALYSES OF PAINTED SPINY POCKET MICE (*HETEROMYS PICTUS*) AND JALISCAN SPINY POCKET MICE (*HETEROMYS SPECTABILIS*) BASED ON EXOMIC REGIONS

Joanna R. Bateman

12 – THE EFFECT OF HOST PHYLOGENY AND DIET ON THE RODENT GUT MICROBIOME

Sufia A. Neha

13 – OPTIMIZING INSECT METABARCODING FOR STUDIES OF INSECTIVOROUS MAMMAL DIETS

Hendra F. Sihaloho

Poster Presentation Abstracts

Posters 1-3 are to be considered for the Vernon Bailey Graduate Award.

Poster 1

FUNCTIONAL DIVERSITY OF FOREST INTERIOR INSECTIVOROUS BAT COMMUNITIES DECREASES FOLLOWING FOREST FRAGMENTATION Isham Azhar^{1,2}, Hendra Sihaloho¹, Caleb Phillips^{1,3}, and Tigga Kingston^{1,2} - ¹Department of Biological Science, Texas Tech University, Lubbock, Texas; ²Southeast Asian Bat Conservation Research Unit, Lubbock, Texas; ³Natural Science Research Laboratory, Texas Tech University, Lubbock, Texas

Habitat loss and fragmentation is one of the main causes of biodiversity loss in the Anthropocene. It is well established that there is a negative relationship between taxonomic diversity and the disturbance of various taxa, including bats. However, understanding the complex mechanisms that contribute to species coexistence and maintenance in severely disturbed ecosystems remains limited. To fill this knowledge gap, we used bat species traits related to species performance, resource acquisition, and roost type to measure changes in functional diversity to assess forest interior insectivorous bat responses to habitat fragmentation. The study was undertaken at Tengku Hasanah Wildlife Reserve and the forest fragments embedded within the surrounding landscape in Malaysia. We quantified the functional diversity of bat assemblages from five continuous forests and 15 forest fragments. Our results uncovered that functional diversity in forest fragments decreases at the landscape level. We also found that the higher functional richness in a few of the medium and small fragment sites is driven by the presence of cave bats and rare bat species that were not detected in the continuous forest sites. Functional richness, functional evenness, functional divergence, and functional dispersion decreased with fragmentation, whereas nearest-neighbor distances between species within the functional space increased with fragmentation. Our findings on the decline in functional diversity with forest fragmentation provide valuable insights into the impacts of forest fragmentation and disturbance and the maintenance of the palaeotropical forest interior insectivorous bat assemblages.

Poster 2

ILLUSTRATED KEY TO THE MAMMALS OF TEXAS Robert D. Bradley¹, Richard D. Stevens², Lisa C. Bradley³, David J. Schmidly³, and Katelyn M. Albrecht¹ - ¹Department of Biological Sciences, Texas Tech University; ²Department of Natural Resources Management, Texas Tech University; ³Natural Science Research Laboratory, Museum of Texas Tech University (katelyn.albrecht@ttu.edu)

Accurate methods for taxonomic identification are necessary to essentially every arena of biological study. Most identification methods involve working through a dichotomous key steeped in knowledge of characters, morphological structures, and a plethora of definitions. To experienced biologists this can be a daunting task depending on one's knowledge and familiarity of a taxonomic group; to the novice this may prove insurmountable. Our primary goal in this project was to develop a key to the mammals of Texas where each character was defined and illustrated so that the user could more easily move from one couplet to another. For this, we developed keys at the Ordinal, Familial, Generic, and Species level for each Texas mammal. A second goal was to provide side-by-side illustrations to help clarify the character of interest. A third goal was to include both external and skeletal characteristics, where possible, so that the user could make some decisions without having to capture an animal or prepare a scientific voucher specimen.

Poster 3

INFLUENCE OF TRAFFIC VOLUME ON THE VARIATION IN THE MAMMAL COMMUNITY COMPOSITION WITHIN THE ROAD EFFECT ZONE

Thomas J. Yamashita¹, David B. Wester¹, Zachary M. Wardle¹, Daniel G. Scognamillo¹, Landon R. Schofield², Michael E. Tewes¹, John H. Young Jr.³, Jason V. Lombardi^{1,4} - ¹Caesar Kleberg Wildlife Research Institute, Texas A&M University – Kingsville; ²East Foundation; ³Environmental Affairs Division, Texas Department of Transportation; ⁴Wildlife Health Laboratory, California Department of Fish and Wildlife (tjyamashta@gmail.com)

Disturbance from vehicle noise and human activity extends into the nearby habitat, creating a road effect zone characterized by changes in the wildlife community structure and species' behavior. This can impact conservation efforts along roads, such as wildlife crossing construction. To ensure that conservation efforts are effective, we must understand how vehicle traffic impacts mammals living around roads. We set up camera traps along a low-traffic highway on the East Foundation's El Sauz Ranch in Willacy County and along a high-traffic highway on a private ranch located in Kenedy County in March 2022. We set up cameras using a randomized block design along seven transects set perpendicular to the highway. Seven cameras were set up in each transect, at 200 m intervals, starting 50 m from the highway. We assessed how traffic volume and distance from highway affected mammal diversity, richness, and community composition. We have detected ocelot, bobcat, coyote, badger, raccoon, nilgai, white-tailed deer, Virginia opossum, eastern cottontail, javelina, and feral hog on camera traps. Species richness and diversity were greater further from roads, especially on the high-volume highway. Our study will provide information on how carnivores, ungulates, and other mammals use these road effect zones and how vehicle traffic impacts use. By comparing a low-traffic road to a high-traffic road, we will provide key information to landowners and the Texas Department of Transportation about how traffic volume could impact management practices of working lands around highways and future highway mitigation efforts for ocelots and other mammals.

Posters 4-8 are to be considered for the Vernon Bailey Undergraduate Award.

Poster 4

WHY BOTTLENOSE DOLPHINS (*TURSIOPS TRUNCATUS*) ORIENT AGAINST THE

CURRENT Emily Cano, Eliza Mills, and Dara Orbach - Department of Life Sciences, Texas A&M University-Corpus Christi, Corpus Christi, Texas (ecano3@islander.tamucc.edu)

Common bottlenose dolphins (*Tursiops truncatus*) have been observed engaging in unusual behavior in Port Aransas, Texas; "orientation against the current" (OAC) happens when dolphins swim in the opposite direction of the current, remaining stationary. Few studies have mentioned OAC behavior but have not investigated the causation of the occurrence. The function of OAC is explored and we hypothesize that it may be a foraging tactic. Environmental conditions during which dolphins engaged in OAC behavior is assessed and compared with conditions when dolphins were known to forage. Data were collected along the Corpus Christi Ship Channel from June 2021 to October 2022 by theodolite tracking dolphins. The time of day (morning, afternoon, late afternoon, and evening), season (summer, fall, winter, spring), current speed (0-1, 1.01-2, 2.01-3 knots, acquired from the National Oceanic and Atmospheric Administration) and group size (1-5, 6-10, 11-15 animals) were recorded while the theodolite scanned the channel, taking note of OAC behavior was present or not. Chi-square goodness of fit tests were used to test for relationships. No significant relationship was found between OAC occurrence and time of day, but significant relationships were found with seasons, current speed, and group size. OAC occurrences were most frequent during the winter, in strong currents (2.01-3 knots) and in small group sizes (1-5 dolphins). Past studies in the region found that bottlenose dolphins foraged most during August-December, in average group sizes of 4-5 dolphins and during strong current speeds, supporting our hypothesis. Our findings may be useful in areas where OAC occurs but has not been fully understood.

Footage of dolphins will be obtained through the use of an unmanned aerial vehicle to see if fish are present, and dolphins are feeding while engaging in OAC behavior.

Poster 5

CURRENT ESTIMATE OF THE POPULATION ABUNDANCE OF BOTTLENOSE DOLPHINS IN THE TEXAS COASTAL BEND Allison L. Wilkins¹, William McGlaun², and Dara N. Orbach¹ -

¹Texas A&M University-Corpus Christi; ²Texas Sealife Center (allison.wilkins@tamucc.edu)

Bottlenose dolphins (*Tursiops truncatus*) are the only marine mammal species residing in the inshore area of Texas Coastal Bend (TCB). The National Oceanic and Atmospheric Administration (NOAA) has recognized TCB dolphins as imperiled due to high levels of anthropogenic and natural threats. Despite these threats and dramatic industrial growth, there has not been published research on this population since aerial surveys were completed in 1983 and 1994. It is important to monitor and update information on the local dolphin population to inform policymakers of conservation needs. The population abundance of dolphins inhabiting the TCB was determined by counting the number of individuals based on unique markings on their dorsal fins captured in photographs. Since 2020, boat-based photo-identification surveys (n = 48) were conducted each quarter of the year to sample and resample dolphins. Photographs collected were quality control checked, cropped, and matched by a minimum of two researchers. Data were analyzed using Cormack-Jolly-Seber models. The population abundance estimate is 1058.824 for Corpus Christi Bay, 1560.195 for Aransas/Redfish Bay, and 1888.324 when the model is applied to both areas. The data indicate a substantially larger population size compared to the 220 dolphins (130 in Aransas Pass, and 90 in Corpus Christi Bay) reported in 1983. The population appears to consist of residential individuals that are recurrently resighted as well as transient individuals. Findings from this study provide insights into the size and stability of the population that can be used as baseline data for future research and conservation actions.

Poster 6

CAMERA TRAPPING SURVEY OF ABILENE STATE PARK IN 2022: THE YEAR OF THE PORCUPINE Blakely Eller, Gracie Granados, and Thomas E. Lee, Jr. - Department of Biology, Abilene Christian University, Abilene, Texas 79699 (blakelykate13@gmail.com)

Camera trapping has become very popular as a tool for basic data collection in the study of terrestrial mammals. The method of camera trapping is a relatively simple and cost-effective means of collecting data. While camera traps were primarily used in the past for specific observations, like activity patterns, they are increasingly being used to collect data for abundance indices and species richness. This is the fourth year of camera trapping Abilene State Park in Taylor County, Texas. We set up 11 cameras around the Abilene State Park area as part of the Snapshot USA program run by Wildlife Insights. These cameras captured images from September to November 2022, capturing a total of 18 identified different mammal species. We found a number of interesting findings that distinguish 2022 from the previous three surveys. These findings include: the first camera capture of jackrabbits, first excellent-quality sighting of multiple porcupines, a beaver sighting, and a coyote playing with one of our camera traps. From the camera trapping data collected over these two months, a significant discovery was that the feral hog population, *Sus scrofa*, now outnumbers the White-tail deer sightings, *Odocoileus virginianus* in Abilene State Park.

Poster 7

BIODIVERSITY ASSESSMENT AND ESTIMATION OF POPULATION DENSITY OF RODENTS AT FIREBASE LIBBY, CALLAHAN COUNTY, TEXAS Luke Marshall, Bricelynn Sikes, and Joel G. Brant - Department of Biology, McMurry University (marshall.luke@mcm.edu)

Documenting how the rodent community fluctuates throughout the year and between habitats is an important step in understanding how the local area responds to environmental changes. Since 2019, we have conducted monthly surveys of the rodent community at Firebase Libby, a 160-acre property in

central Callahan County, Texas. The property contains two habitats: savanna grassland (~40%) and post oak woodland (~60%). A single trapping array of 160 Sherman traps placed in a wagon wheel arrangement with 20 traps per spoke and eight spokes (one for each cardinal direction) were established in each habitat beginning in April 2019. Trapping arrays were run for two nights each month and all new captures were measured and injected with an RFID chip to identify each individual. All captured and recaptured individuals were released at the point of capture. Individuals that perished were collected and deposited in the McMurry University Mammal Collection. Rodent diversity was assessed using Margalef's richness, Berger-Parker dominance, Simpson's evenness, and Shannon's diversity. All diversity analyses were run in Matlab 6.0. Density estimates were calculated using the Cormack-Jolly-Seber model and run in Mark software. Seven rodent species were encountered at Firebase Libby. *Peromyscus attwateri* dominated the wooded habitat while *Baiomys taylori*, *Reithrodontomys montanus*, and *Reithrodontomys fulvescens* were more common in the grassy habitat. The grassy habitat was significantly more diverse than the wooded habitat primarily because the grass is less dominated by one species than the woods. The habitats were not significantly different in terms of richness. Only three species had sufficient recaptures to merit density estimation. *Peromyscus attwateri* had an average density estimate of ~10 individuals per wooded acre. *Baiomys taylori* had an average density estimate of ~4 individuals per grassy acre. *Reithrodontomys fulvescens* had an average density estimate of ~2 individuals per grassy acre.

Poster 8

GEOGRAPHIC, SUBSPECIFIC, AND SEXUAL DRIVERS OF PHENOTYPIC VARIATION IN CAVE BATS (*MYOTIS VELIFER*) Amanda N. Newman, John D. Stuhler, and Richard D. Stevens - Department of Natural Resources Management, Texas Tech University, Lubbock, TX, USA 79409 (ANN, JDS, RDS), Natural Sciences Research Laboratory, Museum of Texas Tech University, Lubbock, TX, USA 79415 (RDS) (amanda.n.newman@ttu.edu)

Phenotypic variation can assume multiple forms, including variation between sexes, among subspecies, or along environmental clines. Importantly, these sources of variation may interact, especially across large spatial and/or temporal extents. We examined phenotypic variation within *Myotis velifer*, a bat distributed across the southwestern United States and Mexico to Honduras. In particular, we measured a series of external and cranial characters for three described subspecies (*M.v. incautus*, *M.v. magnamolaris*, and *M.v. velifer*) to identify potential differences among sexes and subspecies. We also used multivariate analyses to relate variation in morphological characteristics to spatial and environmental gradients. We found significant differences in cranial and external characters among subspecies, but no differences between sexes and no sex-by-subspecies interactions. We also demonstrated that subspecies and spatial and climatic gradients all explained significant unique variation in cranial and external morphology, with climatic gradients explaining the most. Results from this work support existing subspecific designations for this species as well as demonstrate the importance of accounting for geographic clines when examining phenotypic variation in the context of subspecific delineation.

Poster 9

FOX SQUIRREL (*SCIURUS NIGER*) ACORN PREFERENCES AND BEHAVIORS ON A COLLEGE CAMPUS Madeline LeBlanc - Department of Biology, Austin College (mleblanc19@austincollege.edu)

Fox squirrels (*Sciurus niger*) are common rodents in the eastern and central United States, where they inhabit open deciduous forests. Although fox squirrel diet varies depending on geographic location, they are described as omnivorous, with mast and plant matter consisting of much of their diet. Fox squirrels, along with other tree squirrels, exhibit scatter-hoarding behavior, wherein an individual will store collected food in a number of discrete locations. This study investigated squirrel dietary preferences in two dimensions: acorn species (e.g., do squirrels prefer one acorn over another?) and food quality (e.g., do squirrels prefer whole acorns over damaged acorns?). We also measured caching and foraging

behaviors. To accomplish this, eight feeding trays were set up underneath trees on the Austin College campus that hosted squirrel nests. Each tray was filled with an equal number of whole and damaged southern live oak (*Quercus virginiana*) and Shumard oak (*Quercus shumardii*) acorns. Trays were left out for three days, with behaviors being observed with motion-sensitive trail cameras. We found that fox squirrels significantly preferred whole Shumard oak acorns over all other acorns available in the feeding trays. Possible motivations for such a preference are discussed, including nutritional and practical motivations. From here, links between diet and behavior can be drawn and possibly extrapolated to other North American rodents.

Poster 10 is to be considered for the Clyde Jones Undergraduate Award.

Poster 10

GENETIC VARIATION IN AN ISOLATED ELK POPULATION IN THE WICHITA MOUNTAINS WILDLIFE REFUGE, OKLAHOMA: A 20 YEAR COMPARISON Katheryn Gray, Cally Ruiz, and Dana N. Lee - Department of Agriculture, Biology, and Health Sciences, Cameron University (kg943584@cameron.edu)

Elk (*Cervus canadensis*) were traditionally distributed across most of the continental U.S. but were extirpated from most of the U.S. by the 1920's. Remaining populations were protected in the Greater Yellowstone Ecosystem. In effort to protect the species, 21 individuals from this source population were translocated to the Wichita Mountains Wildlife Refuge (WMWR) in 1908-1912. Over the decades this population has been protected but also isolated from other populations of elk. Slow population growth was further hindered by a 70% decrease in population size throughout the 1960's-1970's. Population size was estimated to be 500 individuals in 2001 when a previous study used microsatellites to examine the genetic variation in this slow growing introduced population. Researchers found the WMWR population had zero unique alleles and the second lowest levels of heterozygosity when compared to 4 other reintroduced populations (Hicks et al 2007). It was suggested the population suffered from a founder effect and later genetic bottleneck that could have negative effects on the population. Therefore our objective is to reexamine this population 20 years later and assess if genetic variation levels have improved as the population has grown to a size of 1,300. We obtained 56 samples of muscle from hunter harvested specimens in 2021 and have analyzed genetic variation using 10 of the 12 microsatellite loci used in Hicks et al (2007). This is a unique opportunity to both inform biologists at the WMWR about the genetic health of their elk population and provide insight into potential refinements of future reintroduction methods.

Posters 11-13 are to be considered for the Clyde Jones Graduate Award.

Poster 11

PHYLOGENETIC ANALYSES OF PAINTED SPINY POCKET MICE (*HETEROMYS PICTUS*) AND JALISCOAN SPINY POCKET MICE (*HETEROMYS SPECTABILIS*) BASED ON EXOMIC REGIONS Joanna R. Bateman¹, Caleb D. Phillips^{1,2}, and Robert D. Bradley^{1,2} - ¹Department of Biology, Texas Tech University; ²Museum of Texas Tech University (Joanna.R.Bateman@ttu.edu)

Heteromys pictus and *H. spectabilis* (family Heteromyidae) are members of a species complex of spiny pocket mice found across the coastal lowlands of western and southern Mexico. *Heteromys pictus* (currently considered to be of least concern) occupies the majority of the geographic range, whereas *H. spectabilis* (currently considered to be endangered) is restricted to a small region of southeastern Jalisco. Multiple phylogenetic analyses based on mitochondrial genes (i.e., Cytochrome *b* [*Cytb*]) and nuclear genes have provided significant evidence that the species complex is paraphyletic, with individuals of *H. spectabilis* forming a monophyletic group within *H. pictus*. The goal of this research is to resolve this paraphyly and if some lineages should be (re)classified as species-level taxa. Exome sequencing (Illumina) was performed on 20 ingroup individuals (and 1 outgroup) chosen to represent the 17

previously established *Cytb* “haplogroups,” as well as representing (historical and current) type localities within the species complex. Initial phylogenetic analyses from these datasets were constructed based on individual genes/ exomic sequences. Phylogenetic analyses are currently underway. Sequences found to not be under significant selective pressure or linked will be used to construct species-level trees. Individual gene tree and species-level tree topologies will be compared to predict the evolutionary history of these populations over time and which populations can be considered to be genetically distinct. Once the lineages are more clearly defined, these trees will be assessed under the context of Mexico’s geography and physical barriers to predict which populations are sufficiently distinct to be considered species-level taxa.

Poster 12

THE EFFECT OF HOST PHYLOGENY AND DIET ON THE RODENT GUT MICROBIOME

Sufia A. Neha¹, John D. Hanson², Jeremy Wilkinson³, Caleb D. Phillips¹, and Robert D. Bradley¹ -

¹Department of Biological Sciences, Texas Tech University; ²Blackhawk Genomics; ³PacBio

(sneha@ttu.edu)

Mammalian gut microbial communities play a variety of important roles in health and fitness, including digestion, metabolism, nutrition, immune response, behavior, and pathogen invasion. The gut microbiota diversity primarily is shaped by the phylogenetic relationship between hosts and the host’s diet. Although both host factors may influence microbial community structure, the percentage of contribution may vary depending on a number of variables, such as taxonomic scales of the species studied, host habitat, dietary patterns, geographic location, and gut physiology. The present study focused on twelve species of rodents representing three rodent families and three dietary guilds (herbivores, granivores, and omnivores) to evaluate the influence of host phylogeny and dietary guilds on microbial diversity and community composition. We collected colon samples from these species in Texas and Oklahoma and characterized them using high throughput 16S rRNA gene amplicon sequencing approach targeting V1-V2 variable regions. The results indicated that the microbiota of colon samples was largely dominated by the family Porphyromonadaceae (degrade cellulose and other plant polysaccharides) and that herbivorous hosts harbored richer gut microbial communities than other surveyed hosts. The gut microbiotas displayed patterns consistent with phylosymbiosis and host phylogeny explained more variation in gut microbiotas (31%) than host dietary guilds (8%). Furthermore, the gut microbiota similarity increased with host phylogenetic relatedness ($r = 0.34$, $p < 0.001$) and dietary guilds ($r = 0.21$, $p = 0.03$) across twelve host species. Overall, findings suggested that closely related hosts possessed similar microbiomes, which aid in colonizing microbial communities in similar niches, however, these structures may further be influenced by host dietary patterns.

Poster 13

OPTIMIZING INSECT METABARCODING FOR STUDIES OF INSECTIVOROUS MAMMAL DIETS

Hendra F. Sihaloho, Mohd Isham Azhar, Tigga Kingston, and Caleb D. Phillips - Department of Biological Sciences, Texas Tech University, Lubbock, TX 79409-3131 (HFS, MIA, TK, CDP); Natural Science Research Laboratory, Museum, Texas Tech University, Lubbock, TX 79409-3191 (CDP) (hendrasihaloho@ttu.edu)

Metabarcoding is widely used for molecular identification of organisms. For example, due to its efficiency and specificity characterizing bulk samples, the technique has been applied to bulk insect biodiversity surveys and dietary analysis. The mitochondrial Cytochrome oxidase I (COI) gene is the most widely gene used for metabarcoding in insect-related research, and although it has been used for nearly two decades, the reference databases that are used for taxonomic assignment and methods for survey still need improvement. The goal of this study was to establish best practice for molecular characterization of insect light trap collections that will be used to study ecosystem health and forest interior insectivorous bat niche. We sampled insect diversity using light traps in Tengku Hasanal Wildlife Reserve in Pahang, Malaysia. Each light trap sample was homogenized and repeatedly subsampled to

identify the optimum number of subsamples required to detect total sample diversity. COI insect diversity from 72 subsamples (12 subsamples from each of six light trap collections) was characterized using an Illumina MiSeq. The minimum number of subsamples required to be sequenced to achieve at least 90 percent insect diversity coverage for each light trap was determined. Also, Malaysian and an expanded Southeast Asian regional insect databases were built from the Barcode-of-Life sequence repository and compared for performance at different taxonomic ranks. The results of these efforts will provide measures of insect prey spatiotemporal diversity upon which our subsequent research on bat dietary niche space will be framed.

Texas Society of Mammalogists
41st Annual Members Business Meeting
11 February 2023

AGENDA

1. Call to Order
2. Approval of the minutes of the 2022 Member's Business Meeting
3. Officer Reports
 - a. Secretary-Treasurer, Tom Lee
 - b. Permanent Secretary, Joel Brant
 - c. Editor, Michelle Haynie
4. Committee Reports
 - a. Report of Honorary Membership Committee, Phil Sudman
 - b. Report of Financial Advisory Committee, Phil Sudman
 - c. Report of the Student Honoraria Committee, Jessica Healy-La Price
 - d. Report of the *ad hoc* Informatics Committee, Michelle Haynie
 - e. Report of the *ad hoc* Conduct Committee, Jessica Light
 - f. Report of the *ad hoc* Auction Committee, Krysta Demere
5. Officer Elections
 - a. President-Elect
 - b. Secretary-Treasurer
6. Old Business
7. New Business
 - a. Selection of site for 2024 Annual Meeting
8. Closing Remarks of TSM President, Ray Willis
9. Adjourn

Texas Society of Mammalogists
Treasurer's Report for 1 January to 31 December 2022
Submitted by Thomas E. Lee, Jr., Secretary-Treasurer

Income and expenses of TSM for the 2022 calendar year are shown below. Our checking account is with Bank and Trust. Our investments are handled by Morgan Stanley. The checking account balance as of the first of the year was \$728.09. Total income in 2022 was \$10,194.00 and total expenses were \$8,186.29. TSM total assets at the end of 2022 were \$104,544.38. The value of the investment fund decreased \$30,176.58.

Checking Account Balance as of 1 January 2022	\$728.09
Investment Account (Morgan Stanley) balance 1 January 2022	\$132,713.25
Total TSM assets as of 1 January 2022	\$137,619.06

2022 Income

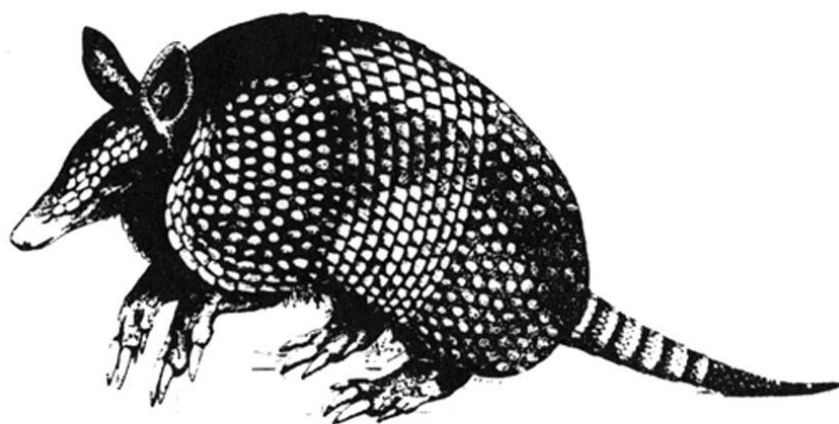
2022 Annual Meeting income (registration, meals and lodging fees)	
Student Registration	\$310.00
Late Registration	\$0.00
Non-Student Registration	\$1,360.00
Late fees	\$0.00
Meals	\$684.00
Lodging	\$435.00
Linens	\$0.00
2022 Membership dues	\$980.00
2022 Patron Memberships	\$785.00
2022 Contributions (any over \$1,000)	\$300.00
2022 Annual Meeting activities	\$0.00
T-shirts (106 ordered)	\$840.00
Auction Income	\$0.00
Entertainment (deposit refund)	\$0.00
Meeting photos	\$0.00
Transfer from Morgan Stanley account	\$4,500.00
Total income	\$10,194.00

2022 Expenses

2022 Annual Meeting Expenses to TTU Center	\$2,000.00
Reimbursements (for meals and housing)	\$886.48
Entertainment – DJ & Bartender	\$0.00
Refreshments/Beverages	\$0.00
Program copy charges (ASU print shop)	\$0.00
Computer, software, Zoom Webinar	\$0.00
Office supplies	\$0.00
Supplies, Honorary Awards	\$0.00
PO Box	\$0.00
Student Awards	\$3,700.00
T-shirts (106 ordered, 42 free)	\$846.52
Fuel to pick-up t-shirts (round trip Abilene to San Angelo)	\$27.97
Speaker Travel Reimbursement	\$0.00
Shipping	\$555.45
Transfer fee, Morgan Stanley	\$0.00
2022 Stripes fees (registration)	\$197.84
Total expenses	\$8,186.29

Checking Account Balance 31 December 2021	\$4,556.09
Investment Account (Morgan Stanley) balance 31 December 2021	\$102,536.67
Total TSM assets as of 31 December 2021	\$104,544.38

Texas Society of Mammalogists



**Newsletter
2023
The 41st Annual Meeting**

2023 Guest Speaker



Our banquet speaker will be Dr. Dana Karelus, State Mammal Specialist for Texas Parks and Wildlife Department (TPWD). Dr. Karelus started her position with TPWD in January of 2022 and her job is to identify and prioritize the research and conservation needs for Texas' non-game mammals (excluding bats) and coordinate projects that address those needs. Her Ph.D. is from the University of Florida, and she collaborated with Florida Fish and Wildlife bear biologists for her dissertation research on space use, movements, and habitat selection of black bears in an area recently recolonized by bears. Following that, she performed postdoctoral research at Borderlands Research Institute on a variety of species including mountain lions and kit fox. She also worked as a research scientist at Texas A&M Natural Resources Institute where she assisted with monitoring on military bases for Threatened and Endangered species as well as Species of Greatest Conservation Need, such as prairie dogs.

Patron Membership

Members are encouraged to consider becoming Patrons of the Society by donating \$100 (or more) to support the Society's student paper awards. A list of Patron members is published on the website and in the program. Regular Patron membership is achieved with a donation of \$100. Members who exceed \$100 in donations to the Society's student awards fund will receive a certificate recognizing their total donation level as follows: \$125, Ocelot Level; \$250, Bobcat Level; \$500, Puma Level; \$1000, Jaguar Level. Members can upgrade at any time, and all donations are cumulative. There is no time limit or minimum contribution requirement as a member works toward the next level. Donation levels are confidential.

News & Announcements

Professors Looking for Undergraduate Travel Opportunities in Tropical Biology / Conservation / Global Studies for 2024?

CREA*, a leading conservation and education non-profit organization is offering study abroad opportunities for professor-led undergraduate groups in 2024 to Panama (e.g., J-Terms, May terms, summer research experiences).

Why CREA?

- CREA has run tailored study abroad trips in Panama since 2007.
- CREA is a one stop shop and can organize (and recommend) every aspect of the study abroad trip while in Panama, depending on the focus of each group.
- CREA owns and operates the *Cocobolo Nature Reserve and Biological Field Station***, a hyper species-rich region with various forest types with limitless teaching and research possibilities.
- CREA has biological faculty of its own that can teach or facilitate teaching material while at the field station.
- CREA has active conservation/research projects at the Reserve within which students can participate.

Please see www.crea-panama.org or contact info@crea-panama.org for more information

*CREA, Conservation through Research Education and Action, is a not for profit 501(c)3 organization and Panamanian registered not for profit organization.

**The Cocobolo Nature Reserve and Field Station is set within the narrowest stretch of the Central American Isthmus where the Caribbean and the Pacific are separated by only 30 miles of ecologically diverse wilderness and human impacted landscapes. Abutting the continental divide it offers an excellent opportunity for students to learn about the rich natural history and evolution of tropical forests and their conservation.

PhD Research Assistantship: Ecology of activity patterns in mammals – Texas State University

I am looking for a highly motivated PhD student to participate in a research project related to large scale patterns of activity patterns of terrestrial mammal species and how do these are relevant to community structure. The basis for analyses will be camera trap data that will be evaluated in a macroecological comparative context. Thus, a student with a highly quantitative and integrative mindset is an asset and one well suited for this project. Student will be supported with a combination of Teaching and Research assistantships (12 mo. support + tuition remission). If interested, please reach out to Dr. Ivan Castro-Arellano (ic13@txstate.edu) to learn more details about this position (or reach out to me during the TSM Annual Meeting).

Students Wanted!

We would like to encourage students to become more actively involved in the society. One of the ways you can do this is to join a committee. Below are the committees that are open for participation. If you are interested in joining a committee, please let us know while you are at the meeting. You also can email TXmammals@gmail.com with the name of the committee(s) you would like to join. We will pass your name along to the committee chair and they will be in touch with you. In addition to committee work, we are looking for volunteers to assist at the meeting every year (e.g., help with registration, etc.). If you are willing to assist at the meeting, please email TXmammals@gmail.com and indicate when you would be available to help and what you would like to do.

Conservation Committee

The role of this Committee is to monitor governmental and other activities that relate to conservation of mammals in Texas; advise officers and membership of the Texas Society of Mammalogists on issues of concern; and respond to the issues via formal resolutions. This Committee is intended to serve as a clearinghouse for information on all aspects of conservation of Texas mammals and to maintain the capacity to respond promptly and effectively in crises.

Ad hoc Auction Committee

The role of this Committee is to request and collect donations, set up and help conduct the live and silent auctions at the meeting, and help collect payments at the end of the auctions. Even though we are virtual this year, you can still join the committee and help with preparations for our next in-person meeting.

Ad hoc Government Liaison Committee

The role of this Committee is to facilitate interactions between the Texas Parks and Wildlife Department and TSM regarding issues that might affect mammalian conservation and research in Texas. It is similar to the Conservation Committee but is aimed specifically at communicating with TPWD.

Ad hoc Informatics Committee

The role of this Committee is to update and maintain the web and social media presence of the society. TSM currently has Facebook and Twitter accounts.

Website Updates

We continue to work on updating the society website and are seeking requests for information you would like to see included on the site. Please send your suggestions and requests to Michelle Haynie (mhaynie@uco.edu; Editor).

Abilene Christian University

Department of Biology, 1600 Campus Court, Abilene, TX 79699



Tom Lee

Phone: 325-370-4442

Email: leet@acu.edu

Research Interests, Projects, and Grants:

In 2022, I used my Clark Stevens endowed professorship funds to attend the SPNHC meetings in Edinburgh, Scotland and the American Society of Mammalogists meeting in Tucson. I presented a paper on Tapichalaca mammals in Tucson. Furthermore, I conducted research in the lab on sequencing DNA of members of the genus *Thomasomys*.

Undergraduate Students and Their Research:

- My students and I are finishing another study on the mammals of the Andes of Ecuador in 2021. Jonathan Jasper, Nicholas Tinoco, and I worked at almost 8,000 feet in southern Ecuador on the last project. I worked with Claire Dunn to sequencing species of *Thomasomys* from the 2021 trip and others. Claire will present her findings at TSM.
- My students Blakely Eller and Gracie Granados conducted a camera trapping survey at Abilene State Park. This project (the fourth camera trapping year for Abilene State Park) was part of the emammal (snapshot) Smithsonian nationwide camera-trapping program. These data will be presented at TSM.
- I finished up a number of projects including one on a new species of *Thomasomys*: *Thomasomys burneoi*, named after Santiago Burneo who has helped me with all my trips to Ecuador over the last 20 years.

Additional Information:

The Abilene Christian University Natural History Collection catalog has been updated and the frozen tissue collection is easy to access (published in Collection Forum of SPHNC). The collection is now part of the ARCTOS and GBIF data base.

Angelo State University

Department of Biology, San Angelo, TX 76909



Loren K. Ammerman

Phone: 325-486-6643

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Web page: www.angelo.edu/content/profiles/75-loren-k-ammerman

Research Interests, Projects, and Grants:

I am interested in bats and other mammals. I work with students to use molecular data to reconstruct evolutionary relationships of organisms, to investigate genetic diversity, and to understand diet. I also am interested in distribution, community structure, and the ecology of bats, especially in Texas. Most recently I have been using thermal imaging and PIT tag systems to monitor seasonal roost use and colony size fluctuation of *Leptonycteris nivalis* in Big Bend National Park (funded by Bat Conservation International). See my ResearchGate profile <https://www.researchgate.net/profile/Loren-Ammerman> for recent publications.

Current Graduate Students and Their Research:

- **Rodrigo Andrade** – MS thesis student, topic to be determined, Fall 2022-present
- **Alex Buckel** – MS thesis student, Interaction of bats and simulated water surfaces in a desert habitat, Fall 2020-present
- **Will McCoy** – MS thesis student, Phylogenetic position of *Sauromys* and *Platymops* within Molossidae, Graduate Research Fellow, Fall 2021- present

Current Undergraduate Students and Their Research:

- **Mariah Martinez**– DNA barcoding of moths (ASU Undergraduate Research Scholar, Spring 2023)
- **Halle Summers** – Using DNA barcoding to confirm identification of *Peromyscus nasutus* from the Davis Mountains (ASU Undergraduate Research Scholar, Fall 2022-present)

Additional Information: The Angelo State Natural History Collection has over 20,000 mammal specimens and over 34,000 tissue specimens. The collection is searchable via Arctos at <https://www.angelo.edu/dept/asnhc/collections.php> and on VertNet and GBIF. You can contact me if you have any questions about the collection.



Robert C. Dowler

Phone: 325-486-6639

Email: robert.dowler@angelo.edu

Research Interests, Projects, and Grants:

Despite my retirement in August of 2022, I hope to continue research on spatial ecology of the plains spotted skunk (*Spilogale putorius interrupta*) in Texas, as well as other projects. I continue to have interest in all skunk species in Texas, porcupine dermatophytosis, and the conservation biology and systematics of Galapagos rodents.

Graduate Students and Their Research:

- J. Clint Perkins, former M.S. student is now a Ph.D. student at Texas Tech University working on the spatial ecology of populations of plains spotted skunks at the Katy Prairie. I am co-advisor with Dr. Richard Stevens at TTU.
- Madeline Arszulowics completed her M.S. thesis: A study of the parasitic fauna of North American spotted skunks (genus *Spilogale*) across the eastern and central United States.
- Matthew H. Hamilton completed his M.S. thesis: Home range analysis of sympatric striped and plains spotted skunks in southeastern Texas.
- Rebecca Scott completed her M.S. thesis: A resurvey of the terrestrial mammals of the Davis Mountains Preserve, Texas.

Austin College

900 N. Grand Ave., Sherman, TX 75090



Jessica Healy-La Price

Phone: 903-813-2338

Email: jhealy@austincollege.edu

Research Interests, Projects, and Grants:

My primary area of study is the physiological ecology of ground squirrels that hibernate. Using both laboratory and field populations of thirteen-lined ground squirrels, I investigate interactions between hormones that control food intake and reproduction. A current project involves investigating the latitudinal differences in hibernation patterns in thirteen-lined ground squirrels. I also have an ongoing long-term project examining the effects of small mammal exclosures on a prairie restoration site.

Undergraduate Students and Their Research:

- Adam Myers – Effects of hibernation on spatial memory in 13-lined ground squirrels
- Carolina Coreas – Mammal diversity at Hagerman National Wildlife Refuge
- Eli Aventa & Maddie LeBlanc – Foraging in fox squirrels
- Davis Stellman – Biotic and abiotic effects of small mammal exclosures at Sneed Prairie

Baylor University

Department of Biology, Waco, TX 76798



Kenneth T. Wilkins (Retired)

Phone: (254) 709-7211

Email: ken_wilkins@baylor.edu

After 39 years on the faculty at Baylor University, including 24 years in administration, I have retired. Of interest to Texas mammalogists is that the Department of Biology mammal collection has been transferred to a location on the Baylor campus that should ensure its care in perpetuity and its availability to researchers. The collection is now housed in Mayborn Museum, a larger museum complex that incorporates the former Strecker Museum.

A teaching collection remains with the Department of Biology, but the research caliber materials transferred to Mayborn Museum. The research collection comprises c. 2,000 specimens (predominantly skin & skull preparations of rodents and bats) mainly from Texas. The specimens represent vouchers from an array of projects: surveys on Texas Parks & Wildlife properties (Fort Parker State Park, Lake Fairfield State Park, Hill Country State Natural Area), population and community studies on Texas Nature Conservancy properties (Clymer Meadow, Leonhardt Prairie), and numerous master's theses and doctoral dissertations conducted at these and other locations. There are a few specimens from Mexico, collected in association with teaching and research at Chapala Ecology Station in Jalisco from 1992 through 2001. Inquiries related to the collection should be directed to Ms. Anita Benedict, Collections Manager at Mayborn Museum.

Cameron University

Lawton, OK 73505



Dana N. Lee

Phone: 580-591-8009

Email: dalee@cameron.edu

Research Interests, Projects, and Grants:

I primarily study bats and am interested in all aspects of their ecology, genetics, and evolutionary relationships; although, I use molecular biology tools to study the genetic variation of other wildlife populations. Undergraduate students in my lab are currently working to determine the levels of genetic diversity of elk present in the Wichita Mountains Wildlife Refuge. We are also planning two new projects to determine the diet of the ghost-faced bat and examine potential interspecific differences of cutaneous water loss in bats found in Big Bend National Park.

Centenary College of Louisiana

2911 Centenary Blvd., Shreveport, LA 71104



Scott Chirhart

Phone: 318-869-5209

Email: schirhar@centenary.edu

Research Interests, Projects, and Grants:

Evolutionary Biology, including: Evolutionary/Population Genetics, Vertebrate Speciation and Systematics, Molecular Variation

Houston Museum of Natural Science

Dept. of Vertebrate Zoology, 5555 Herman Park Dr., Houston, TX 77030-1799



Dan Brooks

Phone: 713-639-4776

Email: dbrooks@hmns.org

Web page URL: www.hmns.org/exhibits/curators

Research Interests, Projects, and Grants:

Although I do quite a bit of work with birds, research interests in mammalogy span a variety of topics including community and behavioral ecology, biogeography and taxonomy, harvest patterns, natural history, and conservation. I am particularly interested in Neotropical species in lowland regions east of the South American Andes (especially the Peruvian Amazon, Paraguayan Chaco, and eastern Bolivia). Additional regions of coverage include Texas, Middle America, Sub-Saharan Africa, and more recently Southeast Asia.

Current mammalogy projects I'm involved in include:

- The Houston Urban Wildlife Project (HUWP) features a section on urban mammal projects that we're involved in (www.hmns.org/huwp).
- This year we have new publications on urban mammalogy involving a Ringtail (*Bassariscus astutus*) outside its typical geographic range with comments on its activity patterns, as well as the effects of severe weather events (flooding and freezing) on a large urban population of free-tailed bats (*Tadarida brasiliensis*).

Additional Information: The primary driver of the Houston Museum of Natural Science is Education, including outreach. We educate every 4th and 7th grader in the Houston Independent School District annually (approx. 700,000 students/yr), have nearly 2.5 million individuals come through the doors per annum, and are the 4th highest attended museum in the country; surpassed only by Smithsonian, AMNH, and the MOMA. We are the highest attended US museum west of the Mississippi. Every year I tour college-level classes through our collections and permanent wildlife exhibit halls. If you have any interest in coming for a visit just touch base directly!

McMurry University

Department of Biology, Abilene, TX 79697



Joel G. Brant

Phone: 325-793-3875

Email: brant.joel@mcm.edu

Research Interests, Projects, and Grants:

My research interests are primarily concerned with the natural history of mammals, particularly in Texas and the Chihuahuan Desert. My current research program focuses on the natural history & ecology of mammals in the Southern Rolling Plains, northern Edwards Plateau, and northeastern Chihuahuan Desert. My current projects include a survey of the mammals of the Southern Rolling Plains, specifically Taylor County & surrounding areas (with Tom Lee); assessing the ecological impacts of wind farms on bat diversity; and various mammal, herp, and bird projects associated with Firebase Libby, a property owned by McMurry University located in Callahan County, Texas.

Midwestern State University

College of Science and Mathematics, 3410 Taft Blvd, Wichita Falls, TX 76308



Ray E. Willis

Phone: 940-397-4408

Email: ray.willis@msutexas.edu

Research Interests, Projects, and Grants:

I am the Chair of Biology and Curator of the Dalquest Vertebrate Collection. My current research is conducted at the Dalquest Research Station located on the northeastern border of Big Bend Ranch State Park. I have initiated ongoing herpetological and mammal surveys of Dalquest with monthly trips throughout the year, along with extended summer opportunities.

I am currently working on new grant opportunities for future funding of the Dalquest Desert Research Station.

Students and Their Research:

I currently have four graduate students working on various vertebrate morphology and phylogenetic research projects. I have funding for all current projects and anticipate having room for at least two more students who would be interested in vertebrate research.

Purdue University

West Lafayette, IN



J. Andrew DeWoody

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Email: dewoody@purdue.edu

Web page: <https://web.ics.purdue.edu/~dewoody/DeWoody/wordpress/>

Research Interests, Projects, and Grants:

Evolutionary genetics and genomics; molecular ecology and evolution; natural history; conservation biology; wildlife and fisheries management. Our research occurs at the intersection of ecology, evolution, conservation, and genomics. Ongoing or recent projects have centered on the distribution of genomic diversity in threatened or endangered (T&E) fishes, herps, birds, and a variety of mammals including marsupials, rodents, and cetaceans.

Graduate Students and Their Research:

My graduate students and postdocs work on a variety of questions in ecology and evolution, including important conservation issues related to T&E species (e.g., gray whale population structure). Students matriculate through either the Biology program or a Wildlife program.

Undergraduate Students and Their Research:

My undergraduates are all mentored by graduate students or postdocs. Most start as “assistants,” but the best students develop their own research projects.

Additional Information:

I am always looking for bright, motivated students so please contact me if you are interested in an immersive experience at a top-notch graduate school. See my webpage for more details.

Tarleton State University

Department of Biological Sciences, Stephenville, TX 76402



Philip D. Sudman

Phone: 254-968-9154

Email: sudman@tarleton.edu

Web page URL: faculty.tarleton.edu/sudman/

Research Interests, Projects, and Grants:

I continue to have a keen interest in pocket gopher genetics/phylogenetics/population genetics as well as general mammal historical biogeography. Although I am still teaching and doing limited research, the bulk of my time these days revolves around the development of a 780 acre ranch along the Colorado River south of Goldthwaite in Mills County into the Timberlake Biological Field Station (<https://www.tarleton.edu/timberlakeranch/index.html>). If anyone is interested in bringing classes for a day, a weekend, or longer, please contact me. Facilities include a classroom building, bathhouse, a small cabin, a large pavilion, and two bunkhouses with capacity for up to 24 students. Unfortunately, mammal diversity in this part of central Texas is rather limited, but birding, herping, and aquatic opportunities are fantastic!

Graduate Students and Their Research:

Madison Gover – Effects of the presence of American Bison (*Bison bison*) and Black-tailed Prairie Dogs (*Cynomys ludovicianus*) on small mammal diversity at Caprock Canyons State Park



Russell S. Pfau

Phone: 254-968-9761

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Web page: faculty.tarleton.edu/pfau/

Research Interests, Projects, and Grants:

My main research focus is population and evolutionary genetics—often with a focus on conservation biology. Small mammals have been the primary subject of my research, but I have broadened my taxonomic coverage to include crustaceans, fish, plants, frogs, and insects. Ongoing projects include:

- Distribution of shrews (*Blarina*) in the southern Great Plains region using mtDNA sequencing (for identification) and morphometric analysis to examine geographical patterns of variation
- Population genetics and soil-type correlations of several pocket gopher species in the genus *Geomys*
- Mitochondrial genomics of the mammalian suborder Castorimorpha
- Species status of two bumblebees in Texas (in collaboration with Jessica Beckham and Jeff Johnson)
- Phylogenetics and species discovery among the Texas anemones (windflowers)
- Population genetics of the Texas endemic plant, *Dalea reverchonii*

- Conservation genetics of the crawfish frog (State Wildlife Grant, TPWD) in collaboration with Toby Hibbitts, Texas A&M—College Station

Undergraduate and Graduate Students and Their Research:

- Julia Nitschmann – fine-scale population genetics of the pocket gopher *Geomys texensis*

Recent Graduates

- Two of my former students who presented their research at TSM within the past two years have graduated from Tarleton State University. Haley Greenia is employed at the Baylor College of Medicine Human Genome Sequencing Center. Shady Kuster is pursuing her PhD at Colorado State University studying mito-nuclear co-evolution.

Texas A&M Natural Resources Institute

1919 Oakwell Farms Parkway, Suite 100, San Antonio, Texas 78218



Stephanie Martinez-Brewer

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Email: Stephanie.martinez@ag.tamu.edu

Web page: <https://nri.tamu.edu/people/research/stephanie-brewer/>

Research Interests, Projects, and Grants:

I am a policy associate for Texas A&M Natural Resources Institute. I support the conservation of nationwide declining, threatened and endangered species by working with the U.S. Fish and Wildlife Service (Service), as well as state and federal partners, to build Species Status Assessments (SSAs) and other Endangered Species Act (ESA)

documents such as five-year reviews, and aiding in species range and habitat mapping. I primarily dedicate my work efforts to GIS-centered analysis for these projects. Since entering policy work in 2018, I have been a part of at least 10 assessment core teams, one being for the plains spotted skunk (*Spilogale interrupta*) in 2021-2022. I am currently a core team member and conducting the GIS work for two “high-profile” species assessments.

I also have previous experience with DoD Natural Resources programs for Texas military lands in environmental monitoring efforts that aid in the mitigation of negative urban-wildlife interactions, particularly those that pose as aircraft strike hazard risks on Air Force installations.

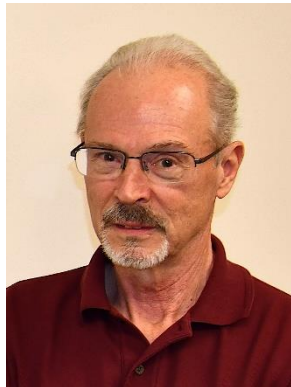
I received a Bachelor of Science in biology from Abilene Christian University in 2013, and a Master of Science in biology from Angelo State University in 2015. During my education, I worked almost exclusively with Mexican free-tailed bat urban populations. I am currently a member of the Texas Society of Mammalogists and Texas Chapter of the Wildlife Society.

My research interests include urban mammal ecology, and how human development influences behavior and species adaptation. I completed a project for DoD last year that focused on urban

Rio Grande ground squirrels (*Ictidomys parvidens*) occurring in west Texas. I have recently recovered from a severe invasive MRSA infection that resulted in numerous surgeries; I had my sixth and final surgery in September 2022. Outside of work, I enjoy the outdoors by birdwatching, hiking, and half marathon training. I plan to return to in-person races in December of this year.

Texas A&M University-College Station

Department of Ecology and Conservation Biology, Biodiversity Research and Teaching Collections, Texas A&M University, College Station, TX 77843



Thomas E. Lacher, Jr. (Professor Emeritus)

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Research Interests, Projects, and Grants:

Ecology and conservation of macaw species in Peru; livestock, Mammalian biodiversity, and local communities in Huascan National Park in Peru; Transboundary conservation of bats and agaves in the Texas and northern Mexico; Acoustic biology of nectar-feeding bats in northern Mexico; Models of white-nose transmission in bats in Texas and Mexico; Payment for ecosystem services and mammalian conservation on a landscape matrix in Costa Rica; Spatial ecology of sloths in Costa Rica; Fragmentation and mammalian biodiversity in Costa Rica; Population and community ecology of bats in the southern Brazilian Atlantic Forest; Cacao plantations and marmoset ecology in the Brazilian Atlantic Forest; Climate change and land-use impacts on amphibians in Colombia; Assessment and monitoring of globally threatened species of Rodentia, Eulipotyphla, and Scandentia.

Graduate Students and Their Research:

- Jessica Gilbert, Ph.D. The impacts and dynamics of the socio-ecological system of livestock grazing on biodiversity in the Huascan Biosphere Reserve. Major Advisor.
- Alaya Keane, M.S. Impacts of intensity of cacao agroforestry on primate communities in the Brazilian Atlantic Forest. Major Advisor.

Undergraduate Students and Their Research:

- Sidney Sanchez: Assisting with the Small Mammal Specialist Group Extinction risk assessment

Additional Information:

- Recipient of the Aldo Leopold Award from the American Society of Mammalogists
- Member of the IUCN Red List Committee (Planning Committee for the Red List Process)
- Co-Chair IUCN Small Mammal Specialist Group

- Member, IUCN Climate Change Specialist Group
- Associate Conservation Scientist, Re:wild, Austin, Texas
- Co-Editor, Volumes 6 and 7, Handbook of the Mammals of the World and Volumes 1 and 2 of the Illustrated Checklist of the Mammals of the World



Jessica Light

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Research Interests, Projects, and Grants:

I am an evolutionary biologist with a focus on phylogenetic, population genetic, and ecological interactions between parasites and their hosts.

To address these broad research interests, I employ a variety of tools such as molecular (multiple genes, population genetic loci, or genomic data) and morphological data from field-collected and museum specimens. My lab is currently funded by the National Science

Foundation on four separate projects: 1) Thematic Collections Network to digitize external parasites of terrestrial vertebrates; 2) Mid-career OPUS to study *Peromyscus* systematics; 3) Collaborative research exploring sucking louse phylogenetics and genomic and morphological selection; and 4) Thematic Collections Network to digitize mammal specimen data from western North America (funding begins in May 2023).

Graduate Students and Their Research:

- Oluwaseun David Ajileye is a 1st-year Ph.D. student interested in host-parasite coevolution, vector-borne disease, and genetic diversity in small mammals and their parasites.
- Ayomiposi Ayodele is a 1st-year Ph.D. student interested in tracking the effects of climate change on mammals and birds. She also is interested in the effects of microplastics on organismal health.
- Rhiannon Belcher is a 3rd-year Ph.D. student interested in lemur evolution, specifically causes of lemur mortality and MHC diversity.
- Brady Craft is a 1st-year M.S. student interested in the evolution of morphological, physiological, and behavioral adaptation mechanisms in different mammalian species. Brandy is working on morphological evolution in *Peromyscus* for her thesis.
- Haley Ellis is a 1st-year M.S. student interested in wildlife conservation, especially endangered species, and wildlife rehabilitation. Haley is working on morphological evolution in *Peromyscus* for her thesis.
- Natalie Hamilton is a 4th-year Ph.D. student studying the population genetics, relatedness, and social connectivity of Townsend's big-eared bats across the western United States. She also is working on several *Peromyscus* systematics projects.
- Ali Lira is a 2nd-year Ph.D. student interested in Neotropical bat flies, bats, and host-parasite coevolution. For her dissertation research, Ali will explore species delimitation in bat flies using morphological and molecular data.

Undergraduate Students and Their Research:

- Katelyn Sanchez is a 3rd-year undergraduate student interested in conservation biology. She is currently working on a bat population genetics study with graduate student Natalie Hamilton.

Technicians and Their Research:

- Danielle Dillard is investigating interactions between the giant kangaroo rat and a trombiculid mite. She also is interested in porcupine range expansions and several other projects ongoing in the Light lab.

Additional Information:

The mammal division in the Biodiversity Research and Teaching Collections (<http://brtc.tamu.edu>) currently has over 67,000 specimens. Our data are available online through VertNet, iDigBio, and GBIF.

Texas A&M University-Corpus Christi

Department Life Sciences, Texas A&M University- Corpus Christi, Corpus Christi, TX 78412



Dara Orbach

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Research Interests and Projects:

My research interests are the functional anatomy and behavioral ecology of marine mammals. My functional anatomy research focuses on reproductive morphology and explores potential evolutionary drivers of diverse genital forms and coevolution between the sexes. My behavioral ecology research assesses mating patterns, decision-making processes, and population biology. Current graduate and

undergraduate lab members are doing: 1) sperm biology analyses to help conserve dolphins through advancements in assisted reproductive technology, or 2) land or boat-based research to explore the population dynamics, habitat use, and health of bottlenose dolphins exposed to extensive anthropogenic disturbances in Coastal Bend, TX.

Graduate Students and Their Research:

- Eliza Mills, M.S. student. Shore-based theodolite tracking of bottlenose dolphin movement and behavior in the Corpus Christi Ship channel
- Jackie Rich, Ph.D. student. Novel artificial vagina development to improve ejaculate quality in dolphins
- Makayla Guinn, M.S. student. Physiological effects of high salinity exposure on common bottlenose dolphins (*Tursiops truncatus*)

Undergraduate Students and Their Research:

- One honors/LSAMP student (Emily Cano) is currently researching why dolphins orient against the current
- One honors/LSAMP student (Ally Wilkins) is currently researching bottlenose dolphin population abundance
- One honor's student (Austin Willson) is currently researching shark morphology
- Three honors students (Anya Ocampos, Leala Punjabi, Maddy Licker) are currently conducting research using bottlenose dolphin photo-identification

Additional Information:

- I have supervised over 130 undergraduate students from groups historically underrepresented in STEM disciplines and serve as a faculty mentor to four professional organizations.
- I do extensive public outreach that highlights the historic gender bias in the field of genital evolution.

Texas A&M University-Kingsville

Feline Research Program, Caesar Kleberg Wildlife Research Institute



Michael Tewes

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Research Interests, Projects, and Grants:

Small cats – ocelot, bobcat, jaguarundi, margay, clouded leopard, Asiatic golden cat, leopard cat, marbled cat; not-so-small: cougar and jaguar

Graduate Students and Their Research:

- Amanda Veals: Ph.D. student; examining resource selection and landscape connectivity of the ocelot in South Texas with the aim to help the Texas Department of Transportation plan for wildlife crossing structures to mitigate vehicle collisions for this endangered species
- Jason Lombardi: Ph.D. student; Factors of Ocelot Occupancy in South Texas (Collaborative Effort with East Foundation); Ocelot-Road Monitoring Project on FM 1847 in Cameron County, TX (Collaborative Effort with TXDOT)

Texas Parks and Wildlife Department

District 1 Diversity Biologist, Alpine, TX 79830



Krysta D. Demere

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Research Interests, Projects, and Grants:

As a Diversity Biologist for Texas Parks and Wildlife, I supervise non-game research projects, provide technical guidance to private landowners regarding management and effective conservation actions for rare and threatened species, conduct outreach programs for landowners and the public, and conduct surveys for nongame species across the ~25 million acres that encompass the 16 counties of the Trans-Pecos Wildlife District. My efforts within the discipline of mammalogy for the past year have primarily focused on compiling a comprehensive database for historical and recent black bear observations, establishing a genetic tissue collection for black bear samples retrieved within west Texas, monitoring overwintering western bat species for the presence of Pd and potential development of white-nose syndrome, and investigating disease outbreaks in local lagomorphs. I have had the honor of serving as the official artist for TSM since 2018 and look forward to representing the society each year.

Texas State University

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Ivan Castro-Arellano

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http://www.researchgate.net/profile/Ivan_Castro-Arellano

Research Interests, Projects, and Grants:

I use my background and training as an ecologist to address questions to understand the ecology of zoonotic diseases and invasive species. Because mammals are natural reservoirs for many zoonotic diseases, most of my work has been devoted to this taxonomic group, especially rodents and bats. Beyond my interest in disease ecology, I also have done research on theoretical aspects of community ecology, specifically on the analysis of assemblage-wide temporal niche overlap and elements of metacommunity structure. I address these questions using a variety of approaches that include modelling, null models, and analyses of both published and empirically

data generated at my lab. Although my research interests are wide, they are intertwined and my goal is to integrate the study of community level dynamics in mammalian hosts to understand the dynamics of pathogen transmission.

Current Projects:

Although I have worked on multiple research topics and new ones develop based on new collaborations, I currently have three main lines of research at my lab:

- 1) Ecology and evolution of activity patterns. Using publicly available large databases and fieldwork my lab is addressing multiple questions related to the ecological determinants of activity patterns and how this information can be used to understand the structure of mammalian assemblages worldwide. Another topic within this line is how anthropogenic changes can affect mammalian activity patterns and the implications for the ecology of these species.
- 2) Host-vector ecology of *Ornithodoros turicata* in Central Texas. The ecology of soft ticks is a little known despite these tick species being vectors of zoonotic pathogens. At my lab, we are trying to ascertain which wild mammals serve the role of reservoirs for the pathogens vectored by these ticks and what role these have to disperse ticks among sites.
- 3) Ecology of TX Kangaroo rat. With funding from TPWD and USFWS and in collaboration with Dr. Joe Veech (Texas State University), we have worked on different questions related to the ecology and conservation of this rodent species endemic to TX. This species is currently being considered for ESA listing and the generation of new knowledge is focused on the management for the conservation of this species.

Graduate Students and Their Research:

Current and recent graduate students

- Stoneham, Margaret (M.Sc. 2022). Temporal overlap among common mesocarnivores throughout the neotropics.
- Bergmanson, Stephanie (M.Sc. 2022). Comparison of Tapir species activity patterns across multiple sites in the neotropics.
- Reagan, Cassidy (M.Sc.). Elements of Metacommunity Structure for Bat Assemblages Across Elevational Gradients Worldwide.
- Ramirez, Rosa (M.Sc.). Integrating Host Community Ecology into the Disease Ecology of a Tick-Borne Relapsing Fever Vector.

I AM CURRENTLY SEEKING WELL QUALIFIED MS AND PhD STUDENTS THAT ARE INTERESTED IN THE TOPICS WE DO RESEARCH AT MY LAB. PLEASE CONTACT ME AT MY EMAIL IF INTERESTED.

Select past students

- Matt Milholland (PhD. 2017). Matt's dissertation work was centered around the ecological correlates for hantavirus seroprevalence at different spatial scales.
- Sara Weaver (PhD. 2019). Sara worked on the effects wind energy production has on populations of bats at wind farm in south Texas.
- Madison Torres (M.Sc.). Madison's thesis was on the home range dynamics of the invasive Small Asian Mongoose (*Herpestes aeropunctatus*) in Puerto Rico.

- Kathryn Michelle Benavidez (M.Sc. 2016). Michelle's research was also in Puerto Rico and centered on the potential role of mongooses and commensal rodents as reservoirs of *Leptospira*, a zoonotic pathogen that has human health concern.
- Bradford Westrich (M.Sc.). Brad's work was related to a NIH-funded grant centered about the population genetic dynamics and vector ecology of *Ixodes scapularis*. His thesis centered on the role of small and meso-mammals as hosts for this tick in eastern Texas.

Texas Tech University

Department of Biological Sciences, and Natural Science Research Laboratory, Museum of Texas Tech University, Lubbock, TX 79409



Robert D. Bradley

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https://www.depts.ttu.edu/nsrl/directory/faculty_curators/bio/robert-bradley.php

Research Interests, Projects, and Grants:

My research interests include: systematic relationships, molecular evolution, genomics, and natural history of mammals, particularly in the cricetid and geomyoid rodents; determining the genetic basis for adaptation in *Peromyscus*; examination of hybrid zones between genetically distinct taxa; understanding isolating mechanisms and the dynamics of genetic introgression; exploring the utility and application of the Genetic Species Concept; examination of the origin and evolution of rodent-borne viruses, especially in the use of rodent phylogenies and genetic structure to predict the transmission and evolution of viruses; various wildlife diseases such as chronic waste disease in deer, modeling predictions associated with epidemiology and the impacts of climate change; and growth and utilization of natural history collections, especially those pertaining to mammals.

Current Projects:

- Systematics of the genus *Peromyscus*
- Use of genomic methods to investigate speciation and adaptation in *Peromyscus*
- Effects of the zonadhesin gene in speciation of mammals
- Hybridization between white-tailed and mule deer
- Detection methods of Chronic Wasting Disease in cervids
- Genetics of transplanted populations of bighorn sheep in Texas
- Phylogenetic relationships of Neotomine and Reithrodontomyine rodents
- Systematic and genome studies of the genus *Cratogeomys*, *Geomys*, and *Thomomys*
- Ecology of hanta- and arenaviruses in the southwestern US and Mexico

- Morphology, landscape genomics and effective population size of the Palo Duro Mouse, *Peromyscus truei comanche*
- NSF funded project to A Partnership to Facilitate Scientific Inquiry into the Vast Functional Trait Diversity of Phyllostomid Bats (Richard Stevens – project PI)
- Use of next-gen methods for detecting zoonoses
- Detection of novel viruses using metagenomics in *Sylvilagus*
- Detection of pneumonia in bighorn and aoudad in Texas
- Taxonomic catalogs of terrestrial vertebrates described exclusively from Texas (David J. Schmidly and Lisa Bradley - PIs)
- Population genetics and density of coyotes based on examination of DNA isolated from scats (Danielle Deming MS project)
- Illustrated key to the Mammals of Texas (David J. Schmidly, Richard Stevens, Lisa Bradley, Robert Dowler, and Katelyn Albrecht Co-PIs)
- Detection of prion disease genes across Mammalia

Graduate Students and Their Research:

- Emily A. Wright (PhD candidate) is in her 6th year. Her research project utilizes genomic methods (SNPs) to characterize population structure and connectivity, genetic variation, and management schemes for Desert Bighorn Sheep in Texas.
- Joanna Bateman (PhD candidate) is in her 5th year and is using genomic methods to determine speciation and evolutionary processes in heteromyid rodents.
- Macy Krishnamoorthy (PhD candidate) is in her 5th year and is co-chaired by Dr. Richard Stevens. Macy is examining bat feeding and pollination impacts on baobab tress, and other bat questions.
- Katelyn Albrecht (MS student) is in her 1st year and is co-advised by Dr. Richard Stevens. Katelyn will be using 3D scans of bats to learn more about ear and wing variations as airfoils.
- Sufia Akter Neha (PhD student) is in her 1st year. Her research project will involve microbiome analyses of bear and mountain lions.

Undergraduate Students and Their Research:

- Last year, 23 undergraduate students (Anjali Aaluri, Joseph Bayouth, Alexandra Benson, Zoe Bixler, Georgina Brugette, Ana de la Cruz, Andrew Dotray, Noah Duong, Beau French, Tess Hollinger, Ranim Ismail, Emma Johnston, Katherine Jones, Vivienne Lacy, Margaret Lee, Erin Lowenberg, Grant McDaniel, Emma McDonald, Brady Miller, Elizabeth Randolph, Maddison Reddock, Kinsey Rich, Emily Schmalzried, and Savannah Ticknor) were involved in various research projects in the Laboratory.

Postdoctoral Researchers:

- Dr. Emma Roberts (PhD 2020). Emma is now a postdoctoral researcher at the Texas Tech University Climate Center. Emma is wearing many research hats: impact of climate change on mammalian zoonoses, developing new methods for detecting chronic wasting disease, investing the role of gametic recognition in speciation and hybridization, and examining mechanisms behind reproductive isolation and the role they play in mammalian speciation.

Additional Information:

- My teaching responsibilities include: Mammalogy, Natural History of the Vertebrates, You're a Biology Major: So Now What?, Zombie Apocalypses, Rise of the Wuvarillas, and other Current Events in Biology, Molecular Systematics and Evolution, Mammalogy for Advanced Students, and Principles of Systematics. In addition, I teach Mammalogy at the Texas Tech University Center at Junction each May (referred to as the Intersession Semester). This is an excellent opportunity to receive credit at the Graduate or Undergraduate level. I also teach "Field Methods" for the Museum of TTU each summer. This three-week course offers an opportunity to garner experience in field biology.
- I am the Director of the Natural Science Research Laboratory, Museum of Texas Tech University. I would be pleased to address questions about loans, visits, or resources.
- In addition, I am editor of the publication series (*Occasional Papers* and *Special Publications*) at the Natural Sciences Research Laboratory, Museum of Texas Tech University. We are seeking to increase the number of contributions to these two series, so please, send us your manuscripts!
- In the Summer of 2022, *Texas Natural History in the Twenty-first Century*, by David J. Schmidly, Robert D. Bradley, and Lisa C. Bradley was published by Texas Tech University Press. This book provides an updated synopsis of Texas natural history. In this version, an effort was made to include information for amphibians, reptiles, and birds as obtained by members of the Bureau of Biological Survey. In addition, the information for mammals was updated and expanded.
- In the Fall of 2019, the Memorial Volume for the Dr. Robert J. Baker was completed and provides a synthesis of the career of one of the most ardent supporters of TSM. It is available on the NSRL website and is cited as follows: Bradley, Robert D., Hugh H. Genoways, David J. Schmidly, and Lisa C. Bradley. 2019. Overture. Pp. v-ix 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.
- In 2019, Dr. Robert Dowler and I were invited to write a summary of North American Mammalogical Research for the Centennial Issue of the *Journal of Mammalogy*. This manuscript (see below) provides useful information for students and faculty who are interested in the history of mammalian research methods. Bradley, Robert D., and Robert C. Dowler. 2019. A century of mammal research: changes in research paradigms and emphases. *Journal of Mammalogy*, Centennial Issue 100:719-732.
- In 2017, David Schmidly led an effort to publish a timeline of important events in North American Mammalogy; this effort resulted in the manuscript (see below) that provides useful information for students (think qualifying exams), faculty, and historians. Schmidly, David J., Robert D. Bradley, Lisa C. Bradley, and Richard D. Stevens. 2017. A timeline of significant events in the development of North American mammalogy. Special Publications, Museum of Texas Tech University, 66:1-37.



Caleb D. Phillips

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Research Interests, Projects, and Grants:

The Phillips laboratory studies metagenomes, genomes, craniofacial development, as well as some morphology and molecular mammalogy. The lab is currently supported by two Texas Parks and Wildlife Department SWGs, the NIH, and NSF.

Graduate Students and Their Research:

- Craig Tipton (PhD student): Interindividual, temporal, and geographic distribution of chronic wound microbiomes and how they are influenced by host (human) genetics
- Khalid Omeir (MS student): Microbiome-genome-wide association of bacteria in chronic wounds
- Jacob Ancira (MS student): Structural equation modeling to predict wound healing time based on wound microbial composition
- Hendra Sihaloho (PhD student): Community assembly of microbiomes of forest interior bats of Malaysia

Additional Information:

My teaching responsibilities include Bioinformatics, Metagenomics and Organic Evolution. These courses are offered at both graduate and undergraduate levels. I am also Curator of Genetic Resources at the Natural Science Research Laboratory.



Richard D. Stevens

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Research Interests, Projects, and Grants:

- Patterns of biodiversity of New World bats.
- Conservation of Atlantic Forest bat communities.
- Metacommunity structure of rodents of the Mojave Desert.
- Dispersal and metapopulation dynamics of Texas Kangaroo rats.
- Continued Study of the Plains Spotted Skunk (with Bob Dowler).
- Use of Highway Structures by Bats in the Trans-Pecos and East Texas.

Graduate Students and Their Research:

- Cristina Rios-Blanco—Cristina started her Ph.D. at TTU in August 2014. She is interested in how bat communities are assembled at regional scales. She is studying Neotropical bat metacommunities along elevational gradients and trying to use elevational contexts to better understand bat metacommunity structure. She will also be

developing a network approach to apply to metacommunities to better elucidate biological processes important to metacommunity dynamics.

- Garret Langlois is a Ph.D. student working on the roosting ecology and behavioral network structure of great fruit-eating bats (*Artibeus lituratus*) in Atlantic Forest of Paraguay.
- John Stuhler—John is a Ph.D. student that completed his M.S. at the University of Wisconsin. He is interested in the ecology/conservation biology of Texas kangaroo rats and is conducting an intensive study of habitat preferences. He is also interested in large-scale diversity patterns in heteromyid rodents.
- Carlos Garcia—Carlos is a M.S. student under David Ray and me. For his masters, he is working on studying the roosting ecology of the threatened bat species, *Myotis septentrionalis*, in Louisiana and is interested in studying the diets between *M. septentrionalis* and *M. austroriparius*. He has also conducted a survey throughout the state of Louisiana for white-nose syndrome.
- Jenna Grimshaw is a Ph.D. student co-advised by David Ray and me. She earned an M.S. at Tarleton State University studying patterns of phylogenetic diversity of Mexican bats. Her current research is to identify patterns of genetic structure in three species of critically-imperiled Louisiana bats: *Myotis austroriparius*, *M. septentrionalis*, and *Eptesicus fuscus*. More specifically, she aims to determine if each of these three species comprise a single population or multiple genetic subpopulations with little gene flow. She is also interested in the distribution of transposable elements among mammalian genomes from a genomic ecological perspective.
- Holly Wilson—Holly is a Ph.D. student who recently earned her M.S. from Fort Hays State University under Elmer Birney. She is interested in how bats use highway structures as day-roosts in the Trans Pecos of Texas as well as characterizing ecological neighborhoods of pallid bats.
- Clint Perkins—Clint is a Ph.D. student who recently earned his M.S. from Angelo State University under Bob Dowler. His project revolves around population and spatial ecology of the plains spotted skunk, *Spilogale putorius interrupta*.
- Macy Madden—Macy is a Ph.D. student co-advised by Robert Bradley and me. She is interested in plant-pollinator interactions between baobab trees and *Rousettus aegyptiacus* and *Epomophorus* species in South Africa and Kenya.
- Angela Alviz—Angela is a Ph.D. student who received her M.S. in Biology from the Pontificia Universidad Javeriana. Angela is interested in Tapir metapopulation dynamics in Colombia.
- Sarah Vrla—Sarah is a third year PhD student co-advised between Dr. David Ray and me. She received a M.S. in Biology at the University of Central Oklahoma under Dr. Michelle Haynie in 2019. She is interested in sensory ecology, particularly the evolution, significance, and function of ultraviolet vision and communication in mammals.
- Emma Sanchez was recruited into the lab to do her M.S. on use of culverts as day roosts by bats in east Texas. She graduated from TTU with her B.S. in 2019 and we are glad to have he back in the lab!
- Erin Stukenholtz and Samantha Garcia graduated with their Ph.D. and M.S. degrees, respectively. Congratulations to both!

Texas Tech University/University of New Mexico

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David J. Schmidly

Retired President and Professor Emeritus

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Email: djschmidly@gmail.com

Research Interests: Natural History, Systematics, and Conservation of Texas Mammals

Projects: I spent the COVID year completing projects that have been underway for several years. With my colleagues, Robert and Lisa Bradley, “Texas Natural History in the 21st Century,” has been published and is available through the Texas Tech Press. This book chronicles how the mammal fauna changed in the state during the 20th and first two decades of the 21st century, beginning with Vernon Bailey’s 1905 publication, “The Biological Survey of Texas,” which is reprinted (with annotations) in the book. The closing chapters explain the major problems and potential solutions to the conservation challenges facing Texas mammals for the remainder of the 21st century.

My colleagues (Frank Yancey, Steve Kasper, Rick Manning) and I completed a “Field Guide to the Mammals of the Trans-Pecos,” and it is scheduled to be published by the Texas A&M Press in the Spring of 2023. The book includes color photographs of mammals, detailed distribution maps, keys, and illustrations of mammals drawn by Chester O. Martin.

Robert Bradley, other colleagues, and I published a paper in the Journal of Mammalogy describing two new species of deer mice of the *Peromyscus boylii* group from Mexico (Bradley, R. D., N. Ortega-Garza, C. W. Thompson, E. A. Wright, G. Ceballos, C. W. Kilpatrick, and D. J. Schmidly. 2022. Two new species of *Peromyscus* (Cricetidae: Neotominae) from the Transverse Volcanic Belt of Mexico. Journal of Mammalogy 103(2):255-274). One of the species, *Peromyscus greenbaumi*, is named after TSM Honorary Member, Ira Greenbaum, and the other, *Peromyscus ensenki*, is named after the late Jan Ensink, one of Ira’s former students who participated in the field work and data development that resulted in the discovery of these new species.

We have completed the work for the publication of a “Taxonomic Catalog for the Recent Terrestrial Vertebrates (Species and Subspecies) Described from Texas.” There are 431 amphibians, reptiles, birds, and mammals in the catalog that were described exclusively from Texas specimens and with type localities in the state, and 143 of these are mammals. Each catalog entry contains the original scientific name and authority, current name and common name, complete synonymy, nature of the type specimen/s (holotype, syntypes, lectotypes, etc.), information about the type locality, topotype and near topotype specimens in museum collections, and information about the describers and collectors of the taxa. The mammal section of the catalog was developed by me, Robert and Lisa Bradley, Frank Yancey,

and Joanna Bateman. There are other authors for the bird and herp catalogs. Rodney Honeycutt helped prepare a conclusion section that explains the importance of the compiled materials to the conservation of Texas' wildlife diversity. The catalog will be published as a Special Publication of the Museum at Texas Tech University and should be completed early in 2023.

My next project will involve working with Robert Bradley and Frank Yancey on a 2023 Revised Checklist of Recent Land and Marine Mammals of Texas, with Annotations. That publication is underway and will be published within the year. Finally, I will be preparing the cetacean key for a new publication "Identification of Texas Mammals: Keys and Characters" that will be published by the Texas Tech Press.

Trinity University

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Research Interests, Projects, and Grants:

I am interested in the evolutionary ecology of small mammals, including *Peromyscus* and elephant-shrews. My research in recent years has ranged from studies of social organization to mating behavior to thermal ecology. I have recently begun leading a course in Costa Rica where we are monitoring the elevational distribution of small mammals on the Pacific Slope from Monteverde to the coast. I now serve as Associate Vice President of Academic Affairs for Budget and Research, so while my own research agenda has diminished, I am enjoying supporting and promoting others at Trinity University.

University of Central Oklahoma

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Michelle L. Haynie

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Research Interests, Projects, and Grants:

My research focuses on mammalian evolution biology, primarily in population genetics and molecular systematics. I am interested in using genetic markers to address conservation and evolutionary questions,

with most of my research focusing on comparative hybrid zone studies and the identification of cryptic species. I also am interested in genomic drivers of the speciation process and local adaptations.

My current projects include:

- Status and trends of bobcat populations in Oklahoma (with Vicki Jackson, Sue Fairbanks, and Jerrod Davis; funded by ODWC)
- An evaluation of bobcat genetic structure in Oklahoma
- A long-term small mammal mark-recapture survey at UCO's Selman Living Lab to identify factors that impact population and community persistence (with Francisca Mendez-Harclerode, Gloria Caddell, Chad King, and Sean Laverty)

Graduate Students and Their Research:

- Tim McSweeney – Genetic diversity and population structure in Oklahoma bobcats (Tim graduated in December 2022)
- Nathan Proudman – Status and trends of bobcat populations in Oklahoma (Nathan is advised by Dr. Sue Fairbanks at OSU, I serve as his laboratory mentor; he has wrapped up his laboratory research and is writing his dissertation)

Undergraduate Students and Their Research:

- C. Claire Smith – Claire is leading the genetic identification of small mammals at the Selman Living Lab
- Tyler Curry, Xander Molina, Katelyn Mullin, Jasleen Nagra, Aly Swank, Duaa Zulfiqar – This group of students is working to generate genetic profiles for bobcats in Oklahoma to determine the impact of fur harvests on genetic diversity

Additional Information:

- After many years, the final draft of the Mammals of Oklahoma, Second Edition is finally complete! It has been submitted to OU Press and is out for formal review.



Vicki Jackson

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Fax: 405-974-5726

Email: vjackson4@uco.edu

Research Interests, Projects, and Grants:

My research interests include spatial ecology and captive wild animal care.

My current projects and grants include:

- Impacts of moon illumination on rodent activity
- Mammal survey of Chandler Park, Tulsa County, Oklahoma

Undergraduate Students and Their Research:

- Use of camera traps to assess impacts on moon illumination on rodent activity at Selman Living Lab, Woodward, OK (Madison Baugh)

University of Michigan

Museum of Zoology, 3600 Varsity Drive, Ann Arbor, Michigan 48109



Cody W. Thompson

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Web page: codythompson.org

Research Interests, Projects, and Grants:

I consider myself a classically trained mammalogist, and as such, I use knowledge gained from observations made during fieldwork and through the examination of museum collections to answer questions about mammalian diversity. Specifically, my lab focuses on the following four areas: 1) hybrid zones and hybridization, 2) systematics and taxonomy, 3) leveraging technology in museums, and 4) basic natural history. My lab currently is funded by the National Science Foundation (Awards #1902105 and #2101909) and the Huron Mountain Wildlife Foundation.

Undergraduate Students and Their Research:

- Ashley Gorris – Thymus development in bats
- Rhea Rajani – Comparisons of bat wing morphology using 3D data
- Lydia Thomas – Rodent functional morphology

Other Lab Personnel:

- Ellen Cassidy – Research Assistant
- Ramon Nagesan – CT Lab Manager
- Shion Otsuka – Research Assistant

Additional Information:

I joined the Mammal Division at the University of Michigan Museum of Zoology (UMMZ) in June 2013. The UMMZ is administered by the Department of Ecology and Evolutionary Biology (EEB). I serve as the UMMZ Mammal Collections Manager and maintain a research appointment in EEB. With these two roles, I am fully involved in all aspects of the UMMZ Mammal Division, and I enjoy the challenge of integrating my experience working in museum collections with my own research program.

The University of Texas at Austin

Texas Memorial Museum, 2400 Trinity St. Stop D1500, Austin, TX 78712



Pamela R. Owen

Phone: 512-232-5511

Email: p.owen@austin.utexas.edu

Web page: www.TexasMemorialMuseum.org

Research Interests, Projects, and Grants:

- Evolutionary history of American badgers (Taxidiinae).
- Late Cenozoic mammalian faunas: I continue work on late Pleistocene mammal remains from the Slaughter Creek Site in southeastern Travis County. There are some intriguing taxa from this

site, including: antilocaprids *Capromeryx* and *Antilocapra*, a llama-like camelid, wolves (*Canis dirus* and *C. lupus*), and a machairodont felid. Other taxa identified include *Bison*, *Odocoileus*, *Equus*, *Procyon lotor*, and *Canis latrans*.

Additional Information:

As Associate Director of Texas Memorial Museum, I am focused on updating and developing new exhibits and experiences as part of a revitalization effort for the museum, scheduled for a phased reopening starting in September 2023. I continue to serve as Associate Editor for *Mammalian Species* (fossil record section) and serve on the Public Education Committee of the American Society of Mammalogists. I provide annual training in mammalogy for several chapters (Balcones Canyonlands, Capital Area, Gideon Lincecum, Good Water, Hays County, Highland Lakes, Lindheimer, and Lost Pines) of Texas Master Naturalists.

University of Houston—Downtown

Department of Natural Sciences, 1 Main Street, Houston, TX 77002



Amy Baird

Phone: 713-222-5301

Email: BairdA@uhd.edu

Web page: <https://bairdlab.wordpress.com/>

Research Interests, Projects, and Grants:

My research interests include molecular phylogenetics, phylogeography, and speciation of mammals. Current projects include molecular phylogenetics of lasiurine bats, including phylogeography of the Hawaiian Hoary bat; population genetics of bowhead whales (grant funded through the North Slope Borough); and molecular phylogenetics of Central American shrews. I am

partially funded by a grant from the North Slope Borough (PI) and an Organized Research and Creative Activities grant through UHD (PI).

Undergraduate Students and Their Research:

- Emily Fritsche is conducting mtDNA sequencing as part of a long-term study on population genetics of bowhead whales
- Yulie Garcia is working on sex-specific genetic markers in bowhead whales
- Alicia Arias Morales and Amy Lam are working on genetics of whale parasites, including kidney worms

U.S. Centers for Disease Control and Prevention

CDC Biorepository, Atlanta, GA 30345



Marcia (Marcy) A. Revelez

Phone: 404-498-1665

Email: mrevelez@cdc.gov

Web page URL: <https://www.cdc.gov/csels/dls/cdc-biorepository.html>

Research Interests, Projects, and Grants:

I have over twenty years of experience working in natural history collections, primarily with mammal and genomic collections. I am now the Lead and Collections Manager for the CDC Biorepository, which is made up of approximately 6.6 million specimens from research, surveillance, and emergency response efforts at CDC, including the COVID-19 response. My role is to modernize the biorepository, with emphasis on policy and collection stewardship. Research interests revolve around best practices, collections management, data management, and IPM. I am part of a new endeavor to create a preparedness repository for CDC, to facilitate public health response to emergency outbreaks in the U.S.

Additional Information:

Member, Federal Interagency Working Group of Scientific Collections (IWGSC); member, Enviro-Bio Group for International Society of Biological and Environmental Repositories; member, Biobanking standards for International Organization for Standardization (ISO); member, workgroup National Plan for digitization of biodiversity collections (Network Integrated Biocollections Alliance (NIBA)), Biodiversity Collections Network (BCoN); member, Diversity and Equity Committee, Society for the Preservation of Natural History Collections (SPNHC); member, Systematics Committee, American Society of Mammalogists (ASM)

Fellows and Their Research:

- Taylor Soniat, Collections Specialist - Taylor is examining optimal storage conditions and sample viability at the CDC Biorepository
- Elizanette Lopez, Biorepository Fellow – Elizanette is examining sample management as it applies to the CDC Biorepository
- James Austin, Biorepository Fellow – Jamie is also examining sample management and best practices as it applies to sample disposition at the CDC Biorepository
 - George Xiang, Communications Specialist – George is examining ways to improve communications and project management as it relates to sample management at CDC

**Texas Society of Mammalogists
Members' Business Meeting
Remote Meeting
19 February 2022**

The meeting was called to order by President Dana Lee at 3:03 pm via Zoom remote meeting software. The minutes of the 2021 Members' Business Meeting were approved following a two-sentence addition to the Secretary-Treasurer's officer report.

Officers' Reports

Secretary-Treasurer. Secretary-Treasurer Tom Lee reviewed the Treasurer's Report for 2021. The beginning balance was \$2,169.48 in the checking account and \$122,893.61 in the investment account, for total assets of \$125,063.09 to begin 2021. At the end of 2021, the balances were \$4,905.81 in checking and \$132,713.25 in the investment account, with total assets of \$137,619.06. In the itemized breakdown of the Treasurer's Report, Tom described how our expenses and income were lower in 2021 due to the online meeting. We did transfer \$4,500 from the investment account to cover the meeting expenses but the performance of the investment account more than made up for the withdrawal (Tom transferred the money when the market was performing well). The society paid a \$2,000 deposit for the use of the Junction Center out of the \$4,500 withdrawal. When we decided to move the meeting to a remote platform, the Junction Center said we could apply that deposit to next year's (2023) meeting. The motion to approve the 2021 Treasurer's Report was moved and seconded. Motion passed.

Permanent Secretary. Permanent Secretary Joel Brant briefly described the role of the position as the historian of the society. Normally he would be the one taking photographs to document the meeting, and maintaining the archives of the society at the TTU Southwest Collection. With this being a virtual meeting, we have been recording the Zoom meetings and he will archive those videos. Precautions regarding COVID dissuaded Joel from traveling to Lubbock to obtain the physical files from Lisa Bradley (previous Permanent Secretary) or depositing items into our archives at the Southwest Collection. However, they are in good hands and Joel will coordinate with Lisa when the COVID crisis has abated. Joel praised the membership for turning out for the remote meeting even in a pandemic. We hosted 27 presentations at this remote meeting, 10 posters last night and 17 talks this morning. Joel congratulated all the presenters for their high-quality presentations and their willingness to embrace the "new" technology of Zoom presentations and recording their presentations beforehand.

Editor. Newsletter Editor Michelle Haynie reported that she prepares the Newsletter of the Society and maintains the website of the Society. She asked that those with research programs please contact her each year to update (or maintain) their profiles in the Newsletter. She also said that any announcements or news that members feel would be appropriate to post to the website or print in the Newsletter should be sent to her. The Executive Committee voted to add an *In Memoriam* section to the newsletter so that request will go out with the call for papers & newsletter request.

Reports of Committees

Phil Sudman, Chair of the Honorary Membership Committee, was traveling and unable to attend the Executive Committee. President Dana Lee reported that no nominations for Honorary Membership had submitted this year. Dana encouraged the membership to nominate folks for this award.

Phil Sudman, Chair of the Financial Advisory Committee, was still traveling so President Lee presented a written report provided by Phil. The report stated that the investment account began the year with \$122,893.61 and ended the year with \$132,676.86. This included a \$5,934.05 debit comprising the

\$4,500 transfer plus \$1,434.05 service fee. The return on our investment account was 7.96% (11.62% without the debit).

Ray Willis, Chair of the Student Honoraria Committee, announced that he would be giving his report at 4:45 pm today (just before the guest speaker address). Ray commented that we had 7 judges who evaluated 10 posters last night and 17 talks this morning.

Michelle Haynie, Chair of the *ad hoc* Informatics Committee, reported that her committee is in charge of the TSM website and social media accounts. She asked that members send her any information that they would like to see included. Michelle thanked John Hanson for help with the website and the abstract and registration forms as well as handling the technology for administering a remote meeting. She also thanked Jessica Light, Stephanie Martinez-Brewer, and Marcy Revelez for being active on the TSM Twitter account and for managing the TSM Facebook account. Michelle also thanked Cathy Early and John Hanson for their efforts to provide close captioning for all of the talks.

Jessica Light, Chair of the *ad hoc* Conduct Committee, was not able to join the Member's Business Meeting. Dana Lee explained that the committee's role is to develop an official Code of Conduct. The Conduct Committee provided the TSM Officers with two examples of potential codes adopted by scientific societies: the American Society of Mammalogists (ASM) and the American Society of Parasitologists (ASP). The main different between these examples is that the ASM code has been vetted by lawyers while the ASP code has not. The TSM Officers decided to base the TSM Code of Conduct on the ASM code and, working with the Conduct Committee, drafted a code that was considered by the Executive Committee last night. This code will be addressed more thoroughly under New Business.

Krysta Demere, Chair of the *ad hoc* Auction Committee, reviewed the auction report from 2021. As the 2021 meeting was held remotely, there was no auction. Krysta did mention that the committee has some items that have been held over from previous meetings, especially books. Krysta solicited mammal themed artwork or knick-knacks for next year's auction, when we are face-to-face again.

Election of Officers

President Lee announced that the Executive Committee had nominated Jessica Healy-La Price (Austin College) and Dara Orbach (Texas A&M-Corpus Christi) for the office of President-elect. The floor was opened for additional nominations. No additional nominations were put forward. A motion to close nominations was moved and seconded. Jessica Healy-La Price was elected President-Elect.

President Lee announced that the Executive Committee had nominated Tom Lee (Abilene Christian University) to continue serving as Secretary-Treasurer. The floor was opened for additional nominations. No additional nominations were put forward so Tom was elected by acclamation.

New Business

Based on the discussions between the TSM Officers and the Conduct Committee, President Lee essentially edited the American Society of Mammalogists code by replacing "ASM" with "TSM" and making a few other editorial changes. This document was emailed to the Executive Committee earlier for their review. The Executive Committee, after much discussion, elected to forward the TSM Code of Conduct to the membership for approval with the following revisions:

- 1) Inclusion of a preamble statement acknowledging the ASM Code of Conduct as the source material of the TSM Code and noting that ASM had given permission for us to modify their code,

- 2) A stipulation that 3 ombudspersons would be appointed by the TSM President in the first year to staggered 3-year terms, with future TSM Presidents appointing one replacement ombudsperson each year after 2022,
- 3) A stipulation that conduct policies will evolve over time and that updates to the policies would be emailed to all TSM members.

President Lee opened the floor for discussion of the TSM Code of Conduct. There were a few editorial comments that were brought up. Dana indicated that we would send the code out to the membership so that they would have an opportunity to consider it prior to a vote. After some discussion regarding the appropriate motion, it was decided that the membership would have a couple of weeks to consider the Code of Conduct and offer potential amendments. Jessica Light will be tasked with determining if a proposed amendment was “friendly” (i.e. not requiring a vote) or “substantial” (i.e. requiring a vote). Once the Code is ready, the membership would vote to approve electronically. The appropriate motion was moved and seconded. That motion passed.

President Lee solicited folks who would be willing to serve as an ombudsperson to contact incoming President Ray Willis. President Willis would then select three individuals to serve with one serving a 1-year term, one serving a 2-year term, and the last serving a 3-year term.

It was moved and seconded to hold the 2023 TSM meeting **in-person** at the TTU Center at Junction. Motion passed. The 2023 meeting will be held February 10-12. Several members requested a hybrid or digital option for the meeting. The officers agreed to look into hybrid options for next year.

President Lee then introduced the new State Mammalogist at Texas Parks and Wildlife, Dana Karelus.

President Dana Lee thanked the TSM Officers for their efforts in preparing the meeting, first as an in-person meeting and then transitioning the meeting to a remote platform. Dana singled out John Hanson for his work in wrangling the technology. Dana thanked Jessica Light for her efforts in shepherding the Code of Conduct through the approval process. Dana thanked Krysta Demere for the wonderful artwork gracing the program and t-shirts. President Lee thanked everyone for the opportunity to serve the society. Dana reminded the members to stick around for the awards ceremony and the Guest Speaker address to follow.

The Members’ Business Meeting was recessed at 3:45 pm.

The Members’ Business Meeting was reconvened at 4:45 pm.

Ray Willis, Chair of the Student Honoraria Committee, announced the winners of the presentation awards. Each winner received a cash award (\$500 for the Packard Award and \$400 for all others). Since this was a remote meeting and the award winners would not be able to hear the applause when their names are announced, Ray encouraged everyone to use the reaction buttons included with Zoom to show appreciation for each award winner. Certificates and checks will be mailed to the winners after the meeting. Ray thanked all the presenters for bearing with the technology and presenting in this new format.

Oral presentation award winners were:

1. Robert L. Packard Award — J. Clint Perkins, Texas Tech University
2. TSM Award — Julia Nitschmann, Tarleton State University
3. William B. Davis Award — Eliza Mills, Texas A&M University-Corpus Christi
4. Bobby Baker Award — Emma Solis, Austin College
5. Rollin H. Baker Award — Caitlynn Partin, Texas A&M University-Corpus Christi

Poster presentation award winners were:

1. Clyde Jones Award (graduate) — Timothy McSweeney, University of Central Oklahoma
2. Vernon Bailey Award (graduate) — Aidan Branney, Texas A&M University-Kingsville
3. Clyde Jones Award (undergraduate) — Emily Fritsche, University of Houston-Downtown
4. Vernon Bailey Award (undergraduate) — R. J. Trent, Cameron University

The Members' Business Meeting was adjourned at 4:50 pm.

Respectfully submitted,
Joel G. Brant
Permanent Secretary

STUDENT AWARDS

These awards are made possible by the generous donations of the Society's members and by fundraising activities.

Robert L. Packard Award – The Robert L. Packard Award is presented for the Best Overall oral presentation. Eligibility is open to any student who has not previously received this award. This award currently includes an honorarium of \$500.

The Robert L. Packard Award was first awarded in 1985 for the best student presentation. In 1990, when the TSM Award was established, the Packard Award was designated for the best presentation in classical mammalogy. Since 1998, the Packard Award has been designated for the Best Overall oral presentation. The award was named in honor of Robert L. Packard (1928-1979), the founder of the Texas Society of Mammalogists.

TSM Award – The TSM Award is presented for the best oral presentation in mammalian molecular biology, evolution, and systematics by a graduate student. Eligibility is open to any graduate student who has not previously received this award. This award currently includes an honorarium of \$400.

The TSM Award was established in 1990.

William B. Davis Award – The William B. Davis Award is presented for the best oral presentation in classical mammalogy at the organismal level by a graduate student. Eligibility is open to any graduate student who has not previously received this award. This award currently includes an honorarium of \$400.

The William B. Davis Award was established in 1998 in honor of William B. Davis (1902-1995), a leading mammalogist in Texas and the first Head of the Department of Wildlife and Fisheries Sciences at Texas A&M University. Davis authored or co-authored five editions of *The Mammals of Texas* (1947, 1960, 1966, 1974, 1994).

Bobby Baker Award – The Bobby Baker Award is presented for the best oral presentation in mammalian molecular biology, evolution and systematics by an undergraduate student. Eligibility is open to any undergraduate student who has not previously received this award. This award currently includes an honorarium of \$400.

The Bobby Baker Award was established in 2013 in honor of Bobby Baker (1986-2012), who was an active and award-winning undergraduate member of the Texas Society of Mammalogists.

Rollin H. Baker Award – The Rollin H. Baker Award is presented for the best oral presentation in classical mammalogy at the organismal level by an undergraduate student. Eligibility is open to any undergraduate student who has not previously received this award. This award currently includes an honorarium of \$400.

The Rollin H. Baker Award was established in 2002 in honor of Rollin H. Baker (1916-2007), president of the Society in 1984-85 and an active member of TSM from 1984 until his death in 2007.

Clyde Jones Awards – The Clyde Jones Awards are presented for the best poster presentations by one graduate student and one undergraduate student in mammalian molecular biology, evolution, and systematics. Eligibility is open to any student who has not previously received the award at the respective academic level.

The initial Clyde Jones Award was established in 2004 in honor of Clyde Jones (1935-2015), Horn Professor of Biological Sciences at Texas Tech University. Jones was an active member of TSM since its inception in 1983 until his death in 2015, and was President of the Society in 1987-88.

Vernon Bailey Awards – The Vernon Bailey Awards are presented for the best poster presentations by one graduate student and one undergraduate student in classical mammalogy at the organismal level. Eligibility is open to any student who has not previously received the award at the respective academic level.

The initial Vernon Bailey Award was established in 2004 in honor of Vernon Bailey (1864-1942), Chief Field Naturalist and Senior Biologist for the Department of Agriculture's Bureau of Biological Survey (1897-1933). Bailey conducted the first and most complete biological survey of Texas, from 1889 to 1905.

TEXAS SOCIETY OF MAMMALOGISTS

Honorary Members

Class of 1985

W. Frank Blair (D)
Walter W. Dalquest (D)
William B. Davis (D)
Robert L. Packard (D)

Class of 1986

Rollin H. Baker (D)

Class of 1991

Howard McCarley (D)

Class of 1992

J Knox Jones, Jr. (D)

Class of 1995

Clyde Jones (D)

Class of 1997

Robert J. Baker (D)

Class of 1998

James Scudday (D)

Herschel Garner

Class of 1999

David J. Schmidly

Class of 2002

Art Harris

Class of 2003

Arthur G. Cleveland

Class of 2004

Ira F. Greenbaum

Robert E. Martin

Class of 2006

Ann Maxwell

Terry Maxwell (D)

Class of 2007

Guy Cameron

Earl Zimmerman

Class of 2008

John Bickham

Class of 2010

Robert Dowler

Class of 2011

Ron Pine

Class of 2013

Fred Stangl

Class of 2015

Rodney Honeycutt

Class of 2017

Michael Tewes

Class of 2018

Lisa Bradley

Robert Bradley

Class of 2019

Loren Ammerman

Phil Sudman

Class of 2020

Thomas E. Lee

Marcia Revelez

Patron Members

Jo Actkinson
Loren K. Ammerman
Amy Baird
Robert Baker (D)
Rollin Baker (D)
John Bickham
Lisa Bradley
Robert Bradley
Joel G. Brant
Dan Brooks
Guy Cameron
Darin Carroll
Brian Chapman (D)
Ron Chesser
Scott Chirhart

Arthur G. Cleveland
Michael Dixon
Robert C. Dowler
Cathy Early
Carla Ebeling
Herschel Garner
Jim Goetze
Ira F. Greenbaum
Meredith Hamilton
John Hanson
Michelle Haynie
Steve Hoofer
Mandy Husak
Michael Husak
Clyde Jones (D)

Stephen Kasper
Thomas E. Lee
Jessica Light
Robert E. Martin
Ann Maxwell
Terry Maxwell (D)
Kevin McKinney
Steve McReynolds
Anne Merchant
Chris Montag
Jim Patton
Clint Perkins
Russell Pfau
Caleb Phillips
Carl Phillips

Brenda Rodgers (D)
Duke Rogers
Kent Rylander
David J. Schmidly
Stephanie Shelton
Steve Smith
Phil Sudman
Michael Tewes
Ron Van Den Bussche
Christopher Walker
Kenneth T. Wilkins
Don Wilson
Ray Willis
Bernd Wursig
Earl Zimmerman