

# Annual Report 2024



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

*Interdisciplinary research, international collaboration, species discovery, collections growth, dissemination of results, and educating the next generation of conservation biologists.*

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## Executive Summary

In 2024, Biodiversity Research and Teaching Collections (BRTC) continued to be staffed with two staff Curators (Hibbitts and Prestridge) funded by the Department of Ecology and Conservation Biology and four ECCB Faculty Curators (Conway, Fitzgerald, Light, and Voelker) who also hold teaching and research appointments. One adjunct volunteer faculty Curator (Wicksten - BIOL) and one Emeritus Curators (Arnold) were active in the collections in 2024 (Arnold working remotely). The collections continue to grow in both number and diversity: the Collection of Fishes added 100,966 specimens divided across 3,002 lots. The total number of specimens in this collection now sits at 993,086, divided across 65,518 lots; The Collection of Amphibians and Reptiles added catalogued 1,868 specimens into the collection that now totals 112,049. The Collection of Birds added 3,000 bird specimens to the collection. The total number of catalogued specimens in the collection is now 34,340. A total of 271 specimens were added to the Collection of Mammals, bringing the total number of specimens to 68,844.

Material accessioned in 2024 included specimens from multiple localities throughout the state of Texas and the Gulf of Mexico as well as international material from Botswana. Specimens were borrowed by researchers in support of a variety of projects, totaling 62 loans of material, including both domestic and international loans. We hosted 24 research visitors on-site who utilized specimens from the collections in support of their research. Curators and students of the BRTC published 19 peer-reviewed articles in 2024, and 39 peer reviewed papers citing [BRTC specimens were published](#). These articles appeared in a variety of journals, including *Biodiversity and Conservation*, *BioScience*, *Frontiers of Biogeography*, *Journal of Mammalogy*, *Vertebrate Zoology* and others.

Projects supported by the National Science Foundation, Texas Comptroller, Texas Parks and Wildlife Department, US Geological Survey and others continue to provide significant support for enhancing the collections and research activities. Curators actively engaged numerous graduate students as Advisors or Committee members in research projects that aid in the curation of the collections and utilize specimens and/or genetic resources. Internships, directed studies, and writing intensive opportunities (ECCB 484/485/285) were offered in all collections in 2024, with multiple students receiving credit. Students and community members continued to engage in collections improvement projects that included specimen preparation and conservation. The number of volunteers grew to include upwards of 40 individuals (including graduate and undergraduate students alongside community volunteers). Departmental funding and extramural funding accounted for an additional 2 and 6 undergraduate students, respectively, on a part-time basis in 2024 to assist with museum curation and research projects.

We hosted laboratory classes for seven ECCB courses during spring and fall semesters. Collectively these labs provided education in biodiversity and related sciences for nearly 600 students. These courses were taught by BRTC faculty curators, with primarily ECCB graduate students serving as teaching assistants. Material from the research collections was made available to supplement the existing teaching collections. We also provided resources and space for BIOL 430- Biological Imaging and made loans of specimens to support k-12 education. In 2024, specimens from the Collection of Birds were publicly exhibited on campus and across the state in association with the Lights Out, Texas! program and specimens from the Collection of Amphibians and Reptiles were displayed at the Stark Gallery (Texas A&M University Memorial Student Center).

## Curatorial Staff 2024

Kevin W. Conway, Faculty Curator of Fishes

Lee A. Fitzgerald, Faculty Curator of Reptiles and Amphibians

Toby J. Hibbitts, Curator of Reptiles and Amphibians (through August 2024)

Jessica E. Light, Faculty Curator of Mammals

Heather L. Prestridge, Staff Curator

Gary Voelker, Faculty Curator of Birds

Mary K. Wicksten, Faculty Curator of Marine Invertebrates

## Emeritus Curators 2024

Keith A. Arnold, Faculty Curator Emeritus of Birds

John D. McEachran, Faculty Curator Emeritus of Fishes

## Mission Statement

Texas A&M University's Biodiversity Research and Teaching Collections (BRTC) are dedicated to the curation of vertebrate specimens and their data in support of education, research, and conservation. The BRTC enhances collaborative and global reach through sharing digitized data sets broadly and publicly, welcoming use of our data and specimens in developing new understandings through research. Furthermore, the BRTC's mission is to support the Department of Ecology and Conservation by providing an interactive hands-on venue and resources for graduate and undergraduate research, education, and job training to prepare and grow the next generation of conservation scientists who will be able to assume roles in leadership, responsibility, and service to society.

## Vision Statement

Texas A&M University's Biodiversity Research and Teaching Collections vision is to be a world-class natural history collection that supports Texas A&M University and the Department of Ecology and Conservation Biology's unified visions of advancing interdisciplinary research, elevating graduate and professional education, and engaging with Texas and beyond to enhance our impact.

## Collections Activity

### Collection of Fishes

The Collection of Fishes (Conway, Prestridge) incorporated 18 accessions of new material in 2024, representing 100,966 specimens divided across 3,002 lots. This represents the largest annual acquisition of ichthyological material for the collection in its 50-year history. The total number of specimens in this collection now sits at 993,086, divided across 65,518 lots. Our collection now contains 4,111 species of fishes, representing 1,613 genera and 373 families. Several species, one genus, and one family previously unrepresented in the collection were added in 2024 (Table 1).

Table 1 - List of taxa newly introduced to the BRTC's Collection of Fishes in 2024.

Family	Scientific Name	Common Name	Note
Callichthyidae	<i>Corydoras hastatus</i>	Dwarf corydoras	New species for our collection. Originally collected from Brazil by Winemiller lab (2014); re-identified by Dr. Conway in 2024
Atherinopsidae	<i>Atherinella brasiliensis</i>	Brazilian silverside	New species for our collection. Collected in 2023 by undergraduate students during the TAMU Caribbean Tropical & Field Biology Education Abroad Program
Polycentridae	<i>Polycentrus schomburgkii</i>	Guyana leaffish	New family, genus and species for our collection. Originally collected from French Guyana in 1987; re-identified by Dr. Conway in 2024
Pholidae	<i>Apodichthys fucorum</i>	Rockweed gunnel	New genus and species for our collection. Collected in 2022 by Conway lab members during research trip to San Juan Islands, WA
Achiridae	<i>Achirus achirus</i>	Drab Sole	New species for our collection. Collected in 2023 by undergraduate students during the TAMU Caribbean Tropical & Field Biology Education Abroad Program

During 2024, the Collection of Fishes facilitated a total of 22 traditional loans to both national and international researchers, including those affiliated with the Illinois Natural History Survey, University of Washington, Yale Peabody Museum of Natural History, University of Texas, University of North Texas, and the Royal Ontario Museum, among others. A small, but diverse, collection of specimens was also gifted to the University of Texas – San Antonio to enhance the Ichthyology teaching collection at that institution. Specimen data from the Collection of Fishes continues to be broadly discoverable via several web portals including VertNet.org, iDigBio.org, and gbif.org. Other portals, including the Fishes of Texas, Fishnet2, and GGBN, continue to host cached data from the Collection of Fishes. The collection also hosts 497 unique CT datasets of BRTC fishes on the publicly accessible 3D data repository Morphosource.org. In 2024, we received 141 requests for downloads of CT datasets via Morphosource.



Figure 1 - TCWC 8280.01, an exceptionally rare specimen of the blind, aquifer inhabiting Widemouth blindcat (*Satan eurystomus*) housed within the Collection of Fishes. This specimen was collected in 1984 from an artesian well in Bexar County by S.W. Kelsch. This specimen represents one of only 12 known specimens of Widemouth blindcat, and is one of the last to be collected.

In 2024, the Collection of Fishes hosted numerous on-site visitors, including researchers from the University of New South Wales (Australia), Rice University, Stephen F. Austin University, Texas A&M - Corpus Christi (TAMU-CC), and Corpus Christi Museum of Science and History. In May, the Collection of Fishes also hosted a group of 13 graduate and undergraduate students from TAMU and TAMU-CC. These students sorted and identified over >2,500 specimens collected from the Guadalupe River basin of Texas, which were subsequently deposited within the collection. In October, the Collection of Fishes also hosted a two-day workshop on the identification of freshwater fishes from east Texas, as part of a TX Comptroller funded project to compile and investigate contemporary distribution patterns for fishes occurring within the Neches and Sabine drainage basins of east Texas. Workshop participants sorted and identified thousands of specimens that were subsequently deposited within the collection.

### Fishes 2024 Projects

National Science Foundation; Collections in Support of Biological Research: *Crucial upgrades to specimen storage, organization, and database management at the Texas A&M Collection of Fishes (Conway and Prestridge)*

This project, funded by the National Science Foundation, aims to: (1) re-organize the Texas A&M Collection of Fishes to achieve an overall more efficient use of a limited collections area, with adequate space to enable future growth; (2) secure the future of valuable oversized (10–14') specimens that are currently housed in a container that is inadequate and failing; and (3) complete crucial and long overdue data management platform upgrades that will enable not only more efficient basic data management but enhance our ability to provide complete records for our extended specimens (e.g., those with images, media, field notes). These activities will rejuvenate our infrastructure available for fundamental ichthyological education, unique research, and discovery at Texas A&M University and regionally.

In 2024, 2 undergraduate student workers and 1 volunteer continued to work on this project, integrating all cataloged material into the collection in preparation of supplies arriving for wholesale reorganization. The replacement storage tank for our largest specimens was sourced, fabricated and delivered. With savings from the purchase of that tank, we were able to order custom braces for our other oversized specimen tanks and a majority of those tanks have been fitted with the new supports.

#### TX-FISH-DNA: A Regionally-Focused DNA Barcode Interface to Enhance Identification and Monitoring of the Freshwater, Estuarine, and Marine Fishes of Texas (Conway and Voelker)

In collaboration with Dr. David Portnoy (TAMU-CC), Dr. Gary Voelker (TAMU), and researchers from TPWD inland fisheries (Dr. Preston Bean) and TPWD Coastal Fisheries (Dr. Joel Anderson), Dr. Conway is developing a regionally focused tissue bank and DNA barcode database for the ichthyofauna of Texas. This database will fuel regional DNA-based research on freshwater, estuarine, and marine fishes (e.g., standard barcoding, metabarcoding, eDNA) by providing access to expert verified tissues and mitochondrial DNA sequences associated with voucher specimens housed in the Collection of Fishes. Part one (estuarine and marine fishes) of this ambitious project has already been funded by TPWD and a grant proposal to support part two (freshwater fishes) was submitted in 2023. This project involves both undergraduate and graduate student researchers and could potentially result in >1,500 high quality voucher specimens (associated with photographs and tissues) being added to the collection. The first publication to result from this collaborative project appeared in *Mitochondrial DNA Part B* in 2024.

#### TX Comptroller: Surveys of Freshwater Fishes Inhabiting the Neches and Sabine River Drainages of Texas (Conway)

In collaboration with Drs. Joshua Perkin (TAMU, PI) and Carmen G. Montaña (Stephen F. Austin University, co-PI), Dr. Conway (also co-PI) is aiding surveys of freshwater fishes inhabiting the Neches and Sabine River drainages of Texas. This project is funded by the TX Comptroller and aims to compare historical survey data (compiled in the 1950s) to that of contemporary data compiled from recent surveys conducted by the research team. All material generated by this project will be deposited within the Collection of Fishes. We predict that >125,000 specimens will be generated as a result of project activities, helping the Collection of Fishes surpass the important milestone of **1 million specimens by close of 2025**.

## Collection of Amphibians and Reptiles

In 2024, the Collection of Amphibians and Reptiles (Fitzgerald, Hibbitts) catalogued 1,868 specimens into the collection that now totals 112,049 specimens (Figure 2). Our collection currently contains 2,506 species in 114 families, with outstanding taxonomic strengths in turtles, snakes, lizards, and important geographic representation of herpetofauna from Texas, SW USA, Mexico, and South America. The collection of amphibians and reptiles at Texas A&M is among the largest university-based herpetological collections at universities in the USA and is world renowned.

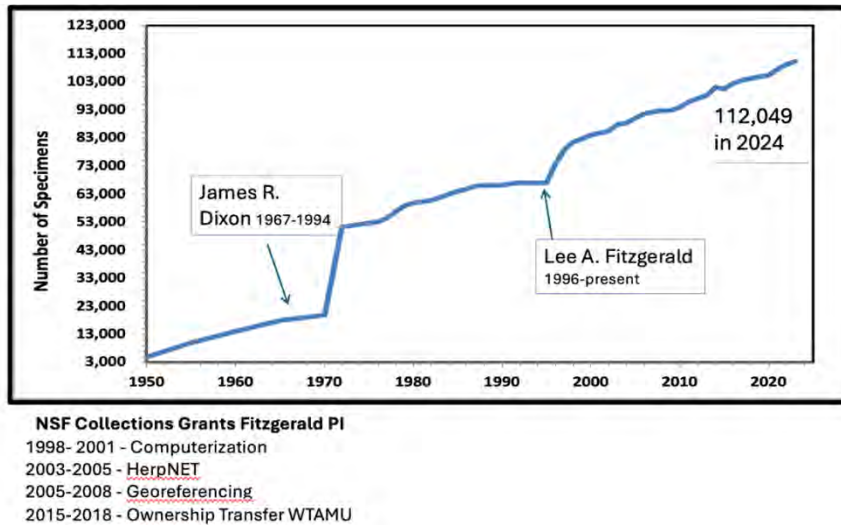


Figure 2 - Growth in the Collection of Amphibians and Reptiles from 1950 to present.

In 2024, we finished cataloging specimens from the West Texas A&M University (WTAMU) collection that we acquired with support from an NSF grant. Three volunteers worked in the herp range in 2024. Their main tasks were cataloging specimens from WTAMU and working on daily tasks to care for the collections.



Figure 3 - The Dunes Sagebrush Lizard (*Sceloporus arenicolus*) has been studied for decades by TAMU herpetologists. Mickey Parker, Ph.D. student, is seen collecting data in the species' unique dune habitat in the Monahans Sandhills, near Monahans, TX. (Photos by Lee Fitzgerald)

Most recent specimen accessions are from Texas (Figure 3). Specimens were collected by faculty members, staff, current and former students, and research collaborators. The Collection of Amphibians and Reptiles hosted 6 research visitors, numerous local collaborators, and processed a total of 9 physical



specimen and tissue loans (Table 2). In 2024, the collection was visited by herpetologists, ecologists, and artists who examined specimens for their research, teaching, and art.

Table 2 - Physical specimen loans from the Collection of Amphibians and Reptiles in the Biodiversity Research and Teaching Collections, Texas A&M University. Loans consisted of whole specimens and tissue samples used for genomic research. Not listed are dozens of information requests directly to BRTC, and also indirectly through the Global Biodiversity Information Facility (GBIF) and USA-based VertNet nationwide online specimen portal. We fulfilled requests for in-house specimen examination and photographic images of specimens, which is increasingly common and saves time, money, and avoids risk of shipping irreplaceable specimens.

Borrowing institution	Date	Description
Coe College, Department of Biology	1-Feb-24	<i>Pseudacris crucifer</i> specimens
Texas A&M University, Galveston	8-Feb-24	<i>Trachemys scripta</i> and <i>Graptemys versa</i> specimens
Texas Natural History Collection	19-Mar-24	<i>Syrrhophus</i> spp. specimens
1601 Chatham Ave	26-Mar-24	<i>Kinosternon hirtipes</i> tissues
University of Texas at Tyler	6-May-24	Bufonid species from Texas tissues
Illinois Natual History Survey	21-May-24	Specimen lost for decades, found by us, returned to INHS
Whittier College	17-Jul-24	<i>Bufo woodhousii</i> specimens
Oklahoma State University	17-Oct-24	<i>Bufo houstonensis</i> and <i>Bufo fowleri</i> specimen loan
Texas A&M University - Corpus Christi	17-Oct-24	<i>Notophthalmus meridionalis</i> tissue loan

Drs. Fitzgerald and Hibbitts each answered dozens of requests for information from the public and reporters. In 2024, they were interviewed by news outlets on various topics ranging from endangered species to snakes to the effect of the solar eclipse on herpetofauna. Fitzgerald was quoted in National Geographic (print edition December 2024), Texas Monthly, Texas Standard, interviewed on NPR Here&Now, Houston Chronicle, GreenSource DFW, and other outlets on rattlesnakes, the dunes sagebrush lizard, and the effect of roads on herpetofauna.

A significant portion of the use of data from the Collection of Amphibians and Reptiles was facilitated through our participation in global online databases such as the Global Biodiversity Information Facility (GBIF), the USA-based portal for vertebrate specimens VertNet. The Collection of Amphibians and Reptiles provides access to special-purpose images, such as CT scans that were accessed at Morphosource. For example, one of our specimens of the Chinese Alligator was accessed 10 times in 2024 by independent researchers. We also fulfilled at least 15 requests to photograph and measure specimens for outside researchers. By providing this service, we reduce the risks of mailing and transporting irreplaceable specimens around the globe. Requests for photographs are an important and increasing use of research specimens. Specimen photographs that allow examination of species traits are especially valuable for researchers in foreign countries because it is difficult and risky to ship physical specimens overseas. A priority is to develop a better system for reporting these kinds of uses of the collection.

## Amphibians and Reptiles 2024 Projects

*The Toll of Texas Roads on Turtles and Snakes. Exhibition of art and science of road ecology.*

Amanda Stronza, Rachel Ivanyi, Lee Fitzgerald. Stark Galleries Texas A&M. Funded by an Academy for the Visual and Performing Arts VPA grant to Amanda Stronza and Lee Fitzgerald. \$9,000. Featured in Texas Monthly, AgriLife Today, The Heart of the Art, KAMU.

*Quantifying benefits of well site selection to avoid disturbance of shinnery oak dunes and to limit landscape fragmentation across the geographic range of the dunes sagebrush lizard.*

Lee Fitzgerald, Burak Gunalp, Inci Gunalp. 2022-2024. \$23,660.

*Impacts Of Road Development On Biodiversity.*

Texas A&M University T3 Triads for Research. Burak Gunalp, Amanda Stronza, Lee Fitzgerald. 2021-2024. \$30,000.

*Endemic Peninsular and Insular Reptiles in Baja California.*

In association with Eco-Alianza de Loreto. Lee Fitzgerald.

*Conservation Translocations of the imperiled Dunes Sagebrush Lizard.*

PhD research by Mickey Parker, Fitzgerald PhD student. \$400,000, funding finished.

*Ecotourism for Conservation? True or False for Costa Rican Amphibians and Reptiles.*

Ph.D. research by Alberth Rojas Carranza, Fitzgerald PhD student.

*Reintroducing Species When Threats Still Exist: Repatriating the Endemic St. Croix Ground Lizard.*

Ph.D. research by Nicole Stevens, Fitzgerald PhD student. \$7,000

*Frogs as Invasive Species: A Global Review and Experimental Focus on the Invasion of the American Bullfrog in the Southwest USA.*

Ph.D. research by Griffin Nicholson, Fitzgerald PhD student. \$7000

*Hybridization of Red-eared slider turtles with native species: Threats from the World's Most Common Turtle and Top 100 Worst Invasive Species.*

Ph.D. research by Isis Davis, Fitzgerald PhD student. NSF Graduate Research Fellowship. \$160,000. 2024-2026.

## Collection of Birds

In 2024, the Collection of Birds (Voelker, Prestridge) accepted 19 accessions of new material, adding 3,000 bird specimens to the collection. The total number of catalogued specimens in the collection is now 34,340. Taxonomically, the collection now represents 1,926 species, 859 genera, and 165 families. Domestic fieldwork was conducted in the Trans-Pecos region of Texas at Cibolo Creek Ranch (Presidio County) and the Davis Mountains (Ft. Davis County). A large accession of tissue subsamples originating from collaborations with colleagues in Italy accounted for just over 1,500 of the specimens cataloged this year.

Because of our continued role in the statewide Lights Out conservation initiative, the Collection of Birds again received large numbers of salvage specimens from all major metropolitan areas, including several rare specimen records for Texas (e.g., LeConte's Sparrow). Samples from the Lights Out materials continue to be loaned with researchers from the Schubot Center for Avian Health (TAMU Vet School), the University of Texas – San Antonio, and the Harris County Health Department. Utilizing exhibition materials purchased in 2023 with funds from the Innovation X program at TAMU, our "Lights Out, Texas!" exhibit was installed at the Dogwood Canyon Audubon Center (Dallas) and the Cedar Hill City Hall. We again hosted the statewide Lights Out, Texas! partners meeting and collections open house with leadership from Texan By Nature, Audubon Texas, Defenders of Wildlife, Texas Conservation Alliance and others. During that time our Lights Out Exhibit was reinstalled at the Parker Astin Building in Downtown Bryan with attracted sponsorship dollars from HEB, Wild Spirit Wild Places, CollidEscape, Destination Bryan, and Titos Vodka.

We continue to maintain an active salvage network, with material being deposited by rehabilitation centers including the Friends of Texas Wildlife, Amos Rehabilitation Keep (ARK – Port Aransas, TX), Gulf Coast Wildlife Rehab (Brazoria, TX), and Southlake Animal Hospital (Southlake, TX). This salvage network continues to provide the collection with specimens that we would not otherwise have access to, such as raptors, owls and even a California Condor (Figure 4). Large sets of samples from salvage specimens have been used investigating Chagas Disease (owls), microplastics (rails), and other lines of inquiry.



Figure 4 – Recent California Condor (*Gymnogyps californianus*) specimen added thanks to connections with United States Fish and Wildlife Service Region 2 Law Enforcement.

Thirty loans were made to various institutions including the University of Montana, Cornell Museum of Vertebrates, University of Texas at San Antonio and the Schubot Center for Avian Health. The Collection of Birds hosted multiple on-site research scientists working on topics covering behavior, plumage, systematics and disease ecology.

We continued to rotate specimens through the Forsyth Gallery on a monthly basis in support of their "[Treasures From The Vault](#)" section, wherein rare artifacts are displayed. Numerous specimens from the research collection were used to support the teaching of ECCB 402 (Ornithology) and ECCB 302 (Diversity and Evolution of the Vertebrates) labs. In 2024, the Collection of Birds hosted several community science organizations for tours through the collection and included Travis Audubon, Texas Master Naturalist (TMN) Chapters from Brazos Valley and El Camino Real, and the Natural Resource Team from Fort Cavazos.

The Collection of Birds continues to see a strong interest by a diverse group of students and community volunteers willing to assist with specimen preparation and curation on a weekly basis; and as of 2022, undergraduates had the opportunity to earn credit for their role in specimen preparation and curation duties. In 2024, our volunteer group included 10 undergraduates, 3 graduate students, and 3 community volunteers. In total, this group prepared 1,76 specimens for the Collection of Birds. One graduate student was supported with departmental funding to prepare specimens over the summer.

### Birds 2024 Projects

#### Avian Malaria

Voelker's lab is investigating the distribution and prevalence of avian malaria across Africa (D.R. Congo, Benin, Malawi and South Africa) and most recently in Europe. Several papers have been published in this research focus area, with recent papers published in 2022 in *Diversity* and 2023 in *Parasitology Research*. The most recent paper, dealing with parasite-abundance relationships across biogeographic regions was published in *Journal of Biogeography* in 2025 (online in 2024).

#### Lights Out Texas

In late 2020, the BRTC engaged with a group to promote a statewide effort to promote dark buildings during peak bird migration. The twofold approach includes educating business owners and city managers about the importance of keeping their buildings and cities dark during peak migration and engaging with volunteers at the local level to conduct surveys. Casualties that are found on survey routes become specimens at the BRTC. In 2024, Curators Prestridge and Voelker again represented the BRTC at the Texan by Nature Conservation summit and continued conversations about long-term partnerships with non-profit organizations and industry that can support the preparation and digitization of these specimens.

#### Microbiomes

With Dr. Sergei Drovetski (United States Geological Survey), we are assessing microbiome variation in Bobwhite and Scaled Quail, Northern Mockingbirds, Golden-fronted Woodpeckers and Northern Cardinals. Specimens are collected in "clean sites" versus sites in heavy cotton production regions. We are assessing the taxonomic profiles of the microbiome, as well as the virulome, resistome, and functional gene expression. This work is accomplished through high throughput sequencing of the metagenome, transcriptome, and metabolome. Our first sampling for this project was in June of 2021, and additional sampling was conducted in June of 2022. We anticipate publishing two papers on

mockingbird microbiomes in 2025. This project is also the basis for the dissertation of a Ph.D. student in Voelker's lab.

#### Phylogeography and systematics of Eurasian birds

Voelker's lab is working in collaboration with Dr. Sergei Drovetski (USGS) and Italian Colleagues Drs. Marco Pavia, Irene Pellegrino and Giovanni Boano (University of Torino, University of Piemonte Orientale, and Natural History Museum of Carmagnola, respectively) on the phylogeography and systematics of selected bird species, for which they have extensive samples from Europe and Russia. Material from our recent expeditions to Sardinia and Sicily have provided new comparative material that will 1) allow us to assess the validity of described subspecies, and 2) provide additional localities for our ongoing assessments of biogeographic patterns and lineage diversification in birds distributed across known glacial refugia. Several papers have been published over the past few years, with the most recent being published in *The European Zoological Journal* in 2022.

#### Phylogeography of African arid-lands birds

With colleagues at UC-Berkley and Oklahoma State University, Voelker is investigating how genetic variation (if present) in a suite of bird species is distributed across southern African arid-lands, in the context of geography and historical climate change patterns. This work was initiated as part of an NSF funded collaborative project, and further collaborative funding is being sought. In addition to research products, this project has also generated over 1,800 specimens for the BRTC. This collaboration has produced a series of papers over the past five years, several additional papers are either in review or various stages of preparation, and the most recently published was in 2024 in *Frontiers of Biogeography*, and another is in press at *Integrative Zoology*.

## Collection of Mammals

The Collection of Mammals (Light, Prestridge) registered 3 new accessions and added 271 specimens to the collection in 2024 bringing the total number of specimens to 68,844, representing 994 species, 424 genera, 94 families, and 22 orders.

During 2024, hundreds of bat specimens were prepared and installed into the BRTC that died during the February 2021 freeze. The BRTC coordinated a specimen preparation day with volunteers from the department to process these bats. Curator Prestridge continues to work with wildlife rehabilitation facilities and game wardens around the state to accession additional specimens.



*Figure 5. Students Ziyu Wang and Amanda Harvey examining hog-nosed skunk (Conepatus melanoleucas) at the Biodiversity Research and Teaching Collections.*

The Mammal Division filled 13 loans to various researchers and institutions nationally and internationally. Loans were made throughout the USA including the Burke Museum, University of Nebraska, and Rice University (among others), and internationally to Brazil. Numerous specimens from the research collection were used to support teaching ECCB 401 (General Mammalogy). Visitors to the collection were primarily from Texas institutions to examine specimens for imaging and measuring.

In 2024 CT datasets of specimens from the Collection of Mammals were loaned to various institutions for a variety of research and teaching purposes. Data from the Collection of Mammals is easily discoverable on several web portals including VertNet, iDigBio, and GBIF.

During 2024, one departmentally supported technician (Amanda Moehring) worked part time in the collections focusing on overall collection organization. Her work has been vital to the maintenance of the collections. Also, during 2024, ECCB 401 (General Mammalogy) students helped with pest management, examining all dry specimens for insect infestation. We had a specimen preparation day in October to help process bat specimens from the 2021 February freeze.

## Mammals 2024 Projects

### Morphological and genomic diversity in the North American deer mouse (*Peromyscus maniculatus*) across its geographic range

With funding from the National Science Foundation, Dr. Light is using genomic data and 3D geometric morphometric data (taken primarily from fluid-preserved specimens) to explore diversity of putative species within *P. maniculatus* throughout its entire geographic range. Specimens from the BRTC, in addition to other specimens from natural history collections, have been instrumental in this work. Recently graduated PhD student Natalie Hamilton is leading the genomic work and MS students Brandy Craft, Haley Ellis, and Grace Martindale are tackling the morphology side of the project. We expect to publish several papers related to this research in the next year. In 2024, we employed several undergraduate students (Abigail Torres and Thomas Yllander) working on the project with extramural funding.

### *Systematics and Selection in Sucking Lice*

Dr. Light and several of her collaborators outside of Texas A&M are funded by the National Science Foundation to explore relationships and selection of sucking lice that parasitize mammals. PhD student Ali Lira worked on this project in 2024, examining mammal specimens for lice and exploring morphology and spatial distributions across all 15 families and approximately 600 species of sucking lice.

### *RANGES: Building Capacity to Extend Mammal Specimens from Western North America*

Dr. Light is part of a National Science Foundation funded Thematic Collections Network initiative across over 20 natural history collections. For this project, each collection is digitizing important trait and ecological data from western North American mammal specimens. We started documenting these data during the summer of 2023, with PhD student Ayomiposi Abraham and technician Emily Coyote. During 2024, Emily continued her efforts digitizing specimen data and training and working with a number of undergraduate students on the project including Katelyn Bartlett, Holden Carey, Emilia Myslak, Priscilla Solis, and Reese Williford.

### *Distribution of Nelson's pocket mouse (*Chaetodipus nelsoni*) in Texas*

With previous funding from Texas Parks and Wildlife and Texas EcoLabs, Dr. Light has explored the species limits and distribution of the *Chaetodipus nelsoni* species group in southwest Texas, specifically the recently described *C. collis* (Neiswenter et al. 2019). Although a specimen of *C. collis* from Webb County is housed in the Biodiversity Research and Teaching Collections, newly collected data (field work and ecological niche modeling; data collected by past PhD students Adrian Castellanos, Leilia Siciliano-Martina, Lacie LaMonica, and past undergraduate students Sarah Ardry, Emma Dohnalik, Stephen Fowler, River Martinez, and Grace Vielleux) support that the species may not reside southwestern Texas. We have a manuscript in review at the *Journal of Mammalogy* describing the distribution of the pocket mouse in Texas as well as determining geographic limitations of the other two species within the *C. nelsoni* species group. This manuscript also involves a PhD student in Dr. Daniel Spalink's lab (Lydia Morley) who examined niche occupancy of each species.

### *Documenting small mammal diversity at the BRTC*

Dr. Light and her mammalogy class trap at the collections and locally every semester documenting small mammal diversity while also screening for ticks and notable pathologies (including the *Brazospox* virus) for collaborative research projects with Sarah Hamer's laboratory (Texas A&M Veterinary Integrative BioSciences).

### *Population genetics and phylogeography of pocket gophers and their chewing lice*

The Light lab continues to investigate relationships among pocket gophers and their parasitic lice (at the population level as well as across large geographic distributions). Current work is focused on finalizing a phylogeographic assessment of *Geomys breviceps* and pursuing pocket gopher and chewing louse population genetics. PhD student Ayomiposi Abraham, technician Danielle Dillard, and undergraduate students Abby Jensen and Katelyn Bartlett are exploring the relationships and phylogeographic patterns of chewing lice parasitizing *Geomys* pocket gophers in Texas and across the geographic range of the genus. This work is funded by Texas Ecolab and involves collecting specimens in the field as well as brushing voucher species in the BRTC and other collections.

### *Porcupine range expansion*

Using specimens from natural history collections (including the BRTC) and observations from community scientists, Dr. Light, staff curator Prestridge, technician Danielle Dillard, and several undergraduate students are exploring possible range expansions of porcupines (*Erethizon dorsatum*) across North America. We are currently collaborating with PhD students in Dr. Daniel Spalink's lab (Lydia Morley, Katie Sanbonmatsu) to develop ecological niche models of this species.

### *Bat Population Genetics and Disease*

In 2024, several manuscripts were submitted examining pigmentation and population dynamics of the Townsend's big-eared bat, (*Corynorhinus townsendii*) from California. Tissue samples used in these studies are housed at the BRTC. Also in 2024, samples from bat specimens (belonging to the species *Tadarida brasiliensis*, or the Mexican free-tailed bat) were accessioned as part of the 2021 Winter Storm Uri. Specimens from this freeze have been used in several disease studies to date and likely will be used in future research.

### *Tick and Parasite Associations*

PhD Student Oluwaseun Ajileye is exploring the associations between tick and their parasites and pathogens (particularly filarial worms) as part of his dissertation research. He is using specimens in the BRTC and other natural history collections to obtain tick samples for his research.



## Collection of Marine and Freshwater Invertebrates

As of 2024, the Collection of Marine Invertebrates (Wicksten, Prestridge) consists of 13,6128 digitally cataloged lots of invertebrates. Our Collection now contains voucher specimens from freshwater streams and springs, useful for comparison with related marine species.

In 2024, we collaborated with Randy Gibson, Texas Parks and Wildlife, on an investigation of a small freshwater shrimp, *Palaemon texanus*, known only from San Marcos and New Braunfels (Figure 5). There were no reports of it since its description in 1974. We found shrimp matching the description at the same sites. Using genetic comparisons, we found that “*P. texanus*” is almost identical to the very common and widespread shrimp *P. paludosus*. We are certain that *P. texanus* is a misidentification of a *P. paludosus*, often used for bait or in aquaria.

In support of his project, we examined all the coastal specimens of *Palaemon* spp. (previously called *Palaemonetes*) in our collections. Previous records of *P. vulgaris* seem to be based on only 2 specimens collected along the Intercoastal Canal. We are working on a new paper correcting the identifications and clarifying the ranges of these species. We will include the first specimen of *P. floridanus* found at Port Aransas.

With help from undergraduate students, we are reassessing identifications of our dry shell collection. We curated specimens from the Caribbean, Gulf of Mexico, and western Atlantic into a separate set of shelves. We have extensive collections of land snails from western Pacific Islands and Florida. We also have fine examples of “specimen shells” that were purchased by private collectors many of which represent species that have been over-harvested and now are illegal to buy or collect.



Figure 5- Study site for *Palaemon texanus* where the shrimp are noted to hide in vegetation from predators like bass (Photo by Mary Wicksten).

## Student Engagement and Mentoring

### Teaching Use

The BRTC continues to be heavily used by undergraduate courses offered by the Department of Ecology and Conservation Biology. While labs are provided with collections of specimens dedicated to teaching, specimens from the research collections are also often utilized for rare species. Laboratory courses taught at the BRTC in 2024 included:

ECCB 302- Diversity and Evolution of the Vertebrates (Fall and Spring – 135 students per semester; Conway/Fitzgerald/Voelker)

ECCB 311- Ichthyology (Fall – 60 students; Conway)

ECCB 314/614 – Biology of Gulf Coast Fishes (Summer – 13 students; Conway; Figure 6)

ECCB 315- Herpetology (Spring – 60 students; Fitzgerald)

ECCB 316 – Field Herpetology (Spring – 25 students; Hibbitts)

RENH 400/ECCB 485 – South Africa Study Abroad (Hibbitts/Fitzgerald)

ECCB 401- Mammalogy (Fall and Spring – 50 students per semester; Light)

ECCB 402- Ornithology (Spring – 45 students; Voelker)



Figure 6 - Students participating in ECCB 314/614 Biology of Gulf Coast Fishes, a summer field course taught by Dr. Conway that trains students in both field and museum techniques (Photos by Texas A&M Agrilife MarCom).

### Graduate Student Advising

Graduate students directly engaged in BRTC Research and Teaching with a BRTC Curator as their advisor.

Ayomiposi Abraham (PhD; Light)

Oluwaseun David Ajileye (PhD; Light)

Wesley Arend (MSc; Conway)

Carolina Bertoul (PhD; Voelker)

Alberth Rojas Carranza (PhD; Fitzgerald)

Brandy Craft (MSc; Light)

Isis Davis (PhD; Fitzgerald/Delmore-TAMU Dept. of Biology)

Haley Ellis (MSc; Light)

Darcae Holmes (MSc; Conway)

Tiffany Inbody (PhD; Conway)

Katrina Keith (PhD; Voelker)

Grace Martindale (MSc; Light)

E. Griffin Nicholson (PhD; Fitzgerald)

Mickey Parker (PhD; Fitzgerald)

Nicole Stevens (PhD; Fitzgerald)

Ryan Weesner (PhD; Voelker)

## Student Workers

Utilizing funds from the Department of Ecology and Conservation Biology, the BRTC was able to employ 2 undergraduate students on a part-time basis during 2024. Marianna Stasney was tasked with managing the beetle colony, skeletonization and preparation of specimens, fumigation and reinstallation of research specimens used in ECCB -ology courses while Amanda Moerhing worked to update specimen organization in the Collection of Mammals. Several additional student workers were employed under extramural funding in 2024 (Figure 7) including Sabri Amrani-Khaldi, Josh Incardona (Collection of Fishes - NSF CSBR), Tyler Hutchinson (Collection of Fishes – Texas Comptroller), Skyler Nix, Hannah Brethorst, Sabri Amrani-Khaldi (Collection of Birds).



Figure 7 - Student workers Josh Incardona, Sabri Amrani-Khadi, Jenna Henry, and Nick Bruni (Photos by Heather Prestridge).

## Interns

Internships (ECCB 485/285) were offered in all divisions in 2024. Each intern had their own specific project that matched their interest in the collections, and included writing intensive intern Sabri Amrani-Khaldi (Conway) and Directed Studies students Jenna Henry, Brisa Vargas (Voelker) and Sabri Amrani-Khaldi (Prestridge)

## Community Engagement

### Support of Community Science

In 2024, the training class for the Brazos Valley Texas Master Naturalist (TMN) chapter continued exclusively utilizing the BRTC as their location for new member training (Figure 8). This organization is sponsored by Texas A&M AgriLife Extension and has been advised by Prestridge since the chapters beginning in 2005. Prestridge serves as their chapter advisor and hosts the introductory session for each training class. Hibbitts contributes to the class annually, teaching the Reptile and Amphibian section. The BRTC provides a unique opportunity for this group because the trainees and members have access to specimens to learn from. Trainees from the class are also exposed to the value of natural history collections and offered volunteer opportunities to engage with the BRTC outside of their training hours. We also routinely supported k-12 education through loaning of educational kits of specimens.



Figure 8. Texas Master Naturalist class of 2024 at the BRTC (Photos by Dwight Bohlmeier).

### Community Volunteers

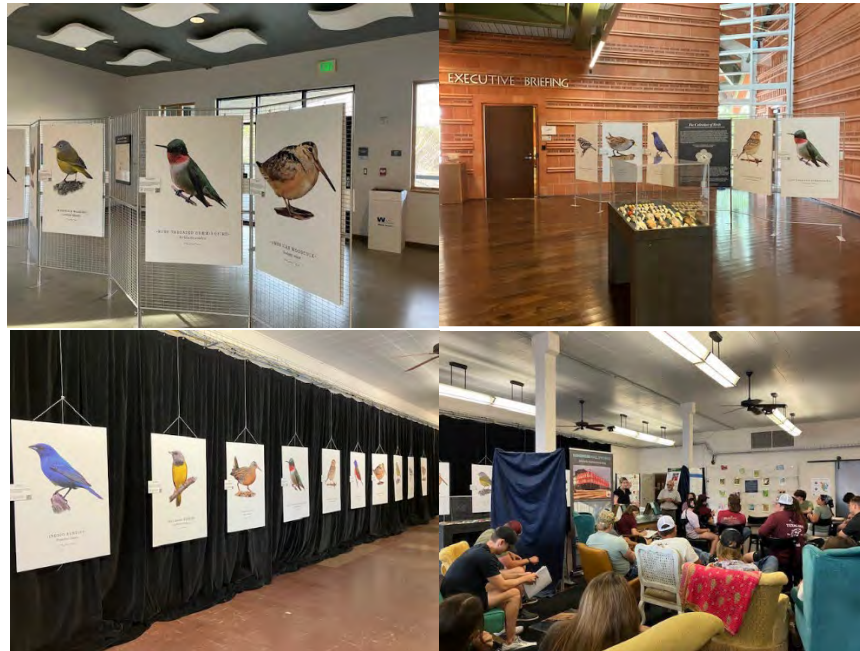
Community volunteers including members of the Texas Master Naturalist (TMN) chapter and former students contributed time in several areas of the collections in 2024. TMN volunteers continued to maintain and improve the native pollinator garden and outdoor classroom area, with monthly workdays on the first Friday of each month. In addition to the TMN workdays, Squadron 6 of the Texas A&M Corps of Cadets volunteered with major projects in the garden several times (Figure 9). Within the collections, several community volunteers continued to serve not only as volunteers, but mentors to students.



Figure 9. Texas Master Naturalist volunteers (left) and Corps of Cadets Squadron 6 (right) at the BRTC gardens workdays in 2024 (Photos by Heather Prestridge).

## Public Expositions

In 2024, specimens from the Collection of Birds were utilized for public expositions at local museums, galleries, and schools. The “Lights Out, Texas!” exhibition traveled to Dogwood Canyon Audubon center and the City of Cedar Hill Municipal Building. Materials from this exhibit were reimagined for, “Lights Out, Texas! Chapter 2: Glass” installed at the Parker Astin building in downtown Bryan in August of 2024 and included artwork, specimens, and messaging about the important conservation initiative with new components that demonstrated bird safe glass and retrofitting options. (Figure 10).



*Figure 10. Lights Out, Texas! exhibition reenvisioned (clockwise from top right) at Dogwood Canyon, Cedar Hill and The Parker-Astin in historic Downtown Bryan including a visit from Dr. Perry Barboza ECCB 308 – Fundamentals of Environmental Decision-Making with presenters from PGP Design Center regarding bird friendly glass (Photos by Heather Prestridge).*

Specimens from the Collection of Reptiles and Amphibians were showcased in the exhibit “The Tolls of Texas Roads on Turtles and Snakes” at the J. Wayne Stark Galleries on Texas A&M University Campus – a collaboration with Amanda Stronza (ECCB) and Rachel Ivanyi a contemporary nature artist (Figure 11).



*Figure 11 - Memorial of a Prairie Kingsnake exhibited at the Toll of Texas Roads exhibit 2024 (Photo by Amanda Stronza).*

## BRTC Operations

### Funding

In FY 25, the BRTC received \$8,000 from the Department of Ecology and Conservation Biology for general support, \$3,000 for support of labs that meet at the BRTC, and additional departmental support to employ an undergraduate student worker (\$12/hr 10 hours per week) and mammalogy technician (\$14/hr 10-15 hours per week).

In addition to our departmentally supplied operating budget, the ECCB supported the purchase of one large specimen cabinet and additional drawers for existing cabinets for teaching collections of mammals totaling \$4,561.50. In April of 2024, ECCB funded the purchase of an additional ultracold freezer and racks plus installation of an additional outlet to support our growing frozen tissues collections totaling \$22,564.

In August of 2024, the University approved a request for infrastructure improvements for the BRTC in the amount of \$185,000 from the following sources:

\$100,000 – New TAMU one time funding  
\$11,880 – College RFP Funding  
\$10,000 – Departmental RFP Cost Share  
\$63,120 – Vice Chancellor PUF

The scope of the renovations will include addressing security of our research collections through the addition of walls/lockable doors to divide the research collections from teaching and general use space, lowering and zoning lighting, additional restroom facilities, adding electrical outlets to workstations and classrooms, upgrades to vent hood fan and the addition of oversized doors leading to our loading dock area. Work is scheduled to take place in the summer of 2025.

## Curator Authored Peer Reviewed Journal Articles 2024

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See our [Google Scholar Profile](#)

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