

MIDWESTERN STATE UNIVERSITY
COLLEGE OF SCIENCE AND MATHEMATICS
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RAYMOND E. WILLIS

EDUCATION

- 2006 Ph.D. Texas Tech University (Biological Sciences)
Dissertation Title: Phylogenetic Inference of the Extant Crocodylians Derived from Nuclear Gene Sequences.
- 2003 M.S. Tarleton State University (Biological Sciences)
Masters Thesis: The Effects of Prescribed Burning on Reptile Utilization of Upland Habitats in Edwards County, Texas.
- 2000 B.S. Tarleton State University (Biological Sciences)

PROFESSIONAL EXPERIENCE

Chair, Dept of Biology- Aug. 2022-Present

Midwestern State University

Director of Dalquest Desert Research Station- Aug. 2016-2018

Midwestern State University

Vertebrate Biologist

College of Science and Mathematics

Associate Professor- Aug. 2017-Present

Midwestern State University

Vertebrate Biologist

Dept of Biology

Curator of Dalquest Vertebrate Collection- Aug 2012-Present

Midwestern State University

Vertebrate Biologist

College of Science and Mathematics

Assistant Professor- Aug. 2012-2017

Midwestern State University

Vertebrate Biologist

Dept of Biology

Assistant Professor- Aug. 2010-Aug. 2012

University of Science and Arts of Oklahoma

Vertebrate Biologist

Dept of Science and Physical Education

Postdoctoral Research Associate- Jan. 2007-Aug. 2010

Texas Tech University Health Sciences Center

Dept of Cell Physiology and Molecular Biophysics

Physiological Significance of Sodium Potassium Pump Diversity

PI: Thomas A. Pressley

Teaching Assistant- Fall and Spring, 2002-2006

Texas Tech University

Dept of Biological Sciences

Courses: Animal Physiology, Anatomy and Physiology, Introductory Biology

Teaching Assistant- 2000-2002

Tarleton State University

Dept of Biological Sciences

Courses: Animal Biology, Plant Biology, Paleontology, Vertebrate Paleontology

United States Navy- 1988-1997

Rank: E2-E6. Machinist, Diver, Recruiter

LECTURE EXPERIENCE

MSU Biological Sciences 2012-Present

Biol 6003 Speciation and Advanced Phylogenetic Techniques

Biol 5673/4673 Desert Ecology

Biol 5233/4233 Mammalogy

Biol 5143/4143 Evolution and Systematics

Biol 4033 Herpetology

Biol 3334 Genetics

Biol 3234 Comparative Vertebrate Anatomy

Biol 3024 Vertebrate Zoology

Biol 3113 Biogeography

Biol 3033 Field Biology

Biol 1214 Life II

USAO Biological Sciences 2010-2012

Biol 4883 Mammalogy

Biol 4883 Advanced Field Techniques

Biol 4883 Herpetology

Biol 4882 Habitat Area Projects

Biol 3104 Evolution

Biol 2253 Human Anatomy

Biol 2203 Comparative Vertebrate Anatomy

IDS 2023 Foundations of Life Science

Biol 1113 General Zoology

TTU Biological Sciences Fall 2006

Biol 6100 Developed and led seminars: Molecular, Speciation, Biogeography

Biol 4410 Organic Evolution Problems Companion Seminar

Biol 4410 Organic Evolution- Team Teach

Biol 1402 Biology of Animals- Team Teach

PUBLICATIONS

- Thibodeau, M. C., **R. E. Willis**, C. M. Watson. 2023. Submitted. Northern bobwhite quail (*Colinus virginianus*) as an umbrella species for the conservation of the threatened Texas horned lizards (*Phrynosoma cornutum*). *Western Wildlife*.
- White, J. W., M. S. Husak, **R. E. Willis**. 2017. Geographic distribution of the nonnative Mediterranean gecko (*Hemidactylus turcicus*) in Oklahoma. *Southwestern Naturalist*. 61 (4): 338-41.
- McAliley, L. R., **R. E. Willis**, C. Ivanyi and L. D. Densmore III. 2017. Captive breeding of the endangered San Esteban chuckwalla, (*Sauromalus varius*). A decade of captive breeding and genetic diversity. *Southwestern Naturalist*. 61 (4): 279-284.
- Fox, M. R., **R. E. Willis**. 2016. New Host Associations and state records for bat ectoparasites in Texas. *Southwestern Entomologists*. 4 (4): 1199-1202.
- Beck, K. G., R. Soler-Gijon, J. R. Carlucci, **R. E. Willis**. 2016. Morphology and histology of dorsal spines of the Xenacanthid shark (*Orthacanthus platypternus*) from the lower Permian of Texas, USA: Palaeobiological and Palaeoenvironmental Implications. *Acta Palaeontologica Polonica* 61 (1): 97-117.
- Mukherjee, S, J. Trice, P. Shinde, **R. E. Willis**, T. A. Pressley, and J. F. Perez-Zogbi. 2013. Ca²⁺ oscillations, Ca²⁺ sensitization, and contraction activated by protein kinase C in small airway smooth muscle. *Journal of General Physiology*. 141(2), 165-178.
- Willis, R. E.** 2009. Transthyretin (*TTR*) intron 1 elucidates crocodylian relationships. *Molecular Phylogenetics and Evolution*. 53, 1049-1054.
- Carr, D. L., J. A. Carr, **R. E. Willis**, and T. A. Pressley. 2008. A perchlorate sensitive iodide transporter in frogs. *General and Comparative Endocrinology* 156, 9-14.
- Willis, R. E.**, L. R. McAliley, E. D. Neeley, and L. D. Densmore III. 2007. Evidence for placing the false gharial (*Tomistoma schlegelii*) into the family Gavialidae; Inferences from nuclear gene sequences. *Molecular Phylogenetics and Evolution*. 43, 787-794.
- McAliley*, L. R. **R. E. Willis***, D. A. Ray, P. S. White, C. Brochu and L. D. Densmore III. 2006. Are crocodiles really monophyletic?-Evidence for subdivisions from sequence and morphological data. *Molecular Phylogenetics and Evolution*. 39, 16-32.
(* Co-first authors)
- McAliley, L. R., **R. E. Willis**, M. R. J. Forstner, T. Guerra, and L. D. Densmore III. 2006. Eight microsatellite markers for the San Esteban Chuckwalla, *Sauromalus varius*. *Molecular Ecology Notes*. 6, 759-761.
- McAliley, L. R., **R. E. Willis**, P. A. Lavine-Murcio, and L. D. Densmore III. In Review. Microsatellite analysis of captive and wild populations of the San Esteban chuckwalla, *Sauromalus varius*. Occasional Papers, Museum Texas Tech University.
- Fox, M. R., **R. E. Willis**. In Review. Chiropteran Seasonal Variation at the Dalquest Desert Research Station (Presidio and Brewster Co., Texas). *Southwestern Association of Naturalists*.

AWARDS and GRANTS

2020-2022	Small Mammal Survey on Fort Wolters Training Center, Mineral Wells, Texas. August 2020-August 2022. \$60,707.
2020-2022	Small Mammal Survey on Camp Swift Training Center, Bastrop Co. Texas. August 2020-August 2022. \$64,113.
2018-2022	National Science Foundation RUI: CSBR: Natural History Collections: Modernization and Consolidation of the Natural History Collections at MSU into the Xeric Ecosystem Research Center (XERC). Sept 2018-Sept 2022. \$472,804.
2017-2019	TXMD; Small Mammal Survey on Camp Maxey Training Center, Lamar Co. Texas. June 2017-June 2019. \$63,068.
2017-2019	TXMD; Reptile and Amphibian Survey on Camp Swift Training Center, Bastrop Co. Texas. May 2017-April 2019. \$34,224.
2015-2017	Small Mammal Survey on Fort Wolters Training Center, Mineral Wells, Texas. Sept 2015-Jan 2017. \$22,882.
2013-2014	Internal Faculty Grant; Investigation of the Sodium-Potassium Pump In Non-Mammalian Vertebrates. \$4,650.
2009 (post doc)	Collaborative Grant- Protein Kinase C Regulation of Pulmonary Vascular Smooth Muscle Tone (Co-PIs T.A. Pressley and J.F Perez-Zoghbi). \$184,000.
2008 (post doc)	International Congress of Physiological Sciences Travel Award. Kyoto, Japan.
2008 (post doc)	American Physiological Society Professional Skills Training Travel Award. Orlando, FL.
2005	Texas Tech University Association of Biologists Summer Research Award.
2004	Texas Tech University Association of Biologists Summer Research Award.
2003	Texas Tech University Association of Biologists Summer Research Award.

MASTER STUDENT THESES MENTORED

2022	Skinner, Drew	Acoustic Bat Monitoring Techniques at the Dalquest Desert Research Station (Presidio and Brewster Counties, Texas).
2017	Mitchell, Erika	Diversity Survey of Carnivorous Mammals at the Dalquest Desert Research Station.
2017	Winters, Dana	Predation, Parental Defense Behaviors, and Microhabitat Structure at Scissor-Tailed Flycatcher (<i>Tyrannus forficatus</i>) Nest Sites.
2016	Knightstep, Gisela	Subspecific Investigation of a Canyon Lizard (<i>Sceloporus merriami</i>) Population from Dalquest Desert Research Station
2016	McBride, Sarah	Examining the Phylogeny of Canyon Lizard Subspecies in the Chihuahuan Desert of West Texas.

- 2016 Fox, Matthew Diversity, Ecological Dynamics, and Ectoparasitism of the Order Chiroptera at the Dalquest Desert Research Station (Presidio and Brewster Co. Texas).
- 2016 Stewart, Robert Biodiversity of the Small Mammals in Two Varied Habitats within the Dalquest Desert Research Station.
- 2014 Nimetz, Erin A Post-Cranial Osteological Comparison: The Ocelot (*Leopardus pardalis*) and Bobcat (*Lynx rufus*).
- 2014 Beck, Kimberly Comparative Histology Among Permian Vertebrates, Arroyo Formation, North Texas.

SELECTED INVITED TALKS

- Vertebrate Research in the Chihuahuan Desert and Beyond. Tarleton State University. Stephenville, Texas. May 2023.
- History of the Dalquest Vertebrate Collection and Research at the MSU Dalquest Desert Research Station. Wichita falls Museum of Art. Wichita Falls, Texas. September 2022.
- Current and Future Work at the Dalquest Desert Research Station. Texas Tech University, Dept of Biological Sciences. Lubbock, Texas. March 2016.
- Bats, Cats and Rats: Current Research and Graduate Student Opportunities at the MSU Dalquest Desert Research Station. Midwestern State University, Board of Regents. Wichita Falls, Texas. November 2015.
- Bats, Cats and Rats: Current Research and Graduate Student Opportunities at the MSU Dalquest Desert Research Station. Cameron University, Lawton OK. October 2015.
- Bats, Cats and Rats: Current Research and Graduate Student Opportunities at the MSU Dalquest Desert Research Station. Northwestern Missouri state University. Maryville, MO. November 2014.
- Horned Lizards, Crocodiles and Other Stuff. Tarleton State University, Speaker Symposium. Stephenville, Texas. September 2012.
- Crocodylian Systematics and Genetic Variation in the Na⁺, K⁺-pump of Under-Represented Vertebrate Lineages. Midwestern State University. Wichita Falls, TX. February 2012.
- Implications of genetic variation in the Na⁺,K⁺- pump of under-represented vertebrate lineages. Interactions of Cardiac Steroids and the Na⁺, K⁺ ATPase. Jerusalem, Israel, February 2011.
- Utility of transthyretin (*TTR*) intron one in elucidating crocodylian relationships. Center for Membrane Protein Research. Texas Tech University Health Sciences Center. Lubbock, TX. March, 2009.
- Na,K Pump variation and acclimation of a freshwater serpent to a marine food source. Center for Membrane Protein Research. Texas Tech University Health Sciences Center. Lubbock, TX. March, 2009.

SELECTED PRESENTATIONS

- Morphological determination of valid subspecies of canyon lizard (*Sceloporus merriami merriami*, *Sceloporus merriami annulatus*, and *Sceloporus merriami longipunctatus*) in the Chihuahuan Desert of West Texas. Joint Meeting of Ichthyologists and Herpetologists. Gisela Knightstep and Ray E Willis. New Orleans, LA. July, 2016. *Poster presentation*
- The Molecular Determination of Valid Subspecies of Canyon Lizard (*Sceloporus merriami merriami*, *Sceloporus merriami annulatus*, and *Sceloporus merriami longipunctatus*) in the Chihuahuan Desert of West Texas,” Joint Meeting of Ichthyologists and Herpetologists. Sarah McBride, and Ray E. Willis. New Orleans, LA, July, 2016. *Poster presentation*
- Examining the Phylogeny of Canyon Lizard Subspecies in the Chihuahuan Desert of West Texas, Evolution. Gisela Knightstep, Sarah McBride, and Ray E. Willis Austin, TX June 2016. *Poster presentation*
- Variation in Diagnostic Characters Among *Sceloporus merriami* 'subspecies' at the Dalquest Desert Research Station. Society of Integrative and Comparative Biology. Gisela Knightstep, Sarah McBride, and Ray E. Willis. Portland, OR. January, 2016. *Poster presentation*
- Diversity Survey of Carnivorous Mammals at the Dalquest Research Site. Erika Mitchell and Ray E. Willis, Texas Society of Mammalogists, Junction, TX. February, 2015 *Poster presentation*
- A Survey of the Order Chiroptera and Their Ectoparasites within the Dalquest Desert Research Station (Presidio and Brewster Co., Texas). Matthew Fox and Ray E. Willis, Texas Society of Mammalogists, Junction, TX. February, 2015 *Poster presentation*
- Biodiversity of the Small Mammals in Two Different Habitats Within the Dalquest Desert Research Station Robert W. Stewart and Ray E. Willis, Texas Society of Mammalogists, Junction, TX. February, 2015 *Poster presentation*
- Investigation of the Sodium-Potassium Pump In Non-Mammalian Vertebrates. Integrative Biology Workshop V. Midwestern State University. Wichita Falls, TX. February 2014. *Oral Presentation*
- Genetic Variation in the Alpha 1 subunit of the Na,K-pump in a Freshwater Serpent. Society of Integrative and Comparative Biology. Seattle, WA. January, 2010. *Poster presentation*
- Utility of transthyretin (*TTR*) intron one in elucidating crocodylian relationships. International Congress of Physiological Sciences. Kyoto, Japan, July, 2009. *Poster presentation*
- Utility of transthyretin (*TTR*) intron one in elucidating crocodylian relationships. Experimental Biology. New Orleans, LA. April, 2009. *Poster presentation*
- Evidence for placing the false gharial (*Tomistoma schlegelii*) into the family Gavialidae; Inferences from nuclear gene sequences. Third International Workshop on Crocodylian Genetics and Genomics. Panama City, Panama. April, 2007. *Oral Presentation*

Are crocodiles monophyletic? Evidence for subdivisions from sequence and morphological data. American Society for Ichthyology and Herpetology Joint Meeting. New Orleans, LA. July, 2006. *Oral Presentation*

Brochu, C., **R. Willis**, and L. Densmore. 2006. The phylogenetic relationships of gavialoid crocodylians: new fossils, new genes, old conflicts. *Journal of Vertebrate Paleontology* 26:45A.

Evidence for placing the false gharial (*Tomistoma schlegelii*) into the family Gavialidae; Inferences from nuclear gene sequences. American Society for Ichthyology and Herpetology Joint Meeting. Tampa, FL. July, 2005. *Oral Presentation*

Evidence for placing the false gharial (*Tomistoma schlegelii*) into the family Gavialidae; inferences from nuclear gene sequences. Texas Tech University Graduate Forum. Lubbock, TX. April, 2005. *Oral Presentation*

Phylogenetic inference of the extant crocodylians based on nuclear gene sequences. Southwestern Association of Naturalists. Huntsville, TX. April, 2005. *Oral Presentation*

Nuclear evidence for genetic subdivisions within the genus *Crocodylus*. American Society for Ichthyology and Herpetology Joint Meeting. Norman, OK. May, 2004. *Poster Presentation*

Nuclear evidence for genetic subdivisions within the genus *Crocodylus*. Texas Tech University Graduate Forum. Lubbock, TX. April, 2004. *Oral Presentation*

The effects of prescribed burning on reptile utilization of upland habitats in Edwards County, TX. Southwestern Association of Naturalists. San Antonio, TX. April, 2004. *Oral Presentation*

PROFESSIONAL and COMMUNITY SERVICE

President, Texas Society of Mammalogists 2022-2023
Treasurer, Southwestern Association of Naturalists 2017-Present
Manager of the USAO Habitat Area, Chickasha, OK 2010-2012

Reviewer: *Journal of Zoology*, *Molecular Phylogenetics and Evolution*, *Physiological Genomics*, Southwestern Association of Naturalists
Associate Editor Southwestern Association of Naturalists- Reptiles and Mammals

Member: Society for Integrative and Comparative Biology 2009-Present
Texas Society of Mammalogists 2000-Present
Southwestern Association of Naturalists 2000-Present
American Society of Ichthyologists and Herpetologists 2003-Present

FIELD EXPERIENCE

Dalquest Research Station, Presidio and Brewster Co. Texas. Vertebrate diversity and baseline inventory. 2012-Present.

USAO Habitat Area, Chickasha, OK. Vertebrate diversity and baseline inventory. 2010-2012.

Llano River, Junction, TX. Representative water snake tissue collection for current Na,K-pump diversity research. 2008.

Rockefeller Wildlife Refuge, Grand Chenier, LA. American alligator collecting and survey. 2006.

- Big Bend State Park, TX. Small mammal survey using Sherman traps, bat collection, reptile and amphibian blood collection. 2006.
- San Esteban Island, Sea of Cortés, Mexico. Blood collection and population survey of San Esteban chuckwalla (*Sauromalus varius*). 2005.
- Elephant Mountain Wildlife Management Area, Southwest, TX. Reptile and amphibian surveys and blood collection. 2002-2004.
- Guadalupe National Park, TX. Small mammal survey in sand dune and transient dune environments. 2003.
- Texas A&M Experiment Station, Sonora, TX. Reptile, amphibian and plant survey and how they respond to prescribed burns. 2001.