

52nd Annual Meeting

of the

Texas Chapter

of

The Wildlife Society



A Texas Parks & Wildlife biologist demonstrates to students how to sample deer for CWD on East Foundation land.

Chronic Wasting Disease in Texas Whitetails...Now What?

18–20 February 2016

San Antonio, Texas

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KORY GANN

TENTATIVE MEETING SCHEDULE – 01.12.2016

Wednesday, 17 February

9:00 AM–4:00 PM Wildlife Tracking Training Workshop Executive Salon 5
Afternoon in-the-field

Thursday, 18 February

8:00 AM–8:00 PM Registration Fiesta Pavilion Foyer
8:00 AM–12:00 PM Exhibitor Set-up Fiesta Pavilion
8:00 AM–12:00 PM Media Training Workshop Texas Ballroom C
8:00 AM–12:00 PM Camp Bullis Field Trip Front of Hotel Lobby
8:00 AM–12:00 PM San Antonio River Field Trip Front of Hotel Lobby
8:00 AM–12:00 PM TCTWS Executive Meeting Texas Ballroom A
8:00 AM–3:00 PM Poster Session Set-up Period Fiesta Pavilion
8:00 AM–3:00 PM Plant ID Set-up & Competition Executive Salon 4
8:00 AM–5:00 PM Texas Quiz Bowl Set-up & Competition San Antonio Ballroom
8:00 AM–9:00 PM TCTWS Office Work Space Directors Room 1
8:00 AM–9:00 PM TCTWS Meeting Space to Hold Directors Room 2
8:00 AM–9:00 PM TWA Directors Meeting Texas Ballroom B
12:00 PM–10:00 PM Exhibits – Breaks Fiesta Pavilion
1:00 PM–3:00 PM TCTWS Business Meeting Texas Ballroom A
1:00 PM–6:00 PM Presentation Submissions Directors Room 1
1:00 PM–7:00 PM Submit for Art & Photo Contest Fiesta Pavilion
1:00 PM–7:00 PM Raffle & Silent Auction Fiesta Pavilion
4:00 PM–6:00 PM Poster Session Judging Fiesta Pavilion
6:00 PM–7:00 PM Student Mentor Mixer Fiesta Pavilion
6:00 PM–10:00 PM President’s Reception Fiesta Pavilion

Friday, 19 February

6:30 AM–8:00 AM Student Breakfast Fiesta Pavilion
7:30 AM–5:00 PM Raffle & Silent Auction Fiesta Pavilion
7:30 AM–5:00 PM Registration Fiesta Pavilion Foyer
7:30 AM–10:00 AM Submit for Art & Photo Contest Fiesta Pavilion
7:30 AM–10:00 PM Exhibits – Breaks Fiesta Pavilion
8:00 AM–9:00 PM TCTWS Office Work Space Directors Room 1
8:00 AM–9:00 PM TCTWS Meeting Space to Hold Directors Room 2
8:00 AM–10:00 PM Presentation Submissions Directors Room 1
8:00 AM–10:00 PM Posters Up Fiesta Pavilion
8:00 AM–10:00 AM Plenary Session Texas Ballroom A, B & C
10:00 AM–10:30 AM Break Texas Ballroom Foyer
10:30 AM–4:00 PM Voting for Art & Photo Contest Fiesta Pavilion
10:30 AM–12:30 PM Cottam Award Papers Texas Ballroom A, B & C
12:30 PM–1:45 PM Past President’s Luncheon Executive Salon 3
12:30 PM–1:45 PM Lunch – **On Your Own**

Friday, 19 February (Continued)

1:45 PM–3:15 PM	Concurrent Technical Sessions	Texas Ballroom A, B, C, Executive Salon 4, 5, and San Antonio Ballroom
3:15 PM–3:45 PM	Break	Fiesta Pavilion
3:45 PM–5:00 PM	Concurrent Technical Sessions	Texas Ballroom A, B, C, Executive Salon 4, and San Antonio Ballroom
5:30 PM–6:30 PM	Awards Ceremony	Texas Ballroom A, B & C
6:30 PM–10:00 PM	Awards Reception	Fiesta Pavilion

Saturday, 20 February

7:00 AM–7:45 AM	Fellowship of Christian Conservationists	Yet to be determined
7:30 AM–11:00 AM	Registration	Fiesta Pavilion Foyer
8:00 AM–11:30 AM	Exhibits – Breaks	Fiesta Pavilion
8:00 AM–10:00 AM	Posters Taken Down	Fiesta Pavilion
8:00 AM–12:00 PM	TCTWS Office Work Space	Directors Room 1
8:00 AM–9:30 AM	Concurrent Technical Sessions	Texas Ballroom A, B, C, Executive Salon 4, and San Antonio Ballroom
9:00 AM–11:00 PM	TCTWS Executive Meeting	Directors Room 2
9:30 AM–10:00 AM	Break	Fiesta Pavilion
10:00 AM–11:30 AM	Concurrent Technical Sessions	Texas Ballroom A, B, and San Antonio Ballroom
12:00 PM	Adjourn 52 nd Annual Meeting	

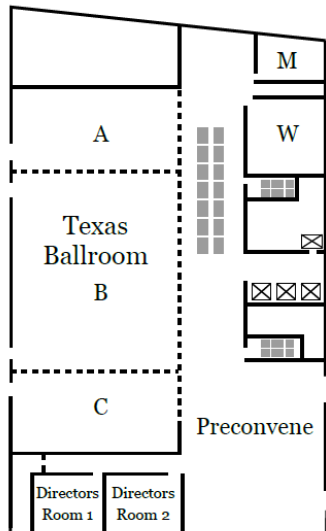
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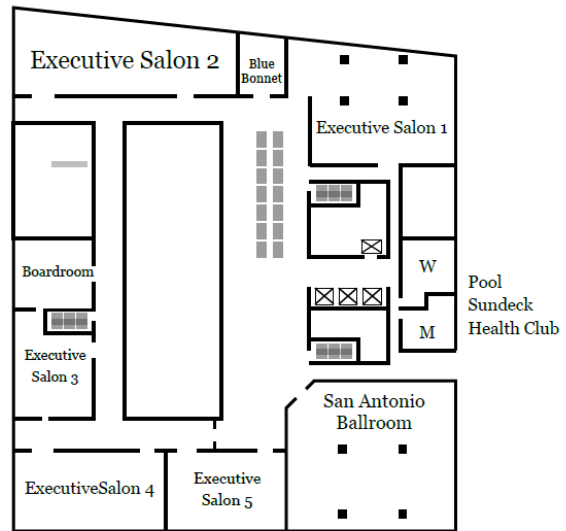
WYNDHAM – SAN ANTONIO RIVERWALK

111 EAST PECAN STREET
SAN ANTONIO, TEXAS 78205

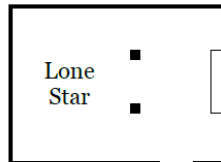
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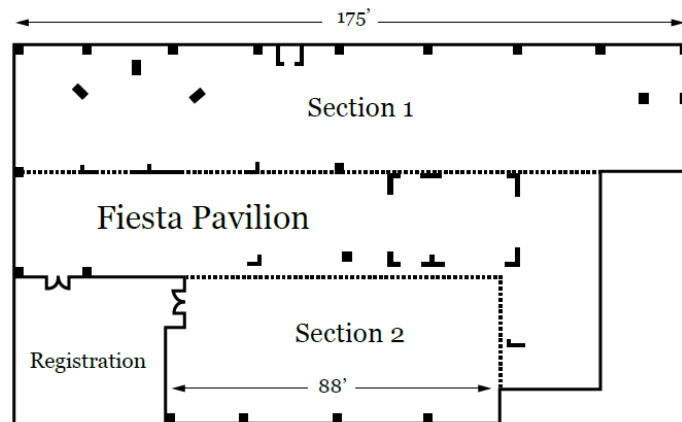
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Lobby Level



Lower Level



Friday, 19 February 2016

PLENARY SESSION TEXAS BALLROOM A, B & C MODERATOR: TYLER A. CAMPBELL

- 8:00 Presentation of Colors**
- 8:05 Welcome & Introduction** – Roel Lopez, President, Texas Chapter of The Wildlife Society
- 8:20 Chronic Wasting Disease 101** – Walt Cook, Clinical Associate Professor, Veterinary Medicine and Biomedical Sciences, Texas A&M University
- 8:40 Status Report from the Texas Parks & Wildlife Department** – Clayton Wolf, Wildlife Division Director, Texas Parks and Wildlife Department
- 8:50 Status Report from the Texas Animal Health Commission** – Andy Schwartz, Assistant Executive Director, Epidemiology & Laboratory Systems, Texas Animal Health Commission
- 9:00 Lessons Learned from Outside the Lone Star State** – Michael Miller, Wildlife Veterinarian, Colorado Division of Wildlife
- 9:20 Panel Discussion & Questions/Answers** – All the Above, plus Dan McBride (Burnet Veterinary Clinic, Inc.), Tom Vandivier (Conservationist and Private Landowner) & Don Davis (Associate Professor, Veterinary Medicine and Biomedical Sciences, Texas A&M University – Moderator for Discussion)
- 10:00 Break – 30 minutes**

CLARENCE COTTAM AWARD COMPETITION TEXAS BALLROOM A, B & C MODERATOR: ALFONSO ORTEGA-SANCHEZ, JR.

- 10:30 Waste rice and natural seed densities in rice fields in the Gulf Coast Prairies of Louisiana and Texas**, Joseph R. Marty, J. Brian Davis, Richard M. Kaminski, and Michael G. Brasher
- 10:45 The influence of weather parameters on Lesser Prairie-Chicken range wide nest survival**, Alixandra J. Godar, Blake A. Grisham, Cody P. Griffin, Sarah R. Fritts, Clint W. Boal, David A. Haukos, Jim C. Pitman, Christian A. Hagen, and Michael A. Patten
- 11:00 Scale-dependent landscape genetics of bobcats across western Texas**, Imogene Davis
- 11:15 Factors influencing listing decisions under the Endangered Species Act**, Kathryn N. Smith-Hicks
- 11:30 Spatial ecology of the Lower Colorado River Valley population of Greater Sandhill Cranes**, Courtenay M. Conring, Blake A. Grisham, Daniel P. Collins, and Warren C. Conway
- 11:45 Next generation sequencing used to assess diversity within major histocompatibility complex of ocelots**, John P. Leonard, Michael E. Tewes, Randall W. DeYoung, Jan E. Janecka, Tyler A. Campbell, and Arturo Caso
- 12:00 Dietary niche partitioning among cattle, deer, and nilgai using stable isotopes**, Stacy L. Hines, Timothy E. Fulbright, J. Alfonso Ortega-S., David G. Hewitt, Thomas W. Boutton, and Alfonso Ortega-S., Jr.

- 12:15 Duck and stock pond forage resource relationships in the Rolling Plains of Texas,** Lisa A. Clark, Samantha S. Kahl, Blake A. Grisham, and Dan Collins

SESSION 1A: BIG GAME ECOLOGY AND MANAGEMENT

TEXAS BALLROOM B

MODERATOR:

- 1:45 Browse species responses to white-tailed deer densities in South Texas,** Justin P. Young, Timothy E. Fulbright, David G. Hewitt, Charles A. DeYoung, Kim N. Echols, and Don A. Draeger
- 2:00 Does supplemental feeding mitigate the impacts of high deer densities on plant communities and available forage?,** Lindsay D. Roberts, Timothy E. Fulbright, David B. Wester, David G. Hewitt, Charles A. DeYoung, Kim N. Echols, and Don A. Draeger
- 2:15 Effects of differing white-tailed deer and supplemental feeder densities on woody plant canopy volume and mast production,** Lindsey M. Phillips, Timothy E. Fulbright, David G. Hewitt, Charles A. DeYoung, Lindsay D. Roberts, David B. Wester, Kim N. Echols, and Don A. Draeger
- 2:30 Drought and density effects on palatable forb species for white-tailed deer,** Ashley A. Wilson, Lindsay D. Roberts, Timothy E. Fulbright, David G. Hewitt, Charles A. DeYoung, David B. Wester, Kim N. Echols, and Don A. Draeger
- 2:45 Translocated pronghorn adult and fawn survival in New Mexico,** Emily R. Conant, Mark C. Wallace, Warren C. Conway, Stewart G. Liley, and Ryan L. Darr
- 3:00 Mortality Factors and the importance of age in translocated pronghorn,** Taylor O. Garrison, Louis A. Harveson, Ryan O'Shaughnessy, Patricia M. Harveson, and Shawn S. Gray
- 3:15 Break – 30 Minutes**

SESSION 1B: ECOLOGY OF MAMMALIAN CARNIVORES

EXECUTIVE SALON 4

MODERATOR:

- 1:45 Distribution and habitat selection by large carnivores in Big Bend National Park, Texas,** Skyler Stevens, Catherine Dennison, Michael Stangl, Raymond Skiles, and Patricia M. Harveson
- 2:00 Home range size, movements and survival of mountain lions on private lands in West Texas,** Catherine C. Dennison, Patricia M. Harveson, Bert Geary, and Louis A. Harveson
- 2:15 Food habits of mountain lions in the Davis Mountains, Texas,** Catherine C. Dennison, Bert Geary, Patricia M. Harveson, Louis A. Harveson, and Dana Milani
- 2:30 Spatial and temporal use of Big Bend National Park by humans and puma,** David P. Rumbelow, Patricia M. Harveson, Louis A. Harveson, Bert Geary, and Catherine Dennison
- 2:45 Determining impacts of diel cycle and lunar illumination on mountain lion hunting behaviors using kill site data,** Kendall J. AuBuchon, Mark Elbroch, Floyd W. Weckerly, and Thomas R. Simpson

- 3:00** **Effects of genetic depletion on estimating risk of extinction of the endangered Florida panther**, Anna Cole, Kelsea Anthony, Chris Chen, Hsiao-Hsuan Wang, Tomasz E. Koralewski, and William E. Grant
- 3:15** **Break – 30 Minutes**

SESSION 1C: ECOLOGY OF UPLAND GAME BIRDS
SAN ANTONIO BALLROOM

MODERATOR:

- 1:45** **Northern bobwhite resource selection in South Texas**, Benjamin R. Olsen, Timothy E. Fulbright, Fidel Hernández, Eric D. Grahmann, David B. Wester, and Michael W. Hehman
- 2:00** **Selection and avoidance of habitat and artificial resources of desert scaled quail during the nesting season in the Trans-Pecos, Texas**, Ernesto Garcia-Ortega, Ryan S. Luna, Louis A. Harveson, and Fidel Hernandez
- 2:15** **Influence of initial nest fate on nest concealment and fate of subsequent nesting attempts of bobwhites**, William L. Lutz, Patrick Clark, Josh D. Pearson, Eric D. Grahmann, Fidel Hernández, Leonard A. Brennan, and David B. Wester
- 2:30** **Northern bobwhite proximity to woody cover in southern Texas**, Josh D. Pearson, James P. Clark, William L. Lutz, Fidel Hernandez, Eric D. Grahmann, Timothy E. Fulbright, and Chad A. Markert
- 2:45** **Habitat-suitability bounds of woody cover for northern bobwhites**, James P. Clark, William L. Lutz, Josh D. Pearson, Eric D. Grahmann, Fidel Hernandez, Timothy E. Fulbright, and David B. Wester
- 3:00** **Impacts of habitat fragmentation on northern bobwhites in the Gulf Coast Prairie Landscape Conservation Cooperative**, Katherine S. Miller, Leonard A. Brennan, Fidel Hernandez, Eric D. Grahmann, Humberto L. Perotto-Baldivieso, and Jose Mata
- 3:15** **Break – 30 Minutes**

SESSION 1D: ECOLOGY OF NON-GAME AND WETLAND BIRDS
TEXAS BALLROOM C

MODERATOR:

- 1:45** **Wintering ecology of American kestrels in southern Texas**, Carter G. Crouch, Leonard A. Brennan, Robert H. Benson, Eric D. Grahmann, Fidel Hernández, and Jeffrey F. Kelly
- 2:00** **Wintering-season ecology of reddish egrets**, Lianne M. Koczur, Bart M. Ballard, and Clay Green
- 2:15** **Breeding season avian diversity and community composition in first- and second-year eucalyptus plantations in southwest Louisiana**, Elizabeth J. Messick, Christopher E. Comer, Michael Blazier, T. Bently Wigley, and Roger J. Masse
- 2:30** **Migration rates of Swainson's hawks through regions of different wind energy potentials between Texas and Argentina**, Clint W. Boal, Laurie Groen, and James D. Ray
- 2:45** **Influence of vegetative characteristics on predation and predator assemblage of bird nests**, Helen T. Davis

- 3:00 The social black-crested titmouse: kin-structured neighborhoods through familial flock formation**, Rebekah J. Rylander, and Michael C. Green
- 3:15 Break – 30 Minutes**

SESSION 1E: ECOLOGY OF REPTILES AND AMPHIBIANS
TEXAS BALLROOM A

MODERATOR:

- 1:45 Conservation of the Louisiana Pine Snake in Texas**, Josh B. Pierce, Amanda Dube, Kevin Skow, Connor Adams, Brian Pierce, Craig Rudolph, Toby Hibbitts, and Wade Ryberg
- 2:00 Use of PVC pipes of different diameters as artificial refuges by Green Tree Frogs in Texas**, Kaitlyn N. Forks, Thainchira Suriyamongkol, Erin McGrew, Ivana Mali, Hsiao-Hsuan Wang, William Grant, Andrea Villamizar-Gomez, and Michael Forstner
- 2:15 Distribution and population status of the Western Chicken Turtle (*Deirochelys reticularia miaria*) in Texas**, Connor S. Adams, Wade A. Ryberg, Brad D. Wolaver, Heather L. Prestridge, Ben J. Labay, Jon Paul Pierre, Ruth A. Costley, Brandon C. Bowers, and Toby J. Hibbitts
- 2:30 Demography of an Ornate Box Turtle population in a Rolling Plains ecosystem**, Trevor J. McVay, Richard T. Kazmaier, Donald C. Ruthven, and Matthew W. Poole
- 2:45 Effect of exotic grass cover on Texas Tortoise (*Gopherus berlandieri*) home range size and microhabitat use in thornscrub habitat**, Kiley V. Briggs, and Kenneth Pruitt
- 3:00 Patch occupancy and abundance of the Crevice Spiny Lizard in the central mineral region of Texas**, Jeffrey T. Jenkerson, Thomas R. Simpson, and James Gallagher
- 3:15 Break – 30 Minutes**

SESSION 1F: GENERAL MAMMALIAN ECOLOGY
EXECUTIVE SALON 5

MODERATOR:

- 1:45 Habitat-specific variation in mammal communities using camera traps in western Texas**, Mark J. Cancellare, and Richard T. Kazmaier
- 2:00 Influence of wildlife on bottomland hardwood forest restoration in degraded river basins in East Texas, USA**, Ryan J. Jacques, Christopher E. Comer, Jeremy P. Stovall, Hans M. Williams, and Matt E. Symmank
- 2:15 Population change of small mammals during large-scale, on-going grassland restoration**, Anthony K. Henehan, Fidel Hernandez, Timothy E. Fulbright, Eric D. Grahmann, David B. Wester, Andrew N. Tri, and Michael Hehman
- 2:30 Assessing predator-prey use and interactions at man-made water sources on the Southern High Plains of Texas**, Trevor S. Gicklhorn, Philip K. Borsdorf, Clint W. Boal, and Matthew Vanlandeghem
- 2:45 Development and evaluation of prototype feral pig toxicants**, Grant S. Lawrence, Ryan S. Luna, Justin A. Foster, and John C. Kinsey
- 3:00 Open**
- 3:15 Break – 30 Minutes**

**SESSION 2A: BIG GAME ECOLOGY AND MANAGEMENT
TEXAS BALLROOM B**

MODERATOR:

- 3:45 Pronghorn diet, nutrition, and carrying capacity in Trans-Pecos, Texas**, Justin T. French, Ryan O'Shaughnessy, Louis A. Harveson, Bonnie J. Warnock, and Shawn S. Gray
- 4:00 Does birth synchrony influence fawn survival of pronghorn in the Trans-Pecos region of Texas?**, Ryan O'Shaughnessy, James H. Weaver, Daniel J. Tidwell, Louis A. Harveson, Shawn S. Gray, and Justin K. Hoffman
- 4:15 Habitat partitioning by sympatric deer species in Big Bend National Park, Texas**, Skyler Stevens, Catherine C. Dennison, Michael Stangl, Raymond Skiles, and Patricia M. Harveson
- 4:30 Evaluation of selective harvest on the distribution male mating success in white-tailed deer**, Masahiro Ohnishi, Randy W. DeYoung, Charles A. DeYoung, Donnie A. Draeger, Bronson Strickland, and David G. Hewitt
- 4:45 Reliability of N-mixture models to estimate abundance of white-tailed deer**, John C. Kinsey, Ryan L. Reitz, and Adam Duarte
- 5:00 Break – 30 Minutes, Just Prior to Awards Ceremony in Texas Ballroom at 5:30**

**SESSION 2B: ECOLOGY OF MAMMALIAN CARNIVORES
EXECUTIVE SALON 4**

MODERATOR:

- 3:45 Chronobiology of sympatric ocelot and bobcat in South Texas**, Justin P. Wied, Michael E. Tewes, John P. Leonard, Shelby Carter, Lauren D. Balderas, Arturo Caso, and Tyler A. Campbell
- 4:00 Mesomammal predator abundance to determine primary northern bobwhite nest predators**, Kristyn G. Stewart, Matthew W. Poole, Kara B. Campbell, and Heather A. Mathewson
- 4:15 Open**
- 4:30 Open**
- 4:45 Open**
- 5:00 Break – 30 Minutes, Just Prior to Awards Ceremony in Texas Ballroom at 5:30**

**SESSION 2C: ECOLOGY OF UPLAND GAME BIRDS
SAN ANTONIO BALLROOM**

MODERATOR:

- 3:45 Evaluation of a multi-temporal approach for modeling northern bobwhite habitat**, Jeffrey G. Whitt, and Kelly S. Reyna
- 4:00 An evaluation of pretreatment estimates of northern bobwhite density for a long-term manipulative grazing study**, Andrea N. Bruno, Leonard A. Brennan, Michael L. Morrison, Andrew N. Tri, and Eric D. Grahmann

- 4:15 Home range and habitat selection of brooding eastern wild turkeys in East Texas,** Kyle T. Hand, Christopher E. Comer, Roger J. Masse, Bryce J. Gerlach, and Jason B. Hardin
- 4:30 Factors influencing nest-site selection by eastern wild turkeys in Texas,** Bryce J. Gerlach, Christopher E. Comer, Roger J. Masse, Kyle T. Hand, and Jason B. Hardin
- 4:45 Movements and habitat selection of lesser prairie-chickens in Conservation Reserve Program-dominated landscapes in the Southern High Plains of Texas,** Samuel W. Harryman, Blake A. Grisham, Clint W. Boal, Samantha S. Kahl, and Christian A. Hagen
- 5:00 Break – 30 Minutes, Just Prior to Awards Ceremony in Texas Ballroom at 5:30**

SESSION 2D: ECOLOGY OF NON-GAME AND WETLAND BIRDS

TEXAS BALLROOM C

MODERATOR:

- 3:45 Impacts of severe drought of black-capped vireo reproduction,** Melanie R. Colon
- 4:00 Effects of grazing on the avian community at a Texas hill country ranch,** Joseph A. Jandle, Thomas R. Simpson, and Michael J. Forstner
- 4:15 A stochastic model to simulate mottled duck population dynamics,** Jena A. Moon, Stephen J. DeMaso, Michael G. Brasher, Warren C. Conway, and David A. Haukos
- 4:30 Seed-bank potential of moist-soil wetlands in the Southwest,** Ryan S. Anthony, Ryan O’Shaughnessy, Dan P. Collins, and Ryan S. Luna
- 4:45 Dynamics of nutrient reserves and digestive tract of female northern pintails wintering along the Texas Coast,** Matthew J. Garrick, Nathaniel R. Huck, Bart M. Ballard, and Kevin J. Kraai
- 5:00 Break – 30 Minutes, Just Prior to Awards Ceremony in Texas Ballroom at 5:30**

SESSION 2E: ECOLOGY OF REPTILES AND AMPHIBIANS

TEXAS BALLROOM A

MODERATOR:

- 3:45 Genetic variation within 3 species of River Cooters,** Kimberly M. Cory, Rocky Ward, and Richard T. Kazmaier
- 4:00 Genetic structure is inconsistent with subspecies designations in the Western Massasauga (*Sistrurus tergeminus*),** Wade A. Ryberg, Johanna A. Harvey, Anna Blick, Toby J. Hibbitts, and Gary Voelker
- 4:15 Current distribution and phylogenetic relationships of *Holbrookia lacerata* in Texas,** Toby J. Hibbitts, Wade A. Ryberg, Dalton Neuharth, Connor S. Adams, Drew E. Dittmer, Johanna Harvey, Gary A. Voelker, Ben Labay, John Paul Pierre, Brad Wolaver, and Travis LaDuc
- 4:30 Home range size, habitat use, and movement of the Reticulate Collared Lizard, *Crotaphytus reticulatus* in southern Texas,** Timothy Garrett, Toby Hibbitts, Wade Ryberg, and Gary Voelker
- 4:45 Population study of the Dunes Sagebrush Lizard (*Sceloporus arenicolus*) in West Texas,** Danielle K. Walkup, Wade Ryberg, Toby J. Hibbitts, and Lee A. Fitzgerald
- 5:00 Break – 30 Minutes, Just Prior to Awards Ceremony in Texas Ballroom at 5:30**

Saturday, 20 February 2016

SESSION 3A: BIG GAME ECOLOGY AND MANAGEMENT TEXAS BALLROOM B

MODERATOR:

- 8:00** Evaluation of aerial survey-related population estimation techniques for pronghorn antelope in Texas, Caroline L. Ward, Randy W. DeYoung, Timothy E. Fulbright, David G. Hewitt, and Shawn S. Gray
- 8:15** Using tooth cementum aging to estimate pronghorn survival in the Texas Panhandle, Caroline N. Ellison, and Richard T. Kazmaier
- 8:30** Using microsatellite composite genotypes to identify hybridization in deer (genus *Odocoileus*) in the Texas High Plains, Rocky Ward
- 8:45** Sable antelope dietary analysis: a comparison of microhistology and TRNL sequence analysis, Amanda Hargrave, Thomas R. Simpson, Dittmar Hahn, David Rodriguez, Floyd Weckerly, and James Gallagher
- 9:00** Effects of density independent and dependent factors on Roosevelt elk juvenile recruitment in Redwood National Park, California, Nicholas R. Kolbe, and Floyd W. Weckerly
- 9:15** Special considerations for handraising a dama gazelle, Elizabeth Cary Mungall, Kathryn Kyle, and Scott A. Smith
- 9:30** Break – 30 Minutes

SESSION 3B: ECOLOGY OF UPLAND GAME BIRDS SAN ANTONIO BALLROOM

MODERATOR:

- 8:00** Rio Grande wild turkey brood habitat use in the Cross Timbers region of Texas, Luke Scroggs, and Bret Collier
- 8:15** An ecological comparison of two sympatric desert quail species during the reproductive season in the Trans-Pecos, Ronald P. Jankowiak, and Ryan S. Luna
- 8:30** New capture technique for northern bobwhite and scaled quail, Byron R. Buckley, and Brad Dabbert
- 8:45** Evaluating novel capture methods of Montezuma quail in central New Mexico, Karlee D. Cork, Ryan S. Luna, and Elizabeth A. Oaster
- 9:00** A comparison of three quail survey methods and harvest data from a South Texas Wildlife Management Area, Sarah F. Resendez, Robert Perez, Jon Purvis, and John Clark
- 9:15** Northern bobwhite use of coastal bermudagrass restored to native vegetation, Carter G. Crouch, Leonard A. Brennan, Eric D. Grahmann, Robert H. Benson, Fidel Hernández, and Jeffrey F. Kelly
- 9:30** Break – 30 Minutes

SESSION 3C: GENERAL AVIAN ECOLOGY

TEXAS BALLROOM A

MODERATOR:

- 8:00** **Factors influencing nest survival of white-tipped doves in south Texas**, Jordan C. Giese, Heather A. Mathewson, Thomas W. Schwertner, and Jeffrey B. Breden
- 8:15** **An examination of gene flow among distinct management units of the reddish egret (*Egretta rufescens*)**, Golya Shahrokhi, Clay Green, David Rodriguez, and Bart M. Ballard
- 8:30** **Impacts of anthropogenic noise and traffic from Eagle Ford Shale exploration on avian nest density**, Kelsey R. Davis, Daisy J. Castillo, Eric D. Grahmann, Fidel Hernandez, Timothy E. Fulbright, Chase Currie, David B. Wester, and Fred C. Bryant
- 8:45** **Evaluating performance of an avian radar system in estimating target size metrics**, Taylor J. Yerrick, Bart M. Ballard, Suzanne Contreras-Walsh, and David B. Wester
- 9:00** **Assessing accuracy of golden-cheeked warbler population estimates**, James M. Mueller
- 9:15** **Whooping crane monitoring: from illusions of perfect knowledge to acknowledgement of uncertainty**, Matthew J. Butler, and Bradley N. Strobel
- 9:30** **Break – 30 Minutes**

SESSION 3D: VEGETATION/HABITAT ECOLOGY

EXECUTIVE SALON 4

MODERATOR:

- 8:00** **Effectiveness of Sendero® on Torrey mesquite for scaled quail habitat restoration**, James D. Eddy, Ryan S. Luna, Bonnie J. Warnock, Charles R. Hart, and Dewey Stockbridge
- 8:15** **Impacts of anthropogenic noise and traffic from Eagle Ford Shale exploration on quail habitat use**, Kelsey R. Davis, Eric D. Grahmann, Fidel Hernandez, Timothy E. Fulbright, Chase Currie, David B. Wester, and Fred C. Bryant
- 8:30** **Effects of tanglehead expansion on bobwhite habitat use in South Texas**, John T. Edwards, Fidel Hernández, David B. Wester, Leonard A. Brennan, Chad J. Parent, and Fred C. Bryant
- 8:45** **A multi-practice approach to tanglehead (*Heteropogon contortus*) management and control**, Joshua L. Grace, David B. Wester, and Scott Mitchell
- 9:00** **Surveying wetland vegetation with an unmanned aerial system on Richland Creek Wildlife Management Area**, Nicholas R. Villarreal, Matt Symmank, Mike Frisbie, Thomas B. Hardy, Kristina M. Tolman, and Jennifer Jensen
- 9:15** **The Northeast Texas Conservation Delivery Network: partnerships growing grass root projects into landscape scale conservation**, Laura J. Speight, Gary E. Calkins, and Corey D. Mason
- 9:30** **Break – 30 Minutes**

**SESSION 3E: GENERAL WILDLIFE MANAGEMENT
TEXAS BALLROOM C**

MODERATOR:

- 8:00 A WILD Workshop: training K-12 educators on bird conservation curriculum,** Janel L. Ortiz, April A. Conkey, Leonard A. Brennan, La Vonne Fedynich, and Marybeth Green
- 8:15 Lipid loss as a cost of reproduction in Ambystomatid salamanders,** Imogene A. Davis, David E. Scott, Stacey L. Lance, and Ruth Estes
- 8:30 Substrate utilization among the Dunes Sagebrush Lizard and its relationship with two sympatric species,** Logan D. Ediger, Danielle K. Walkup, Wade A. Ryberg, Lee A. Fitzgerald, and Toby J. Hibbitts
- 8:45 Landscape effects on geneflow of porcupines along two Texas Panhandle river drainages,** Erica D. Thomas, and Rocky Ward
- 9:00 Waterfowl hunter duck identification skills on the upper Texas coast,** Michael D. Whitson, Thomas V. Riecke, Warren C. Conway, David A. Haukos, Jena A. Moon, and Patrick Walther
- 9:15 Effects of neonicotinoid exposure on embryonic development and organ mass in northern bobwhite quail,** Amanda D. Gobeli, and Kelly S. Reyna
- 9:30 Break – 30 Minutes**

**SESSION 4A: BIG GAME ECOLOGY AND MANAGEMENT
TEXAS BALLROOM B**

MODERATOR:

- 10:00 Factors influencing water consumption by white-tailed deer in South Texas,** Jeffery H. Brooks, Charles A. DeYoung, Timothy E. Fulbright, David G. Hewitt, Kim N. Echols, and Don A. Draeger
- 10:15 Effect of baiting on weight, age, total points, spread, and percentage of legal bucks harvested on the Chaparral Wildlife Management Area,** John Clark, Jon Purvis, Stephen Lange, and Sarah Resendez
- 10:30 Density and supplemental feeder effects on white-tailed deer populations in southwest Texas,** Ashley A. Wilson, John H. Clark, Charles A. DeYoung, Timothy E. Fulbright, David G. Hewitt, David B. Wester, Kim N. Echols, and Don A. Draeger
- 10:45 Pelleted feed consumption by white-tailed deer in South Texas,** Emily H. Belser, David G. Hewitt, David B. Wester, Timothy E. Fulbright, Charles A. DeYoung, Kim N. Echols, and Don A. Draeger
- 11:00 Mexican white-tailed deer hunting as economic development and anti-poaching tool in south central Mexico,** Alejandro J. Reina, Yesenia M. Tello Leyva, Valeria Garcia Loza, Paola P. Valera Guzmán, Lorena Montes Aparicio, and Maria I. Araujo
- 11:15 Social factors during feeding influence sexual segregation in Roosevelt elk,** Leah M. Peterson, and Floyd W. Weckerly

SESSION 4B: ECOLOGY OF UPLAND GAME BIRDS
SAN ANTONIO BALLROOM

MODERATOR:

- 10:00 Species visitation at quail block feeders**, Brenda I. Gallegos, Ryan Luna, Louis A. Harveson, and Bonnie J. Warnock
- 10:15 Adaptive genetic variation in the northern bobwhite**, Damon Williford, Randy W. DeYoung, and Leonard A. Brennan
- 10:30 Genetic diversity and relatedness of northern bobwhite coveys in South Texas**, Katherine S. Miller, Leonard A. Brennan, Randy DeYoung, Fidel Hernandez, and X. B. Wu
- 10:45 Influence of vegetation structure and composition on lesser prairie-chicken abundance, survival, and recruitment following an intense drought**, Sarah R. Fritts, Blake A. Grisham, Robert D. Cox, Clint W. Boal, David A. Haukos, and Patricia McDaniel
- 11:00 A range-wide assessment of the influence of anthropogenic features and land cover patterns on lesser prairie-chicken lek attendance**, Cody P. Griffin, Alixandra J. Godar, Sarah R. Fritts, Blake A. Grisham, Clint W. Boal, David A. Haukos, Jim C. Pitman, Grant M. Beauprez, Michael A. Patten, and Christian A. Hagen
- 11:15 Incorporating contemporary statistical methods into long-term ecological data: a case study using lesser prairie-chickens**, Alixandra J. Godar, Blake A. Grisham, Beth E. Ross, Clint W. Boal, Sarah R. Fritts, Cody P. Griffin, Christian A. Hagen, David A. Haukos, Michael A. Patten, and Jim C. Pitman

SESSION 4C: GENERAL AVIAN ECOLOGY
TEXAS BALLROOM A

MODERATOR:

- 10:00 Establishing a sustainable landscape conservation strategy for whooping cranes**, Kristine L. Metzger, Matthew Butler, Grant Harris, Sarah Lehen, and Steven Sesnie
- 10:15 GIS analysis and modeling of Galveston Bay rookery island erosion risk along the Gulf Intracoastal Waterway**, Amanda D. Hackney, and Luz Lumb
- 10:30 Foraging behavior of phalaropes in a shrinking ecosystem**, Maureen G. Frank, and Michael R. Conover
- 10:45 Heavy metal concentrations within breeding snowy plovers in saline lakes of the Southern Great Plains of Texas, New Mexico, and Oklahoma**, Hannah M. Ashbaugh, Warren C. Conway, Daniel P. Collins, Christopher E. Comer, and David A. Haukos
- 11:00 Mercury concentrations in wetland sediments and blood of breeding snowy plovers in the Southern Great Plains**, Laura E. Duffie, Christopher E. Comer, Warren C. Conway, David A. Haukos, Daniel P. Collins, Kenneth W. Farrish, Roger J. Masse, and Robert J. Taylor
- 11:15 Parental behavior of nesting white-tipped doves in south Texas**, Jared D. Hall, Jordan C. Giese, Heather A. Mathewson, Thomas W. Schwertner, and Jeffrey B. Breden

POSTER SESSION
THURSDAY, 18 FEBRUARY 2016: 4:00–6:00 PM
FIESTA PAVILION
CONTACT: KORY GANN

1. ***Use of water and lambing behavior by aoudad and desert bighorn sheep in the Sierra Vieja, Texas**, J. Silverio Avila-Sanchez, Carlos E. Gonzalez-Gonzalez, Jose Etchart, and Louis A. Harveson
2. ***A comparison of rodent trap preferences in South Texas**, Heather J. Hannusch, and April A. T. Conkey
3. ***Do small mammals cause spot fires during prescribed burns? Fact or urban legend?**, Justin E. Plata, Scott E. Henke, and Sandra Rideout-Hanzak
4. ***Is short-distance translocation a viable management option for maritime pocket gophers?**, Cameron Hegler, Justin E. Plata, Tara Hansler, Scott E. Henke, Humberto Perotto, Clay Hilton, and Jon Baskin
5. ***Grain storage and aflatoxin testing: problems faced by quail managers from southern Texas**, Justin E. Plata, Scott E. Henke, Greta Schuster, Alan M. Fedynich, and James C. Cathey
6. ***Do moth balls really repel wildlife?**, Justin E. Plata, and Scott E. Henke
7. ***Efficacy of online videos as a public education tool for wild pig management**, James S. Cash, Mark A. Tyson, Kimberly L. Aston, Josh L. Helcel, and James C. Cathey
8. ***Effect of oil spills on populations of the loggerhead sea turtle**, Hannah C. Gerke, Kacy Beck, Brittany Stamps, Hsiao-Hsuan Wang, and William E. Grant
9. ***Effects of gillnet entanglement on mortality of dusky dolphins**, Aminta N. Arevilca, Samantha Murray, Marissa Ortega, Sara Stephens, Hsiao-Hsuan Wang, and William E. Grant
10. ***Influence of distance from water and cattle grazing on plant species richness**, Kristen K. Sustaita, Andrea Bruno, Leonard Brennan, and Fidel Hernandez
11. ***Testing a habitat appraisal guide for Rio Grande turkey**, Ty E. Higginbotham, Brandon S. Mitchell, Shannon M. Hall, Alfonso Ortega-Santos, William P. Kuvlesky, Jr., and Leonard A. Brennan
12. ***Dietary overlap among pronghorn, cattle, and prairie dogs in Trans-Pecos, Texas**, Jill L. Morgan, Justin T. French, and Ryan O'Shaughnessy
13. ***Estimating climate-based range expansion in honey mesquite**, William M. Keenan, Bryce J. Gerlach, and Joshua M. Brokaw
14. ***Baseline survey of small mammals and bacterial pathogens in the southeastern Rolling Plains**, Hannah Seah, Daisy Gomez, Nathan R. Neill, Kevin F. Watson, and Joshua M. Brokaw
15. ***Relationships between small mammal assemblages and land management in the southeastern Rolling Plains**, Catherine C. Longest, Daisy Gomez, Leneka T. Hagins, Nathan R. Neill, Jamie E. Thompson, Reece C. Wells, and Joshua M. Brokaw
16. ***Nest box use and productivity of American kestrels on the High Plains of Texas**, Christopher K. Gulick, and Clint W. Boal
17. ***Survival and reproduction of translocated versus resident northern bobwhites**, Cullom S. Simpson, Bradely W. Kubecka, Ty Bartoskewitz, Heather A. Mathewson, and Dale Rollins
18. ***The importance of rainfall distribution and its effects on biomass production in South Texas**, Jose G. Cortez Jr., Ramon Saenz, Alfonso Ortega-S, Timothy E. Fulbright, David Hewitt, Tyler A. Campbell, and Alfonso Ortega-S Jr.
19. ***Trail preference use and large carnivore encounters by visitors of Big Bend National Park**, Carolina Medina-Nava, David P. Rumbelow, and Patricia M. Harveson
20. ***A preliminary evaluation of the effects of neonicotinoid insecticides on northern bobwhite quail in Texas**, Hannah M. Ertl, Christopher Z. Johnson, and Miguel A. Mora

21. ***Effects of burning on relative abundances and morphological characteristics of green tree frog in Texas**, Thanchira Suriyamongkol, Kaitlyn Forks, Erin McGrew, Andrea Villamizar-Gomez, Ivana Mali, Hsiao-Hsuan Wang, William Grant, and Michael Forstner
22. ***Getting our ducks in a row: building a teaching collection of waterfowl and upland game bird species for use in Texas Parks and Wildlife's game warden training**, Preston S. Mitchell, Gary A. Voelker, and Heather L. Prestridge
23. ***Observations of the cave cricket abundance at selected caves located in Government Canyon Natural State Area**, Whitney M. O'Connell
24. ***Prevalence of gizzard helminths in female northern pintails wintering along the Texas coast**, Derek C. Ballard, Matthew J. Garrick, Bart M. Ballard, and Alan M. Fedynich
25. ***A survey of small mammal ectoparasites in South Texas**, Hunter A. Folmar, Aleyda P. Galán, Ralph P. Eckerlin, Ashley P. G. Dowling, Jessica E. Light, and Tyler A. Campbell
26. ***Habitat and landscape factors influencing acoustic detections of various bat species in east Texas**, Cassey Edwards, Christopher E. Comer, Carla Weinkauff, and Jonah Evans
27. ***Abundance and occupancy patterns of ocelots and bobcats at East El Sauz Ranch and Yturria Ranch**, Shelby B. Carter, Michael E. Tewes, Justin P. Wied, Lauren D. Balderas, John P. Leonard, Arturo Caso, and Tyler A. Campbell
28. ***Distribution of wildlife captured on stratified random remote cameras at Elephant Mountain Wildlife Management Area, Texas**, Alec D. Ritzell, James D. Eddy, Thomas S. Janke, and Ryan S. Luna
29. ****Index of spent shot in Louisiana and Texas Gulf Coast Prairie rielands**, Joseph R. Marty, J. Brian Davis, Richard M. Kaminski, Michael G. Brasher, and Erin Brinkman
30. ****Black rail occupancy and abundance in Texas**, James D. M. Tolliver, Amanda Moore, M. Clay Green, and Floyd Weckerly
31. ****Distribution and habitat selection by mesocarnivores in Big Bend National Park, Texas**, Skyler Stevens, Catherine C. Dennison, Michael Stangl, Raymond Skiles, and Patricia M. Harveson
32. ****Permeability and viability of *Baylisascaris procyonis* eggs within various soil types in southern Texas**, Jacob L. Ogdee, Scott E. Henke, and David B. Wester
33. ****Spatial ecology of American alligator nest sites**, Cord B. Eversole, Scott E Henke, Amos Cooper, and Haibin Su
34. ****Evaluating models of nutritional carrying capacity for wintering moose on the Copper River Delta, AK**, Sharon E. Smythe, Dana M. Sanchez, and Clinton W. Epps
35. ****Effects of relative predator abundance on northern bobwhite nest success**, William L. Lutz, Patrick Clark, Josh D. Pearson, Eric D. Grahmann, Fidel Hernández, Leonard A. Brennan, and David B. Wester
36. ****Influence of initial nest fate on bobwhite nest placement**, William L. Lutz, Patrick Clark, Josh D. Pearson, Eric D. Grahmann, Fidel Hernández, Leonard A. Brennan, and David B. Wester
37. ****Land cover associations of migrant and wintering golden eagles in the Southern Great Plains**, Natasia R. Mitchell, Ben Skipper, and Clint W. Boal
38. ****Survey and analysis of helminth parasites in northern bobwhites from South Texas**, Stephanie A. Shea, Alan M. Fedynich, Leonard A. Brennan, and David B. Wester
39. ****More than storage: building biodiversity knowledge via scientific collections**, Aleyda P. Galán, Tyler A. Campbell, and Jessica E. Light
40. ****Overwinter fawn habitat selection in South Texas**, Justin P. Young, Timothy E. Fulbright, David G. Hewitt, Charles A. DeYoung, Kim N. Echols, and Don A. Draeger
41. ****Northern bobwhite abundance and agricultural land use in the Edwards Plateau**, Laney Redus

42. ****Effects of differing white-tailed deer and supplemental feeder densities on woody plant canopy cover**, Lindsey M. Phillips, Timothy E. Fulbright, David G. Hewitt, Charles A. DeYoung, Lindsay D. Roberts, David B. Wester, Kim N. Echols, and Don A. Draeger
43. ****Prevalence of endoparasitic helminths of the small Indian mongoose on the island of Puerto Rico**, Jose A. Martinez III, Ivan Castro-Arellano, David G. Huffman, and Thomas R. Simpson
44. ****Identification of corridors for natural black bear recolonization in east Texas**, Caitlin M. Glymph, Christopher E. Comer, and Daniel G. Scognamillo
45. ****Avian response to brush management on the Welder Wildlife Refuge**, Olivia A. Kost, Clint Boal, and Terry Blankenship
46. ****Mosquito surveillance for West Nile virus from 2012 to 2015 in Lubbock, TX, United States**, Steven T. Peper, Daniel E. Dawson, Jordan Hunter, Grant E. Sorensen, Francis Loko, Sadia Almas, Kevan Athanasiou, Anna G. Gibson, and Steven M. Presley
47. ****Habitat suitability bounds of Montezuma quail in the Edwards Plateau**, Zachary J. Pearson, Eric D. Grahmann, Fidel Hernández, Robert Perez, Humberto L. Perotto-Baldivieso, and Leonard A. Brennan
48. ****Using blood gas analytes to determine physiological effects of parasite load and habitat on bird health**, John Pistone, J. Jill Heatley, and Gary Voelker
49. ****Investigation of potential avian and bat impacts at a proposed wind farm in South Texas**, Sara P. Weaver, Nevin D. Durish, Ivan Castro-Arellano, Thomas R. Simpson, Michael C. Green, and Cris Hein
50. ****Effects of fall and spring patch burning in coastal cordgrass communities on East El Sauz Ranch, Texas, USA**, Victoria L. Haynes, Adam Toomey, Sandra Rideout-Hanzak, J. Alfonso Ortega-Santos, David B. Wester, Timothy E. Fulbright, Humberto Perotto-Baldivieso, Tyler A. Campbell, and Alfonso Ortega-S Jr.
51. ****Management intensive grazing for improved soil health**, Landen R. Gulick, David B. Wester, J. Alfonso Ortega-Santos, Sandra Rideout-Hanzak, Steven D. Lukafahr, Randy Stanko, and David E. Ruppert
52. ****Short-term implications of prescribed fire on soft mast producing species found in restored pine woodlands of the Ouachita Mountains of western Arkansas**, Tamara B. Wood, Christopher E. Comer, Roger W. Perry, and Phillip N. Jordan
53. ****Insights into nest-site fidelity and seasonal survival of the Bewick's wren (*Thryomanes bewickii*) in central Texas**, Anna M. Matthews, and M. Clay Green
54. ****Where the antelope play: fine-scale analyses of habitat use and home range size of GPS-collared pronghorn in Texas**, Caroline L. Ward, Randy W. DeYoung, Timothy E. Fulbright, David G. Hewitt, Shawn S. Gray, and Humberto L. Perotto-Baldivieso
55. ****Evaluation of the efficacy of nalbupine-azaperone-medetomidine for immobilization of feral swine and the reversal of that immobilization with naltrexone and atipamezole**, Heather Sanders, Clayton Hilton, William Lance, Nathan Snow, and David Hewitt
56. ****Variation in small mammal and vegetation community composition across successional stages following prescribed burning at a Blackland Prairie in northeast Texas**, Niko R. Brown, Jacob Rodell, Johanna Delgado-Acevedo
57. ****Bacteria prevalence in small mammals on Puerto Rican dairy farms**, Kathryn M. Benavidez, Madison Torres, Dittmar Hahn, David Rodriguez, Ivan Castro-Arellano, and Adalberto Perez de Leon
58. ****Fallow rice field seed bank potential on the upper Texas coast: viability for moist-soil management**, Michael D. Whitson, Warren C. Conway, David A. Haukos, and Daniel P. Collins
59. ****Human dimensions of conservation photographers in wildlife management**, William C. Colson, April A. Torres Conkey, and Scott E. Henke

60. ****Effects of thermal environment on the growth and health of white-tailed deer fawns (*Odocoileus virginianus*) during summer**, Nicole A. Alonso, David G. Hewitt, Clayton D. Hilton, and Randy W. DeYoung
61. ****Temporal and spatial distribution of historic human and carnivore encounters in Big Bend National Park**, David P. Rumbelow, Patricia M. Harveson, Carolina Medina-Nava, and Jack R. Skiles
62. ****Roost-site selection of northern bobwhites in the Edwards Plateau**, Josh D. Pearson, Fidel Hernandez, Eric D. Grahmann, Chad A. Markert, and Timothy E. Fulbright
63. ****Influence of woody cover on northern bobwhite seasonal survival**, James P. Clark, William L. Lutz, Josh D. Pearson, Eric D. Grahmann, Fidel Hernandez, Timothy E. Fulbright, and David B. Wester
64. ****Reproductive success of barn swallows nesting on buildings along the SH 24 corridor in northeast Texas**, Katelyn M. Miller, and Jeffrey G. Kopachena
65. **Antler characteristics and trophy potential of juvenile white-tailed deer**, Susan M. Cooper, Shane S. Sieckenius, and Andrea L. Silva
66. **Green anole habitat relationships in longleaf pine forests and their importance in the diet of nesting American kestrels**, Richard R. Schaefer, and Craig Rudolph
67. **Migratory birds in an urban setting: a series of case studies**, Ryan K. Blankenship
68. **Modeling northern bobwhite nest success and breeding-season survival on two categories of post-grazing habitat recovery**, Rachel A. Smith, Leonard A. Brennan, Fidel Hernandez, Humberto K. Perotto-Baldivieso, Andrea Bruno, Ross O. Couvillon, and Fred C. Bryant
69. **Wildlife diversity and feral hog populations in southern Bexar County**, Dean Wiemers, Darrell Smith, and Jose R. Valdez Barillas
70. **Development of a carbon dioxide euthanasia trailer for feral swine**, John C. Kinsey, Justin A. Foster, and Ryan L. Reitz
71. **Short distance translocation as a management strategy for the endangered Jamaican boa**, Brent C. Newman, Scott E. Henke, David B. Wester, and Susan E. Koenig
72. **Variation in the melanocortin 1 receptor (MC1R) gene and plumage differences among New World quails**, Damon Williford, Randy W. DeYoung, and Leonard A. Brennan
73. **Simulated effects of sex-ratio disparity on population dynamics of the endangered Houston toad**, Rebecca E. Aden, Lela Culpepper, Erin McGrew, Hsiao-Hsuan Wang, Ivana Mali, William E. Grant, and Michael Forstner
74. **Arthropod response to irrigation of wildlife habitat**, Ross O. Couvillon, Leonard A. Brennan, Fidel Hernandez, Bart M. Ballard, and Thomas V. Dailey
75. **Habitat use of the Texas tortoise on a landscape managed for recreational hunting**, Ross O. Couvillon, Leonard A. Brennan, Fidel Hernandez, Bart M. Ballard, and Thomas V. Dailey
76. **Prevalence of infectious and noninfectious diseases in Rio Grande wild turkeys located in southern Texas**, Julia K. Burchsted, Clayton D. Hilton, Brandon S. Mitchell, William P. Kuvlesky, Jr., Alfonso Ortega-Santos, and Leonard A. Brennan
77. **Winter roosting fidelity for Rio Grande turkeys in the South Texas Plains**, Amber L. Brown, Brandon S. Mitchell, Shannon M. Hall, Alfonso Ortega-Santos, William P. Kuvlesky, Jr., and Leonard A. Brennan
78. **Differences in poult rearing season home ranges of wild turkeys in the South Texas Plains**, Jonatan J. Tamez, Brandon S. Mitchell, Alfonso Ortega-Santos, William P. Kuvlesky, Jr., Leonard A. Brennan, and Shannon M. Hall
79. **Determining home range area curve asymptotes for Rio Grande wild turkeys in South Texas**, Brandon S. Mitchell, William P. Kuvlesky, Jr., Alfonso Ortega-Santos, Leonard A. Brennan, and Shannon M. Hall
80. **Productivity of unmanaged white-tailed deer populations in South Texas: effects of soil and precipitation**, Michaela F. Rice, Kory R. Gann, Aaron M. Foley, David G. Hewitt, Randy

- W. DeYoung, J. Alfonso Ortega-S., Jr., J. Alfonso Ortega-S., Tim E. Fulbright, and Tyler A. Campbell
81. **Rio Grande wild turkey brood habitat use in the Cross Timbers region of Texas**, Luke D. Scroggs, and Bret Collier
 82. **Comparison of common methods used in wetland seed bank analyses**, Jacquelyn D. Evans, Ryan Anthony, Ryan O'Shaughnessy, Ryan S. Luna, and Daniel P. Collins
 83. **Monitoring endangered springsnails at Bitter Lake National Wildlife Refuge: how much effort is enough?**, William P. Johnson, Jeff Sanchez, Matthew J. Butler, and Brandon Wadlington
 84. **Ectoparasite surveillance of wild turkeys in South Texas**, Victoria R. Saenz, Julia K. Burchsted, Clayton D. Hilton, Brandon S. Mitchell, William P. Kuvlesky, Jr., Alfonso Ortega-Santos, and Leonard A. Brennan
 85. **Sandhill crane winter habitat selection and future availability along the Texas gulf coast**, Emily D. Wells, Bart M. Ballard, Shaun D. Oldenburger, Daniel P. Collins, and Humberto L. Perotto-Baldivieso
 86. **Collecting baseline data on wildlife diversity and abundance in a fire-suppressed Edwards Plateau Woodland community, Mountain Home, TX**, Melissa L. Karlin, and Jeffrey C. Rankin
 87. **Using rod surface elevation tables to identify marsh elevation dynamics on Texas National Wildlife Refuges**, Douglas M. Head, Jena A. Moon, and Kris L. Metzger
 88. **Evaluation of the success and effectiveness of the Welder Wildlife Foundation's Rangelands Curriculum**, Angelica F. Arredondo, April A. Conkey, and Selma N. Glasscock
 89. **Utilizing patch burn grazing and floristic quality assessment in the Texas Blackland Prairie**, Timothy Siegmund, Jay Whiteside, and Jason Singhurst
 90. **Habitat selection by ducks wintering at Anahuac National Wildlife Refuge**, Tiffany Lane, Blake Grisham, Jena Moon, Doug Head, David Haukos, and Warren Conway
 91. **White-tailed deer preference for corn with 2 additives to improve palatability**, Darrion Crowley, Alex Lichtenberger, Nicole Alonso, David Hewitt, and James Theis
 92. **Optimizing effort for monitoring occupancy of a small mammal community in South Texas**, Jeremy A. Baumgardt, Michael L. Morrison, and Leonard A. Brennan

*Undergraduate student posters to be judged.

**Graduate student posters to be judged.

ABSTRACTS

COTTAM ABSTRACTS – IN ORDER PRESENTED

WASTE RICE AND NATURAL SEED DENSITIES IN RICE FIELDS IN THE GULF COAST PRAIRIES OF LOUISIANA AND TEXAS

Joseph R. Marty, Mississippi State University Starkville, MS 39762, USA

J. Brian Davis, Mississippi State University Starkville, MS 39762, USA

Richard M. Kaminski, Clemson University Georgetown, SC 29585, USA

Michael G. Brasher, Gulf Coast Joint Venture, Ducks Unlimited, Inc. Lafayette, LA 70506, USA

Abstract: Ricelands provide important habitats for waterfowl in the Chenier Plain (CP) of Louisiana and Texas and the Texas Mid Coast (TMC). Because of the importance of these regions to waterfowl and need for contemporary estimates of rice and natural seed densities available to waterfowl, our objective was to conduct a spatially and temporally explicit study investigating waste rice and natural seed densities in production and idled ricelands. We collected 8,750 soil cores from production and idled rice fields during August, October, and November 2010-2013. We estimated mean rice and natural seed density among geographic regions, time-periods, and post-harvest treatments. Natural seed density ranged from 141 kg/ha (CV = 15%) in disked idle fields in the CP to 361 kg/ha (CV = 14%) in standing idle fields in TMC. Rice density was greatest in fields with a standing unharvested second crop in both the CP (812 kg/ha; CV = 11%) and the TMC (1,137 kg/ha; CV = 39%). Density of waste rice in CP and TMC fields with a harvested second crop was 217 kg/ha (CV = 14%) and 444 kg/ha (CV = 18%), respectively. In CP fields without a second rice crop, density declined to 108 kg/ha by November (CV = 16%). Growing and harvesting a second crop of rice mitigates loss that occurs between the first and second harvests, likely as combination of decomposition, granivory, and germination. Our results will be critical metrics for daily ration models used to estimate foraging waterfowl carrying capacity of ricelands in these regions.

THE INFLUENCE OF WEATHER PARAMETERS ON LESSER PRAIRIE-CHICKEN RANGEWIDE NEST SURVIVAL

Alixandra J. Godar, Texas Tech University Lubbock, TX 79410, USA

Blake A. Grisham, Texas Tech University Lubbock, TX 79410, USA

Cody P. Griffin, Texas Tech University Lubbock, TX 79410, USA

Sarah R. Fritts, Texas Tech University Lubbock, TX 79410, USA

Clint W. Boal, U.S. Geological Survey Texas Cooperative Fish and Wildlife Research Unit
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David A. Haukos, U.S. Geological Survey Kansas Cooperative Fish and Wildlife Research
Unit Manhattan, KS 66506, USA

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Christian A. Hagen, Oregon State University Bend, OR 97702, USA

Michael A. Patten, Sutton Avian Research Center Norman, OK 73019, USA

Abstract: Lesser prairie-chicken (*Tympanuchus pallidicinctus*; LEPC) populations exist along a diverse climatic gradient. Temperature and precipitation impact survival in the sand shinnery oak (*Quercus havardii*) prairie in the southern extent of the range, but the potential impact remains unexplored across the extent of the range. To assess the impact of environmental conditions on nest survival across the distribution of the species, we collected data in the short-grass prairie (SGP; 2013–2014), the sand sagebrush (*Artemisia filifolia*) prairie (SSP; 1997–2002), the sand shinnery oak prairie (SSOP; 2000–2011), and the mixed-grass prairie (MGP; 2013–2014). We used the nest survival model in Program MARK to assess effect sizes of biologically relevant weather variables on nest survival for each ecoregion. In the SSOP and MGP, there was model selection uncertainty ($AIC_c w_i \leq 0.90$) but there was no model selection uncertainty in the SGP and SSBP. The same top model of total precipitation during incubation + hot days + cold days had the most support in three of the four ecoregions and SSOP's model of

winter precipitation + hot days + total precipitation during incubation had the most support. The greatest daily nest survival rates were on the periphery of the range, 97% in the SGP (northern periphery) and 96% in the SSOP (southern periphery). Our models suggest that weather conditions during nesting are good predictors of nest survival, and precipitation and extreme temperatures influenced nest survival across the range of the lesser prairie-chicken.

SCALE-DEPENDENT LANDSCAPE GENETICS OF BOBCATS ACROSS WESTERN TEXAS

Imogene A. Davis, Savannah River Ecology Laboratory Aiken, SC 29802, USA

Abstract: A consideration of spatial scale is necessary when defining landscape genetics research objectives, as genetic variation may respond differently over varying spatial scales. We compared the heterozygosity of a highly mobile species, the bobcat (*Lynx rufus*), to environmental variables throughout western Texas to determine whether landscape-level changes impact population structure at varying scales. Tissue samples from 102 bobcats were collected from 5 ecoregions throughout western Texas and genotyped for 9 microsatellite loci to estimate genetic variation and population structure. We observed minimal population structure ($K = 2$), yet a higher inbreeding coefficient ($FIS = 0.1002$) as well as significant variation in allele frequencies throughout samples suggested substructuring across the landscape. To examine landscape influence on bobcat genetic structure at different spatial scales, we performed local and regional scale ordination analyses using 9 landscape variable classes, with the 16 most influential variables selected at each scale. At both scales canonical correspondence analyses indicated that ~25% of the variation was explainable by the environmental variables used. The landscape variables selected as functionally relevant differed considerably between scales, but at both levels bobcat heterozygosity was impacted by habitat variation, vegetation composition, and spatial heterogeneity. Our approach demonstrates the necessity of considering scale when identifying correlations between landscape variables and genetic discontinuities in highly mobile species, as well as the importance of landscape heterogeneity to bobcats. Identifying landscape variables relevant to population structure has important management implications for maintaining genetic variation in and connectivity between populations.

FACTORS INFLUENCING LISTING DECISIONS UNDER THE ENDANGERED SPECIES ACT

Kathryn N. Smith-Hicks, Texas A&M University College Station, TX 77843, USA

Abstract: U.S. Fish and Wildlife Service (FWS) are required to make determinations of species status under the Endangered Species Act (ESA) solely based on the best scientific and commercial data available and without the consideration of possible economic or other effects. Scientific data can only make predictions regarding risk of extinction and cannot provide guidance for how much risk is acceptable; therefore, decisions on listing a species under the ESA are essentially value judgements that are disposed to effects from multiple other influences. I obtained data on 143 ESA listing decisions between 10 February 2011 and 3

October 2014 from 101 Proposed and Final Rules published by the FWS and used logistic regression to estimate the dynamic influences of the various explanatory variables on likelihood of protection under the ESA. Species evaluated in the Southeastern FWS region were ~23 times more likely to be given ESA protection than species evaluated in other regions and species that primarily occupy private lands were 23.6% less likely to be designated as endangered or threatened than species occurring primarily on public land. Additionally, the odds of protection of a species decreased ~2.5 times for every decrease in number of listed threats. Population and range size data had no significant influence on likelihood of protection in my model. The strong influence of non-biological variables, specifically FWS region and ownership of habitat, on listing decision indicate that scientific and commercial data are not the sole source of influence on which species are protected under the ESA.

SPATIAL ECOLOGY OF THE LOWER COLORADO RIVER VALLEY POPULATION OF GREATER SANDHILL CRANES

Courtenay M. Conring, Texas Tech University Lubbock, TX 79410, USA

Blake A. Grisham, Texas Tech University Lubbock, TX 79410, USA

Daniel P. Collins, USFWS Albuquerque, NM 87102, USA

Warren C. Conway, Texas Tech University Lubbock, TX 79410, USA

Abstract: Due to lack of baseline ecological information on the Lower Colorado River Valley Population (LCRVP) of greater sandhill cranes (*Grus canadensis tabida*), management efforts are convoluted and further research on the winter ecology, migratory paths, and breeding distribution of this population is warranted. We fitted 18 greater sandhill cranes on three study sites in southwest Arizona, southeast California, and west-central Idaho from January–July 2014 with platform transmitter terminals (PTTs). PTTs recorded four global positioning system locations per day per bird. For our overwinter space use assessment, we calculated average winter home range size using the Brownian bridge movement model (BBMM). Average winter home range size was 18,710 ha (SE = 3,809). In the overwinter habitat selection study, we used selection ratio-based resource selection functions and found habitat types including wetlands, woody wetlands, trees, open water, and shrubland were selected for at the population level. In the migratory connectivity and new summer area study, we used the BBMM to assess migration corridors and migratory stops, then outlined all PTT locations outside of the known LCRVP breeding distribution during the 2014 and 2015 summers. Fall and spring migration corridors covered similar areas. We identified 16 stops throughout the three migration events and we identified 3 new summer units. Targeting habitat management of roost site availability on the LCRVP wintering grounds, at migratory stops, and conducting comprehensive banding efforts on western sandhill crane populations could address winter and migratory concerns for this population and provide further evidence of intermingling between western populations.

NEXT GENERATION SEQUENCING USED TO ASSESS DIVERSITY WITHIN MAJOR HISTOCOMPATIBILITY COMPLEX OF OCELOTS

John P. Leonard, Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville Kingsville, TX 78363, USA

Michael E. Tewes, Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville Kingsville, TX 78363, USA

Randall W. DeYoung, Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville King, TX 78363, USA

Jan E. Janecka, Bayer School of Natural and Environmental Sciences, Duquesne University Pittsburgh, PA 15282, USA

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Abstract: The ocelot (*Leopardus pardalis*) is an endangered felid whose range in the United States is restricted to 2 isolated breeding populations in southern Texas, both having experienced recent declines in genetic variation. Previous studies of ocelots have used neutral markers, which provide only a surrogate for adaptive variation. To better assess the genetic health of these populations and advise future translocation efforts, an examination of functional genetic variation is also necessary. The major histocompatibility complex (MHC) is a genomic region that codes for antigen-presenting molecules that play an integral role in the immune response. High allelic diversity at MHC loci confers disease resistance to animal populations by allowing a wide range of antigens to be presented to the immune system. Our goals were to compare changes in MHC allele frequencies over time between ocelot populations in Texas and Mexico, test for the presence of selection on MHC alleles, and determine if alleles have been lost over time due to inbreeding and genetic drift. We amplified exon 2 of the MHC DRB locus for 53 ocelots from both Texas populations and from Tamaulipas, Mexico, and obtained nucleotide sequences using the Illumina platform. We identified 16 alleles, 6 of which had not been previously described in ocelots. Antigen-binding sites showed high dN/dS ratios, indicating a high posterior probability of positive selection. We found between 1 and 3 private alleles per population, suggesting that translocations between populations might be necessary to maintain MHC variation within Texas ocelot populations.

DIETARY NICHE PARTITIONING AMONG CATTLE, DEER, AND NILGAI USING STABLE ISOTOPES

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Abstract: Postulates regarding species classification along dietary niche continuum are controversial. White-tailed deer (*Odocoileus virginianus*), nilgai (*Boselaphus tragocamelus*), and cattle (*Bos* spp.) have been classified as browsers (consume <10% grasses), intermediate feeders (60–70% grasses), and grazers (>80% grasses), respectively, based on morphological differences (body size and digestive anatomy) and past diet studies. Therefore, we predicted minimal dietary niche overlap of these sympatric ruminants. During autumn, winter, and spring 2012–2014, we randomly collected 20 fresh fecal samples for each species on 2,500-ha study sites scattered across a 134 km east to west precipitation gradient in south Texas. We used stable isotope analysis because it eliminates biases associated with past diet study methods. Dietary niche reflects variation within and between species, hence we analyzed fecal carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) isotope signatures using multivariate F-tests with overlap indicated if $P > 0.05$. Cattle dietary niche did not overlap with either nilgai ($P < 0.001$; $n = 17$ comparisons) or deer ($P < 0.001$; $n = 40$ comparisons) unless grass was minimally available ($P > 0.052$; $n = 2$ comparisons). Deer and nilgai dietary niches overlapped ($P > 0.090$) for 41% of comparisons and were completely separate for only one comparison. Our results agreed with classification of deer as browsers and cattle as grazers. However, nilgai dietary niche is more similar to browsers not grazers as previously indicated. Our results provide evidence based on diet composition under field conditions that classifying intermediate feeders based on morphological characteristics may not always be accurate.

DUCK AND STOCK POND FORAGE RESOURCE RELATIONSHIPS IN THE ROLLING PLAINS OF TEXAS

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Abstract: Throughout the nonbreeding season, the quality and availability of habitat affects the rate and ability of waterfowl to undergo annual life cycle events, which can influence survival and reproduction. Recent mid-winter survey data, conducted by Texas Parks and Wildlife indicates an increase in annual abundance estimates of waterfowl in the rolling plains ecoregion. Numerous man-made livestock stock ponds exist within the region, providing abundant aquatic habitat in the semiarid rangelands; however, limited data exists regarding waterfowl use and forage resources of these ecosystems. We estimated duck-energy-days (DED) for seeds and aquatic invertebrates across 32 stock ponds, characterizing and quantifying potential forage resources that are available to nonbreeding waterfowl. DED estimates provide information on the capacity at which stock ponds are capable of supporting ducks energetically. Preliminary analysis on biomass and DED estimates after site-specific extrapolation for seeds indicates high variability between study ponds. We hypothesize the variability among estimates may be explained by morphological characteristics, particular management strategy of the property,

temporal scale, and/or geographic location within the region. Further analysis will explore potential differences between ponds regarding DED estimates of seeds, aquatic invertebrates, and both collectively. Additionally, pond construction type, morphological parameters (shoreline complexity, depth, and size), and water quality parameters will be incorporated to evaluate the influence these parameters have on duck use and associated DED estimates. Exploring waterfowl and stock pond forage relationships will give insight to the conservation value of stock pond habitats and provide information to managers for incorporation in waterfowl management strategies.

CONCURRENT SESSION ABSTRACTS – IN ALPHABETICAL ORDER OF AUTHOR’S LAST NAMES

DISTRIBUTION AND POPULATION STATUS OF THE WESTERN CHICKEN TURTLE (*DEIROCHELYS RETICULARIA MIARIA*) IN TEXAS

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Abstract: The Western Chicken Turtle (*Deirochelys reticularia miaria*) is thought to be rare and declining throughout its range. The U.S. Fish and Wildlife Service (FWS) issued a 90-day finding (FWS 2011) that states listing the species as threatened or endangered may be warranted. The FWS requested information on current and future threats to *D. r. miaria* populations and habitat throughout its range. Current information on distribution and population status of *D. r. miaria* in Texas is lacking, making conservation decisions difficult. We initiated a state-wide survey of suitable *D. r. miaria* habitat. Survey locations were selected from suitable habitat areas based on access and proximity to public roadways. Turtles were captured using hoop nets and crayfish traps. Wetlands near public roadways were surveyed with binoculars and spotting scopes. Here, we present results from these surveys and discuss the implications of our findings for conservation of *D. r. miaria* in Texas. 1,489 surveys across 105 Texas counties resulted in three *D. r. miaria* observations. 2,458 trap nights at five historical localities yielded a single *D. r. miaria* capture. The captured turtle was transferred to the Houston Zoo to take part in captive propagation and head start program studies. Based on results of this study, the likelihood of *D. r. miaria* occurrence is positively correlated with wetland density. Wetland loss

due to urban expansion is the major threat to *D. r. miaria* habitat. These results suggest that *D. r. miaria* is rare in Texas and that protection may be warranted.

SEED-BANK POTENTIAL OF MOIST-SOIL WETLANDS IN THE SOUTHWEST

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Abstract: There are few moist-soil wetlands in the arid Southwest U.S. which makes them invaluable for the conservation of migratory birds. Waterfowl and shorebirds consume seeds to meet the energetic demands of migration and breeding while in the Southwest. Therefore, knowing how to optimize seed production in moist-soil wetlands is critical to wetland managers. Our goal was to manipulate and test conditions in the greenhouse that will yield the greatest biomass of seeds for water birds. We assessed the effects of moist and flooded treatments on germination rates of wetland dependent plant species by experimentally maintaining soil samples under moist (i.e. no water above the surface of the soil) and waterlogged conditions (i.e. <4 cm water above the surface of the soil) in planting trays housed within a greenhouse. Soil samples for the seed bank germination experiment were attained from benthic core samples collected from three moist-soil wetland sites within the Chihuahuan Desert Biome of Texas and New Mexico ($n = 204$). The core samples were divided into two equal halves and placed under moist or waterlogged conditions. Upon germination and identification seedlings were removed at 30 day intervals and categorized as desirable/undesirable. Desirable species are those that provide energy or other nutrients useful for wintering and migrating waterfowl. Non-desirable species produce a lower quantity and quality of seeds. Our research will assist arid wetland biologists to make informed decisions for maximizing food resources for water birds in wetlands throughout the desert Southwest region of the United States.

HEAVY METAL CONCENTRATIONS WITHIN BREEDING SNOWY PLOVERS IN SALINE LAKES OF THE SOUTHERN GREAT PLAINS OF TEXAS, NEW MEXICO, AND OKLAHOMA

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Abstract: Interior snowy plover (*Charadrius nivosus*) populations are declining due to deteriorating habitat quality, poor juvenile survival, and declining nest success. Regionally, snowy plovers are nearly obligate nesters in saline lakes, but hydrological perturbations have potentially elevated concentrations and availability of deleterious heavy metals. Currently, snowy plover exposure to potential environmental contaminants remains unknown, but may be partially linked to declining populations that use saline lakes of the Southern Great Plains during the breeding season. We collected the 5th primary feather and blood of breeding snowy plovers to estimate V, As, Cd, Pb, and Se concentrations and potential exposure to develop a regional environmental risk assessment for Texas, Oklahoma, and New Mexico. This primary feather was assumed to represent exposure during feather growth during fall migration and winter, whereas blood concentrations reflect local, recent exposure during breeding season. Inductively coupled plasma mass spectrometry (ICP-MS) was used to quantify metal concentrations. For all metals, feather and blood concentrations were below reported background levels, except for Se. About 50% of all feathers were quantifiable, and 10% of all feathers were above reported Se toxicity thresholds. For blood, ~85 % of samples were quantifiable and above Se reported toxicity thresholds. Chronic exposure to toxic levels of Se can negatively impact snowy plovers via reproductive malformations and mortality, and may be a factor in long term population declines. Currently, few data on regional contaminants exist, and this research reveals the significance of increasing monitoring efforts to identify this and other potential contaminant sources.

DETERMINING IMPACTS OF DIEL CYCLE AND LUNAR ILLUMINATION ON MOUNTAIN LION HUNTING BEHAVIORS USING KILL SITE DATA

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Abstract: The mountain lion occupies the largest geographical range of any terrestrial mammal in the western hemisphere. Mountain lions live in a variety of habitats including mixed forests, high elevation plateaus, shrub communities, open steppe, valley bottoms with slopes, and riparian habitats. Mountain lions are active primarily during the nocturnal periods and they have a varied prey base with the majority including mule deer (*Odocoileus hemionus*) and elk (*Cervus elaphus*). We investigated characteristics of mountain lion kills in response to diel cycle and lunar illumination. We collected data from 4 March 2011 to 11 December 2012 on 432 predation events from eleven different mountain lions fitted with Global Positioning System (GPS) collars near De Beque, Colorado. In the Southern Yellowstone Ecosystem of Wyoming, 484 predation events were investigated from 2 November 2012 to 25 June 2014 from eleven different mountain lions. We used a linear mixed-effects model and logistic regression using R version 3.2.2 to assess whether the data points representing time of kill have a specific pattern or are due to random chance. Diel cycle and season had significant effects on mountain lion kills. The greatest proportion of kills occurred during periods of greatest illumination (>90 %),

suggesting that illumination may be a driving factor in Mountain lion hunting behaviors. Understanding which factors account for the most variation in mountain lion kills will allow us to predict which conditions are most favorable for kills to occur, thus aiding in Mountain lion management as well as their prey populations.

PELLETED FEED CONSUMPTION BY WHITE-TAILED DEER IN SOUTH TEXAS

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Abstract: Providing pelleted feed for white-tailed deer (*Odocoileus virginianus*) is a common management practice in South Texas. As deer densities increase, feed may not be accessible to all deer due to competition at the feed site. Patterns of feed consumption may vary by season and amount of vegetation available, which is influenced by rainfall. Some feed may be lost to sources other than deer, i.e. waste and non-targets. To test these assumptions, pelleted feed was provided year round, ad libitum within six, 81-ha enclosures on two ranches in South Texas with the following numbers of deer and feeders, respectively: 0/1, 20/1, 40/1, 60/1, 60/3, and 80/4. Feed levels were measured when feeders were filled to determine feed disappearance (kg/day). Preliminary results show that feed disappearance, which is affected by an interaction between deer density, rainfall and season, generally increases with an increasing deer density and decreases with increasing rainfall, suggesting that deer turn to vegetation and rely less on the feed. Additionally, feed disappearance was lowest during the summer, despite this period being important nutritionally for antler growth and parturition and lactation. The average amount of feed lost to non-targets was 2.13 kg per day per feeder, which can add up to be a significant loss. The results of this study help us to understand trends in diets of white-tailed deer in South Texas.

MIGRATION RATES OF SWAINSON'S HAWKS THROUGH REGIONS OF DIFFERENT WIND ENERGY POTENTIALS BETWEEN TEXAS AND ARGENTINA

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Abstract: We placed GPS platform transmitter terminals on Swainson's hawks (*Buteo swainsoni*) to monitor their movement rates and locations throughout their autumnal and vernal migrations between their breeding grounds in west Texas to their wintering grounds in the Pampas of Argentina. We assess gender and season specific patterns in migration timing and rates of passage. Of interest was the potential risk of the species to wind energy development

along the migration route. As a proxy of risk, we used categorizations of wind energy potential along the migration route, with increasing wind potential translating to higher probability of wind energy development. We assessed the amount of time Swainson's hawks spent in areas of different wind energy potential, and the speed in which they transited through areas of different wind energy potential, by utilizing tools in Program R and ArcGIS. We established categories of high, moderate and low wind potential using imagery from 3Tier and ESRI online. By comparing wind potential composition in the landscape to areas utilized during migration, our preliminary analysis indicates Swainson's hawks are selecting against areas where there is a high wind potential, and selecting for areas with low wind potential. However, this may be an artifact of time spent in different areas. For example, Swainson's hawks may be spending less time in high wind potential areas simply because they are transiting across those areas quicker. We will present our final analysis that will resolve this question.

EFFECT OF EXOTIC GRASS COVER ON TEXAS TORTOISE (*GOPHERUS BERLANDIERI*) HOME RANGE SIZE AND MICROHABITAT USE IN THORNSCRUB HABITAT

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Abstract: Past studies of the Texas tortoise (*Gopherus berlandieri*) suggest exotic grasses limit resource availability and reduce habitat quality. We hypothesized that exotic grasses influence *G. berlandieri* by altering microclimate, restricting tortoise movement, and reducing availability of preferred forage, and that tortoise growth and home range size would be impacted by reduced resource availability in areas with greater exotic grass cover. We conducted a radio telemetry study of 24 tortoises in thornscrub habitat at Laguna Atascosa National Wildlife Refuge in Cameron County, TX. Cover by forbs, native grasses, and exotic grasses were estimated using the point-intercept method and temperature loggers were placed under patches of native and exotic grass. Mean cover by exotic grass was lower inside tortoise home ranges than in surrounding habitat. Home range size was not correlated to exotic grass or forb cover, but increased with the amount of bare ground, ($R^2 = 0.111$). Thermal microclimate of exotic grass cover was similar to that of native grasses. Carapace length of tortoises did not differ between study sites. In the range of exotic grass cover included in this study (1.1–30.9%) it is unlikely that tortoise behavior or growth is adversely affected, but it is possible that tortoise populations are impacted at higher levels of exotic grass cover. Identifying the threshold at which exotic grass cover adversely affects tortoise behavior and growth will be important in identifying ground cover targets during habitat management and restoration efforts.

FACTORS INFLUENCING WATER CONSUMPTION BY WHITE-TAILED DEER IN SOUTH TEXAS

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Abstract: Little is known about water consumption by white-tailed deer (*Odocoileus virginianus*). The highly variable climate in South Texas may cause stress in animals that are unable to maintain water balance. This study was replicated on the Faith and Comanche ranches in Dimmit County, Texas. Each ranch had two 81-ha enclosures with 20 or 60 deer. Each enclosure had one centrally located water trough and supplemental feed site. Five bucks and five does of varying ages were selected in each of the 4 enclosures. The amount of water consumed by the selected deer was monitored using a video camera, scale, and water tub. Water consumption data were collected for one year and compared to rainfall, temperature, Palmer Drought Severity Index (PDSI), productive processes, and deer density in order to determine the effects of these variables on water consumption. Bucks (1.474 L/week) consumed over 3 times more water than does (0.433 L/week) and deer on the Comanche Ranch (1.36 L/week) consumed at least twice as much water as deer on the Faith Ranch (0.547 L/week).

AN EVALUATION OF PRETREATMENT ESTIMATES OF NORTHERN BOBWHITE DENSITY FOR A LONG-TERM MANIPULATIVE GRAZING STUDY

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Abstract: Cattle grazing can be beneficial or detrimental to northern bobwhites (*Colinus virginianus*), however, there is no consensus about how to properly co-manage cattle operations and sustain bobwhite populations. During 2014 we initiated a large-scale, long-term manipulative grazing experiment to explain this relationship. Within this framework, we evaluated the precision of bobwhite density estimates in order to reliably detect changes in density over space (treatment vs. reference sites) and time (pre-treatment vs. treatment). We collected pre-treatment estimates of bobwhite density on 12,140-ha of the East Foundation in Jim Hogg County, Texas in December 2014 and 2015. We counted coveys using line-transect distance sampling from a helicopter platform at 100% coverage. In post hoc analyses, we evaluated our ability to satisfy 3 assumptions of distance sampling and provide an assessment of survey coverage (i.e., transect spacing) through simulated analyses. We estimated the proportion of bobwhites not detected by observers by comparing video footage from cameras underneath the helicopter to observer counts. We provide recommendations of survey coverage by re-designing the completed surveys at different levels (50% and 25%) and re-analyzing the data. Pre-treatment density estimates in 2014 were 0.47 ± 0.06 birds per ha. Our results suggest future surveys be designed at $\geq 50\%$ survey coverage in order to maintain precision of density

estimates. These preliminary results provide the foundation for our long-term study and allow us to make recommendations for flying aerial surveys for bobwhites in South Texas.

NEW CAPTURE TECHNIQUE FOR NORTHERN BOBWHITE AND SCALED QUAIL

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Abstract: Northern bobwhite (*Colinus virginianus*) and scaled quail (*Callipepla squamata*) have long been captured using the Stoddard walk-in-funnel trap method developed in the mid-1930s. However, the Stoddard trap is a passive method and has a reliance on quail's attractant to food. When food is plentiful (i.e., insect, native seeds, or vegetative matter), Stoddard traps effectiveness decreases. We are using a CO₂ powered hand-held net-gun to capture adult quail during various times of the year. The net gun propels a 5.08 cm square mesh 121.92 cm wide net with 8 rubber coated weights. After capture, all quail are monitored for 14 days for potential capture myopathy. To date, 14 quail (out of 30 attempts) have been captured with the net-gun. All quail captured have surpassed the 14 day monitoring period. Currently, no quail have been harmed using this capture method. So far, vegetative composition appears to be a major limiting factor when using the net-gun to capture quail because of entanglement issues. Net entanglements allowed quail to escape unabated. Future research will focus on continued efforts to hone the net-gunning technique. We will take blood sample to test stress hormones. Capture effort and stress hormone samples will be compared between quail captured with Stoddard traps and net-guns. We believe this capture method can potentially aid in mid-summer disease monitoring and/or augment quail sample sizes for research projects without relying solely on the Stoddard walk-in-funnel traps.

WHOOPING CRANE MONITORING: FROM ILLUSIONS OF PERFECT KNOWLEDGE TO ACKNOWLEDGEMENT OF UNCERTAINTY

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Abstract: The annual abundance of the Aransas-Wood Buffalo whooping crane (*Grus americana*) flock, which overwinters along the Texas gulf coast has been enumerated using aerial surveys since 1950. Past surveys were assumed to be censuses that documented all individuals in the population (i.e., complete enumeration). True population censuses for natural, free ranging wildlife populations are exceptionally difficult, if not impossible, to achieve. The U.S. Fish and Wildlife Service evaluated the traditional aerial survey technique (1950–2010) and determined that it was insufficient because it lacked standardization and relied on untenable assumptions. For example, it was assumed that all whooping cranes were detected (i.e., 100% detectability) and that observers had the ability to uniquely identify unmarked individuals. Moreover, results were reported as if the survey resulted in perfect knowledge about the flock's abundance. In 2011, the U.S. Fish and Wildlife Service began to redesign the whooping crane monitoring effort to account for incomplete detection, acknowledge uncertainty in abundance

estimates, and provide spatially-explicit predictions of whooping crane abundance. The primary objectives of the new survey are to monitor whooping crane abundance with enough precision to detect a 10–15% annual population decline over a 3- to 4-year period and monitor recruitment of hatch-year birds into the winter flock. Additionally, hierarchical distance sampling models are used to produce spatially-explicit maps of abundance which are useful for identifying important habitat and directing land conservation activities. The new survey protocol has been implemented since 2011, providing a defensible, statistically rigorous monitoring program for whooping cranes in Texas.

HABITAT-SPECIFIC VARIATION IN MAMMAL COMMUNITIES USING CAMERA TRAPS IN WESTERN TEXAS

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Abstract: Understanding the influences of habitat on mammalian communities is integral to management. Although many single species habitat studies exist, few studies have tried to simultaneously investigate an entire medium to large sized mammal community because of the logistic difficulties of live trapping such a suite of organisms. Camera trapping offers a means to help gather such data. We initiated a camera trap study at 3 sites in western Texas to investigate how habitat influences mammalian communities. Our study sites were Buckhollow Ranch in the Hill Country, Black Gap Wildlife Management Area in the Trans Pecos, and Independence Creek Preserve at the junction of the 2 ecoregions. Cameras were installed in 4 different habitat types on each study site: lowlands, uplands, midslopes, and drainages. Currently, we have accumulated 1,137,099 images over 21,058 camera-days across all 3 sites. Scoring of images is still ongoing, but preliminary results suggest interesting patterns of habitat use among the mammal communities. Forty mammal species have been detected: 27 at Independence Creek Preserve and 29 at both Black Gap Wildlife Management Area and Buckhollow Ranch. Measurements of diversity were similar across all habitats at Buckhollow Ranch. Lowlands were the least diverse habitat at Independence Creek Preserve (mean modified Simpson's Index = 0.400), whereas at Black Gap Wildlife Management Area uplands were the least diverse habitat (mean modified Simpson's Index = 0.553). Variation in richness and diversity across habitats suggests large differences in habitat use by the mammal community across these sites.

HABITAT-SUITABILITY BOUNDS OF WOODY COVER FOR NORTHERN BOBWHITES

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Abstract: Several researchers have provided recommendations for optimal amounts of woody-plant canopy cover for bobwhites, and their suggestions have often differed substantially. Discrepancies in these recommendations could be an artifact of inconsistent research methodologies, differences in the scale of measurement, or the ability for bobwhites to interchange the use of habitat components, a concept also known as slack. Our objectives were to quantify 1) the relationship between woody-plant and herbaceous-plant canopy cover at bobwhite locations and 2) to quantify woody-plant canopy cover used at 3 different spatial scales (point-of-use, home range, and pasture scale) by bobwhites. Our study occurred from April–August (2014–2015) on 5 ranches in Goliad, Zavala, Real, and La Salle Counties. At the point-of-use scale, mean percent woody cover was greater at bobwhite locations (55%) compared to random locations (36%); however, mean percent herbaceous cover was similar between bobwhite locations (34%) and random locations (35%). Woody cover had a stronger effect on habitat use than herbaceous cover, but optimum use occurred when intermediate amounts of both were present. Results from this research will allow managers to refine brush management for bobwhites based on spatial scale and the amount of herbaceous cover present.

EFFECT OF BAITING ON WEIGHT, AGE, TOTAL POINTS, SPREAD, AND PERCENTAGE OF LEGAL BUCKS HARVESTED ON THE CHAPARRAL WILDLIFE MANAGEMENT AREA

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Abstract: The Chaparral Wildlife Management Area utilizes antler restrictions to protect younger age classes of white-tailed deer (*Odocoileus virginianus*) from harvest. Bucks must meet one of the following criteria to be legally harvestable: have at least 1 unbranched antler, have 7 points or less and a spread \geq 12 inches, or have 8 points or more and a spread \geq the ear tips (\geq 13 inches). We compared bucks harvested during the 2009–2012 ($n = 141$) hunting seasons during which baiting was not allowed to bucks harvested during the 2012–2015 ($n = 155$) hunting seasons when baiting was allowed to investigate whether the percentage of legal bucks was affected by allowing hunters to bait. We also examined the effect of baiting on total points, inside spread, field dressed weight, and age of harvested bucks. Preliminary analysis shows that the percent of legal bucks harvested increased significantly ($P < 0.01$) from 85.82% to 95.48%, average total points increased significantly ($P < 0.01$) from 6.04 to 7.27, average spread increased from 322.87mm to 369.13mm, and average age increased ($P < 0.01$) from 3.93 to 4.84. Field dressed weights appear to be similar. It should be noted that over half of all illegal bucks taken were harvested during the 2009–2010 season, the first season during which antler restrictions were reinstated. Should this season be removed from the dataset it is highly unlikely baiting would significantly affect the percentage of illegal bucks harvested. By allowing hunters to bait on the Chaparral WMA we have enabled hunters to harvest older animals of higher quality.

EFFECTS OF GENETIC DEPLETION ON ESTIMATING RISK OF EXTINCTION OF THE ENDANGERED FLORIDA PANTHER

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Abstract: The Florida panther (*Puma concolor coryi*), a subspecies of the cougar, is an iconic and essential mesopredator of southern Florida. Once widespread throughout the southeastern United States, the panther population is now restricted to two isolated patches in Everglades National Park and Big Cypress National Preserve. Consequently, they have been classified as “endangered” by the U.S. Federal List. Urbanization encroachment, habitat fragmentation, and human-wildlife conflicts have had a devastating impact upon this subspecies. The population went through a bottleneck, dipping below 100 individuals, that has likely led to a detrimental loss of genetic diversity. Resulting inbreeding depression is manifested through apparent compromised reproductive and physiological fitness of the subspecies. In 1995, the Fish and Wildlife Service captured and released eight female Texas cougars, a related subspecies, into the Florida panther habitat to increase genetic diversity of the latter. Prior to 1995, panther populations had been declining at an annual rate of 5%. After the genetic diversity restoration efforts started, population is now found to be increasing at an annual rate of 3–4%. The objective of our study is to determine how the genetic depletion could affect the population dynamics of Florida panther. We conducted a thorough literature review to obtain the best basic demographic data available and developed a stage-structured population dynamics model for Florida panther using STELLA®7.0.1. We then used the model to test the potential effects of genetic depletion on the populations of Florida panther. Our results agree with previously published work that the event of genetic depletion could negatively affect the conservation efforts of Florida panther. Likewise, long term monitoring program for the effects of genetic depletion on Florida panther is recommended.

IMPACTS OF SEVERE DROUGHT ON BLACK-CAPPED VIREO REPRODUCTION

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Abstract: Variation in temperature and precipitation can have profound effects on avian reproduction. The spring of 2011 was one of the hottest and driest on record in Texas and provided a unique opportunity to observe avian responses to an extreme drought. I monitored

habitat use and reproductive output of black-capped vireos in 2011 and 2012, a moderate drought year. Available cover was significantly lower in 2011; however, the only observed difference in habitat use was the preferential use of Ashe juniper as a nesting substrate. Pairing success was 11% lower and fledging success 78% lower in 2011. Vireos also nested two weeks later, re-nested less often, and did not attempt second broods in 2011. Under extreme drought conditions, brood parasitism was higher; initial clutch size was smaller; hatching success was lower; and nest failure was higher. Although drought is not preventable, understanding avian responses to climate variability and extreme weather events could improve long-term species management and conservation. This information may also be useful when considering the potential effects of climate change on vireo populations in Texas.

TRANSLOCATED PRONGHORN ADULT AND FAWN SURVIVAL IN NEW MEXICO

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Abstract: Translocations have been a common component of pronghorn (*Antilocapra americana*) management across the western United States to augment declining or reestablish extirpated populations. However, in most cases, post translocation monitoring has either been minimal or non-existent. In 2013, the New Mexico Department of Game and Fish entered into an agreement with a ranch located east of Cimarron, New Mexico to reduce and minimize winter crop depredation by pronghorn while simultaneously translocating those captured individuals to supplement declining populations in the southeast portion of the state. We monitored and assessed survival of adult pronghorn translocated in New Mexico in January 2013 and 2014. Also, low fawn:doe ratios observed in 2013 provided an opportunity to more closely examine fawn survival from translocated does in 2014 and 2015. A total of 144 adults were translocated to Fort Stanton, New Mexico (61 male and 83 female). Adult survival was estimated for both years of translocation (2013 and 2014) and the year post translocation (2013 animals in 2014). Adult seasonal survival was high both year of translocation (0.68 ± 0.08 ; 2013 and 0.91 ± 0.06 ; 2014) and the year post translocation (0.95 ± 0.05). Twenty nine fawns were captured in 2014 and 31 fawns were captured in 2015, where seasonal fawn survival was 0.01 in 2014, and 0.04 in 2015. High adult survival indicated that these translocation efforts were successful in establishing a viable adult population. However, poor fawn survival in both years indicate that future efforts should focus upon identifying and improving potential limiting factors that are currently negatively impacting fawn survival in this localized population.

EVALUATING NOVEL CAPTURE METHODS OF MONTEZUMA QUAIL IN CENTRAL NEW MEXICO

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Abstract: Montezuma quail (*Cyrtonyx montezumae*) are some of the most understudied quail in North America with few studies dedicated to them. As discussed by Hernandez et al. (2006), this is most likely due to the fact that contemporary capture methods for quail have not been effective. Our research team has tested several novel capture methods to determine if there is a reliable capture method that may facilitate more research on this species in the future. Methods tested during this study were: funnel traps with nontraditional bait; using the female call to lure males to various traps; opportunistic net gunning; trained bird dogs; and lastly using previously radio marked birds as “Judas birds” to locate coveys for night captures. Out of 271 man hours of quail capture effort using the aforementioned methods, 20 birds were caught. The most successful method proved to be a combined mist net with sound lure method. This yielded four birds through 44 man hours. Although our efforts did result in the capture of some quail, the amount of man hours required made most of these methods unreasonable due to time and monetary constraints. Our team has concluded that more research is needed to determine better capture methods for future study of the Montezuma Quail.

GENETIC VARIATION WITHIN 3 SPECIES OF RIVER COOTERS

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Abstract: Three species of the genus *Pseudemys* occur west of the Mississippi River: the eastern river cooter (*P. concinna*), the Texas river cooter (*P. texana*), and the Rio Grande cooter (*P. gorzugi*). These species have similar life history strategies and yet are adapted to very different riverine environments. Samples were obtained using minimally invasive techniques on field collected individuals, and on museum samples. We obtained 51 samples of *P. gorzugi*, 56 samples of *P. texana*, and 99 samples of *P. concinna*. Genomic DNA was purified using techniques appropriate to the sample type and condition and PCR amplified. Sixteen microsatellite loci were examined for informativeness and consistent amplification. The resulting multilocus microsatellite data were analyzed in a landscape genetics framework that provides insight into population subdivision and gene flow among populations. Comparisons among the 3 river cooter species are hoped to provide information on their abilities to adapt to future challenges and provide a basis for scientifically defensible management strategies.

WINTERING ECOLOGY OF AMERICAN KESTRELS IN SOUTHERN TEXAS

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Abstract: Although American kestrels (*Falco sparverius*) are North America's most abundant falcon, they are declining in many parts of their range. Most studies on this species take place in the breeding range, but far less is known about them during migration and on their wintering grounds. The objectives of this study were to estimate home range size and winter site fidelity, as well as determine roost sites of kestrels. We conducted this study primarily along county roadways in Bee, Live Oak, Nueces and San Patricio counties, Texas. We used trapping and resighting methods along county roads in agricultural areas to estimate home range size and winter site fidelity. Kestrels were captured using a bal chatri trap baited with wild caught mice from October – December in 2014 and 2015. Trapped birds were color marked with celluloid flat bands (Avinet[®]), as well as color dyed on their breast feathers with non-toxic fabric markers (Tulip[®]). We attempted to resight color-marked birds 1–3 times a week using a spotting scope (Leopold[®]). After resighting a kestrel, we took a GPS location to estimate territory size. We began looking for returning birds in mid-September 2015. During 2014, we color marked 34 kestrels, 30 of which were resighted after trapping. Thirteen of these original birds were resighted in 2015 on the same territory. During 2015 we color-marked an additional 23 kestrels. We have found kestrels roosting in trees and manmade structures. The information from this study will increase the knowledge base for conservation of this declining raptor.

NORTHERN BOBWHITE USE OF COASTAL BERMUDAGRASS RESTORED TO NATIVE VEGETATION

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Abstract: Conversion of native grassland to non-native grasses poses a threat to grassland birds, including northern bobwhites (*Colinus virginianus*). Coastal bermudagrass (*Cynodon dactylon*) is a commonly introduced grass planted widely for cattle grazing in the southeastern United States. The objectives of this study were to document and compare bobwhite abundance and habitat on coastal bermudagrass pasture, a native shrubland community, and a former coastal bermudagrass pasture restored to warm season bunchgrasses (bobwhite habitat). In 2014, we trapped 105 individual bobwhites in the restored site, 27 in native shrubland, and 4 in the bermudagrass sites. These results coincide well with our habitat results; as the restored site had nearly 6.3 times more grass clumps suitable for nesting than one bermudagrass pasture and nearly 13 times more than the other pasture. In 2015, we trapped 77 bobwhites in the restored site, 24 in native shrubland, and 34 in the bermudagrass sites. The habitat was different in 2015, with the restored site providing a similar amount of suitable nesting clumps as one bermudagrass pastures and just over twice as many as the other pasture. The driving cause of this difference was due to high levels of spring precipitation and low levels of grazing on the bermudagrass sites in 2015. To our knowledge this is the first study to look at effects of bermudagrass pasture on bobwhite abundance. This study reinforces the notion that bermudagrass provides poor habitat for bobwhite, but demonstrates that bermudagrass pastures can be restored to quality bobwhite habitat.

INFLUENCE OF VEGETATIVE CHARACTERISTICS ON PREDATION AND PREDATOR ASSEMBLAGE OF BIRD NESTS

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Abstract: Predation is the primary cause of nesting failure in birds. Thus, understanding this process is paramount to conserving birds and mitigating population declines. My goal is to investigate predator/nest relationships and how these relationships are influenced by nest site specific vegetative characteristics. Specifically, I am examining how predator assemblages and predation rates of bird nests are influenced by vegetation characteristics on the 60,000 ha San Antonio Viejo ranch of the East Foundation in south Texas. I will present results from data collected between March and August 2015. During this period, I visually monitored 137 bird nests to estimate nest survival and deployed 59 infrared digital video recorders to identify avian nest predators. I then constructed *a priori* models to determine if vegetative characteristics at the nest site (shrub cover, concealment, and distance to edge) could be used to predict nest

survival. Lastly, I analyzed data collected from infrared video recorders to determine if vegetative characteristics were significant predictors of nest predator identities. Results of my study will help predict how vegetation management could potentially influence predator dynamics and breeding bird nest survival.

IMPACTS OF ANTHROPOGENIC NOISE AND TRAFFIC FROM EAGLE FORD SHALE EXPLORATION ON AVIAN NEST DENSITY

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Abstract: Since 2008, the Eagle Ford Shale has been rapidly developed in nearly 30 counties in Texas. Disturbance from the exploration and development of the Eagle Ford Shale has the potential to negatively impact bird species. Our objective is to determine how localized oil-and-gas disturbance impacts avian nest density in South Texas. Our study is located on 2 private ranches in Dimmit and Maverick counties. Study sites consist of 2 areas along an oil-and-gas exploration corridor (treatment) and 2 areas along corridors where no exploration activities have occurred (control). In 2015, we counted nests in 32, 100 × 400-m belt transects (16 in both treatment and control areas). Ambient sound levels were recorded using a sound level meter. We also measured traffic rates using single road tube accumulators. Although not statistically different ($P = 0.260$), mean maximum sound levels were numerically lower in control areas (61.0 ± 0.6 dBA) than in treatment areas (67.3 ± 3.5 dBA). Overall traffic rates (vehicles/wk) were not statistically different among control and treatment areas ($P = 0.882$); however mean rates were 1,571.5 on primary exploration roads in treatment areas compared to 29.5 on primary roads in control areas. Mean nest densities (nests/ha) in treatment (1.34 ± 0.6) and control (1.69 ± 0.6) areas did not differ ($P = 0.702$). Aside from outright habitat loss, preliminary data suggests that noise and traffic from oil-and-gas exploration does not influence avian reproductive effort in this region.

IMPACTS OF ANTHROPOGENIC NOISE AND TRAFFIC FROM EAGLE FORD SHALE EXPLORATION ON QUAIL HABITAT USE

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Abstract: Northern bobwhites (*Colinus virginianus*) and scaled quail (*Callipepla squamata*) have been declining across their ranges for decades due to habitat loss. Since 2008, the Eagle Ford Shale has been rapidly developed in nearly 30 counties in Texas. Our objective is to determine how bobwhites and scaled quail respond to localized oil-and-gas disturbance. Our study is located on 2 private ranches in Dimmit and Maverick counties. Study sites consist of 2 areas along an oil-and-gas exploration corridor (treatment) and 2 areas along corridors where no exploration activities have occurred (control). Ambient sound levels were recorded using a sound level meter and traffic rates were measured using single road tube accumulators. Metrics of quail habitat use were collected using radio-telemetry. Although not statistically different ($P = 0.260$), mean maximum sound levels were numerically lower in control areas (61.02 dBA) than in treatment areas (67.29 dBA). Overall traffic rates (vehicles/wk) were not statistically different among control and treatment areas ($P = 0.882$); however mean rates were 1,571.5 on primary exploration roads in treatment areas compared to 29.5 on primary roads in control areas. Mean home range sizes (ha) of scaled quail were not different ($P = 0.995$) among treatment (22.91 ± 4.68) and control areas (22.87 ± 3.52). Aside from overall habitat loss as a result of development, preliminary analyses suggest quail space use may not be adversely affected by sound and vehicle passages encountered during our study. Our study will conclude in 2017.

LIPID LOSS AS A COST OF REPRODUCTION IN AMBYSTOMATID SALAMANDERS

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Abstract: Species life-history and the costs experienced during reproduction impact survival and energy allocation. Our objective was to compare the costs of reproduction in female marbled (*Ambystoma opacum*) and mole (*A. talpoideum*) salamanders, two species that differ dramatically in their reproductive strategies: *A. opacum* exhibits nest attendance, whereas *A. talpoideum* does not. We examined the energetic costs of reproduction by examining lipid utilization of salamanders during the breeding period to evaluate whether parental care in *A. opacum* is costly. We collected 160 salamanders from 3 Carolina bays on the US Department of Energy Savannah River Site over two years. For both species, analysis of covariance was used to assess the influence of breeding condition (pre- and post-breeding) on lipid use as well as to compare differences in lipid levels of gravid females. At the onset of the breeding season, the total investment of lipids was not different between species, but parental investment did differ. Lipid levels decreased more significantly post-breeding in *A. opacum*, suggesting that the energy costs of reproduction for adults is greater for *A. opacum* than *A. talpoideum*, particularly regarding nest attendance. These results imply that there is an energetic cost of brooding in *A. opacum* and that overall parental investment is greater than in *A. talpoideum*. The relatively high investment in current reproduction by *A. opacum* may impact future reproductive success due to competing compartments of resource allocation.

FOOD HABITS OF MOUNTAIN LIONS IN THE DAVIS MOUNTAINS, TEXAS

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Abstract: As an apex predator, mountain lions (*Puma concolor*) have the potential to make significant impacts on prey populations. We used information collected from GPS collared mountain lions and field investigations of kill sites to assess predatory behavior on privately owned land in the Davis Mountains. Data collected from trail cameras within the study area was used to compare prey availability to prey use. We identified 200 kill sites, and 4 scavenged carcasses made by 16 mountain lions. A wide variety of prey species were available within the study site, and fourteen species were preyed upon including ungulates, mesocarnivores, and small mammals. The top 5 species preyed upon were mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), elk (*Cervus elaphus*), javelina (*Pecari tajacu*), and feral hog (*Sus scrofa*); combined, these species composed 76% of mountain lion diet. While mule deer were the most common species preyed upon, elk made up the largest percentage of biomass consumed. The average handling time at a kill site was 51 hours, 34 minutes ($n = 195$), and was similar for males and females, but varied between individual mountain lions. Female mountain lions selected for mule deer, and killed fewer javelina than would be expected based on prey availability. Males on the other hand did not exhibit selection for any prey species, but did kill fewer elk and white-tailed deer than expected. Selection and avoidance of prey species varied between individual mountain lions as well. Our results suggest that individual preferences and habits may play an important role in the overall effect that mountain lion predation has on prey populations in the area.

HOME RANGE SIZE, MOVEMENTS AND SURVIVAL OF MOUNTAIN LIONS ON PRIVATE LANDS IN WEST TEXAS

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Abstract: Mountain lions (*Puma concolor*) are a wide-ranging apex predator, and not much is known about their behavior on private lands in Texas. We used data collected from GPS collars to evaluate movements, survival, and home range size of 20 mountain lions on private lands in

the Davis and Van Horn Mountains. Survival estimates were calculated in program MARK using a known-fate analysis. Movement rates were calculated using the Program-R package “move”. To estimate home range size, we calculated 100% Minimum Convex Polygons (MCPs), and also used the program T-LoCoH to estimate 95% and 50% utilization distributions (UDs). Nine monitored mountain lions are known to have died over the course of the study, 7 due to predator control. The annual survival rate was 0.536 (95% CI = 0.311–0.728). The average daily movement rate for all mountain lions was 3.74 km/day (SE = 0.38, $n = 20$), and ranged between 1.07 km/day and 7.53 km/day for individuals. There was no statistical difference found between the average movement rates of males, and females ($P = 0.758$), nor was there a significant difference in movement rates between seasons ($P = 0.624$). Adult MCPs ranged from 24–1036 km², and averaged 392 km². In general, the MCP home ranges we observed were larger than have been recorded in previous studies of west Texas mountain lions. Adult female MCP and 95% and 50% UD averages were all smaller than the averages for adult males. In the Davis Mountains, MCP’s covered on average at least 25 properties (SE = 3, $n = 19$). Our results indicate the large area and multiple land owners that one mountain lion can impact, and be impacted by, and accentuate the need for a landscape level approach to management of Texas’ mountain lions.

MERCURY CONCENTRATIONS IN WETLAND SEDIMENTS AND BLOOD OF BREEDING SNOWY PLOVERS IN THE SOUTHERN GREAT PLAINS

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Abstract: Breeding populations of interior western snowy plovers (*Charadrius nivosus nivosus*) are declining throughout much of the Southern Great Plains. Coupled with regional declines in habitat quality in nesting saline lake and alkali flat habitats, snowy plovers may also be susceptible to elevated heavy metals, such as mercury in these environments. We collected 34 sediment samples from 7 potential snowy plover breeding sites in Texas, Oklahoma, and New Mexico, from July – August 2014 to estimate environmental mercury availability in regional saline lake and alkali flat nesting habitats. Concurrently, we collected blood samples from 97 adult snowy plovers captured while incubating from April – August 2014 to estimate blood

mercury concentrations. Mercury concentrations in sediment samples ranged from 0.0004–0.0268 ppm while snowy plover blood mercury concentrations ranged from 0.0222–0.7060 ppm. All sediment and blood mercury concentrations were above detection limits, but below established environmental and associated avian adverse effect thresholds, indicating a low risk of mercury toxicity to snowy plovers via saline lake sediment. While contaminant exposure may contribute to population declines, mercury does not seem to be to an important singular factor influencing breeding interior western snowy plovers in the Southern Great Plains. Instead, regional snowy plover population declines may be best attributed to declining habitat quality and physiological stresses incurred from concurrent molt and incubation activities in breeding habitats. Also, the interplay between mercury and other potential contaminants may be relevant to population stability, but such interactions remain unknown.

EFFECTIVENESS OF SENDERO® ON TORREY MESQUITE FOR SCALED QUAIL HABITAT RESTORATION

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Abstract: Woody plant encroachment and shrubs which outcompete native grass populations is a problem in many parts of the Western United States and the Trans-Pecos region of West Texas is no exception. This woody plant encroachment is in large part due to factors such as fire suppression, overgrazing, and livestock affecting seed distribution. Unfortunately, once woody plant encroachment has taken place, it is quite difficult to reverse. In fact, left alone the process will continue to degrade these grasslands. The focus of this project is to evaluate the effectiveness of Sendero®, an herbicide found effective at controlling honey mesquite (*Prosopis glandulosa*), on Torrey mesquite (*Prosopis glandulosa* var. *torreyana*). Additionally, we are evaluating the use of Sendero as a means to promote forbs and grasses, thereby restoring scaled quail (*Callipepla squamata*) habitat at Elephant Mountain Wildlife Management Area. The effectiveness of the Sendero treatments are being assessed by utilizing belt transects, a Modified-Whittaker nested vegetation sampling method, and aerial photography on multiple sites using 2 different treatments (Sendero and a Sendero-Remedy mix). A comparison of foliar treatment versus aerial broadcast is also being evaluated to determine which method of application yields the best results. Wildlife habitat use is being assessed in the treatment and control areas pre and post treatment by deploying game cameras placed in a stratified random sampling pattern. The information being garnered from this research will be of interest to many parties including: ranchers, land managers, state and federal agencies, and wildlife management institutions.

SUBSTRATE UTILIZATION AMONG THE DUNES SAGEBRUSH LIZARD AND ITS RELATIONSHIP WITH TWO SYMPATRIC SPECIES

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Abstract: The dunes sagebrush lizard, *Sceloporus arenicolus*, is an extreme habitat specialist, occurring solely in dune blowouts located within shinnery oak sand dune systems. The species has one of the smallest ranges of native lizards, restricted to a small portion of Western Texas and the southeastern corner of New Mexico. As a sand burrower, substrate characteristics could be an important factor in the distribution of this species. We looked at effect of sand grain size composition on capture numbers of *S. arenicolus* and two habitat generalists (*Aspidoscelis marmorata* and *Uta stansburiana*) in a shinnery oak sand dune system within Andrews County, Texas. Capture data from two pitfall trap grids opened regularly from May 2012 to August 2015 was compared to sand samples collected at the trap locations. The samples were sifted and separated into 4 grain size categories (large, medium, small, and fine) in order to determine percent composition for each sample. We then calculated linear regressions comparing the captures to the various grain size categories. From the 275 pitfall traps 645 *S. arenicolus*, 1,385 *A. marmorata*, and 3,255 *U. stansburiana* individuals were captured. *S. arenicolus* exhibited a positive association with large grain size percentage ($P < 0.001$, $r^2 = 0.067$) and a negative association with fine grain size percentage ($P < 0.001$, $r^2 = 0.090$). *Aspidoscelis marmorata* and *U. stansburiana* both had a positive association with fine grain size composition ($P < 0.001$, $r^2 = 0.046$; $P < 0.001$, $r^2 = 0.041$; respectively).

EFFECTS OF TANGLEHEAD EXPANSION ON BOBWHITE HABITAT USE IN SOUTH TEXAS

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Abstract: Non-native, invasive grasses have been shown to reduce usable space for northern bobwhite (*Colinus virginianus*) throughout South Texas rangelands. Tanglehead (*Heteropogon contortus*), a native grass, recently has increased rapidly in the western Sand Sheet area of

South Texas, and similar to non-native grasses, has formed high-density monocultures. The objectives of our research were to 1) determine selection-avoidance of habitat features by bobwhites, and 2) determine the effects of tanglehead cover on vegetation characteristics. We obtained covey locations ($n = 488$) on 20,103 ha of rangeland using helicopter surveys conducted during December 2014 in Jim Hogg and Duval County, Texas. We then measured 6 vegetation characteristics (grass and forb species richness, vegetation height, woody-plant cover, tanglehead cover, and non-native grass cover) at all covey detections and an equal number of random locations. To determine habitat use by bobwhites, we developed continuous selection ratios based on probability density functions of used and random points derived using Simple Saddlepoint Approximations. We also modeled the relationships between tanglehead and vegetation factors using quantile regression, at the 10th, 50th, and 90th quantiles. Bobwhite avoided areas of high canopy cover (>20%) of all invasive grasses. Brush cover was selected for up to 47%, after which it was avoided. We found significant negative relationships between tanglehead cover and forb and grass species richness, bare ground, and shrub cover, and a positive relationship with vegetation height at all quantiles modeled. Our results demonstrate the negative effects of increased tanglehead cover on native rangeland habitats. Further expansion by tanglehead has the potential to significantly reduce usable space for bobwhites in South Texas.

USING TOOTH CEMENTUM AGING TO ESTIMATE PRONGHORN SURVIVAL IN THE TEXAS PANHANDLE

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Abstract: Estimating pronghorn (*Antilocapra americana*) survival using traditional methods that follow individuals throughout their lives is costly. It is cheaper and easier to use preexisting age structure data to calculate survival. This method is common in the fields of herpetology and fisheries, but has not been widely applied to ungulates. We used age data obtained from tooth cementum aging to determine the standing age structure of pronghorn harvested in the Texas Panhandle from 2012–2015. We regressed the log (frequency) on age for pronghorn ages 3–12 with linear regression. The antilog of the slope of the line represented the annual survival of the population. We used this method to calculate survival for the Panhandle as a whole, as well as for individual herd units. We plan to compare herd unit survival using a Chi-squared test. We are currently analyzing the preliminary results for this study, and will be finished in time to share our findings at the meeting in February.

USE OF PVC PIPES OF DIFFERENT DIAMETERS AS ARTIFICIAL REFUGES BY GREEN TREE FROGS IN TEXAS

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Abstract: With the sharp decline in amphibian populations worldwide, it is becoming increasingly important to evaluate use of artificial refuges by amphibian species. The objective of this study was to evaluate PVC pipes as artificial refuges for green tree frogs (*Hyla cinerea*) in Texas. This method has been widely used in the southeastern United States, but only rarely in Texas. In addition, this study aims to assess possible differences in use of PVC pipes of different diameters (1.5-inch versus 2.0-inch diameters). Field data on green tree frogs was collected in partnership with colleagues at Texas State University on the Griffith League Scout Ranch in Bastrop, Texas. A total of 80 PVC Pipes were placed around 4 ponds, in both burned and unburned areas of the ranch. Ten pipes were placed in the ground around the perimeter of each pond and 10 pipes were tied to surrounding trees at each pond. The pipes were placed so that 1.5-inch and 2-inch diameters were alternating. Green tree frogs were collected using mark-recapture method, and individuals under 31 mm SUL were not marked. Based on the data collected with Texas State University, green tree frogs do utilize PVC pipes as artificial refuges. Moreover, they do not show preference in either 1.5-inch (46.5% of captures) or 2-inch (53.5% of captures) diameter pipes. In addition, 64.3% of captures were juveniles, more of which were captured around the pond perimeter, suggesting that PVC pipes might serve as protection for juveniles post-emergence.

FORAGING BEHAVIOR OF PHALAROPES IN A SHRINKING ECOSYSTEM

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Abstract: Wilson's phalaropes (*Phalaropus tricolor*) and red-necked phalaropes (*Phalaropus lobatus*) use Great Salt Lake (GSL), Utah as a staging area each year before their fall migrations. GSL contains an abundance of aquatic invertebrates that are a valuable prey resource for phalaropes. In recent years, drought and anthropogenic water use have decreased the amount of water that reaches the GSL ecosystem. The goal of our study was to compare phalarope foraging behaviors at different sites in GSL to determine which factors were most strongly correlated with a high proportion of a flock engaged in foraging behaviors. We also compared behavior across the two years of the study. At all sites, the proportion of a flock engaged in searching behavior (rather than attempted prey capture), increased 132% from 2014 to 2015. Furthermore, as the lake elevation fell in 2014, phalaropes ceased to use a site that had

previously been a profitable foraging site. The lake elevation continued to decrease in 2015 and phalaropes did not return to that area. This research indicates that habitat changes due to decreased water availability can affect migratory shorebirds that rely on staging area resources.

PRONGHORN DIET, NUTRITION, AND CARRYING CAPACITY IN TRANS-PECOS, TEXAS

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Abstract: Pronghorn (*Antilocapra americana*) populations in the Trans-Pecos have declined precipitously since the late 1980's with particularly dramatic decreases to historic lows in the last decade. Various causes have been suggested for this decline including movement barriers, low recruitment, parasites, and habitat conditions. We undertook this study to establish a means of assessing pronghorn habitat quality in order to complement ongoing research and translocation efforts. This study was conducted on 2 study areas; one in the Marathon Basin and one on the Marfa Plateau. Diet composition was estimated using fecal microhistology and corrected for differential digestibility. Twenty fecal samples were analyzed per site per each of 3 seasons. Digestibility and total digestible nutrients (TDN) were estimated based on acid digestible fiber analysis. Protein content of forage species was estimated from measured nitrogen content. Forage availability was estimated using a combination of dry-weight-rank sampling and a modified Robel pole. Carrying capacity was calculated by comparing forage, protein and TDN intakes to their availability. This methodology was then used to assess three potential relocation areas in November of 2014. Pronghorn diets averaged 82.4% forbs, 9.1% grasses, and 8.4% shrubs. Protein intake was highest in the monsoon season while TDN intake was highest in the winter. Carrying capacity estimates based on TDN availability in winter were lowest, suggesting winter energy may be a limiting resource for pronghorn in the Trans-Pecos. Pronghorn populations were well below carrying capacity. Accessibility of patchy resources may limit pronghorn from realizing potential carrying capacity.

INFLUENCE OF VEGETATION STRUCTURE AND COMPOSITION ON LESSER PRAIRIE-CHICKEN ABUNDANCE, SURVIVAL, AND RECRUITMENT FOLLOWING AN INTENSE DROUGHT

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Abstract: The lesser prairie-chicken (*Tympanuchus pallidicinctus*) is a prairie grouse species with high conservation priority due to recent population declines, particularly following the 2011 drought in the southwestern United States. Understanding the phenology of vegetation recovery post-record drought and its influence on lesser prairie-chicken populations are important for management and conservation of the species, particularly in the context of a changing climate. We had 3 objectives in Sand Shinnery Oak (*Quercus havardii*) Prairies on the Southern High Plains of New Mexico: 1) assess recovery of habitat metrics following the most severe drought on record by comparing each habitat metric among 3 years using multivariate analysis of variance; 2) examine relationships between abundance and habitat metrics in 2012, 2013, and 2014; and 3) rank the importance of habitat metrics on short-term survival and recruitment post-drought. For objectives 2 and 3, we used hierarchical models that correct for imperfect detection with each habitat metric as a continuous predictor variable. Lesser prairie-chicken abundance decreased throughout the duration of the study. There was a high degree of uncertainty in the 2012 and 2013 abundance models, indicating habitat metrics were poor indicators of abundance. In 2014, shinnery oak cover had a negative relationship with abundance. Survival and recruitment had negative relationships with grass cover. Results indicate that population vital rates experience time lags that may lead to recovery taking >3 years post-drought and adds to the emerging evidence that increases in drought intensity and frequency due to climate change may be detrimental to lesser prairie-chickens.

SPECIES VISITATION AT QUAIL BLOCK FEEDERS

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Abstract: Scaled quail (*Callipepla squamata*) are one of the most important economic species in the Trans-Pecos region. However, scaled quail abundance has declined for unknown reasons since the early 1960s. One way that landowners are attempting to bolster current quail populations is by providing supplemental feed. Few studies have examined utilization of supplemental feed by scaled quail, and the non-target species that are also utilizing supplemental feed. We used game cameras to assess species visitation at nine locations that provide supplemental feed in the form of quail blocks on a ranch located in Culberson County, Texas during the summers of 2014 and 2015. Although avian species were the primary consumers, twenty percent of the quail blocks were consumed by mammals. Of the species that frequented the quail blocks during daylight hours, scaled accounted for 60% of the visits. These findings suggest that quail are the primary consumers of the supplemental feed; however, these feeds are being utilized by a wide variety of wildlife.

SELECTION AND AVOIDANCE OF HABITAT AND ARTIFICIAL RESOURCES OF DESERT SCALED QUAIL DURING THE NESTING SEASON IN THE TRANS-PECOS, TX

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Abstract: The scaled quail (*Callipepla squamata*), or commonly referred as “cottontop” or “blue quail”, inhabits the western half of Texas, occurring west of the 100th meridian in the western portions of the Rolling Plains, Edwards Plateau, and South Texas Plains ecoregions. Since the early 1960s, their populations have diminished through their historical range due to anthropogenic and environmental factors that have also changed their habitat. Radiotelemetry was conducted in a 2 year study during the summers of 2014 and 2015 to 1) assess habitat utilization during the nesting season, 2) evaluate selection or avoidance of artificial resources, and 3) determine the effects of weather on scaled quail nesting ecology. Thirty scaled quail females were radio collared with VHF necklace transmitters, and tracked 2–3 times per week from early April to mid-September. When individuals were located, their locations were marked using GPS units. Habitat selection were determined using ArcGIS 10.1 software. Landscape utilization differed between years, as did yearly weather patterns. Precipitation produced changes across years in the ecosystem which resulted in differences in selection-avoidance behavior of scaled quail between 2014 and 2015. Future research will be needed to determine and predict changes in behavior among different seasons and weather patterns. Understanding trigger effects on scaled quail behavior will produce better habitat management practices that will help to conserve this and other species of quail in Texas.

HOME RANGE SIZE, HABITAT USE, AND MOVEMENT OF THE RETICULATE COLLARED LIZARD, *CROTAPHYTUS RETICULATUS* IN SOUTHERN TEXAS

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Abstract: The reticulate collared lizard (*Crotaphytus reticulatus*) is uncommon lizard in Texas. Texas Parks and Wildlife Lists the species as state threatened mainly to keep these species from being collected for the pet trade. Most of their habitat falls within large ranches in south Texas and ranching practices in the region have remained unchanged for decades; however, oil and gas extraction activities within the Eagle Ford Shale pose new potential threats. These threats include habitat directly lost to development of energy infrastructure and impacts of additional roads and increased traffic traveling along these roads. Roads are known to impact populations

of lizards through direct mortality and in some cases habitat fragmentation. Little research has been performed on this species, and its natural history is poorly understood. Detailed studies pertaining to activity, movement, habitat, and home range size have not been conducted and are needed to assess any impacts of disturbances to reticulate collared lizard habitat. Radio-telemetry and GPS telemetry were used to study home range size, activity patterns, movements, and fine scale patterns of habitat use at two sites. Tissue samples were also taken from all individuals captured in order to determine relationships among populations of reticulate collared lizards.

DYNAMICS OF NUTRIENT RESERVES AND DIGESTIVE TRACT OF FEMALE NORTHERN PINTAILS WINTERING ALONG THE TEXAS COAST

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Abstract: Unlike other dabbling ducks in North America, abundance of the northern pintail (*Anas acuta*) has remained below long-term average population levels and well below population objectives established by the North American Waterfowl Management Plan. A large proportion of pintails in the Central flyway winter along the Texas Coast, where changes in land use over the last few decades have greatly changed the capacity of the region to support wintering pintail populations. Our objectives are to investigate several aspects of nutrition and energetics of pintails during winter. We collected pintails along the Texas coast from mid-October to mid-March during 2012–15. We estimated molt intensity using a grab sampling technique from 9 major plumage regions composed of 29 feather tracts. Specimens were plucked and necropsied to determine digestive-organ and muscle mass dynamics. Following necropsies, we dried carcasses and ground them into a fine powder to estimate fat content with ether extraction, and estimate protein content by ashing in a muffle furnace. Preliminary analysis on about 40% of our sample suggests that female pintails maintain protein reserves and catabolize 25% ($P < 0.001$) of their somatic fat reserves across winter. Digestive track mass declined by 18% ($P < 0.001$), primarily as a result of atrophy of the gizzard. Further analyses on molt intensity, blood metabolites, and the remainder of our sample will help reveal patterns in nutrient reserves of female pintails across winter.

MORTALITY FACTORS AND THE IMPORTANCE OF AGE IN TRANSLOCATED PRONGHORN

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Abstract: Pronghorn (*Antilocapra americana*) populations in Trans-Pecos, Texas have declined from an estimated 17,000 in the 1980s to a low of 2,700 in 2012. In 2011, Texas Parks and Wildlife Department, Borderlands Research Institute, and other partners translocated 200 pronghorn from the Texas Panhandle to the Trans-Pecos. Pronghorn were again translocated in 2013 (130, Marathon Basin) and in 2014 (102, Marfa Plateau). Approximately 50% of pronghorn from each release were equipped with Global Positioning System (GPS; Advanced Telemetry Systems [ATS]) collars. Survival was estimated by using Program Mark[®] using known-fate analysis. Fifty nine and 54 pronghorn were equipped with GPS collars in 2013 and 2014, respectively. In 2014, an additional 13 fawns were equipped with the expandable collars. Two competing models (Season and Age \times Season) received 89% of the Akaike's Information Criterion model weight. Parameter survival estimates showed sub-adults (95%, 99%) had higher survival probability than adults (92%, 95%) during acclimation periods and dry seasons, respectively. Adults (100%) had higher survival than sub-adults (98%) in the wet season. Survival rates for GPS collared pronghorn were 74.67% in 2013 and 67.20% in 2014. In 2014, fawn survival (84.62%) was higher than all other ages. Sub-adults (80.33% in 2013, 77.45% in 2014) had higher annual survival than adults (69.41% in 2013, 51.81% in 2014). Restoration efforts center on capturing more females to boost reproduction. Therefore, based on the data in this study, we recommend for future capture efforts, managers translocate younger females.

FACTORS INFLUENCING NEST-SITE SELECTION BY EASTERN WILD TURKEYS IN TEXAS

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Abstract: Restoration efforts for the eastern wild turkey (*Meleagris gallopavo silvestris*) are currently being conducted across east Texas using the super-stocking method. This involves translocating approximately 80 birds to a large parcel (e.g., $\geq 4,046.9$ ha) of suitable habitat identified by a regional Habitat Suitability Index. High quality breeding habitat has been found to be a limiting factor for eastern wild turkeys in Texas and so we decided to study the reproductive ecology of these translocated birds to better understand current habitat use. In 2015 we marked 32 hens with Minitrack Backpack GPS transmitters. These birds exhibited a 100% initial nesting rate. Furthermore, of all 22 the hens that experienced an unsuccessful initial nesting attempt, 15 (68%) attempted to reneest. The average time a hen spent incubating was approximately 10.5 days. Out of 50 total nesting attempts, only 5 (10%) were successful

(defined as ≥ 1 egg hatched). Each nest site was field sampled after the fate (i.e., successful or failed) of the nesting attempt was determined. Various vegetation structural variables (e.g., vegetation type, visual obstruction, basal area, canopy cover, and fine-scale vegetation components) were measured for each nest site and at a paired, random point to identify those structural characteristics most important in determining nest site selection and nest success.

ASSESSING PREDATOR-PREY USE AND INTERACTIONS AT MAN-MADE WATER SOURCES ON THE SOUTHERN HIGH PLAINS OF TEXAS

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Abstract: A primary concern with man-made water sources are that they are attractive to both predator and prey species and may cause increased mortality of prey species. Although a contested topic, predation at man-made water sources remains a minimally studied subject. We used motion activated cameras to investigate temporal patterns of visits by predator and prey species at 13 man-made water sources in the sand-shinnery oak/sand sagebrush ecosystem on the High Plains of Texas over a 4 year period. We collected 1,887,902 digital images over 4,572 trap days. We recorded all species detected, but only conducted analysis for predator and prey species of interest. These included all raptors, carnivores, mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), and the lesser prairie-chicken (*Tympanuchus pallidicinctus*). We conducted a cluster analysis to identify biologically relevant time frames of wildlife activity based only on time and date. Within each time frame, we assessed species visit rates and overlap between predator and prey species. With the exception of mule deer, we found evidence of predator avoidance by the prey species based on time of water source visit. However, closer examination with a non-linear quantile regression analysis, using the 99th quantile to examine the extreme values, revealed mule deer also avoided predators at water sources. Our data suggests low probability that water sources increase mortality of prey species in our study area.

FACTORS INFLUENCING NEST SURVIVAL OF WHITE-TIPPED DOVES IN SOUTH TEXAS

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Abstract: The white-tipped dove (*Leptotila verreauxi*) is a sedentary gamebird whose northernmost range extends into the Lower Rio Grande Valley (LRGV) of south Texas. Little

research has been devoted to the species' nest ecology, predation, and survival. In the LRGV, white-tipped doves nest in both citrus agriculture and native woodland habitats. The objectives of this study were to investigate the impact of habitat and land use variations on nest survival and to identify nest predators. We conducted nest searches in both habitat types and placed camera systems on a subsample of nests to determine causes of nest failure and to identify nest predators. Real-time, infrared emitting cameras allowed for 24 hour monitoring of nests ($n = 10$). Our study represents the first video surveillance of a nesting wild Columbidae. Our results indicated that white-tipped doves are extremely vulnerable to nest predators throughout the nesting cycle as all nest failures could be attributed to predation ($n = 10$). Of the five predator species identified by video surveillance, green jays (*Cyanocorax yncas*) were the most common predator ($n = 5$) of white-tipped dove nests, specifically in citrus groves. Nest success was significantly greater in native woodland habitats (survival = 0.61) than citrus groves (survival = 0.16). Nest survival models indicate that canopy cover, distance to foliage edge, and vertical density have significant impacts on nest survival. Our use of nest monitoring and video surveillance has provided new information on white-tipped dove nest ecology and will continue during the summer of 2016.

EFFECTS OF NEONICOTINOID EXPOSURE ON EMBRYONIC DEVELOPMENT AND ORGAN MASS IN NORTHERN BOBWHITE QUAIL

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Abstract: Since their emergence in the early 1990's, neonicotinoids have grown exponentially in popularity to become the world's most widely used insecticides. Although there is considerable research concerning the lethality of neonicotinoids, their sub-lethal and developmental effects are still being investigated, especially with regards to non-mammalian species. The goal of this research was to observe the effects of the neonicotinoid imidacloprid on physiology and development of northern bobwhite (*Colinus virginianus*) embryos at various stages of incubation. Bobwhite eggs ($n = 650$) were injected with imidacloprid concentrations of 0 (sham), 10, 50, 100, and 150 grams per kilogram of egg mass, which was administered at day 0 (pre-incubation), 3, 6, 9, or 12 of growth. Embryos were dissected on day 19 when they were weighed, staged, and examined for any overt structural deformities. The embryonic heart, liver, lungs and kidneys were also weighed and preserved for future use. Results show instances of severely deformed beaks and legs, as well as larger hearts and smaller lungs at the higher dosing concentrations. Some impacts are more pronounced in specific dosing periods, implying that there may be critical windows of development when embryos are highly susceptible to neonicotinoid exposure. Investigation into these effects will continue by examining embryonic heart rate in ovo and comparing between treatments, using dissected hearts in collagen assays to measure the amount of type 1 collagen present in the organs, and conducting transcriptomics analysis to evaluate how gene transcription rates are impacted by exposure to the insecticide.

INCORPORATING CONTEMPORARY STATISTICAL METHODS INTO LONG-TERM ECOLOGICAL DATA: A CASE STUDY USING LESSER PRAIRIE-CHICKENS

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Abstract: Agencies invest financial and logistical resources in the collection of ecological data, which are typically implemented as short-term field projects (2–3 years). Long-term (>10 years) data sets and contemporary statistical techniques offer a unique perspective on the ecology of species that typical 2–3 year projects cannot incorporate, but have additional costs and logistical issues. Large-scale, long-term data facilitates the development of rigorous research questions that can be answered with multiple, simultaneous analyses. Combining data sources provides the potential for new insights and more information. Agencies and non-governmental organizations in the five state-distribution of the Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) collaborated with Kansas State University and Texas Tech University by contributing lek survey data and financial assistance to collect field data from 1995–current. Using these data, we are collaborating on a Bayesian integrated population model to simultaneously assess the impact of environmental variables and landscape use on population persistence of Lesser Prairie-Chickens across their distribution. The model incorporates relationships among weather and demographic data, landscape characteristics, use patterns, lek persistence, and other variables. Using large data sets and contemporary statistical techniques offer their own set of challenges and advantages that are demonstrated through our collaborative effort.

A MULTI-PRACTICE APPROACH TO TANGLEHEAD (*HETEROPOGON CONTORTUS*) MANAGEMENT AND CONTROL

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Abstract: South Texas has experienced increases of several invasive grasses including tanglehead (*Heteropogon contortus* [L.] P. Beauv. ex Roem & Schult.). Tanglehead is a warm season, perennial bunch grass rapidly increasing throughout the Texas Coastal Sandsheet of south Texas. The grass forms dense, monotypic stands that may be detrimental to wildlife

habitat and livestock use. To examine potential management practices and control techniques for tanglehead, we evaluated vegetation response to several common management practices, singly and in combination, for 2 years. These practices included discing, multiple discing, warm-season burn, cool-season burn and the application of 3 pre-emergent herbicides at 3 rates. Experimental plots were replicated at 3 ranches in the Texas Coastal Sandsheet. Discing, multiple discing, warm-season burn and cool-season burn alone did not influence invasive grass, native grass, or forb density compared to control plots (no treatment). Herbicide application following these management practices did affect invasive grass and tanglehead response. The effect herbicide rate (high, medium, low) was the same across all applications. The use of pendimethalin following mechanical treatments or fire had very little effect on tanglehead control. Tebuthiuron or imazapyr application following mechanical treatment or fire had a greater effect on tanglehead. In specific, application of tebuthiuron and imazapyr following warm-season burn was most effective in reducing tanglehead density during our study. Our results suggest some commonly used practices for managing tanglehead in this region may be ineffective; however, these practices used in combination with herbicide can be an effective approach for managing tanglehead at certain scales.

A RANGE-WIDE ASSESSMENT OF THE INFLUENCE OF ANTHROPOGENIC FEATURES AND LANDCOVER PATTERNS ON LESSER PRAIRIE-CHICKEN LEK ATTENDANCE

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Abstract: Land cover characteristics influence available lesser prairie-chicken (*Tympanuchus pallidicinctus*) nesting habitat. Additionally, nesting lesser prairie-chickens avoid oil and gas wells, transmission lines, highways, and wind turbines. However, the influence of land cover patterns and anthropogenic structures on lek density is unknown. We used ArcGIS 10.3.1 to digitize and calculate anthropogenic feature dispersion and Landsat 4–8 imagery within ERDAS IMAGINE 2015 to classify land cover types (e.g., cropland, bare, shrubland, grassland,

grassland/shrubland, CRP) within 4.8 km around known leks in Texas, New Mexico, Kansas, and Oklahoma from 1996–2015. We then used FRAGSTATS 4.2 to calculate patch indices for each cover type. Spring lek counts served as an index of population size and can be used to assess temporal trends in response to anthropogenic features and land cover patterns. We assessed relationships among lek attendance, land cover patch indices, and anthropogenic structure dispersion using generalized linear mixed models. We used the maximum number of birds per lek per year as the response variable, land cover patch indices and anthropogenic dispersion as continuous and fixed variables, and each unique lek identification number as the random variable. Preliminary results suggest anthropogenic structures (oil/gas beta = -0.2 ; transmission lines beta = -0.88 ; highways beta = 0.02 ; wind turbines beta = 0.00) and agriculturally dominated areas (agriculture beta = -0.05) negatively influenced lek attendance. We speculate this likely was due to decreases in quality and quantity of available nesting habitat around leks.

GIS ANALYSIS AND MODELING OF GALVESTON BAY ROOKERY ISLAND EROSION RISK ALONG THE GULF INTRACOASTAL WATERWAY

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Abstract: The coastal islands of Texas provide critical habitat for colonial waterbird rookeries. Prior to the Gulf Intracoastal Waterway (GIWW) dredging projects of the early 1900s, birds were dependent on natural islands for nesting. When the GIWW was completed in the mid-20th century, dredged material heaped along its sides formed new "islands" that became replacement rookery sites. We assembled GIS data and built a spatial, habitat-based model to predict the risk of rookery islands along the GIWW becoming unusable for nesting. Parameters estimating site longevity included sea level rise, erosion rates, elevation, habitat type/ conversion, and ship estimated wake damage. The model predicted islands most at-risk over a span of 5, 10, 25, and 50 years. GIS data was assembled on all rookery islands within a 2,500 m buffer of the GIWW centerline ($n = 25$). Historical data ranged from 2004 to 2014. Colonial waterbird breeding population data was then assembled for this time period for the following species: Brown Pelican, Laughing Gull, Royal Tern, Sandwich Tern, Snowy Egret, Roseate Spoonbill, and Forster's Tern. Survey data was compared with the model results to gain a better understanding of how the island-risk model's predictions will affect different waterbird species and how species have responded to changes in habitat over time. With greater funding opportunities coming to the Texas coast for habitat conservation, it is expected that this model will help inform partners on sites most in need of urgent restoration.

PARENTAL BEHAVIOR OF NESTING WHITE-TIPPED DOVES IN SOUTH TEXAS

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Abstract: The white-tipped dove (*Leptotilla verreauxi*) was designated as a gamebird in Texas in 1984. Since then there has been little scientific research conducted on the species providing little insight on the ability of this population to sustain itself under hunting pressure. White-tipped doves reach the northernmost extent of their range in the Lower Rio Grande Valley (LRGV) of south Texas. In the region, an estimated 95% of native vegetation has been destroyed for agricultural and urban use. The objectives of this study were to investigate nest attendance patterns and adult behavior throughout the nesting cycle in two different habitat types. We hypothesized that doves nesting in citrus groves would experience increased disturbance resulting in more time away from their nest and reduced foraging efficiency. We located nests in citrus agriculture and native woodland habitats in the LRGV. We used real-time, infrared video camera systems to monitor behavior at the nest. We sampled video to establish time budgets for 6 nests. Our results indicated a significant increase in time spent feeding each day as nestlings increased in age ($r = 0.33$, $P < 0.02$). There was no significant difference between A.M. and P.M. parental switch times, female recess times, or return time following disturbances between habitat types. Our results indicate that habitat type does not influence parental behavior or foraging efficiency. Further research on parental nesting behavior will improve understanding of the reproductive habits of white-tipped doves in the fragmented landscape of south Texas.

HOME RANGE AND HABITAT SELECTION OF BROODING EASTERN WILD TURKEYS IN EAST TEXAS

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Abstract: Brooding habitat, or areas which provide ample feeding opportunities and protection from predators, has been identified as a possible factor limiting the success of eastern wild turkey (*Meleagris gallopavo sylvestris*) restoration in East Texas. From January to March of 2015 we radio-marked 32 hens (18 first-year translocated, 14 second-year translocated, 2 native) using backpack GPS units. All hens from our study attempted at least one nest, with up to 4 nesting attempts for some individuals. Five of the 32 radio-marked hens (16%) successfully hatched broods. Three broods were lost prior to seven days post-hatch and two broods survived more than 30 days post-hatch. Two randomly selected GPS fixes per day, one from the morning period (0700–1200 CDT) and one from the evening period (1300–1900 CDT), were sampled

from successful broods. Paired random locations, approximately 100 m from selected GPS fix location, were sampled following the same methods. A suite of metrics were collected in the field including: percent cover for tree, shrub, vine, native grass, non-native grass, and forb species, percent bare ground, basal area, canopy cover, visual obstruction, and habitat type were recorded for each brood and random location. Hens with broods favored open areas along forested edges such as day-lighted roads and improved pastures. Home range and core area were created for each brooding hen by creating 95% and 50% minimum convex polygons for movements of day one to day thirty post-hatch.

SABLE ANTELOPE DIETARY ANALYSIS: A COMPARISON OF MICROHISTOLOGY AND TRNL SEQUENCE ANALYSIS

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Abstract: Plant species identification by microhistological analysis of epidermal plant tissue in rumen contents or fecal material has been the primary method used in analyzing diets of large herbivores for decades. Microhistological analysis is time consuming and dependent on an extensive reference collection of plant epidermal tissues. A common criticism of this technique is the level of human error involved, potentially leading to misidentification of plant species. We compared the results of microhistological plant identification and dietary analysis with a new method of identifying plant species in fecal samples using DNA analysis targeting the chloroplast trnL (UAA) intron. Eighty fecal samples were collected from sable antelope (*Hippotragus niger*) at Mason Mountain Wildlife Management Area and analyzed using microhistological techniques. Twenty-two plant species were detected by microhistological identification. Thirteen of the fecal samples were successfully amplified for DNA analysis and sent to the University of Texas at Austin's Genomic Sequencing and Analysis Facility for illumina MiSeq sequencing. A taxonomically more detailed picture of the diet emerged from DNA analysis with 24 unique plant sequences identified. Although not directly comparable, species identified by both techniques, including little bluestem (*Schizachyrium scoparium*), Texas wintergrass (*Stipa leucotricha*), oak (*Quercus* spp.), switchgrass (*Panicum virgatum*), and barnyard grass (*Echinochloa obtusifolia*), accounted for more than 80% of the annual diet indicated by microhistological analysis. As used, DNA analysis did not allow us to quantify the amount of each species consumed. Drawbacks of DNA analysis included high cost of sequencing, complicated bioinformatics, ambiguity of the targeted region, and need for additional reference material.

MOVEMENTS AND HABITAT SELECTION OF LESSER PRAIRIE-CHICKENS IN CONSERVATION RESERVE PROGRAM-DOMINATED LANDSCAPES IN THE SOUTHERN HIGH PLAINS OF TEXAS

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Abstract: Lesser prairie-chicken (*Tympanuchus pallidicinctus*, LEPC) populations and geographic range have been greatly reduced over the past 75 years, and the species is a high conservation priority. The Conservation Reserve Program (CRP) has been identified as a conservation practice that may help facilitate population recoveries of LEPCs. The goal of our study was to assess LEPC movements in relation to lek locations and habitat selection within CRP-dominated landscapes in Texas. We captured 9 LEPCs in Bailey and Cochran Counties and equipped each with GPS Platform Terminal Transmitters (PTTs). We measured the distance from each GPS relocation to the nearest lek in ArcMap 10.2 and compared distances between the lekking season (15 March–31 May) and summer months (1 June–31 August). We assessed habitat selection at Johnson's 2nd and 3rd orders using compositional analysis. The habitat types included in the analysis were CRP, native rangeland, agriculture, and an "other" category that included playas, stock tanks, roads, and mesquite savannas. The average distance to leks was significantly greater during the summer months compared to the lekking season, 0.53 ± 0.01 km vs. 1.39 ± 0.01 km. Habitat type rankings were CRP > "other" > agriculture > native range at the 2nd order and CRP > native range > agriculture > "other" at the 3rd order. Based on our results, focusing management actions in areas within 3 km of known leks, and either re-enrolling CRP fields or maintaining them in grasses upon contract expiration would be beneficial for lesser prairie-chickens.

POPULATION CHANGE OF SMALL MAMMALS DURING LARGE-SCALE, ON-GOING GRASSLAND RESTORATION

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Abstract: Small mammal communities shift from diverse groups of granivores, insectivores, and carnivores to uniform communities of omnivores in the presence of non-native grasses. Small-mammal response to large-scale grassland restoration is unknown. We initiated a large-scale (118 ha) restoration of a buffelgrass-dominated grassland to native vegetation. The objective of our study was to determine the composition and densities of small mammal communities between a native shrub-land (117 ha), non-native grassland (109 ha), and an area being restored to native grassland (118 ha). Here we report findings on population change in small mammals during the restoration process (Mar–Apr of 2014–2015). Our study is located in LaSalle County, TX. The native area was comprised of 6 species ($n = 89$ individuals): *Peromyscus* spp. (60%), northern grasshopper mouse (17%), Ord’s kangaroo rat (12%), hispid pocket mouse (5%), Southern Plains woodrat (5%), and hispid cotton rat (1%). The non-native area supported 4 species ($n = 156$ individuals): hispid cotton rat (95%), *Peromyscus* spp. (3%), northern grasshopper mouse (0.9%), and hispid pocket mouse (0.4%). The restoration area supported 3 species ($n = 24$ individuals): northern grasshopper mouse (47%), hispid pocket mouse (32%) and *Peromyscus* spp. (21%). Our density results indicated higher small mammal density on the native area (29 ± 5 individuals/ha) than the non-native area (11 ± 4 individuals/ha) and the restoration area (5 ± 2 individuals/ha) in 2014. In 2015, the non-native area had the highest density estimate with 19 ± 3 individuals/ha compared to the native area (17 ± 4 individuals/ha). We did not capture enough individuals on the restoration area in 2015 to calculate density. Understanding the response of small mammals to grassland restoration will help land managers better manage for this important guild.

CURRENT DISTRIBUTION AND PHYLOGENETIC RELATIONSHIPS OF *HOLBROOKIA LACERATA* IN TEXAS

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Abstract: The Spot-tailed Earless Lizard (*Holbrookia lacerata*) has been thought to be an uncommon species over most of its distribution. Surveys conducted in 2009 were only able to detect the species at or near 12 of the 219 historic localities and only one locality within the

distribution of *H. l. subcaudalis*. Based on the few records observed in the 2009 surveys and the apparent extirpation of the species at locations in the south and east of the lizard's distribution it was petitioned for federal listing. Also, the USFWS found in its review of the petition that this species warranted further research to determine if federal listing was needed. In this study we conducted surveys across the entire historic distribution to determine the current species distribution and to collect tissues to determine if the northern (*H. l. lacerata*) and southern subspecies (*H. l. subcaudalis*) were genetically distinct from one another. We based our selection of survey sites on a newly constructed distribution models, visual inspection of habitat, and accessibility to low-traffic public roads. We used mtDNA (ND2) to investigate the validity of the two currently recognized subspecies.

INFLUENCE OF WILDLIFE ON BOTTOMLAND HARDWOOD FOREST RESTORATION IN DEGRADED RIVER BASINS IN EAST TEXAS, USA

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Abstract: Due to historic losses and degradation of bottomland hardwoods, there is interest in improving restoration techniques and the success of restoration projects. Past forest restoration efforts have raised questions as to the main causes of poor survival rates of hardwood seedlings in reforestation and afforestation sites. This study examined the influence wildlife (e.g., white-tailed deer (*Odocoileus virginianus*) and feral swine (*Sus scrofa*)) have on survival and establishment of 1–0 bare-root seedlings. In particular, we hope to identify an effective and economical procedure to mitigate the impacts wildlife have on seedling survival. Three mitigation techniques (Gallagher portable electric fence, 8-ft. woven wire fence and 2-ft Tubex[®] individual tree shelters) are being tested to determine their effectiveness in protecting seedlings of three species (Shumard oak, bur oak, and pecan) from herbivory. We recorded survival on four study sites in the Trinity, Sabine, and Sulphur river basins at three months after planting and again after the first growing season. We estimated density of white-tailed deer and feral pigs at each study site via 14-day trail camera surveys. Feral swine significantly impacted seedling survival on two of the four sites, showing selective herbivory towards pecan seedlings. Even at moderate to high (compared to regional averages) white-tailed deer densities we noted minimal browse damage to hardwood seedlings. Although feral swine can affect seedling survival, other factors besides herbivory, such as multiple prolonged flooding events and short-term severe drought, are possible to cause more significant impacts on seedling survival.

EFFECTS OF GRAZING ON THE AVIAN COMMUNITY AT A TEXAS HILL COUNTRY RANCH

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Abstract: Livestock grazing on >40.4 mil ha of Texas rangeland can have species specific and mixed results for local bird communities and other wildlife. Rangeland in the Edward's Plateau Ecoregion of Central Texas supports a wintering bird community rich in ground foraging species, as well as regionally declining prairie and shrubland breeding birds. At Freeman Center, a 1,701 ha working cattle ranch in Central Texas, we examined grazing effects on bird foraging frequency and the overall bird community. From April 2014–May 2015, we conducted 135 fixed radius point counts and 437 walking transects in two grazed and two ungrazed pastures. We identified 138 avian species, including 4 upland/migratory game birds and 27 primarily ground foraging species. Based on Linear Mixed Effects Models, grazing did not significantly affect breeding bird diversity ($P = 0.287$) and richness ($P = 0.087$). However, mean richness was higher in grazed sites (grazed = 9.39, ungrazed = 8.36). Grazing significantly affected breeding bird abundance ($P = 0.001$). Mean abundance was higher in grazed sites (grazed = 16.27, ungrazed = 12.20). Grazing significantly affected wintering bird abundance ($P = 0.009$). Winter mean abundance was higher in grazed sites (grazed = 12.17, ungrazed = 7.84). Grazing significantly affected winter ground foraging frequency ($P = 0.033$). Mean foraging counts were higher in grazed sites (grazed = 3.44, ungrazed = 1.78). We recommend woody vegetation removal and prescribed burning in ungrazed pastures to promote grassland and shrubland systems for the avian community at Freeman Center.

AN ECOLOGICAL COMPARISON OF TWO SYMPATRIC DESERT QUAIL SPECIES DURING THE REPRODUCTIVE SEASON IN THE TRANS-PECOS

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Abstract: Scaled quail (*Callipepla squamata*) and Gambel's quail (*Callipepla gambellii*) are a significant biological component to the desert ecosystems of the Chihuahuan Desert, specifically the Trans-Pecos region of Texas. Scaled quail populations have been on the decline over the last 40 years, while Gambel's quail populations have remained relatively stable. A comparative study is being implemented at a ranch that encompasses portions of Culberson, Hudspeth, Jeff Davis, and Presidio counties to gain a more in-depth understanding of how these game bird species interact with one another and to derive ecological differences between the two. Nesting ecology, summer survival, and spatial distribution are the main focal points of the study. Summer survival between the two species has varied over the last two years. A cumulative survival rate of 0.615 and 0.515 was recorded, for scaled and Gambel's quail respectively. Nest site selection is also being evaluated between the two species. The information collected during this study, such as habitat selection and nesting ecology, will provide beneficial knowledge and insight to biologists, wildlife managers, and landowners to better manage these two species in the Trans-Pecos region of Texas.

PATCH OCCUPANCY AND ABUNDANCE OF THE CREVICE SPINY LIZARD IN THE CENTRAL MINERAL REGION OF TEXAS

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Abstract: Herpetofaunal species within a landscape are strongly associated with the amount and availability of suitable habitat as defined by numerous characteristics of the microhabitat. We estimated occupancy and density of crevice spiny lizards (*Sceloporus poinsettii*) on monadnock features present on Mason Mountain Wildlife Management Area within the Llano Uplift area of the Central Mineral Region of Texas. From June to September 2015, I captured and marked 46 adult crevice spiny lizards using Floytag® T-bar anchor tags. Average lizard density across sites was 1.41/100 m² (SE = 0.023, *n* = 46). Additionally, 382 lizards were detected across 20 locally isolated granitic outcrops during abundance sight surveys. These estimates were used to evaluate the relative influences of microhabitat variables on the distribution of this saxicolous lizard species within the context of habitat size and a landscape level variable (burning treatment). I measured variables that are either known or suspected to influence habitat suitability, including fine-scale rock habitat (i.e. ground cover, geology, amount of refuge and vertical surface area) and the landscape context (burning treatment). Multimodel information-theoretic approach suggests that at a local scale, crevice spiny lizard occupancy and abundance may be more closely related to habitat quality (i.e. prevalence of vertical surface area or vegetation complexity) than to horizontal extent of suitable habitat. Landscape level context may also play a role in habitat suitability and thus quantification of suitable habitat without consideration of management context is unlikely to be sufficient for the assessment of species distribution.

RELIABILITY OF N-MIXTURE MODELS TO ESTIMATE ABUNDANCE OF WHITE-TAILED DEER

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Abstract: Establishing reliable harvest quotas is contingent upon knowing the current population abundance of the species within the area of interest. Still, many currently accepted and practiced survey methodologies and abundance estimators for deer have been shown to be biased and imprecise, resulting in inaccurate estimates of population parameters. It has recently been argued that having reliable estimates of white-tailed deer (*Odocoileus virginianus*) abundance is not necessary. This may be true when managing open populations of deer, where

individuals are able to freely traverse across the landscape. However, the increasing use of 2.4-m-high game fences throughout the state of Texas deters deer movement between populations, and by extension, has led to an increased number of geographically closed populations across the state. The decreased dispersal events between populations increases the need to monitor population abundance to establish reliable harvest strategies when rescue effects cannot occur and when overabundant deer populations may exhaust available resources leading to alterations in ecosystem function. Thus, we evaluated the efficacy of N-mixture models to estimate deer abundance using spatially and temporally replicated counts of unmarked individuals on high-fenced properties. To accomplish this, we conducted 10 blind count surveys (5 morning and 5 evening) on a known population of white-tailed deer within a 214 ha 2.4-m high game fenced enclosure in both 2006 and 2007. Data were analyzed using various structures of N-mixture models. We evaluated whether abundance estimates derived from N-mixture models agreed with known abundance for each sex and whether detection varied between morning and evening surveys. We found N-mixture models to be a promising abundance estimator for closed populations of white-tailed deer and that detection was higher during evening surveys. Thus, using N-mixture models with evening blind count surveys will increase the effectiveness of deer population management recommendations on private lands across Texas.

WINTERING-SEASON ECOLOGY OF REDDISH EGRETS

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Abstract: The reddish egret (*Egretta rufescens*) is the rarest and least studied heron in North America and much remains to be learned about its habitat use and seasonal requirements. Research efforts have led to the identification of many wintering areas of reddish egrets, and current management goals aim to identify and protect foraging and roosting habitat within their winter range. Roost sites are used for resting and sleeping, and safe roost sites are crucial for survival during nocturnal hours. Furthermore, high quality roost sites should be near foraging sites to minimize the amount of energy expended flying from roosts to foraging sites. In order to examine the winter ecology of reddish egrets, we attached GPS satellite transmitters to 30 adults that were breeding in the Laguna Madre, Texas and tracked their movements daily. Preliminary results show that reddish egrets utilize shallow water that is ~1.5 km from the mainland, which may provide protection from mammalian predators. Mean distances flown from winter roost sites to foraging sites ranged from 0.37 (\pm 0.02) to 4.79 (\pm 1.23) km. Egrets also exhibited a high degree of fidelity to roost sites and foraging sites across years, exemplifying the need to protect these areas. These results will contribute to conservation of habitats vital to reddish egrets.

EFFECTS OF DENSITY INDEPENDENT AND DEPENDENT FACTORS ON ROOSEVELT ELK JUVENILE RECRUITMENT IN REDWOOD NATIONAL PARK, CALIFORNIA

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Abstract: Density independent and dependent factors are known to influence population dynamics of Roosevelt elk (*Cervus elaphus roosevelti*). Climatic variation and prescribed fire are density independent factors as they occurred without regard to current population abundance. Conversely, population abundance should exert a density dependent influence on populations as body condition, fecundity and juvenile recruitment are affected by the population influence on the food supply. Past studies have rarely assessed the effect of density independent and dependent factors on recruitment in elk populations. To assess this interaction, population abundance estimates of Roosevelt elk were collected in the Bald Hills region of the Redwood National Park located in Humboldt County, California from 1978–2016. Climatic and prescribed fire data were collected from 2001–2016. We first estimated a K carrying capacity of 275 elk using the Gompertz state space model. A model selection analysis of 35 linear regressions estimating juvenile recruitment considering abundance, prescribed fire, and climatic influences were assessed using the Akaike information criterion corrected for small sample size. Population abundance had the strongest influence on juvenile recruitment. Our findings may be affected by the population being below K carrying capacity. A density independent influence is less noticeable at low populations because of the lack of need for increased resources. Thus, density dependent factors become more apparent to act on population dynamics at low abundance.

DEVELOPMENT AND EVALUATION OF PROTOTYPE FERAL PIG TOXICANTS

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Abstract: The current U.S. population of feral pigs (*Sus scrofa*) is estimated at 3–5 million, with 2.6 million pigs in Texas alone. Current harvest methods fall vastly short of the required removal rate (>70%) to maintain a stable population, therefore other methods of population control might be necessary. Toxicants have shown potential to be a multi-regional feral pig management tool. Although there is not a registered feral pig toxicant within the U.S., sodium nitrite (SN) is being evaluated as an active ingredient. We tested 13 novel SN formulations (8 enteric and 5 gastric deployment) on 71 pigs in an oral gavage study to determine the most

humane and effective toxicant matrix. The best candidate formulation was determined by a humaneness model assessing the following categories: dosage to first clinical sign of intoxication, first clinical sign to mortality, dosage to mortality, frequency of clinical signs of intoxication, vomit rate, and product stability. Each category allowed a judgement to be made about the humaneness of a method then the methods were ranked. The overall humaneness of each SN formulation was obtained by calculating the total sum of each category. The most effective, humane formulation was based on the minimization of clinical signs of intoxication while retaining high lethality. We obtained 92.96% lethality across all formulations, 90.91% in enteric formulas ($n = 44$) and 96.30% in gastric formulations ($n = 27$). Results from this project will be the first step in obtaining E.P.A registration of a U.S. feral swine toxicant in the future.

INFLUENCE OF INITIAL NEST FATE ON NEST CONCEALMENT AND FATE OF SUBSEQUENT NESTING ATTEMPTS OF BOBWHITES

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Abstract: The northern bobwhite (*Colinus virginianus*) is an important game bird in Texas. Much is known about bobwhite nesting ecology; however, relatively little is understood regarding how nest predators influence bobwhite nest selection and re-nesting behavior. The objective of our research is to compare how the fate of an initial nest influences the re-nesting behavior of bobwhites (i.e., concealment, placement, and success of subsequent nests). Our study was conducted on 5 spatially independent study sites across South Texas, in Brooks (2000–2008) and LaSalle (2009–2011) and Goliad, Real, and Zavala counties in 2014–2015. Through the use of radio-telemetry, we collected information on nest fate and nest substrate. In addition, we estimated concealment at nest sites using nest volume and bunchgrass density. Using a McNemar test, we found that bobwhites were more successful on subsequent nesting attempts ($P = 0.03$). During preliminary analyses, there was no significant difference in nest volume or bunchgrass density between successful and unsuccessful nests ($P \geq 0.1744$). Understanding the habitat factors associated with increased nest success could aid managers in making appropriate management decisions for bobwhites on the landscape.

DEMOGRAPHY OF AN ORNATE BOX TURTLE POPULATION IN A ROLLING PLAINS ECOSYSTEM

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Abstract: Turtles are declining globally because of habitat loss, climate change, and many other factors. Although once considered abundant, ornate box turtles (*Terrapene ornata*) are now considered “near threatened” by the IUCN. A monitoring program was established at Matador Wildlife Management Area, Cottle County, Texas, in 2004 to assess the structure and viability of the site’s ornate box turtle population. When turtles were captured, they were sexed, measured, marked as individuals, and released. We collected data from 616 individuals for a total of 1,046 captures from 2004 to 2014. When possible, we also used annuli counts to assess age by counting the number of annuli on impressions taken from their plastrons. The sex ratio of the population appears to be strongly female biased. We used multiple methods to calculate survival resulting in survival estimates of 0.760 for an age-structured analysis, 0.801 for Kaplan-Meier, and 0.723 based on CMR. A Pradel Model produced a Lambda of 0.930, with an upper 95% confidence limit of 0.970. Several studies in other states report annual survival rates >0.90. The low survival rates and a population growth rate < 1.0 suggest this population is declining. This population decline may be attributed to low juvenile recruitment or the severe drought which accounted for a large portion of the time period of the study. This population is showing trends similar to the global decline, and further research is needed to determine their particular effects for future management.

BREEDING SEASON AVIAN DIVERSITY AND COMMUNITY COMPOSITION IN FIRST- AND SECOND-YEAR EUCALYPTUS PLANTATIONS IN SOUTHWEST LOUISIANA

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Abstract: Eucalyptus (*Eucalyptus* spp.) plantations have potential to boost availability of small-diameter hardwoods for traditional wood products and bioenergy feedstocks, and they can be grown on sites accessible during wet weather. Eucalyptus is currently being grown in southwest

Louisiana and southeast Texas as pulpwood feedstock. The response of wildlife to eucalyptus plantations in the U.S., however, has not been investigated. Thus, we sampled assemblages of birds during two breeding seasons after stand establishment in five *Eucalyptus benthamii* plantations in southwestern Louisiana. Reference slash pine (*Pinus elliottii*) stands of both the same age (1- to 2-years post establishment) and height (6- to 7-years post establishment) were also surveyed. In year one, avian species richness and diversity in eucalyptus plantations were intermediate to that in the two reference stand types. In year two, avian diversity in eucalyptus plantations was still intermediate, but species richness was greater than either age class of pine. Structurally similar pine plantations showed 83% community similarity to eucalyptus, whereas similarity increased from 38% in year 1 to 50% in year 2 between young pine plantations and eucalyptus. Neotropical migrants, foliage gleaners, and shrub nesting species were detected more frequently in eucalyptus than pine plantations of either age class. In contrast to previous studies of eucalyptus plantations in other parts of the world, we found little evidence that conversion of pine plantations to eucalyptus resulted in negative impacts on breeding bird diversity or abundance.

ESTABLISHING A SUSTAINABLE LANDSCAPE CONSERVATION STRATEGY FOR WHOOPING CRANES

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Abstract: Shoreline and inland habitats of the Texas Gulf Coast house a diverse spectrum of species, whose populations are threatened by anthropogenic stressors, climate change and sea-level rise. The response to preserve these species and mitigate threats lies in identifying high-quality habitats to conserve and protect over the long-term. The challenge becomes understanding species needs and diagnosing the present and future threats on species to prioritize conservation activities in the right places. This project meets these challenges by linking information describing climatic changes, urbanization and species-habitat associations to predict where sustainable habitats should remain. We began with refining the Sea Level Affecting Marshes Model (SLAMM) for Texas coastal National Wildlife Refuges and surrounding areas, to predict the ecosystem impacts of sea level rise. Next, we perform a vulnerability assessment on habitats by developing new analytical and decision making tools that integrate sea level rise information with predictions describing land conversion, anthropogenic stressors and climate change. Lastly, we focus on building species-habitat associations using a surrogate species approach: whooping cranes (*Grus americana*). We link these species population responses to expected habitat amount and condition. Preliminary scenarios coupling these results help to predict and identify conservation lands for sustaining

these and other species over the coming century. Our approach identifies the present status of habitats along the Texas Gulf coast and predicts their future to inform strategic land acquisition efforts by the USFWS and partners.

GENETIC DIVERSITY AND RELATEDNESS OF NORTHERN BOBWHITE COVEYS IN SOUTH TEXAS

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Abstract: Northern bobwhites (*Colinus virginianus*) employ polygamy, male incubation, and double brooding as mating strategies; which may result in more siblings. Our goal was to determine genetic diversity and relatedness for coveys on a private ranch in Jim Hogg County in South Texas. We sampled northern bobwhite coveys (≥ 3 birds) from 2010–2011 and 2011–2012 hunting seasons. We analyzed 11 northern bobwhite microsatellite DNA loci, determined an inbreeding coefficient, and used coefficients of relatedness (Queller and Goodnight's R) and a full pedigree maximum-likelihood algorithm in Colony to assign relationships. The inbreeding coefficient (F_i) averaged 0.08 ± 0.03 ($n = 96$ birds, 29 coveys). Relationship coefficients ranged from -0.82 – 1.00 , but most birds were unrelated ($R = -0.004 \pm 0.002$ SE). In 2010–2011, Colony assigned 130–149 half sibling, 1–4 full sibling, and 0–3 parent–offspring pairs ($n = 2,887$, 5 trials, probability > 0.99). Thirteen coveys (56%) had related individuals (20 pairs). An additional 146 related pairs were found among coveys. In 2011–2012, Colony assigned 5–10 half sibling and 1 full sibling pairs ($n = 161$). Two coveys (33%) had related individuals (2 pairs), and an additional 9 related pairs were found among coveys. The occurrence of related individuals among coveys suggests that the fall shuffle is effective at mixing families, and the high half sibling count among coveys seems to suggest polygamy. These breeding strategies may help northern bobwhite populations maintain a weakly moderate level of genetic diversity.

IMPACTS OF HABITAT FRAGMENTATION ON NORTHERN BOBWHITES IN THE GULF COAST PRAIRIE LANDSCAPE CONSERVATION COOPERATIVE

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Abstract: Habitat change is an important factor negatively influencing the populations of many avian species. For populations with large ranges, such as northern bobwhite (*Colinus virginianus*), it is important that we manage local populations while considering the species in a large scale context. The objective of this study is to compare northern bobwhite population declines with habitat changes in Texas, Oklahoma, and Louisiana. We will use Breeding Bird Survey (BBS) data to determine northern bobwhite abundance and population changes, and then collect land use, road density, and human population data from the US Census of Agriculture. We will choose 9 counties with stable populations and 9 counties with declining populations for a regional analysis. We will compare populations to land cover changes using patch-based metrics (percent landscape, mean patch area, patch density, edge density, largest patch index, and Euclidean nearest neighbor). We will compare these using ANOVAs or Kruskal-Wallis tests with $\alpha = 0.05$. We will then identify drainage networks, disturbance areas, and vegetation suitable for northern bobwhites. In these areas, we will use patch-based metrics, as above, and then quantify connectivity with the index of integral connectivity (IIC). By using a multi-scale analysis, we can identify where northern bobwhite populations are in decline and predict how land use and human population growth will change northern bobwhite populations in the future. Funding has been provided by the Gulf Coast Prairie Conservation Cooperative.

A STOCHASTIC MODEL TO SIMULATE MOTTLED DUCK POPULATION DYNAMICS

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Abstract: A systems-based modeling approach for regional mottled duck populations can be used to elucidate the importance of individual vital rates and develop predictions regarding mottled duck persistence, while simultaneously identifying key uncertainties and priority research needs. We used STELLA 10.0.3, to construct, parameterize, and evaluate a stochastic, seasonally-explicit, annual cycle demographic model based on data currently available from the Western Gulf Coast (WGC) population of mottled ducks. Our model is based on difference equations, with stochastic variables drawn from normal distributions. We simulated mottled duck populations for 100 years and evaluated our model by comparing results with independent estimates of population parameters reported in the literature. The model simulated the flow of individual mottled ducks through the annual cycle within the WGC region (i.e., the system). The flow of individuals was driven by production and began with nest survival in season 1. The model was partitioned into 3 different seasons based on mottled duck life history: breeding/brooding, post-breeding, and winter. Because mottled ducks are non-migratory and our model was based on the entire population of WGC mottled ducks, we assumed no immigration and emigration. Following model evaluation a sensitivity analysis was conducted. The model was sensitive to variation in breeding parameters. As presented, the model assumes constant habitat conditions across time and does not incorporate future degradation of habitats. This quantitative model can be used to clarify functional relationships among demographic rates

and population growth to provide input for conservation actions and long-term management of the WGC mottled duck population.

ASSESSING ACCURACY OF GOLDEN-CHEEKED WARBLER POPULATION ESTIMATES

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Abstract: Mathewson et al. (2012) developed a range-wide population model for the golden-cheeked warbler. O'Donnell et al. (2015) evaluated that model and two other models developed at a local scale. They concluded that the Mathewson et al. model overestimated warbler densities by as much as 3000% at low densities and that none of the models were accurate. I reexamined the data used by O'Donnell et al. to assess the accuracy of the Mathewson et al. model. The observed bias for all 21 plots as compared to territory mapping data was 34%. One plot had a predicted abundance of 15 territories and an observed territory mapping estimate of only 0.5 territories, thus rendering the error reported by O'Donnell et al. of 3000% (15/0.5). Removing this one plot reduced the observed bias to 27%. I conclude that the accuracy of this range-wide model was reasonable at this scale and much of the observed bias should be expected due to an earlier study demonstrating effects of survey duration on bias. I recommend that bird surveyors record precise times of detections to maximize the ability of accounting for bias by parsing the data to appropriate survey durations if known and/or using other density estimators.

SPECIAL CONSIDERATIONS FOR HANDRAISING A DAMA GAZELLE

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Abstract: Examination of handrearing of a critically endangered dama gazelle (*Nanger dama ruficollis*) was initiated when a newborn had to be withdrawn from its breeding group. Because many Texas exotics owners keep this species, guidelines for saving the occasional orphan are important for conservation. During this study, several characteristics became evident that anyone raising a dama gazelle would want to consider. Fawns run very fast. A fawn can kill itself against a fence during exercise. When evaluating shelter, know that a fawn may become reluctant to be closed in. A growing fawn may beat its head against the door of the same crate which contained it safely at night as a newborn. The study fawn took 5 mo. after the addition of a young goat to follow the example of its companion and go in out of the rain, even though their shelter was open on two adjacent sides. When active, a dama gazelle seeks company. Before the goat was added, the gazelle would bang on the door from the outdoor pen to the house when left alone. To do this, she had to climb a stairway. Then she was stranded and would have to be carried back down. Dama gazelles have difficulty going up or down steps. Sometimes, the fawn would hazard a jump down, but a dama gazelle's legs are long and slender, and the jump was dangerous. Stairs had to be blocked off. This study is one kind of unexpected research opportunity which wildlife students can meet.

EVALUATION OF SELECTIVE HARVEST ON THE DISTRIBUTION MALE MATING SUCCESS IN WHITE-TAILED DEER

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Abstract: Selective harvest, or culling, is a widely practiced strategy aimed at increasing antler size in managed populations of cervids. However, the effects of culling on deer populations are poorly documented. Culling based on age and antler size of male deer may change population sex ratio and age structure. As a result, culling practices may affect the distribution of male mating success, and ultimately genetic variation. The goal of this study was to define effects of culling on the demographic traits and distribution of male mating success in white-tailed deer (*Odocoileus virginianus*) from southern Texas, USA. We established 3 study areas, one subject to intensive culling (14 km²), one to moderate culling (72 km²), and one as a control (20 km²). Each autumn during 2006–2014, we captured deer using the helicopter net-gun method. We estimated age, measured antler characteristics, and collected a tissue biopsy for genetic analyses. Deer that did not meet culling criteria for their age class were sacrificed during 2006–2012. We recorded 4,264 captures of 2,503 individual deer. The culling treatments in the intensive and moderate treatments altered the sex ratio (1M:5F, 1M:1.5F, respectively) and the age structure of candidate sires was skewed toward adult age classes (≥ 3.5 years old). Parentage analyses indicated that most offspring were sired by adult males (≥ 3.5 years old) the distribution of mature male mating success exceeded its young age. The resulting information from this study will have important implications for harvest management.

NORTHERN BOBWHITE RESOURCE SELECTION IN SOUTH TEXAS

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Abstract: Habitat use by northern bobwhites (*Colinus virginianus*, hereafter bobwhite) is constrained by heat. Our objective is to determine the importance of thermal environment variables on temporal patterns of habitat selection by bobwhites. From May to September 2015, we relocated 26 bobwhites fitted with radio collars 2–3 times per week. For each bird

relocation, we recorded an associated random location placed 20 meters in a randomly generated cardinal direction. For each random and nonrandom location, we measured the following variables: light intensity, operative temperature, soil surface temperature, plant community, ambient temperature, wind speed, time of day, and percent cloud cover. We estimated resource selection functions using case-controlled logistic regression with generalized estimating equations (GEE). We used quasiliikelihood under the independence model criterion (QIC) in model selection because models fit with the GEE procedure have R-side random effects. Soil surface temperature, time of day, cloud cover, and their interactions were the most important variables in our best model. The odds of a bobwhite using a location decreased 4% for every 1°C increase in temperature after accounting for all other variables in the model. Our study will increase knowledge of bobwhite resource selection in South Texas that will allow wildlife managers to make more informed management decisions that could improve bobwhite habitat.

A WILD WORKSHOP: TRAINING K-12 EDUCATORS ON BIRD CONSERVATION CURRICULUM

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Abstract: Natural history and wildlife are often topics put aside by teachers in the classroom due to the lack of time, resources, and priority preparation for state testing. Nor do many teachers have the background to integrate wildlife into their classroom. To fulfill this need, teachers ($n = 6$) and environmental educators ($n = 4$) were invited to participate in a training workshop to gather the background and information they needed in order to conduct five lesson plans in their classrooms or with their school groups. It is hypothesized that teacher training and conducting lessons in the classroom will increase teacher affinity, appreciation, and knowledge of birds. The lesson plans, aligned with Texas state standards (TEKS), included techniques, research, and citizen science in the area of bird conservation. Educators who participated in the workshop completed a questionnaire, pre-program survey, and workshop survey including questions related to their education, experience, teaching methods, workshop thoughts, and knowledge of birds. Of the 6 participating teachers, only one had heard of citizen science and all agreed or highly agreed they were interested in wildlife. Participating sixth grade teachers will have the opportunity to evaluate the curriculum by conducting lessons in their classrooms during the school year. Two teachers have implemented the curriculum, and the program is ongoing and recruiting. Lessons will provide local educators with additional tools to incorporate wildlife techniques and research into their instruction and for students to be introduced to the STEM (Science, Technology, Engineering, & Math) career of wildlife biology.

DOES BIRTH SYNCHRONY INFLUENCE FAWN SURVIVAL OF PRONGHORN IN THE TRANS-PECOS REGION OF TEXAS?

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Abstract: Birth synchrony is an often used strategy by ungulates functioning to reduce risk of predation on young by increasing prey availability. The goal of birth synchrony is to saturate prey availability in a short time frame to predators and reduce individual risk of predation. In most of their range, pronghorn fawns are born within a 3-week period during early spring, and peak fawning occurs over a 10-day period. Our objectives were to: 1) determine the length of the pronghorn fawning season in the Trans-Pecos region of Texas, 2) identify the peak period of fawning, 3) determine cause specific mortality of fawns, and 4) estimate fawn survival rates. Using spotlights and vaginal implant transmitters we located and fit pronghorn fawns with expandable VHF radio collars. Collared fawns were monitored throughout the fawning season. We found the fawning season ranged between 30 and 56 days. Pronghorn in the Trans-Pecos do not appear to have a significant peak fawning period as described elsewhere. Predation accounted for the majority of fawn mortalities, with coyotes and bobcats being the primary predators. There was no difference in survival of fawns born during peak fawning periods and those born outside of peak periods. Fawn survival rates increased with increasing precipitation across study sites.

NORTHERN BOBWHITE PROXIMITY TO WOODY COVER IN SOUTHERN TEXAS

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Abstract: Northern bobwhites (*Colinus virginianus*) require low-growing woody plants for thermal and escape cover. Understanding how woody cover should be interspersed across the landscape may be critical in restoring bobwhites in areas where this habitat component is lacking. Unfortunately, recommendations for woody cover in the bobwhite literature vary as the amount of this component needed by bobwhites differs by region and plant community. The objective of this study was to determine the proximities of bobwhites to woody cover across the landscape. We used data collected from 5 radio-telemetry studies that were conducted across South Texas (Brooks, Goliad, LaSalle, Real, and Zavala Counties) from 2009 to 2015. Bobwhites were trapped and radio-marked in these studies across contrasting plant communities with varying amounts of woody cover, where their locations were marked via GPS. We ran a

proximity analysis of bobwhite locations to woody cover and compared this data to the proximity of randomly generated points to delineated woody plants across areas with varying amounts of woody cover. Bobwhites remained within 30 m from woody cover when not under it. Determining the proximity of bobwhites to woody cover in different regions and plant communities will aid managers in planning brush management and restoration across different areas of Southern Texas.

SOCIAL FACTORS DURING FEEDING INFLUENCE SEXUAL SEGREGATION IN ROOSEVELT ELK

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Abstract: Sexual segregation can be defined as the differential use of space by males and females and is often explained by intersexual differences in forage acquisition due to body size dimorphism. Furthermore, foraging behavior might be affected by social factors operating at the scale of the foraging bout. Adult males and females may respond differently to social factors during a foraging bout because of the group type or size, and time spent in close proximity to other conspecifics. It is therefore possible that social influences on foraging behavior might help explain spatial patterns of sexual segregation at the landscape scale. To assess the influence of social factors, focal observations were collected from a non-migratory population of Roosevelt elk (*Cervus elaphus roosevelti*) from 2009–2016 in the Redwood National and State Parks, California. From these data, AIC model selection analyses were conducted to obtain a linear-mixed effect model that predicted the distance traveled, turning angle variance, and time spent with head out of the feeding position during a foraging bout. Males in male-only groups differed in these behaviors from both females and males in female groups. Specifically, males in male-only groups varied more in turning angle and traveled less distance during foraging bouts. All males were more affected by elk in close proximity than were females. Thus social factors did influence the feeding behavior that occurred during the foraging bout. These findings might help explain movement of males from patches with females to patches that were vacated by females.

EFFECTS OF DIFFERING WHITE-TAILED DEER AND SUPPLEMENTAL FEEDER DENSITIES ON WOODY PLANT CANOPY VOLUME AND MAST PRODUCTION

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Abstract: White-tailed deer (*Odocoileus virginianus*) browse upon shrubs across their range of distribution because shrubs are the most reliable food source, particularly in drought-prone portions of their range. Our objective was to determine the impacts of varying deer and supplemental feeder densities on canopy volume and mast production of three palatable shrub species. In March 2013, we established 6 81-ha enclosures on each of 2 ranches, with target densities of 0, 20, 40, and 60 deer/81 ha with one feeder each, 60 deer/81 ha with three feeders, and 80 deer/81 ha with four feeders. In summer 2013–2014, we measured canopy volumes of pairs of Texas lignum-vitae (*Guaiacum angustifolium*), blackbrush acacia (*Vachellia rigidula*), and spiny hackberry (*Celtis ehrenbergiana*) that were unprotected or protected from browsing. Blackbrush acacia and spiny hackberry were split into 2 height classes (<1.50 m tall and >1.50 m tall). In summer 2014–2015, we measured mast production on the same plants. Canopy volume of spiny hackberry in the large height category increased with increasing deer density and a constant deer to feeder ratio ($P = 0.016$). Mast production of spiny hackberry in the large height category decreased with increasing deer density ($P = 0.041$) and increased with increasing deer density and a constant deer to feeder ratio ($P = 0.023$). These shrubs appear to be adapted to surviving with increased deer browsing and the addition of feed appears to allow increased growth and reproduction of spiny hackberry.

CONSERVATION OF THE LOUISIANA PINE SNAKE IN TEXAS

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Abstract: The Louisiana Pine Snake (*Pituophis ruthveni*, LPS) is rare and thought to be declining throughout its range. Only 234 individuals have ever been documented. As a result, the U.S. Fish and Wildlife Service currently consider LPS as a Candidate Species under the

U.S. Endangered Species Act. Extensive research has been conducted on USDA Forest Service lands in Texas and Louisiana since 1992; however, current information on the population status, distribution, and abundance of LPS on private lands in Texas is lacking. Here, we present a model that expands upon an existing LPS habitat model based on soils. Our model is designed to fill the gap in our knowledge of this species. First, we used all known records of LPS in Texas to generate a model of historical habitat based on forest type. Then, we generated a model of current habitat by using Change Detection Analysis to identify pine forests that have not been harvested in 30 years. The resulting model consisted of habitat fragments that were sorted by size to guide trapping efforts on private lands in 2016 and to identify future reintroduction sites in Texas. Future trapping efforts will incorporate trail cameras into standard LPS trapping arrays in order to minimize field technician traffic on private lands. All captured LPS individuals will be incorporated into the existing captive breeding program for Texas with the goal of reintroducing juveniles to the site recommended in our current habitat model.

MEXICAN WHITE-TAILED DEER HUNTING AS ECONOMIC DEVELOPMENT AND ANTI-POACHING TOOL IN SOUTH CENTRAL MEXICO

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Abstract: Mexican white-tailed deer (*Odocoileus virginianus mexicanus*) has been the main incentive to protect sympatric wildlife species in the Mixteca Poblana region, Puebla, Mexico. Wildlife harvesting in south central Mexico is part of the local community culture. State and federal wildlife law enforcement agencies (PROFEPA) have no significant impact to protect wildlife due the lack of staff and vehicles to patrol the rural areas. Our goal was to prove the economic, social and ecological impacts that wildlife management and legal wildlife harvesting promoted by Colin[®] – Wildlife Consultants have in two wildlife management areas (UMAs) known as “Cristo Rey” and “Los Chamoles” in Chiuatla County, Puebla, Mexico. We set up five guzzlers, six trail cameras, and five barbed wire enclosures in UMA Cristo Rey. Native white-tailed deer population and sympatric species have been using the guzzlers. Six cam trails were set up in strategic places, proving wildlife presence and abundance. Restriction of livestock grazing preserve high quality food plots for wildlife. We collected biological, social and economic data from each hunting event during 2014–2015 and 2015–2016 hunting seasons. We record deer morphometry, weight, trophy’s age and kidney fat score. As part of the social impact we hired more than 20 local hunting guides, promoting self-employment in some of the poorest areas. Economic investment from hunters to hunting has been recorded. Local hunting guides income increased by 3 times more than conducting regular agricultural activities.

Wildlife population numbers have increased due to the continuous monitoring of wildlife by improving cam trails and protecting wildlife habitat. Hunters' and wildlife biologists' presence has decreased poaching in the region. Mexican white-tailed deer sympatric species such as coatimundi (*Nasua narica*), gray fox (*Urocyon cinereoargenteus*), white collared peccary (*Pecari tajacu*), raccoon (*Procyon lotor*), ring tail (*Bassariscus astutus*), coyote (*Canis latrans*), chachalacas (*Ortalis poliocephala*), and bobcat (*Lynx ruffus*) have benefited as a consequence of wildlife management and legal hunting. Local communities have increased economic revenues as a consequence of white-tailed-deer harvesting. Wildlife conservation has dramatically increased by the local community because it represents an economic benefit for the people.

A COMPARISON OF THREE QUAIL SURVEY METHODS AND HARVEST DATA FROM A SOUTH TEXAS WILDLIFE MANAGEMENT AREA

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Abstract: Northern bobwhites (*Colinus virginianus*) have been monitored on the Chaparral Wildlife Management Area for the past 3 decades through spring call counts, fall roadside counts, helicopter covey counts, and harvest data. We examined in-year correlations between quail surveys and subsequent harvest data to determine how reliable these surveys are at predicting harvest success. We also investigated offset-year correlations where we compared harvest data to subsequent quail surveys to see if total harvest, harvest/hunter day, or age ratios have any indication of the following year's breeding population or recruitment status. Spring call counts ranged from 0.2–6.0 birds calling/stop from 1996–2015, while fall roadside counts ranged from 0.2–10 birds seen/mile driven from 1988–2015. Helicopter survey observations ranged from 8–222 coveys from 1988–2015. Between 1988 and 2014, total bobwhite harvest ranged from 11–3126 birds/season, and quail harvest/hunter day ranged from 0.02–2.12 birds/hunter day. The age ratio of juveniles: adults during this period ranged from 0–5.82. For the in-year correlations, aerial surveys, spring call counts, and fall roadside counts were all significantly correlated with total quail harvest and quail harvest/hunter day, suggesting that they all may have some predictability of harvest success. Spring call counts were most closely correlated to total quail harvest counts ($\rho = 0.74$, $P = 0.002$) and quail harvest/hunter day ($\rho = 0.79$, $P < 0.001$). For the offset-year correlation, only helicopter covey counts and age ratios were significantly, but weakly, correlated ($\rho = 0.42$, $P = 0.05$).

DOES SUPPLEMENTAL FEEDING MITIGATE THE IMPACTS OF HIGH DEER DENSITIES ON PLANT COMMUNITIES AND AVAILABLE FORAGE?

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Abstract: Presence of supplemental feeders in a variable semiarid environment may alter the effects of white-tailed deer (*Odocoileus virginianus*) on vegetation. We collected herbaceous biomass during March and May 2014–2015 on 2 ranches, each with 6 81-ha enclosure treatments. We compared the response of the standing crop of palatable and unpalatable forbs using 2 different sets of treatments: 0, 20, 40, and 60 deer/81 ha with one ad libitum feeder in each treatment and 0, 20, 60, and 80 deer with one ad libitum feeder/20 deer in each treatment. In May 2015, palatable forb biomass was 24% greater in the 60 deer than 40 deer treatment in the contrast of treatments with only one feeder; but, was at least 37% lower in the 80 deer treatment compared to other treatments in the one feeder/20 deer contrast ($P \leq 0.001$). Conversely, unpalatable biomass was lower in the 60 deer compared to the 40 deer treatment in the contrast of treatments with one feeder for May 2015 ($P \leq 0.001$); but, increased by at least 20% with each increasing 20 deer increment in density in the one feeder/20 deer contrast. Changes in forb biomass between treatments with one feeder/20 deer compared to treatments with only one feeder indicate that supplemental feeding may magnify deer selectivity and undesirable effects of increasing population density on plant communities. However, these comparisons also show there may be a density threshold in which supplemental feed would be advisable for sustaining large deer populations without degrading habitat quality.

SPATIAL AND TEMPORAL USE OF BIG BEND NATIONAL PARK BY HUMANS AND PUMA

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Abstract: Big Bend National Park (BIBE) provides the largest area of protection (801,163 acres) for puma (*Puma concolor*) in the state. Current annual visitation exceeds 300,000 visitors per year and BIBE has become a destination for uncrowded wilderness. Our goal was to understand human and puma spatial and temporal use of the park to aid with puma conservation and human safety issues. To this end we collared 4 puma (2 M, 2 F) in BIBE with satellite

linked GPS collars between January 2014 and October 2015. Puma point locations were categorized based on distance to human structures, and the distribution of points was compared to randomly generated points using the maximum likelihood Chi-square test for independence. Special attention was given to point locations at puma predation sites which were located using program Cluster. Additionally we deployed TrailMaster TM1550 active infrared trail monitors on 20 trails across the study area from November 2014 through October 2015 to monitor trail use by park visitors. We combined all trails and used season as the sampling unit to show the percent of groups that passed trailhead monitors during each diel period across high and low use periods and weekdays vs weekends. Understanding human and puma use of BIBE will enable the park to encourage safer practices as well as potentially foster the push towards cohabitation and increased outdoor recreation across the United States.

GENETIC STRUCTURE IS INCONSISTENT WITH SUBSPECIES DESIGNATIONS IN THE WESTERN MASSASAUGA (*SISTRURUS TERGEMINUS*)

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Abstract: The Massasauga (*Sistrurus catenatus*) was historically divided into three subspecies, but this long-standing taxonomy has been questioned. Genetic research now recognizes an Eastern Massasauga (*S. catenatus*) and Western Massasauga (*S. tergeminus*), with the latter split into two subspecies, the Desert Massasauga (*S. t. edwardsii*) and Prairie Massasauga (*S. t. tergeminus*). While the distinction between *S. catenatus* and *S. tergeminus* is well-supported genetically, the geographic relationships among populations of *S. t. tergeminus* and *S. t. edwardsii* remain unresolved due to incomplete sampling throughout the species range. This poses a challenge for conservation. *Sistrurus t. tergeminus* does not have state or federal conservation status, but *S. t. edwardsii* has been petitioned for listing under the US Endangered Species Act. In this study, we used nuclear and mitochondrial DNA from 52 individuals from seven states to explore taxonomic relationships between *S. t. tergeminus* and *S. t. edwardsii* populations. Maximum likelihood and Bayesian inference frameworks for nuclear and mtDNA genes indicated that *S. t. tergeminus* and *S. t. edwardsii* populations were genetically indistinguishable. However, at the species level, we found eight well-supported mtDNA clades within *S. tergeminus*, including five peripheral populations in 1) Arizona/New Mexico, 2) Colorado/Kansas, 3) Missouri, 4) Oklahoma, and 5) south Texas. These peripherally isolated populations surrounded a larger population from north-central Texas, New Mexico, and Oklahoma that was contiguous with three additional genetically distinct populations. We conclude that *S. t. tergeminus* and *S. t. edwardsii*, as currently defined, represent polytypic phenotypes of *S. tergeminus* rather than discrete taxonomic entities.

THE SOCIAL BLACK-CRESTED TITMOUSE: KIN-STRUCTURED NEIGHBORHOODS THROUGH FAMILIAL FLOCK FORMATION

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Abstract: The black-crested titmouse (*Baeolophus atricristatus*, hereafter BCTI) is a non-migratory passerine that is found in small flocks throughout the year. A recently elevated species, separated from its sister-taxon, the tufted titmouse (*B. bicolor*), the BCTI is an ideal model species for studying family-flocking dynamics. Between 2013 and 2015, 263 individual BCTI were captured and color-banded at the Freeman Center in San Marcos, Texas where family flocks were resighted and monitored. Using a generalized linear mixed effects model and Fisher's exact test, the factors weight ($P < 0.01$) and sex ($P < 0.01$) of juvenile BCTI appeared to influence which individuals in a brood delay their dispersal. The factor Julian date was found to be a significant predictor for annual flock size ($P < 0.001$), with territory size increasing an average 3.4 ha ($P < 0.01$) between the breeding and non-breeding season. Juvenile BCTI that delayed their dispersal often established territories adjacent to their parents the following year, creating kin-structured neighborhoods. Social interactions between these related individuals were almost always passive as opposed to aggressive ($P < 0.05$), potentially increasing the inclusive fitness for both individuals involved. Family flocking dynamics of the BCTI are more complicated than previously thought, and future research may yield insight into how this species evolved its current social structure. With the ever-growing threat of habitat fragmentation, the importance of the family unit to the survival of the BCTI may be key for management of this species.

RIO GRANDE WILD TURKEY BROOD HABITAT USE IN THE CROSS TIMBERS REGION OF TEXAS

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Abstract: Patterns of habitat selection have long been suggested to influence species demography at both local and broad scales. For Rio Grande wild turkey (*Meleagris gallopavo intermedia*) habitat availability and type has been known to influence reproductive success and hence local abundance in some portions of Texas. As recruitment is the primary driver of Rio Grande wild turkey population trends, poult survival during brood-rearing periods can greatly influence rangewide trends. Our goal was to evaluate if female Rio Grande wild turkeys actively select brood-rearing habitats. During 2014–2015, we radio-tagged 95 females with GPS backpacks and remotely download GPS data twice a week for brooding hens. We categorized the brood-rearing period as the first 15 days after the poults hatched when >1 poult was present with the female. We estimated 50 and 95% kernel ranges for brooding females and classified both fine and broad scale vegetation conditions within brood ranges relative to overall range vegetation conditions. Dominant plant species used were annual broomweed (*Amphiachyris dracunculoides*) followed by honey mesquite (*Prosopis glandulosa*), Texas wintergrass

(*Nassella leucotricha*) and annual sunflower (*Helianthus annuus*). We found little evidence for brood range selection by Rio Grande wild turkey females. Rather, Rio Grande wild turkeys primarily required patchy woody habitats interspersed within a grassland matrix.

AN EXAMINATION OF GENE FLOW AMONG DISTINCT MANAGEMENT UNITS OF THE REDDISH EGRET (*EGRETTA RUFESCENS*)

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Abstract: The Reddish Egret (*Egretta rufescens*) is one of the least studied herons in North America. I examined gene flow and genetic diversity among populations across the range of the species. We collected blood and feather samples from nestlings ($n = 145$) of three regions (Western, Central, and Eastern) and eight sample sites (Baja California, Chiapas, Yucatan, Tamaulipas, Texas, Louisiana, Florida and the Bahamas). We extracted DNA from collected samples and used ten microsatellite markers and the mitochondrial control region to estimate deviations from Hardy-Weinberg equilibrium, genetic differentiation, population structure, and gene flow. In all analyses, I detected more differentiations among groups and regions ($F_{st} = 0.21$) than among populations within groups ($F_{st} = 0.09$). Our results revealed three primary breeding concentration centers, one in each of the management units (Baja California in the Western region, Chiapas for the Central region, and Bahamas for the Eastern region) providing further support for the previously established management units. We found greater differentiation among populations in our mtDNA analysis suggesting less movement across populations and management units and greater philopatry by females than by males. Recent banding and telemetry data also support differences in movement patterns between males and females. Lastly, gene flow between the Baja California population and the other populations is weak; whereas, we detected weak to moderate gene flow between sampling sites in Central and Eastern management units.

THE NORTHEAST TEXAS CONSERVATION DELIVERY NETWORK: PARTNERSHIPS GROWING GRASS ROOT PROJECTS INTO LANDSCAPE SCALE CONSERVATION

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Abstract: Understanding that building partnerships enhances opportunity for large scale conservation, Texas Parks and Wildlife took the lead role and together with eight State, Federal and non-governmental organizations formed the Northeast Texas Conservation Delivery Network (NETX CDN). This conservation effort serves a 27 county area and functions as a forum for on the ground delivery professionals to exchange ideas, inform others of current projects and priorities, and to find opportunities to work together. The partnership promotes

coordination of conservation work allowing agencies to pool their resources thereby greatly increasing potential outcomes. With multiple agencies working together, the ability to find and secure funding greatly increases as well as our capacity to deliver landscape scale conservation projects. The NETX CDN product driven approach is based on the best science available and working groups formed by the membership have created a prioritization tool which has allowed the NETX CDN to prioritize its conservation actions. As a result of the NETX CDN partnerships, two on-the-ground projects are currently in the works, and several others are soon to follow.

DISTRIBUTION AND HABITAT SELECTION BY LARGE CARNIVORES IN BIG BEND NATIONAL PARK, TEXAS

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Abstract: Big Bend National Park is home to two species of large carnivores, the mountain lion (*Puma concolor*) and the American black bear (*Ursus americanus*). Once extirpated, black bears naturally recolonized the park beginning in the 1970's and today are quite common in the Chisos Mountains. Mountain lions have long been part of the park ecosystem, escaping extirpation from overhunting and predator control efforts that had previously impacted the bears. While both species have been studied in the park, there is little understanding of how the two species interact and partition habitat. To better understand their interactions, we examined habitat selection and overlap between the two species using remote cameras. We placed a single Bushnell Trophy Cam at 58 different sites, within a system of grids, covering 450-km² of the Chisos Mountains and foothills. Camera sites were chosen specifically for their likelihood of capturing animal movement, in areas such as washes, canyons, mountain passes, or saddles along a ridgeline. We collected a total of 515,698 pictures, from a total of 14,452 trap days. Lions were captured at 35 locations and bears at 40 locations, overlapping at 28 sites. Using a Chi-square with Bonferroni confidence intervals we analyzed four habitat categories: 1) elevation, 2) fine scale terrain ruggedness, 3) broad scale terrain ruggedness, and 4) vegetation type. We found that bears had a significant preference within all habitat categories while lions only showed significant selection for elevation and vegetation type.

HABITAT PARTITIONING BY SYMPATRIC DEER SPECIES IN BIG BEND NATIONAL PARK, TEXAS

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Abstract: Big Bend National Park is home to both Carmen Mountain white-tailed deer (*Odocoileus virginianus carminis*) and mule deer (*Odocoileus hemionus*). Within the park the deer appear to occupy different elevations and habitat types, but there is potential for overlap and competition. We used remote cameras to investigate habitat selection and distribution of the two species, as camera traps are able to continuously survey multiple species at the same time. A single Bushnell Trophy Cam™ was placed at 58 different locations within a 450-km² grid system, covering the Chisos Mountains and surrounding foothills. Cameras were placed strategically in areas likely to capture animal movement. We collected a total of 515,698 images over 14,452 trap days. White-tailed deer were captured 1,174 times, at a total of 30 locations and mule deer were captured 89 times, at a total of 23 locations. The two species overlapped at 10 locations. Habitat selection was analyzed using a Chi-square with Bonferroni confidence intervals, for four different categories: 1) elevation, 2) fine scale terrain ruggedness, 3) broad scale terrain ruggedness, and 4) vegetation type. We found that there were differences in habitat selection by the two species across all four categories, with some strong partitioning. White-tailed deer avoided low elevation, low terrain ruggedness on a broad scale, while mule deer avoided high elevation and high terrain ruggedness on a broad scale. White-tailed deer and mule deer also selected for different vegetation types within the park, often avoiding types preferred by the other species.

MESOMAMMAL PREDATOR ABUNDANCE TO DETERMINE PRIMARY NORTHERN BOBWHITE NEST PREDATORS

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Abstract: The Matador Wildlife Management Area (WMA), in Paducah, Texas has a stable northern bobwhite (*Colinus virginianus*) population. However, there has been a gradual decline in quail numbers across the state. We examined the mesopredator release hypothesis, which suggests that predation of ground nests might increase in areas with reduced coyote densities because of increases in mesopredator populations. The objective of our study was to determine mesopredator occurrence across the WMA compared to nest predators at artificial bobwhite nests. We used 12 cameras on scent and water locations and on 30 artificial nests, in an effort to identify primary nest predators. The 12 cameras at scent and water locations ran continuously for 1–2 months. We constructed 30 artificial bobwhite nests in different vegetation types that represented bobwhite nesting habitat. We monitored the nests for two weeks. Of 120,964 photos

from the scent and water stations, some recurring mammals were raccoons (*Procyon lotor*), bobcats (*Lynx rufus*), and coyote (*Canis latrans*). Wild hog (*Sus scrofa*), was also common across the WMA. Four nests were predated, two by coyote, one by striped skunk (*Mephitis mephitis*), and the last was unidentifiable. We obtained fewer nest depredations than expected, eliminating our ability to compare nest predators against the predator assemblage, but coyotes were our primary nest predator. The nest predators identified were not uncommon; given multiple studies show these same species being nest predators. Overall occurrence of mammals across the WMA stayed consistent.

LANDSCAPE EFFECTS ON GENEFLOW OF PORCUPINES ALONG TWO TEXAS PANHANDLE RIVER DRAINAGES

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Abstract: North American porcupines (*Erethizon dorsatum*) in the Great Plains region of North America are relatively unstudied. Information specific to this geographic area will aid in management and to the overall understanding of the porcupine in Texas. The objective of this study is to determine how landscape influences genetic subdivision and gene flow of porcupines along the Canadian River and Red River drainages in the Texas panhandle. Male versus female movements along these drainages is a point of interest within this study. The identification of spatial genetic patterns requires the collection of genetic data from many individuals whose exact geographical location is known. At present, 86 individual (1 male and 85 female) tissue samples (quill, muscle, and/or fecal material) have been collected from both live-trapped animals and vehicular mortalities. Genomic DNA was extracted using a variety of molecular techniques (DNeasy[®] Blood & Tissue Kit: Spin-Column Protocol) and PCR amplified with 19 microsatellite loci. We utilized individual-based analyses to estimate population structure and gene flow within each river drainage and to determine the degree to which porcupines inhabiting the two drainages are genetically isolated.

SURVEYING WETLAND VEGETATION WITH AN UNMANNED AERIAL SYSTEM ON RICHLAND CREEK WILDLIFE MANAGEMENT AREA

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Abstract: In order to meet growing water supply demands, Texas Parks and Wildlife (TPWD) and Tarrant Regional Water District (TRWD) collaborated to design and construct a wetland facility that cleans Trinity River water to provide a dependable source for TWRD's approximately 1.8 million customers. The approximately 900 ha George W. Shannon Wetland Water Re-use Project is located on the 5,762 ha Richland Creek Wildlife Management Area near Palestine, Texas. The project is a model for meeting future water supply demands in Texas as it contributes supplementary water without the adverse environmental impacts of reservoir construction. The wetland system incorporates five sediment basins and 20 inundated individual wetland cells. As effluent-rich water from the Trinity River flows through the wetland system, clay substrate and vegetation absorb phosphorus, nitrogen, and other nutrients, which improving water quality. In addition to water supply, the wetlands provide high quality wildlife habitat for a variety of amphibians, invertebrates, mammals and migratory birds. Annual aerial vegetation coverage estimates are necessary to adequately monitor the cell-to-cell spatial diversity of vegetation, which fluctuate by abundance, age, and species. Mapping vegetation is essential to evaluate the biodiversity, overall health, and success of the constructed wetland system. The Meadows Center for Water and the Environment used an unmanned aerial system to annually collect high-resolution imagery (18 cm) of the wetland cells. Ground truth data, representing species composition, were collected using Trimble Geo XH units to ensure accurate geo-location. Imagery was processed with Agisoft's Photoscan and ERDAS Imagine. Using ground truth data, estimated vegetation cover was classified with eCognition Developer. Ultimately, the classification products will be applied to detect annual change of vegetation and establish vegetation response to different management practices

POPULATION STUDY OF THE DUNES SAGEBRUSH LIZARD (*SCELOPORUS ARENICOLUS*) IN WEST TEXAS

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Abstract: The dunes sagebrush lizard (*Sceloporus arenicolus*) is a habitat specialist, endemic to west Texas and southeast New Mexico. With heavy oil and gas development occurring throughout its range, habitat fragmentation is an ongoing concern for the persistence of this species. We developed a mark-recapture study examining the demographics and movements of the dunes sagebrush lizard that was implemented in Andrews County, Texas. Two "super-grids" of pitfall traps were installed: one in undisturbed habitat, the other in disturbed habitat. The dunes sagebrush lizard was the third most common lizard species captured, with approximately 1,539 individuals captured. We modeled both apparent survival and detection probability as a

function of time, grid, sex, and life stage, using Cormack-Jolly-Seber (CJS) models in Program MARK. Top models show support for apparent survival modeled as an additive function of sex and time, and detection probability modeled as an additive function of life stage, grid, and time. The apparent survival results are interesting as previous work in New Mexico has shown that disturbance has a negative effect on dunes sagebrush lizard population sizes. However, the relatively low (for the area) amount of disturbance surrounding the grids appears to 1) not have been enough to have an effect on survival, 2) had an effect when the disturbances first happened with the population subsequently returning to survival rates on par with the non-disturbed area, or 3) have an effect on populations not reflected in their survival rates.

USING MICROSATELLITE COMPOSITE GENOTYPES TO IDENTIFY HYBRIDIZATION IN DEER (GENUS *ODOCOILEUS*) IN THE TEXAS HIGH PLAINS

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Abstract: White-tailed deer (*Odocoileus virginianus*) have expanded their distribution in the High Plains of Texas as agriculture and urbanization have dramatically altered the original habitat. This has increased contact with the native mule deer (*O. hemionus*) raising concerns about introgression into the mule deer population. Mule and white-tailed deer samples were collected from harvested and road-killed animals in the High Plains and from putatively non-introgressed populations of the two species in central Texas and in New Mexico. A suite of informative microsatellite markers were PCR amplified and score on a Beckman-Coulter Ceq8000 DNA Analyzer. Detrended correspondence analysis of the data found little evidence of hybridization, even among individuals identified by hunters as 'hybrid'.

EVALUATION OF AERIAL SURVEY-RELATED POPULATION ESTIMATION TECHNIQUES FOR PRONGHORN ANTELOPE IN TEXAS

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Abstract: Aerial surveys are an efficient way to track population trends of large mammals, but are inaccurate due to external factors that diminish animal detectability. Survey results can be corrected by determining detectability of animals in different environments and adjusting estimates accordingly. We estimated pronghorn (*Antilocapra americana*) abundance in the Texas Panhandle and Trans-Pecos using distance sampling. Pronghorn were captured and fitted with GPS collars at two sites in the Panhandle (Dalhart, Pampa) during March 2014 and Trans-Pecos (Alpine, Marathon) during February 2015. We surveyed collared pronghorn during June 2014 and 2015 at respective locations and recorded *a priori* covariates identified as potential factors of pronghorn sighting probability, including activity, group size, habitat type, cover, terrain, and distance from the survey line. We used Program DISTANCE to estimate population sizes and detection probabilities for both the Panhandle and Trans-Pecos overall and the 2 sites

within each ecoregion. We found that the Panhandle and Trans-Pecos had similar detection probabilities (Panhandle = 0.555, Trans-Pecos = 0.575), and that basic models that pooled observations across sites within ecoregions provided best results. Pronghorn abundance estimates were realistic for the Panhandle (Dalhart N = 1,079, Pampa N = 1,451), but estimated population size was greater than expected in the Trans-Pecos (Alpine N = 1,668, Marathon N = 2,122). We also estimated population size for the Panhandle using a mark-resight approach, resulting in more conservative yet still realistic estimates (Dalhart N = 896.1, Pampa N = 915.9). We plan to perform similar mark-resight analyses for the Trans-Pecos.

WATERFOWL HUNTER DUCK IDENTIFICATION SKILLS ON THE UPPER TEXAS COAST

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Abstract: The Texas coast attracts hunters with a variety of skill, experience, and familiarity with local waterfowl. Regionally, mottled ducks (*Anas fulvigula*) are of conservation and management concern. For example, 2014–2015 regulations allowed a single “dusky duck” (i.e., mottled duck, Mexican-like duck, black duck and their hybrids) in a daily bag, but only after the first five days of the regular season. During the 2012–2013 hunting season we administered a post-hunt, voluntary survey at check stations in Anahuac and McFaddin National Wildlife Refuges, on the upper Texas coast. Successful hunters were asked to identify bagged birds to common name and sex; both successful and unsuccessful hunters were asked to participate in a photographed-based identification quiz. There were 442 successful hunters (89% of total participants), whom correctly identified 89% of their harvested birds to common name. Gadwalls (*A. strepera*) were most frequently incorrectly identified (29% of all incorrect identifications), whereas 10% of all incorrect species identifications were of mottled ducks. However, this is tempered, as of >500 gadwalls harvested, only 8% were misidentified. Conversely, 25% (13/51) of harvested mottled ducks were misidentified as either female mallards (*A. platyrhynchos*) or American black ducks (*A. rubripes*; of which no individuals were ever observed at check stations). Photo-quiz identification success for successful and unsuccessful hunters dropped to ~70%, and 50% respectively; mirroring identification success of gadwall and mottled ducks for both hunter groups. These preliminary results indicate hunter duck identification skills are good for birds in-hand, but may be related to familiarity with commonly harvested species.

EVALUATION OF A MULTI-TEMPORAL APPROACH FOR MODELING NORTHERN BOBWHITE HABITAT

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Abstract: Northern bobwhite (*Colinus virginianus*) populations have declined more than 80% across the United States, primarily due to habitat loss. While bobwhite habitat loss has occurred on multiple scales, most solutions have been focused on fine scale management. As bobwhite management focus moves from a local to a regional scale, there is an increased need for regional data on habitat quality and bobwhite populations as well as data that can be used across multiple scales. We classified LANDSAT OLI scenes from three different seasons into 80 classes, ranking each class as northern bobwhite habitat on a scale from 0 to 1. We combined these classes into a single raster to build a preliminary habitat model in Clay County, Texas. We then evaluated the model by conducting breeding season call counts at 545 locations in 2014 and 825 locations in 2015, creating a bobwhite density probability map of the county. This map is being used to build and refine a larger-scale regional habitat model. The regional habitat model will be tested using 2016 breeding season call count data from Montague County, Texas.

CHRONOBIOLOGY OF SYMPATRIC OCELOT AND BOBCAT IN SOUTH TEXAS

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Abstract: The composition of an ecological guild depends on individual species separating into niches based on habitat, diet, and activity patterns. Ocelot (*Leopardus pardalis*) and bobcat (*Lynx rufus*) are sympatric in their distribution in the Rio Grande Valley of southern Texas. Studies on activity patterns have not been undertaken on either felid in this location. From 2011–2015, remote cameras were placed on the East Foundation’s El Sauz Ranch. Photographs from these cameras indicate date and time of capture, and they are sorted by identifying individuals using unique spot and coat patterns. Our objective is to describe the effect of environmental cues on activity patterns of the two felids. Additionally, we will determine overlap of activity between species and the activity of ocelot and bobcat in relation to time of day, lunar phase, and percent moon illumination. This information can be used to understand how these two species temporally compete for resources through time.

ADAPTIVE GENETIC VARIATION IN THE NORTHERN BOBWHITE

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Abstract: The northern bobwhite (*Colinus virginianus*) has undergone a precipitous decline during the last 40 years. Bobwhite conservation would be enhanced with a better understanding of how genetic variation is partitioned across its range. Previous research based on neutral genetic markers found little congruence among subspecies and shallow population structure overall. The wide geographic range of the northern bobwhite and extensive plumage variation among subspecies suggests the possibility of regional variation in adaptive traits. We used a newly developed method, double-digest restriction site-associated DNA sequencing to assess genetic variation within the bobwhite nuclear genome. We analyzed genomic DNA from masked bobwhites and hunter-harvested bobwhites from the Midwestern United States (U.S.), and North, East, and South Texas. We obtained 298,104 loci, of which 3,988 were variable. Masked bobwhites exhibited the lower levels of heterozygosity and nucleotide diversity in comparison with U.S. populations. Pairwise F_{ST} values and Bayesian clustering analysis suggested that most of the observed genetic structure was due to differences between masked bobwhites and U.S. populations. An F_{ST} outlier test revealed the possibility that 15 loci may be under the influence of balancing selection and 206 loci under the influence of positive selection. Our results show that bobwhite populations possess high levels of genetic diversity, which is consistent with previous research based on mtDNA and microsatellites. However, our results revealed strong genetic differentiation between Sonoran bobwhites and those in the United States and suggested that some of this differentiation is due to natural selection.

DENSITY AND SUPPLEMENTAL FEEDER EFFECTS ON WHITE-TAILED DEER POPULATIONS IN SOUTHWEST TEXAS

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Abstract: Managers in Texas use supplemental feed to increase body mass and population growth rates of white-tailed deer (*Odocoileus virginianus*). Our objectives are to determine effects of deer density and deer: feeder ratios on population growth rates (λ -apparent), fawn growth rates, and yearling mass. We will test the predictions that λ -apparent, fawn growth rates, and yearling mass will decrease as deer density increases with a single feeder, but will not decrease when the deer: feeder ratio is held constant. The study was conducted on 2 ranches in southwest Texas. Each ranch included 5, 81-ha enclosures with target deer populations of 20, 40 or 60 and 1 feeder, 60 deer and 3 feeders, and 80 deer and 4 feeders. Camera surveys were conducted biannually to monitor deer populations, followed by captures to add or harvest deer as needed. After one year of implementing density treatments, the effect from the single feeder treatment was not significant on λ -apparent, but a previous researcher had suggested a downward trend ($P = 0.14$). When a constant ratio of 20 deer: feeder was maintained with increased densities, λ -apparent did not decrease ($P = 0.78$). No significant effects due to treatment were detected for fawn growth rates ($P = 0.25$) or for male yearling body mass ($P = 0.40$). A second year of data will be presented to investigate treatment effects over an extended temporal scale. These results will help managers balance deer population size with supplemental feed programs to maximize deer growth rates and body mass in a semi-arid environment.

DROUGHT AND DENSITY EFFECTS ON PALATABLE FORB SPECIES FOR WHITE-TAILED DEER

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Abstract: Forbs offer high quality nutrition in white-tailed deer (*Odocoileus virginianus*) diets when they are available, but forb abundance is strongly influenced by environmental resource pulses in semi-arid environments. We hypothesized that variation in precipitation and temperature has a greater effect on presence or absence of 2 palatable perennial forb species than deer population density. The study was conducted on 2 ranches in southwest Texas. Each ranch included 6, 81-ha enclosures with target deer populations of 0, 20, 40 or 60 and 1 feeder,

60 deer and 3 feeders, and 80 deer and 4 feeders. We permanently marked 20 individuals of the perennial forbs low menodora (*Menodora heterophylla*) and blackfoot daisy (*Melampodium cinereum*) in each enclosure. During 2014–2015, we recorded presence or absence of marked plants, and recorded whether they appeared senesced or browsed. We then compared the effects of monthly average precipitation, temperature, deer density, and deer: feeder ratios on the average percent of low menodora and blackfoot daisy that were present, senesced, and browsed. Preliminary results show that the presence of low menodora was unrelated to deer density, but presence varied over time ($P < 0.001$). In contrast, fewer blackfoot daisy individuals were present at higher deer densities ($P = 0.031$), and presence also varied substantially with time ($P < 0.001$). Managers making decisions about effects of deer density on habitat should take into account that individual forb species vary in the importance of environment verses deer population density in influencing their abundance.

EVALUATING PERFORMANCE OF AN AVIAN RADAR SYSTEM IN ESTIMATING TARGET SIZE METRICS

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Abstract: Ornithologists utilize radar technology to describe bird migration characteristics, however, radar performance remains relatively unknown. Assessing an avian radar unit's performance is essential given that the results of radar studies provide managers with an estimate of impacts that development will have on migratory bird populations. Our objective was to assess the performance of an avian radar system in monitoring bird movements. We released representatives of five species of birds ($n = 204$) through the radar coverage while the radar recorded 60 parameters for each target; however, only 15 parameters help estimate target size. Prior to release, we measured mass and a series of body dimensions to calculate body volume and a surface area index. We used a trigonometric model, based on the 2-dimensional surface area of targets rotated about the y-axis, to model a bird's maximum cross section exposed as a function of orientation to the radar. We tested equality of models ($P = 0.072$) and equality of regression planes ($P = 0.042$) to determine application of a pooled model. The effect of distance from the radar on size-estimating parameters was determined when target bearing and orientation were constant. These parameters were adjusted for distance and orientation with a piecewise function and then analyzed through a stepwise linear regression to find which radar parameters best explained variation in bird size. Though radar technology remains an efficient technique for conducting bird migration research, the assessment of performance of radar units allows for a better understanding of the factors influencing target signatures and more resolution in avian radar information.

BROWSE SPECIES RESPONSES TO WHITE-TAILED DEER DENSITIES IN SOUTH TEXAS

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Abstract: Research on African shrub communities similar to those in South Texas suggests heavy browsing stimulates regrowth with higher nutritional quality than un-browsed plants. Conversely, shrubs may allocate resources to defenses such as thorns, branching, or secondary compounds in response to herbivory. Based on the optimization hypothesis, the objective was to test the prediction that there may be an optimum white-tailed deer (*Odocoileus virginianus*) density at which regrowth and nutritional quality of blackbrush acacia (*Acacia rigidula*), twisted acacia (*Acacia schaffneri*), and spiny hackberry (*Celtis pallida*) can be maintained through browsing. Starting July 2014, shoots and thorns were measured annually on marked stems for each shrub species in 81-ha enclosures containing 0, 25, 50, and 75 deer per km² on each of 2 ranches. Each July and October, leaf and twig samples were removed from a different set of plants of each shrub species for nutritional quality analysis. Measurements and samples were taken within the white-tailed deer's browsing zone (50–100 cm from the ground) in each cardinal direction on the plants. Preliminary results indicated that the number of non-lignified stems increased with increasing deer density, peaked at 50 deer per km², and then declined from 50 to 75 deer per km². Traditionally, managers try to achieve deer densities that are low enough to avoid causing undesirable changes in the plant community. A more efficient approach may be to manage for deer densities that optimize browse quality and quantity.

POSTER ABSTRACTS – IN NUMERICAL ORDER

(Number at beginning of title is number on poster board)

(At end of title: *Judged undergraduate poster; **Judged graduate poster)

1. USE OF WATER AND LAMBING BEHAVIOR BY AOUDAD AND DESERT BIGHORN SHEEP IN THE SIERRA VIEJA, TEXAS*

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Abstract: Exotic species can cause problems to native species. An example of such is the aoudad (*Ammotragus lervia*), where they can compete for food, space, water, and are a potential source of disease transmission to desert bighorn sheep (DBS) (*Ovis canadensis*). The use of trail cameras has recently become popular for studying wildlife. By using this technique we have evaluated the usage of water sites between aoudad and DBS and compared their seasonal, daily, and lambing activity in Sierra Vieja, Texas. We installed cameras at water troughs ($n = 9$) with a 2-photo burst and 5 minute delay. A total of 4,887 pictures of aoudad and DBS were collected over 1 year. Pictures were sorted and analyzed in program Data Organize and Data Analyze from smallcats.org. Results showed that aoudad and DBS seasonal use of water peaked in June. As for diurnal utilization, aoudad peaked twice at 08:00 hrs and 18:00 hrs, while DBS peaked once at 13:00 hrs. Lamb activity peaked in June for both species. Results suggest that aoudad, DBS, and their lambs coincide in seasonal water usage in the dry season (June) when temperatures were highest and water was most limiting. DBS diurnal activity showed a tendency to avoid contact with aoudad. Although aoudad were seen at every water trough, DBS only utilized 5 of 9 sites and had no activity where aoudad usage was highest.

2. A COMPARISON OF RODENT TRAP PREFERENCES IN SOUTH TEXAS*

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Abstract: In the field of wildlife research, it has been suggested that rodent trapping success is improved by using previously used traps (where rodent scent may remain). The purpose of this project was to determine if rodents demonstrate a preference regarding previous trap use. To this end, 80 traps were set along two transects for a total of four trapping nights on the Texas A&M University-Kingsville campus. On both transects, new and used traps were alternately placed. Traps were set and baited with oats each evening. In the mornings, the traps were checked. Data regarding each rodent trapped was recorded. In total, 152 rodents were captured over 4,480 trapping hours. Seventy-nine rodents were captured in new traps, and 73 were captured in used traps. Chi Square analysis was used with a null hypothesis that previous trap use has no effect on trap success. Unfortunately, species richness (4) was relatively low with a population estimate of 1,614 (Schnabel mark-recapture analysis). Therefore, implications can only be directed to the primary species captured: Hispid Cotton Rat (*Sigmodon hispidus*). Chi Square analysis demonstrated that the null hypothesis could not be rejected ($X^2 = 0.0822$, $P < 0.05$); thus, I conclude that previous trap use has no impact on Hispid Cotton Rat trapping success. Therefore, researchers can use new and used traps interchangeably without concern as to how it will affect trapping success.

3. DO SMALL MAMMALS CAUSE SPOT FIRES DURING PRESCRIBED BURNS? FACT OR URBAN LEGEND?*

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Abstract: A commonly-held belief among land managers is that rabbits and rodents may become trapped during a prescribed burn, and in an attempt to escape, run through the fire to an adjacent property, thus igniting the adjacent property. Our objective was to determine if such a scenario is plausible. We developed 10 pairs of 3 x 3 m plots with each pair of plots separated by 2.5 m of tilled soil. Each plot contained >125 g/m² herbaceous biomass (6,057 lbs/acre), which was sprayed with Round-up[®] once per week for a month to achieve 100% kill. Carcasses from cottontail rabbits (*Sylvilagus virginianus*) and cotton rats (*Sigmodon hispidus*) were obtained and used to simulate live animals. The plots were ignited with a drip torch and the carcasses were pulled through the fire into a mound of dried grass. Neither species appeared capable to ignite a spot fire; therefore, the concept of small mammals lighting fires by running through flames is highly unlikely.

4. IS SHORT-DISTANCE TRANSLOCATION A VIABLE MANAGEMENT OPTION FOR MARITIME POCKET GOPHERS?*

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Abstract: The Maritime pocket gopher (*Geomys personatus maritimus*) is a fossorial rodent endemic to the upper South Texas coastal region of Nueces and Kleberg counties. Maritime pocket gophers were listed as a threatened species and as a Species of Concern; it has been suggested that they could be listed as a separate species due to their unique morphology and genetics. Gophers can be a nuisance due to their fossorial habits in lawns and gulf courses; however, if their legal status changes back to threatened, management options to remedy their damage would become limited. Relocation is a potential option; however, such a management option for Maritime pocket gophers is untested. We trapped 14 Maritime pocket gophers in the Flour Bluff area of Corpus Christi, Texas, and subcutaneously implanted each with a 5 g radio transmitter. Ten gophers were relocated 3–5 km from their site of capture and 4 gophers were released at their capture site and served as control animals. All gophers were tracked 3

times/week during a 5 month period. Relocated Maritime pocket gophers did not return to their capture site. Overall, gophers did not move directionally toward their original capture site. Therefore, relocation of Maritime pocket gophers can be a viable management option for this potential nuisance species.

5. GRAIN STORAGE AND AFLATOXIN TESTING: PROBLEMS FACED BY QUAIL MANAGERS FROM SOUTHERN TEXAS*

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Abstract: Populations of Northern Bobwhites (*Colinus virginianus*) have steadily declined in the United States, prompting wildlife managers to provide supplemental feed. Grain can contain aflatoxin, which is a harmful fungal metabolite of *Aspergillus flavus* and *Aspergillus parasiticus*. Our objectives were to compare immunoassays for the detection of aflatoxin that can be performed by a rancher easily and inexpensively and to assess common grain storage methods of wildlife corn that can shed light on how to reduce aflatoxin production. We used lower division college-aged students with no laboratory training to test the precision, accuracy, and ease of use of commercially available quantitative aflatoxin tests. Differences occurred among the products concerning the ease of use, but accuracy and precision were similar among the commercially available tests. Training is required to properly quantify aflatoxin concentrations in grain. Also, all quantification tests require specialized equipment; thus, tests are fairly expensive to conduct (i.e., 1,000's US dollars). An average of 5 quantitative tests should be conducted per sample due to high variability of aflatoxin concentration of single tests. Qualitative and quantitative tests that use small grain samples (<10 g samples) potentially mask the aflatoxin concentration of grain. Also, we placed wildlife corn in open air, barn, and pavilion environments, and in metal aluminum, and plastic containers, which mimicked feeder-type structures. We determined weekly aflatoxin levels and grain moisture content. In addition, we monitored weather parameters (daily temperature, relative humidity, and dew point) inside and outside of each storage structure. Grain moisture and aflatoxin concentrations fluctuated weekly within each type of storage container and ranged from 10.4–97.5% and 0–1,200 ppb, respectively. Each storage type contained corn samples that exceeded recommended aflatoxin levels deemed safe for wildlife within 2 weeks. After 8 weeks of storage, aflatoxin concentrations began to increase significantly in each storage method. Condensation build-up within metal storage containers increased mold growth on corn, which subsequently resulted in greater aflatoxin concentrations of corn along the sides of such containers compared to corn sampled within the center of the same container. Obtaining a low aflatoxin concentration does not necessarily mean low concentrations will occur thereafter, and vice versa. A high concentration of aflatoxin could be followed by a low concentration of another sample within

the same bag of grain because aflatoxin is rarely, if ever, evenly distributed throughout grain. We recommend storing grain <2 months and to thoroughly clean and dry wildlife feeders often.

6. DO MOTH BALLS REALLY REPEL WILDLIFE?*

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Abstract: Moth balls are considered an age-old remedy to repel a variety of wildlife species. Moth balls contain naphthalene as the active ingredient, which is considered an irritant of respiratory tracts. We tested the efficacy of moth balls as a repellent of wildlife, and specifically of rodents. We sealed 5 moth balls into 4 x 4 cm wire screen baskets and placed 1 basket into 40 Sherman live traps. We set a line of 80 randomly-assigned traps within grassland-mesquite (*Prosopis glandulosa*) habitat along fence lines for 2 weeks. Traps either contained moth balls or were cleaned with detergent; trap assignment remained constant throughout the experiment, but random order of traps and location changed each night. In addition, Reconyx cameras were placed to record wildlife species that approached traps. Moth balls did not repel ($F_{1,22} = 1.3$, $P = 2.6$) cotton rats (*Sigmodon hispidus*) or house mice (*Mus musculus*). Numerically fewer cotton rats and house mice visited traps that contained moth balls (4.7 ± 1.4 and 0.8 ± 0.6 , respectively) than clean traps (7.5 ± 2.0 and 2.1 ± 0.9 , respectively); however, repellency was not achieved. In addition, moth balls appeared to attract white-tailed deer ($n = 10$; *Odocoileus virginianus*), cotton-tailed rabbits ($n = 6$; *Sylvilagus floridanus*), armadillos ($n = 5$; *Dasypus novemcinctus*), skunks ($n = 5$; *Mephitis mephitis*), coyotes ($n = 8$; *Canis latrans*), and gray foxes ($n = 4$; *Urocyon cinerargenteus*). Therefore, the belief that moth balls can be used as area repellents to keep wildlife away is a myth.

7. EFFICACY OF ONLINE VIDEOS AS A PUBLIC EDUCATION TOOL FOR WILD PIG MANAGEMENT*

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Abstract: Landowners interested in wild pig (*Sus scrofa*) management desire access to on-demand educational resources that explain the various legal management techniques available. The Wildlife and Fisheries Extension Unit uses online videos to share wild pig management techniques with the public via YouTube and AgSmart TV. The recently released five part Wild

Pig Management Video Series has had 5,395 views since its launch in August 2015. In an attempt to gauge the impact that these videos have on viewers, a short post-video survey was created for each video. Participants were asked if their overall knowledge on the video subject increased (yes or no) and to rate their knowledge of subjects presented on a 1 to 5 scale based on what they knew before and after watching the video. Participants were also asked what the likelihood was of them recommending AgriLife to their friends and family. Results of the surveys ($n = 133$) showed that 96.99% reported an increase in overall knowledge. On average, participants reported an increase in knowledge related to the various management techniques from 2.55 to 4.18 on a 5 point scale, a 64.09% increase. The likelihood that video survey participants would recommend AgriLife to friends and family was an average of 9.52 on a 1–10 scale. The results of these surveys indicate that online videos are a viable public education tool for wild pig management.

8. EFFECT OF OIL SPILLS ON POPULATIONS OF THE LOGGERHEAD SEA TURTLE*

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Abstract: Sea turtle populations around the world have seen drastic declines in recent years. As commercial and private development along the coasts increase and interactions with humans continue to rise, sea turtles face intensifying threats to their survival. The loggerhead sea turtle (*Caretta caretta*), native to the southeastern United States, is one such species whose decline has been correlated with anthropogenic activity. Listed as federally endangered in 1978, its populations continue to decline despite major conservation efforts centered on egg and hatchling survival. Human-related threats such as incidental bycatch and pollution are among the greatest sources of mortality in juvenile and adult loggerhead sea turtles. Hence, conservation efforts have been executed in many countries since 1992. However, recent oil disasters, such as the Deepwater Horizon oil spill, raise concerns about the impact of gas and oil-related activities. The objective of our research is to determine how the event of oil spills affects the population dynamics of loggerhead sea turtles. We conducted a thorough literature review to obtain the best basic demographic data available and developed a stage-structured population dynamics model for loggerhead sea turtles using STELLA[®]7.0.1. We then used the model to test the potential effects of oil spills on the population of loggerhead sea turtles. Our results showed that the event of oil spills could negatively affect the conservation efforts of loggerhead sea turtles. Long term monitoring program for the effects of oil spills on loggerhead sea turtles is urgently needed.

9. EFFECTS OF GILLNET ENTANGLEMENT ON MORTALITY OF DUSKY DOLPHINS*

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Abstract: Wildlife populations are negatively impacted in a variety of ways. Humans, in particular, have played a huge part in species declines today as well as species extinctions in the past due to overexploitation. Recent declines of large marine vertebrates that are of little or no commercial value, such as sea turtles, seabirds, and marine mammals, have focused attention on the ecological impacts of incidental take, or bycatch, in global fisheries. The dusky dolphin (*Lagenorhynchus obscurus*) is a marine mammal that inhabits coastal waters of the Southern Hemisphere which commonly is caught in gillnets. However, the effect of gillnet-related mortality on the population dynamics of this species is unknown. I will conduct a thorough literature review to obtain the best information available related to gillnet entanglement of the Argentina subspecies of dusky dolphins, *Lagenorhynchus obscurus fitzroyi*, as well as the basic demographic data necessary to develop a stochastic population dynamics model. I then will use the model to estimate the potential effect of gillnet-related mortality on the population dynamics of this subspecies of dusky dolphins in view of the parametric uncertainty associated with the model. The predicted preliminary results indicate the decline of the *L. o. fitzroyi* population size due to the negative effects of gill-net entanglement.

10. INFLUENCE OF DISTANCE FROM WATER AND CATTLE GRAZING ON PLANT SPECIES RICHNESS*

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Abstract: Research suggests that grazing pressure decreases with increasing distance from water. Thus, water lots and their influence on the spatial distribution of grazing on rangelands

may be an important factor influencing plant diversity on a landscape. The objective of this study were to 1) determine if a trend existed between plant-species richness and cattle grazing relative to distance from water, and 2) compare how this relationship differed between grazed and ungrazed systems. We collected information on plant-species richness from 2 areas: (1) an ungrazed area that had been deferred for 2 years (7,684 ha) and (2) a continuously grazed area (4,366 ha; 12–24 ha per animal unit) on the San Antonio Viejo Ranch, Jim Hogg County, Texas. We surveyed 20-m transects on the ungrazed ($n = 144$ transects) and grazed ($n = 45$ transects) areas during October–November 2015. We identified and counted all species (forbs, grasses, and sub-shrubs) rooted within 5, 20×50 cm Daubenmire frames placed at 5 m intervals along the transect. We used a spatial join in ArcMap to calculate the distance from transects to the nearest water lot. We plotted plant-species richness as a function of distance from water lots and developed diversity-gradient maps based on this relationship for each area (i.e., grazed and deferred). The results from this study will provide information on the spatial effects of localized and landscape grazing on plant species diversity.

11. TESTING A HABITAT APPRAISAL GUIDE FOR RIO GRANDE TURKEYS*

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Abstract: Rangelands often contain areas where limiting factors affect populations. In the South Texas Plains, roosting cover is often considered a limiting factor for wild turkeys (*Meleagris gallopavo*). We will be testing a habitat appraisal guide for Rio Grande Wild Turkeys (RGWT, *M. g. intermedia*) on a ranch located approximately 19 km south of Hebbronville, Texas in Jim Hogg County. The study site is located in the South Texas Plains ecoregion. The appraisal guide enables managers to determine which factors are limiting for RGWT's on their property. We hypothesize the major limiting factor on this property is roosting habitat; therefore we will utilize the appraisal guide to test our hypothesis and determine limiting factors on this property. To test the guide, 30 random points will be established in two separate pastures using ArcGIS. The first 15 points in each pasture will be used for evaluating roosting and feeding habitat, whereas the last 15 points will evaluate nesting and brood-rearing habitat. Litter, bare ground, and herbaceous cover percentages will be measured using a 1-m² Daubenmire frame, which will also represent the boundary for forb abundance sampling. A Robel pole will be used to measure vegetation height at each of the sites. Each data set collected will be rated on a 0–10 point scale as defined by the guide then accumulated in a total score to designate a poor to good rating for the property being evaluated.

12. DIETARY OVERLAP AMONG PRONGHORN, CATTLE, AND PRAIRIE DOGS IN TRANS-PECOS, TEXAS*

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Abstract: There has been a gradual downward trend in pronghorn (*Antilocapra americana*) populations since the initial impact of western expansion in North America. As recently as 1987, this species roamed the Trans-Pecos ecoregion in numbers of around 17,000 individuals. Recently, translocation efforts were implemented by the Borderlands Research Institute and Texas Parks and Wildlife Department to aid in restoring these populations. Graduate student Justin French recently evaluated the nutritional and dietary habits of pronghorn in the area to evaluate the quality of range conditions in terms of suitability for pronghorn sustainability. My objectives were to: 1) obtain estimates of the composition of pronghorn, cattle, and prairie dog diets via fecal microhistology, and 2) use this data to evaluate dietary similarities and overlap between pronghorn, cattle, and prairie dogs. After analyzing 10 fecal samples from each species: cattle and prairie dogs exhibited the greatest average dietary overlap of 77%, cattle and pronghorn overlapped an average of 31%, and prairie dogs and pronghorn overlapped an average of 14%. Cattle were shown to have the greatest impact on prairie dogs, as they overlapped 90% of prairie dog diets, while prairie dogs overlapped 65% of cattle diets. Pronghorn overlapped cattle 33%, and cattle overlapped pronghorn 30%. Pronghorn overlapped prairie dog diets 17%, and prairie dogs overlapped pronghorn diets 11%. This data suggests that pronghorn and cattle may exhibit competition for resources under the conditions in which the study was conducted, although more research in the future would be beneficial to further evaluate these relationships.

13. ESTIMATING CLIMATE-BASED RANGE EXPANSION IN HONEY MESQUITE*

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Abstract: With the current struggles land managers face to control incursion by *Prosopis glandulosa*, it is important to understand where this species has lived (paleoniche), currently lives, and where it has the potential to live in the future. The purpose of this study was to evaluate the paleoniche and current potential distribution of *Prosopis glandulosa* in order to identify areas that will become vulnerable to invasive spread as climate warming trends continue. Current species distribution data was consolidated from several databases, including the Global Biodiversity Information Facility and USDA databases. This data was then compared with historical and future climate estimates and current climate conditions from the WorldClim database. Using species habitat modeling (Maxent) and GIS (Diva and ArcGIS)

software we were able to estimate current and past niches. Comparison of these niches to historical distribution data suggested a correlation between warming trends and expansion of the possible *Prosopis glandulosa* range. Reconstructions suggest that *Prosopis glandulosa* had a paleoniche range south of the Rio Grande River during the last glacial maximum and moved north during the current interglacial period. This range has noticeably continued north since Little's 1970 documented range, suggesting that warming can partly explain even recent expansions. The most important finding, however, is that our model shows that there are non-invaded areas that possess suitable climate currently or in the future that are, therefore, vulnerable to introduction and spread of *Prosopis glandulosa*.

14. BASELINE SURVEY OF SMALL MAMMALS AND BACTERIAL PATHOGENS IN THE SOUTHEASTERN ROLLING PLAINS*

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Abstract: The southeastern boundary of the Rolling Plains lies near the geographic center of Texas at the confluence of three ecoregions: Rolling Plains, Cross Timbers, and Edwards Plateau. Elements of these ecoregions, including edaphic conditions and vegetation intergrade in our survey site southeast of the Callahan Divide in Callahan County. Biodiversity knowledge in this region is sparse due to large amounts of private land ownership. Through recent acquisition of a conservation easement by the Texas Land Conservancy, we have been given the opportunity to document biodiversity, including small mammal species, to serve as baseline data from which change related to land use and climate can be monitored. Our primary objective is to document the diversity of species of small mammals (primarily rodents) in the southeastern Rolling Plains across various habitat types. Because rodents are reservoirs for a variety of tick- and flea-borne bacterial pathogens, we also aim to document bacterial pathogens that are associated with rodents in the southeastern Rolling Plains. We collected tissue samples from rodents using Sherman live traps during late spring and early fall of 2015. We are using PCR and DNA sequencing to identify captured rodents and any detectable bacterial pathogens in the genera *Borrelia* (causative agent for Lyme disease and other diseases), *Rickettsia* (causative agents for spotted fevers and typhus), and *Yersinia* (causative agent for plague). Due to the ecotone nature of our survey site, the inventory of pathogens in this region could contribute to greater understanding of disease transmission and migration in central Texas.

15. RELATIONSHIPS BETWEEN SMALL MAMMAL ASSEMBLAGES AND LAND MANAGEMENT IN THE SOUTHEASTERN ROLLING PLAINS*

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Abstract: Prairie restoration is an increasingly important facet of land management in central Texas. In order to understand the ecological impacts of changes in land use, complex relationships between abiotic and biotic variables must be described. In this study we investigate relationships between soils, vegetation, and small mammal populations under four different management histories in the southeastern Rolling Plains. Surveys were conducted on four adjacent range sites with the following management histories: 1) unrestored oldfield with discontinued cultivation, no grazing, no vegetation management, 2) kleingrass/pricklypear/mesquite pasture with introduced forage, intensive grazing, minimal vegetation management, 3) mesquite shrubland with native vegetation, unrestrained grazing, no vegetation management, and 4) restored prairie: reintroduced native tall grasses, no grazing, shrub mitigation management. Sampling was conducted during spring, summer, and fall from a 50 x 50 m grid positioned in the interior of each site. Soils were sampled for chemical and physical properties from the corners and center of each grid; vascular plant species composition was sampled using 9 meter-square quadrats from the edges and center of each grid; and the small mammal assemblage was measured using a 5 x 10 grid of Sherman live traps. Small mammal assemblages differed substantially across treatments and seasons. Lowest mammal quantity and diversity occurred in the unrestored oldfield. Mammal assemblages at other sites varied seasonally, with greatest overall diversity occurring in the restored prairie.

16. NEST BOX USE AND PRODUCTIVITY OF AMERICAN KESTRELS ON THE HIGH PLAINS OF TEXAS*

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Abstract: The American Kestrel (*Falco sparverius*) is a widely ranging falcon in North America. These raptors are secondary cavity nesters in that they rely on previously formed cavities in order to rear their young. This adaptation has aided their distribution across North America, especially in exurban environments where cavities within man-made structures are plentiful. However, despite their wide range, kestrel numbers have been declining throughout much of their distribution. In order to analyze factors affecting kestrel success in exurban environments, we constructed and monitored 29 kestrel nest boxes over the course of three

years. Our study site has experienced an increase in both nest box use and reproductive success by kestrels in the years since its establishment. We will assess a suite of covariates including year, monthly precipitation, nest box orientation, land cover type, distance to other nest boxes, and categorical levels of human activity to evaluate their influence on the response variables of nest box use, success, and productivity. We will use these factors to create predictive models of American kestrel nest box use in exurban environments on the high plains of Texas. The model results will provide box placement guidance for expansion of the American kestrel next box program in the region.

17. SURVIVAL AND REPRODUCTION OF TRANSLOCATED VERSUS RESIDENT NORTHERN BOBWHITES*

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Abstract: Translocation of wildlife has historically been tested and proven as an efficient method of revitalizing populations. However, translocation of northern bobwhites (*Colinus virginianus*) has yielded mixed results due to variation in suitability of release sites and release methods. The objectives of this pilot study were to 1) gauge the performance (i.e., by comparing seasonal survival) for resident bobwhites versus soft- and hard-released birds, and 2) compare nesting effort of translocated bobwhites versus resident bobwhites. We trapped, tagged and translocated 80 bobwhites ($n = 40$ soft-released, $n = 40$ hard-released) from properties in the western Rolling Plains eastward to the MT7 ranch in Stephens County. We fitted translocated hens ($n = 20$ soft-released, $n = 20$ hard-released) with 6-g necklace-type radio transmitters to monitor nesting efforts and survival via radio-telemetry. On the MT7 ranch, we trapped resident bobwhites and fitted 15 hens with radio transmitters. We will use Kaplan-Meier analysis for survival with 95% CI to compare resident, soft- and hard-released birds. We used a Chi-square goodness of fit test with Yate's continuity correction to compare translocated and resident bobwhite nesting efforts. Our results indicate that there was no difference between nesting efforts of translocated and resident bobwhites ($\chi^2 = 0.43$, $P = 0.51$). Our results suggest translocated bobwhites' survival and reproduction were comparable to resident bobwhites and warrant further investigation to refine translocation efforts.

18. THE IMPORTANCE OF RAINFALL DISTRIBUTION AND ITS EFFECTS ON BIOMASS PRODUCTION IN SOUTH TEXAS*

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Abstract: Rain is a very important variable when dealing with rangeland productivity. When looking at the total amount of biomass in a rangeland pasture, the amount of rain can roughly determine the total amount of forage available for cattle and wildlife. Rainfall of East Foundation ranches are gathered by using weather stations located throughout the ranches. Our objective is to determine how total and distribution of precipitation in the months of September and October affect the production of forage standing crop production. Rainfall in 2014 for these two months was approximately 49 percent below average and approximately 3 percent higher in 2015. Total biomass of forage standing crop will be collected in autumn (October and November). We hypothesize that the amount of biomass will increase with the above average rainfall or evenly distributed precipitation within the months of September and October. Results of this study will give a glimpse of the relationship between the total amount and distribution of precipitation in the month of September and October and total biomass of forage standing crop.

19. TRAIL PREFERENCE USE AND LARGE CARNIVORE ENCOUNTERS BY VISITORS OF BIG BEND NATIONAL PARK*

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Abstract: While acknowledging the risk posed by large carnivores such as black bears (*Ursus americanus*) and puma (*Puma concolor*), the focus by the National Park Service (NPS) is on conservation of native species. We studied the use preferences of trails by visitors in Big Bend National Park (BBNP) and cataloged carnivore sighting reports from visitors. We deployed active infrared trail monitors on 18 trails in the greater Chisos Mountains of BBNP. Trail monitors recorded a digital count with a date and time stamp. Black bear and puma encounters were compiled and maintained in a computer database by the BBNP staff via visitors' observation cards. Carnivore sightings were mapped on ArcGIS. The greatest average visitor-use of trails (mean = 90%, SE = 1%) occurred during the day and there did not appear to be any difference in overall trail use between weekdays and weekends. During our spring period (1 March–30 June) 22 puma sightings and 62 black bear sightings were reported. Seven puma sightings and 30 black bear sightings were reported on trails that were monitored. Based on visitors' trail use trends and carnivore sightings, risk of carnivore-visitor encounters was greatest during the day (63% and 57% for bears and puma, respectively). Interestingly, while 7% of trail visitor-use occurred during the evening, 42% of puma sightings and 20% of black bear sightings were reported during this time period. This information can aid NPS management personnel in proactively dealing with carnivore-visitor encounter protocols that help minimize the probability of conflicts.

20. A PRELIMINARY EVALUATION OF THE EFFECTS OF NEONICOTINOID INSECTICIDES ON NORTHERN BOBWHITE QUAIL IN TEXAS*

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Abstract: Northern bobwhite quail (*Colinus virginianus*) have experienced marked declines in abundance over recent years in Texas and across their range. In that time, neonicotinoid insecticides have become the most extensively used insecticide class in the world, and are a growing cause of environmental concern. Due to the frequent use overlap with bobwhite quail ranges, we evaluated the possibility that they may be influencing bobwhite abundance over Texas landscapes. Bobwhite samples ($n = 60$) were collected from three different field sites across the state from autumn 2014 through spring 2015. Each sample was assessed for chemical residues in the crop and liver and signs of tissue damage in the liver, kidneys, spleen, and gonads. We found 11 detections of neonicotinoid residues in quail spanning all three field sites. Additionally, we identified indications of testicular degeneration ($n = 3$) and hepatocellular vacuolation ($n = 12$) consistent with signs of neonicotinoid toxicity.

21. EFFECTS OF BURNING ON RELATIVE ABUNDANCES AND MORPHOLOGICAL CHARACTERISTICS OF GREEN TREE FROG IN TEXAS*

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Abstract: Amphibians are important components of ecosystems throughout the temperate and tropical regions of the world. However, populations of many species of amphibians are declining in various regions of the world due to disease, pollution, climate change, and most

significantly, habitat loss. Large wildfires, such as the one that occurred in 2011 near Bastrop, Texas, are natural phenomena that can impact native fauna by altering, and sometimes destroying, their habitats. The Lost Pines area near Bastrop is the home to many wildlife species including tree frogs. The objective of this study is to compare the relative abundance of green tree frogs (*Hyla cinerea*) in areas severely burned in 2011 with those in unburned areas near Bastrop. We analyzed weekly data on tree frog distribution collected by Texas State University over the five-month period from June to October 2015 using 80 PVC pipes placed around 2 ponds each in burned and unburned areas of the ranch. Our results showed that 55.9% of green tree frogs are found in unburned area and 44.1% of green tree frogs are found in burned area. For conclusive results, this study will be repeated in subsequent years of forest recovery until the forest is restored.

22. GETTING OUR DUCKS IN A ROW: BUILDING A TEACHING COLLECTION OF WATERFOWL AND UPLAND GAME BIRD SPECIES FOR USE IN TEXAS PARKS AND WILDLIFE'S GAME WARDEN TRAINING*

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Abstract: Scientific collections hold importance in biological and ecological education and prove to be an invaluable tool for formal or informal training. Texas Parks and Wildlife Game Wardens are reliant on bird identification knowledge to enforce game regulations and wildlife laws. Identification of waterfowl can sometimes prove difficult with over 25 species of waterfowl known to frequent Texas, many of whom exhibit plumage variations between seasons, ages, and/or sexes. The focus of this project is to use gamebird species acquired by means of natural mortality, donation, or hunter confiscation to build a scientific teaching collection for use in game warden cadet training. Collected specimens were prepared using standard collections techniques and data such as weight, sex and locality were recorded when applicable. The overall goal of this project is to use birds that would have been wasted to provide Texas Parks and Wildlife's Law Enforcement Division with a tool that gives cadets valuable hands on game bird identification experience.

23. OBSERVATIONS OF THE CAVE CRICKET ABUNDANCE AT SELECTED CAVES LOCATED IN GOVERNMENT CANYON NATURAL STATE AREA*

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Abstract: The purpose of the research is to observe the fluctuations of the secret cave cricket (*Ceuthophilus secretus*) in seven caves located on Government Canyon Natural State Area in San Antonio, TX – Surprise Sink cave, Lost Pothole cave, Dancing Rattler cave, Hackberry Sink cave, Lithic Ridge cave, Bone Pile cave, and G.C Bat cave – over a duration of eleven years (2003–2014). Secret cave crickets are a keystone species; meaning their existence is vital

to the balance in cave ecosystems. By examining changes in the cave cricket population, cave biodiversity and health can be determined. To collect the data, staff/volunteers sat next to the cave entrances with handheld tally counters for two hours and recorded the number of crickets that emerged. After the completion of the study, it was discovered that there was a noticeable decrease in cave cricket abundance in the various caves over a decade. The change in the quantity of cave crickets may be attributed to variations in temperature and humidity. The results from the study indicate that cave biodiversity correlates with the fluctuation in the keystone species.

24. PREVALENCE OF GIZZARD HELMINTHS IN FEMALE NORTHERN PINTAILS WINTERING ALONG THE TEXAS COAST*

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Abstract: Major wintering areas for northern pintails include the Central Valley of California and the Gulf coast of Texas and Louisiana. The northern pintail is currently 45% below population objectives and has been declining or well below population objectives since the 1950s. Although many studies have been conducted to better understand the ecology of the northern pintail, there is little knowledge about the influence of parasites. Parasite infections can lead to damage to the gizzard lining and to gizzard dysfunction, as well as possible poor growth rates of juveniles. Our objectives are to identify and determine the frequency and intensity of helminths that occur underneath the gizzard lining in female northern pintails while evaluating the influence of host age on parasite populations. One hundred female northern pintails, representing 51 adults and 49 juveniles, were collected along the Texas coast between 15 October 2014 and 15 March 2015. Each specimen was aged by wing and other feather characteristics, and necropsied as part of a larger study. Twenty-six (26%) birds were infected with one or more helminth species. Twenty-one percent were infected with >1 species of nematodes and five percent were infected with the cestode *Gastrotaenia cygni*. Of the 51 adults examined, 16% were infected with nematodes while 10% had the gizzard cestode *G. cygni*. Of the juveniles examined, 16% had nematodes and 18% had *G. cygni*. Our results will provide additional information to help explain variation in nutrient reserve dynamics of female northern pintails from a concurrent study.

25. A SURVEY OF SMALL MAMMAL ECTOPARASITES IN SOUTH TEXAS*

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Abstract: Texas is a geographically variable state containing a large diversity of plants and animals. Due to widespread private land ownership, organismal biodiversity, especially of invertebrate and parasitic taxa, is poorly known across the southern portion of the state. We investigated the diversity of small mammal ectoparasites on private properties owned by the East Foundation in an effort to document and better understand invertebrate biodiversity across South Texas. Small mammals (primarily rodents) were captured and examined for ectoparasites, which were placed in ethanol and stored for quantification and identification. To date, four ectoparasite taxa have been collected from their hosts: ticks, fleas, lice, and mites. We have uncovered at least one new host association, a hoplopleurid louse parasitizing the northern pygmy mouse (*Baiomys taylori*), and we expect to find new host associations and geographic localities as we identify each parasite. Our work will aid in broadening the knowledge of general biodiversity in this area, including possibly discovering new associations and determining zoonotic diseases risks for South Texas.

26. HABITAT AND LANDSCAPE FACTORS INFLUENCING ACOUSTIC DETECTIONS OF VARIOUS BAT SPECIES IN EAST TEXAS*

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Abstract: Bats across North America have been the subject of elevated conservation concern in recent years due to several emerging threats. Primary among these is the rapid spread of white-nose syndrome (WNS). As outlined in the North American WNS management plan, it is important to obtain baseline information on species presence and population size prior to the onset of WNS. We implemented a pilot-scale project following protocols outline in the North American Bat Monitoring Program (NABat) on public land in east Texas. These protocols provide presence information and limited population density estimates for bat species. We surveyed using acoustic monitoring of echolocation calls in the Angelina National Forest and Sabine National Forests within East Texas from 5 June to 24 July 2015 and included stationary monitoring stations and driving transects. We recorded 4,662 bat calls of 8 species at 48 stationary points. Mobile acoustic sampling along 24 transects recorded 633 bat calls from 7 species. Tricolored bat (*Perimyotis subflavus*), big brown bat (*Eptesicus fuscus*), and eastern red/Seminole bat (*Lasiurus* spp.) had the greatest numbers of calls by both methods. Species

detections were related to landscape-level habitat variables such as: predominant community types, distance to permanent water, percent forest cover, and features present. We used Analysis of Variance (ANOVA) and regression to examine the influence of various parameters on bat call numbers. Preliminary results suggest that tricolored bats occurred more in mixed pine hardwood forest, big brown bats occurred in openings and along forest edges, and the eastern red/Seminole bat are positively associated with proximity to permanent water features.

27. ABUNDANCE AND OCCUPANCY PATTERNS OF OCELOTS AND BOBCATS AT EAST EL SAUZ RANCH AND YTURRIA RANCH*

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Abstract: The ocelot (*Leopardus pardalis*) occupies both the East El Sauz Ranch and the Yturria Ranch. Both ranches occur in South Texas where populations have been studied. These felids are solitary; therefore, any coexistence and occupancy information of this endangered cat will be important. This study will evaluate abundance and occupancy patterns of ocelots on the East El Sauz and Yturria ranches. Results from this study will help biologists understand the overall dynamics of the Willacy ocelot population.

28. DISTRIBUTION OF WILDLIFE CAPTURED ON STRATIFIED RANDOM REMOTE CAMERAS AT ELEPHANT MOUNTAIN WILDLIFE MANAGEMENT AREA, TEXAS*

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Abstract: In the Trans-Pecos region of Texas, wildlife is diverse and often wide ranging. Various factors influence wildlife movements, including water sources, food availability, cover,

and seasonal changes. At Elephant Mountain Wildlife Management Area (EMWMA), remote game cameras will be used to assess the spatial distribution of wildlife in areas to be treated with Sendero[®] herbicides. This study will be in accordance with a larger project assessing the response of scaled quail (*Callipepla squamata*) and other wildlife to the Sendero herbicide application at EMWMA. Vegetation types at the camera sites include honey mesquite shrublands and creosote-tarbrush flats. Wildlife documented included mule deer (*Odocoileus hemionus*), scaled quail, coyote (*Canis latrans*), and bobcat (*Lynx rufus*). Sixty game cameras will be setup in the treatment areas 24 hrs/day with motion sensors on 1-minute intervals. Camera sites have been assigned in a stratified random sample using ArcGIS. Pre-treatment frequencies of wildlife sightings recorded for each camera were compiled to assess wildlife distribution in the treatment area. This study will lead to a greater understanding of wildlife movements in areas being treated by Sendero herbicides.

29. INDEX OF SPENT SHOT IN LOUISIANA AND TEXAS GULF COAST PRAIRIE RICELANDS**

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Abstract: An estimated 2–3% of North American waterfowl die annually from lead poisoning despite the long-term ban on lead shotgun shells for waterfowl hunting. Waterfowl may ingest residual lead or non-toxic shot while foraging. We conducted a study to estimate density of lead and non-toxic shot in ricelands in the CP and TMC. We randomly collected 1,000 soil cores (10-cm diameter and depth) from production and idled ricelands in the CP and TMC ($n = 760$ and $n = 240$, respectively) in November 2013. We washed soil cores through a series of graduated sieves (4.75 mm–300 μ m) to remove soil. We imaged the remaining plant biomass using a 600 mA generator x-ray system and computed radiography imaging plates. We detected one lead shot pellet from a production rice field in the CP of Louisiana and zero non-toxic pellets. Density of lead shot was 1,273 pellets/ha (95% CI: 0–3,820). We believe that x-ray images were effective in detecting lead and non-toxic shot, because we imaged 20 soil cores containing known numbers of lead and non-toxic shot with 100% detection before imaging the 1,000 core samples. We speculate that regular soil tillage incorporates spent shot into the soil, rendering it unavailable to foraging waterfowl. As spent shot likely exhibits a clumped spatial distribution, our line-transect sampling may have been an imperfect design for estimating shot availability. Nevertheless, our results indicate that lead shot is not a widespread concern for waterfowl foraging in Gulf Coast ricelands.

30. BLACK RAIL OCCUPANCY AND ABUNDANCE IN TEXAS**

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Abstract: The black rail (*Laterallus jamaicensis*) is a secretive marsh bird which occurs in North, Central, and South America. In North America the California black rail (*L. j. courtturnicops*) is listed as threatened by the state of California and the eastern black rail (*L. j. jamaicensis*) is declining throughout the Atlantic seaboard. Eastern black rails occur in Texas and little research has been done on their distribution and abundance. To assess the status and conservation need of the black rail in Texas, we conducted point counts at six study sites along the Texas coast. At each survey point we conducted call broadcast surveys which lasted for 5 minutes. There were 98 points surveyed at Anahuac National Wildlife Refuge (NWR), 145 survey points at Brazoria and San Bernard NWRs, 66 survey points at Mad Island Wildlife Management Area and Clive Runnel's Mad Island Marsh Preserve, and 40 points surveyed at Powderhorn Ranch Preserve. At each survey point we recorded the number of black rails detected. We detected black rails at five of the six study sites. Black rails were detected at 22.55 percent of survey points across the five sites where detections occurred. The proportion of points where detections occurred ranged from a high of 11.44 percent at Anahuac NWR to a low of 2.94 percent at the two Mad Island sites. Surveys will be performed at the same study sites in 2016 to continue collecting data to estimate abundance and distribution of the black rail.

31. DISTRIBUTION AND HABITAT SELECTION BY MESOCARNIVORES IN BIG BEND NATIONAL PARK, TEXAS**

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Abstract: Mesocarnivores serve an important role in ecosystems, acting as both prey to large carnivores and predators to small mammals and birds. Big Bend National Park is home to many mesocarnivore species, including striped skunks (*Mephitis mephitis*), hooded skunks (*Mephitis macroura*), hog-nosed skunks (*Conepatus leuconotus*), western spotted skunks (*Spilogale gracilis*), coyotes (*Canis latrans*), bobcats (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), ringtails (*Bassariscus astutus*), raccoons (*Procyon lotor*), badgers (*Taxidea taxus*), and long-tailed weasels (*Mustela frenata*). To better understand how these species interact and partition the available habitat we used remote cameras placed at 58 different locations across a 450-km² grid, covering the Chisos Mountains and surrounding foothills. Cameras were placed strategically to capture animal movement, in places such as washes, canyons, mountain passes, and saddles in a ridgeline. A total of 515,698 pictures were collected over a total of 14,452 trap days. Skunks were captured at 43 locations, coyotes at 12 locations, bobcats at 33 locations, gray fox at 52 locations, ring-tails at 32 locations, raccoons at 5 locations, badger at 2 locations,

and long-tailed weasels at 5 locations. Using a Chi-Square and Bonferroni confidence intervals we analyzed four habitat categories: 1) elevation, 2) fine scale terrain ruggedness, 3) broad scale terrain ruggedness, and 4) vegetation type. Only species with a more than 100 independent captures were analyzed. Bobcats, coyotes, gray fox, skunks, and ringtails all showed a significant preference within the four habitat categories.

32. PERMEABILITY AND VIABILITY OF *BAYLISASCARIS PROCYONIS* EGGS WITHIN VARIOUS SOIL TYPES IN SOUTHERN TEXAS**

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Abstract: *Baylisascaris procyonis* is a large parasitic nematode found in the small intestines of raccoons (*Procyon lotor*), the definitive host, and is considered an emerging zoonotic threat. Adult parasites typically do not harm their definitive hosts; however, the larvae in intermediate hosts can cause visceral, ocular, and neural larva migrans. Our objective was to determine the quantity and viability of *B. procyonis* eggs in 4 soil textures (i.e., sand, silt, clay, and loam soils), 2 soil moistures (i.e., >75% soil moisture content and <20% soil moisture content), 2 canopies (soils exposed to full sunlight and soils in 100% canopy cover), and at 4 soil depths (soil surface, 1.0 – 2.0 cm depth, 2.1 – 6.0 cm depth, and 6.1 – 10.0 cm depth). A 1 mL aliquot containing 100 *B. procyonis* eggs was pipetted into the center of each of 100 squares/soil texture and 5 squares were randomly selected at time 0, 1, 3, 6, 12, 18, and 24 months after egg placement. A soil column was extracted and the number of eggs was enumerated for each soil depth, texture, moisture, and canopy. Dry soils were mainly impermeable; even after 2 years >60% of *B. procyonis* eggs remained on the surface of all soil textures. Wet soils were more permeable than dry soils, but after 2 years approximately 30% to 80% of *B. procyonis* eggs for sandy to clay soils, respectively, remained on the soil surface. Egg movement through a soil column was slow; in wet sandy soils, it required 1 year before the majority of eggs transitioned from the soil surface to the next soil depth, while other soil textures required more time for a similar effect. For all soil textures, moistures, canopies, and depths, >92% of *B. procyonis* eggs remained viable after 2 years in the southern Texas environment. Therefore, *B. procyonis* must be considered an important zoonotic parasite that physicians and veterinarians should include in differential diagnoses.

33. SPATIAL ECOLOGY OF AMERICAN ALLIGATOR NEST SITES**

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Abstract: Despite the numerous studies that have been conducted, there still remains much needed information about American alligator (*Alligator mississippiensis*) ecology and population dynamics. More specifically, there is a dearth of information concerning the nesting ecology and habitat selection of nesting female alligators throughout their range. We identified spatial characteristics of alligator nest sites along the Texas coast during 2014-2015. Alligator nests ($n = 231$) occurred in 26 different wetland types, of which estuarine intertidal wetlands were the predominate wetland type for alligator nests ($n = 58$). Other important wetland types for alligator nests included palustrine emergent wetlands ($n = 34$), riverine wetlands ($n = 22$), and artificially flooded emergent palustrine wetlands ($n = 15$). The multi-distance spatial cluster analysis indicated that alligator nests followed a clustering pattern, rather than a dispersed pattern (based on Ripley's K-function). Of the 231 alligator nest site locations, 56 were located within areas of high statistical significance (based on the Getis-Ord G_i^* Statistic). Our study elucidates important nesting habitats of American alligators, which is needed for reproduction, and thus overall management of this iconic species in Texas.

34. EVALUATING MODELS OF NUTRITIONAL CARRYING CAPACITY FOR WINTERING MOOSE ON THE COPPER RIVER DELTA, AK**

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Abstract: Models of Nutritional Carrying Capacity (NCC) produce estimates of idealized, sustainable resources to which further environmental, biological, or managerial factors can be added. Thus, estimates of NCC are often a first step when evaluating the need for further managerial actions or calculations. We compared results from five model structures to estimate the NCC for an isolated and locally-important moose (*Alces alces gigas*) population on the western Copper River Delta (CRD) of Alaska. Our models incorporated forage nutritional data and forage biomass available during the 2012–14 winters. Because of concerns of reduced forage availability due to snow burial and differences in moose winter range observations, we also incorporated a variety of winter (mild, moderate, and severe) and range (12,995–53,945 ha) scenarios into all model types. Estimates of NCC across all models, winter ranges, and scenarios ranged from 195–5,228 moose. These estimates allow for managerial flexibility in adjusting to variable winter ranges and potentially decreased winter severities with climate change. However the model and range most currently applicable produced estimates between 2,198–3,471 moose, depending on winter severity. Results from a sensitivity analysis (S_x) conducted on this model show lowest and highest S_x were attributed to digestible dry matter reduction resulting from lignin levels and snow depth, respectively. Our results will aid wildlife managers as they balance local needs and ecosystem diversity, while our NCC model structure can be applied to other ungulate populations with dynamic forage availability, ranges, or ecosystems.

35. EFFECTS OF RELATIVE PREDATOR ABUNDANCE ON NORTHERN BOBWHITE NEST SUCCESS**

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Abstract: Much is known about northern bobwhite (*Colinus virginianus*) nesting ecology; however, relatively little is understood regarding how predator abundance influences nest fate. The objective of our research was to determine how nest predator abundance influences nesting success. Our study was conducted on 4 spatially independent study sites across South Texas, in Brooks (2000–2008), and Goliad, Real, and Zavala counties in 2014–2015. Predator abundance was determined by conducting scent stations 3 consecutive days/month. Nest fates (successful or depredated) were determined by using radio-telemetry. We conducted a simple logistic regression analysis with the relative predator density value closest to each nest as our independent variable and nest success as our binary dependent variable. Analyzing data from 477 nests monitored over the course of each projects respective field seasons, we found no relationship ($P = 0.92$) between relative predator abundance and bobwhite nest success. Bobwhite nest depredation by meso-predators may to be compensatory in nature whereby the same percentage of nests may be depredated regardless of predator density.

36. INFLUENCE OF INITIAL NEST FATE ON BOBWHITE NEST PLACEMENT**

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Abstract: Much is known about northern bobwhite (*Colinus virginianus*) nesting ecology; however, relatively little is understood regarding how nest predators influence bobwhite nest selection and re-nesting behavior. The objective of our research was to compare how the fate of an initial nest influences the placement of a bobwhite's subsequent nest. We predicted that bobwhites would move greater distances for subsequent nesting attempts if the prior nesting attempt was a failure as opposed to nests that were successful. Our study was conducted on 5 spatially independent study sites across South Texas in Brooks (2000–2008), LaSalle (2009–2011) and Goliad, Real, and Zavala counties in 2014–2015. We located bobwhite nests and collected information on nest fate through the use of radio-telemetry. Using ArcGIS, we measured the distance moved between 131 pairs of nests. We found that bobwhites with initial failed nest attempts moved significantly farther (mean = 190m) than birds with successful initial nesting attempts (mean = 158m) ($P = 0.034$). Greater distances moved for subsequent nest placement after initial nest failure may signify an evolutionary strategy of predator avoidance to improve nest success.

37. LAND COVER ASSOCIATIONS OF MIGRANT AND WINTERING GOLDEN EAGLES IN THE SOUTHERN GREAT PLAINS**

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Abstract: Wind energy development is a rapidly advancing source of renewable, non-carbon emitting energy in the Southern Great Plains. However, it is not without environmental cost in terms of potential mortality and disturbance to wildlife. Golden eagles in particular appear to be susceptible to direct mortality from wind turbines. Each winter, the Southern Great Plains experiences an increase in golden eagles that migrate through the area or settle in for the winter. However, little contemporary or quantitative information is available regarding land cover associations of these birds across the landscape. We initiated golden eagle surveys along 50 50-km road survey transects in the Southern Great Plains of eastern New Mexico, the panhandle of Texas, and western Oklahoma in December 2014. Our goal was to identify land cover associations of migrating and wintering golden eagles and to assess potential risk of wind energy development in the region. We are using ArcMap 10.3.1 to analyze the land cover associations of golden eagles in the study area. We have completed the first year of surveys in December 2014 and January 2015, with December 2015 and January 2016 surveys pending. Analysis of all surveys will be presented.

38. SURVEY AND ANALYSIS OF HELMINTH PARASITES IN NORTHERN BOBWHITES FROM SOUTH TEXAS**

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Abstract: The long-term decline in northern bobwhite (*Colinus virginianus*) populations in some regions of Texas has prompted speculation about the role of parasitism and disease. There is little information on quail parasites in South Texas. This study was initiated to identify helminth parasite species from hunter-donated bobwhites and determine the effects of host age, host body weight, and host sex on the prevalence, intensity, and abundance of commonly occurring helminth species. One hundred and twenty-four bobwhites were examined from the 2014–2015 hunting season. Four species of nematodes and 1 acanthocephalan were found. Cestodes were also found and will be identified. The cecal nematode *Aulonocephalus pennula* dominated numerically (6,651 individuals; 99% of all nematode individuals found), occurred in 80% of the sample, and averaged 67 worms per infected bird. Three species (*Dispharynx nasuta*, *Tetrameres pattersoni*, and *Oxyspirura petrowi*) known to be pathogenic to quail and/or other Galliformes were found, but occurred infrequently (individual prevalence $\leq 4\%$ and contributed little (38 worms) to the total nematodes found). Our research provides insight into the composition of helminth communities in bobwhites within South Texas and aids in our understanding of the potential impacts of parasitic infections within individuals and populations of wild bobwhites.

39. MORE THAN STORAGE: BUILDING BIODIVERSITY KNOWLEDGE VIA SCIENTIFIC COLLECTIONS**

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Abstract: Scientific collections contain millions of specimens, historical images and documents, and other materials that are invaluable sources of primary data for researchers working in a variety of fields such as biodiversity, vertebrate and invertebrate evolution, endangered species, wildlife and fisheries conservation, and forensic biology. The specimens and materials contained within scientific collections serve as reference material that document past biodiversity and provide the base-line materials necessary to forecast species distributions and extinction risk. Scientific collections are especially important for documenting biodiversity in areas that are difficult to access. The Biodiversity Research and Teaching Collections (BRTC) at Texas A&M University is a substantial University-based natural history collection, with over one million preserved specimens divided across six research divisions. The BRTC is currently serving as a repository for terrestrial vertebrate specimens (amphibians, birds, mammals, and reptiles) collected from East Foundation properties in south Texas, an area that can be difficult to document biodiversity due to large percentage of private properties. We

review specimens collected from East Foundation properties, and describe their value in current and future research endeavors. For example, specimens collected from East Foundation properties will therefore represent a substantial increase in knowledge of South Texas terrestrial vertebrate biodiversity. Furthermore, these specimens are currently being used for research pertaining to disease ecology, host-parasite ecology, species phylogeography, population genetics of widely distributed species, and will undoubtedly be used for innumerable future studies.

40. OVERWINTER FAWN HABITAT SELECTION IN SOUTH TEXAS**

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Abstract: White-tailed deer (*Odocoileus virginianus*) harvest recommendations after autumn surveys are often based on the assumption that most fawns will be recruited into the population. We hypothesized overwintering fawns may be pushed into lower quality habitat as deer density increases resulting in increased mortality after weaning. Based on this hypothesis, we predicted that with increased deer density overwintering fawn use of lower quality areas will increase, home range size will decrease, spatial overlap will increase, foraging time will increase, body mass will decrease, and survival will decrease. We also predicted that providing more supplemental feeders may reduce these effects. Fawns captured during November 2014 in 81-ha enclosures on the Comanche and Faith ranches were fitted with GPS collars and/or ear tags within enclosures with 40 deer/1 feeder, 60 deer/1 feeder, or 60 deer/3 feeders. Relocation data from the GPS collars and survival estimates using trail cameras in conjunction with program MARK were used to test our predictions. Preliminary results indicate fawns in the high density with 1 feeder treatment concentrated foraging efforts in areas where high quality forage would be most prevalent, unlike the lower density and multiple feeder treatments in which habitat selection was at random. Our results suggest fawns increased search time for high quality forage in the presence of increased intraspecific competition, and providing multiple feeders or decreasing deer densities may resolve this effect.

41. NORTHERN BOBWHITE ABUNDANCE AND AGRICULTURAL LAND USE IN THE EDWARDS PLATEAU**

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Abstract: The northern bobwhite (*Colinus virginianus*) has been in decline across much of its range for the past 50 years or more. While there are likely many factors contributing to this decline in abundance, the literature primarily identifies the conversion of pristine habitat to farmland as one of the important drivers of this decline. Using data from the Agricultural Census and the Breeding Bird Survey, this study investigates the link between area devoted to agricultural land uses and northern bobwhite abundance in the Edwards Plateau Region over the years of 1987 to 2012. It was found that the Edwards Plateau bobwhite population showed a

significant decline over this time frame but no change was observed in land area devoted to cropland, pastureland, or total agricultural land use area. While it appears that encroachment of agriculture is not the primary factor causing the northern bobwhite decline in this region at this time, there are a number of other proposed factors which have not yet been investigated as contributing factors in this decline.

42. EFFECTS OF DIFFERING WHITE-TAILED DEER AND SUPPLEMENTAL FEEDER DENSITIES ON WOODY PLANT CANOPY COVER**

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Abstract: Traditional browsing theory predicts that with increasing white-tailed deer (*Odocoileus virginianus*) density, selective foraging results in a decline in palatable shrubs and an increase in unpalatable shrubs. Removing nutritional constraints by providing high-quality food may either exacerbate this effect, or protect shrubs from excessive browsing. Our objective was to determine the effects of increasing deer density and provision of supplemental feed on canopy cover of shrubs. In March 2013, we established 6 81-ha enclosures on each of 2 ranches, with target densities of 0, 20, 40, and 60 deer/81 ha with one feeder each, 60 deer/81 ha with three feeders, and 80 deer/81 ha with four feeders. We divided shrubs into 13 ecologically important plant functional groups that included groups of unpalatable shrubs and low-growing, palatable shrubs that should be susceptible to damage from browsing. During summer 2012–2014, we used the line intercept method to estimate shrub canopy cover along 20 transects/enclosure. Data were analyzed using repeated measures for mixed models. Canopy cover of honey mesquite increased ($P < 0.001$) with increasing deer density and a single feed site. Canopy cover of honey mesquite and other unpalatable shrubs decreased ($P < 0.025$) with increasing deer density and a constant deer to feeder ratio. Canopy cover of palatable shrubs was not affected ($P > 0.052$). Deer consuming supplemental feed may increase use of unpalatable shrubs that are poorly digestible to offset ruminal acidosis or other effects of a highly digestible diet.

43. PREVALENCE OF ENDOPARASITIC HELMINTHS OF THE SMALL INDIAN MONGOOSE ON THE ISLAND OF PUERTO RICO**

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Abstract: The small Indian mongoose (*Herpestes auro-punctatus*, henceforth mongoose) was introduced to Puerto Rico in the late 1800's as a biological control for *Rattus* spp. in sugarcane fields. The mongoose is an opportunistic generalist which readily exhibits prey switching in the face of limited food resources. It forages on a wide range of foods including plants, insects, crustaceans, reptiles and amphibians, small mammals, and birds. Because of the diversity of its food preference, the mongoose has the potential to be infected with a diverse array of endoparasitic helminths. Although considerable research has been conducted on the mongoose in the Caribbean on food habits and parasite load, little to no research has been reported on the Puerto Rico population. The community of helminths associated with the mongoose on Puerto Rico may have important disease management implications for humans and domestic animals. Previous researchers have found humans in Puerto Rico infected with helminths which may be harbored by the mongoose. However, the Puerto Rico population of the mongoose has not been systematically surveyed for helminths. In our study, we are conducting systematic helminthological examinations of the Puerto Rico population of the mongoose, with special attention to species that may pose risks to humans and domestic animals.

44. IDENTIFICATION OF CORRIDORS FOR NATURAL BLACK BEAR RECOLONIZATION IN EAST TEXAS**

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Abstract: Black bears (*Ursus americanus*) once ranged across the southern United States; however, habitat loss and overexploitation led to fragmented remnant populations and they were considered extirpated in Texas by the 1900's. Recent research has identified suitable, yet unoccupied, black bear habitat in east Texas available for recolonization of their historic range. Protected habitat corridors between source populations and available habitat in east Texas are necessary for this process. We are implementing a spatial modeling study to identify potential dispersal corridors between the east Texas target areas and the extant populations in Louisiana, Arkansas and Oklahoma. To achieve this, we will be classifying the study area habitats using

the ecological modeling software, BioMapper 4.0, which will predict suitability for black bears based on different physical and human impact variables. These variables will be defined and described based on geospatial land cover and black bear occurrence data from neighboring states. The binomial response variable for the model will be black bear presence or absence. The final models will be chosen using information theoretic approaches and combined to create a global model. The final model will provide a tool to categorize the habitat within the study area, and identify habitat patches that represent potential corridors. The results of this study will be used as part of a more extensive path analysis effort to determine likely colonization paths for black bears in the region.

45. AVIAN RESPONSE TO BRUSH MANAGEMENT ON THE WELDER WILDLIFE REFUGE**

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Abstract: Grassland obligate birds are experiencing population declines across North America, and anthropogenic actions have been identified as the primary driver of these declines. Among these actions, fire suppression and grazing management have facilitated encroachment by native and introduced woody species, resulting in altered grassland habitat. Considerable attention has been focused on prairie restoration and avian conservation in the Great Plains region of North America; far less attention has been given to the Gulf Coast prairies. We are assessing avian community response to prairie restoration efforts on the Welder Wildlife Refuge. We have established 58 variable circle survey points in a 355-acre treatment plot and a 533-acre control plot. We began conducting point count surveys and vegetation surveys during the breeding season prior to herbicide application in October 2014, and will continue to do so for the breeding and wintering seasons of 2015 and 2016. Our preliminary results indicated a high avian diversity prior to treatment, but this was ultimately dominated by 5 species: Northern Cardinal, Painted Bunting, White-eyed Vireo, Northern Bobwhite, and Yellow-billed Cuckoo. We observed novel species during the breeding season of 2015, including an influx of Dickcissels and Red-winged Blackbirds. We are currently conducting density estimates based on species-specific detection probabilities in Program DISTANCE. We also sampled vegetation with 30 m line transects at each survey point. These data will provide a baseline of avian community composition and densities, and vegetation composition, in each study plot for comparisons of effects following brush removal efforts.

46. MOSQUITO SURVEILLANCE FOR WEST NILE VIRUS FROM 2012 TO 2015 IN LUBBOCK, TX, UNITED STATES**

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Abstract: West Nile virus (WNV) was first detected in the United States in 1999 and has since spread to all states except Alaska. West Nile virus is an arbovirus in the genus *Flavivirus* (family Flaviviridae) and causes West Nile fever and West Nile Neuroinvasive Disease. West Nile virus also has a deleterious effect on some wild bird populations. West Nile virus is maintained in nature through a bird-mosquito-bird transmission cycle, most commonly in the Western United States by *Culex tarsalis* and *C. quinquefasciatus*. As part of a WNV surveillance program we trapped mosquitoes from around the city of Lubbock, TX, USA, and screened them for WNV using reverse transcription polymerase chain reaction (RT-PCR). During 2012–2015 we trapped 56,471 mosquitoes, including 16,571 (29.3%) *C. tarsalis* and 1,500 (2.7%) *C. quinquefasciatus* over 914 trap nights. Each week, female *C. tarsalis* and *C. quinquefasciatus* were pooled by species and trap site, and RT-PCR was used to determine if mosquitoes were infected with WNV. Of the total screened, 21 (5.6%) *C. tarsalis* and 2 (1.1%) *C. quinquefasciatus* pools tested positive for WNV. Data were utilized by the city to focus their mosquito control efforts. Initial data analyses strongly indicates that incidence of WNV in *C. tarsalis* is influenced by temperature ($P < 0.02$), not occurring below 23 degrees Celsius. These results demonstrate that WNV screening can be an important and versatile aspect of a vector control program.

47. **HABITAT SUITABILITY BOUNDS OF MONTEZUMA QUAIL IN THE EDWARDS PLATEAU****

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Abstract: Montezuma Quail (*Cyrtonyx montezumae*) populations have declined precipitously in the Edwards Plateau for at least a century. Today, the Edwards Plateau population is mostly

restricted to 4 counties centered on Edwards County. Some landowners in the area have expressed interest in managing habitat for this species; however, such little is known about their habitat needs that recommendations cannot be made with confidence. The objective of our study was to quantify habitat suitability bounds of Montezuma quail habitat within the Edwards Plateau. From April–August 2015, call-back surveys were conducted at 60 points, twice per month, on 8 ranches in Edwards and Kinney counties where Montezuma quail are present to determine occupancy. These points were stratified across high, medium and low degrees of slope, elevation, juniper density, and in valleys, hillsides, and hilltops. At each location micro and macro-habitat characteristics were quantified during June, and subterranean food plant density was determined during October–November. Here we present findings on using resource selection functions between occupied and unoccupied sites. Information provided by this study will aid landowners and natural resource agencies in making management recommendations based on quantitative data for Montezuma quail in the Edwards Plateau.

48. USING BLOOD GAS ANALYTES TO DETERMINE PHYSIOLOGICAL EFFECTS OF PARASITE LOAD AND HABITAT ON BIRD HEALTH**

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Abstract: There has been minimal research done in the Rio Grande Valley of South Texas, with respect to the health of wild bird populations. To assess bird health, an iStat machine was used to record blood gas analytes for both migratory and sedentary birds. I also assessed external body condition, and whether birds carried ecto-parasites or malaria parasites. Blood samples were screened for malaria using polymerase chain reactions. Collectively, these measures can be a tool to determine overall health of an organism and its environment. Many of the analytes exhibited a normal distribution and were tested against other parameters using a Student's *t*-test in the program Analyse-it. We found that malaria did not have any statistically significant effect on any of the blood gas or electrolytes measured, but the Pac-cell Volume (PCV) value was more variable in birds that were negative for malaria. Migration affected birds via increased hemoglobin and hematocrit levels, while decreasing other electrolyte levels. Seasonality and body condition score were the two variables that had statistically significant influence on all analytes recorded in this study. Louse parasitism had a negative impact on certain electrolytes, but more investigation is needed. Despite being infected with malaria, the birds in this area are not adversely affected based on the analytes we tested, suggesting a healthy population and ecosystem.

49. INVESTIGATION OF POTENTIAL AVIAN AND BAT IMPACTS AT A PROPOSED WIND FARM IN SOUTH TEXAS**

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Abstract: Texas is the leading wind energy producer in the U.S. with an installed wind power capacity of over 15,000 megawatts. Despite this, research on wildlife impacts from wind energy is lacking in Texas. Our goals were to 1) collect site-specific, pre-construction observations of bat and avian activity for a proposed 250 megawatt wind farm currently under construction in Webb County, Texas; 2) predict potential annual mortality of bats and raptors; and 3) make site-specific recommendations for further studies. We placed three Anabat SD2 bat detectors on meteorological towers associated with the wind farm with microphones at heights of 48 meters and recorded for 1,021 detector-nights. In addition, nineteen, 20-minute fixed avian point count locations were established, resulting in 78 hours of observation. Acoustic monitoring resulted in an average rate of 5.25 passes/detector-night. The highest activity levels were observed during spring and fall migration. The Brazilian free-tailed bat (*Tadarida brasiliensis*) was the most commonly detected bat species. Predicted annual bat mortality is approximately 9.54 bats/megawatt. Avian studies resulted in a total mean use of 17.6 birds/point count. The most commonly observed raptor species Crested Caracara (*Caracara cheriway*). Predicted annual raptor mortality is 0.236 raptors/megawatt. These data contributed to site-specific recommendations for initiation of post-construction studies and wildlife impact reduction strategies. Future research efforts will focus on bat and avian behavior at wind turbines and refinement of wildlife impact reduction strategies.

50. EFFECTS OF FALL AND SPRING PATCH BURNING IN COASTAL CORDGRASS COMMUNITIES ON EAST EL SAUZ RANCH, TEXAS, USA**

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Abstract: When gulf and marshhay cordgrasses (*Spartina* spp.) remain undisturbed and are allowed to mature their senescent stands create undesirable forage for livestock and wildlife. In this study, we will apply prescribed fire to large patches containing cordgrass and the adjacent herbaceous community to remove decadent cordgrass growth and promote forb growth. We will also monitor movement of cattle (*Bos* spp.) within the area. Thirty female cows were collared with Lotek's LifeCycle® collars, which record locations every 13 hours, allowing us to analyze cattle movement both spatially and temporally in relation to burned areas. Our study is being conducted on East Foundation's El Sauz property in Willacy County, Texas, USA. The property consists of approximately 28,000 acres with no interior fencing. Three treatments (non-burned control, spring burn, and fall burn) were randomly assigned to 10 pastures (roughly 500 acres each) with 2, 4, and 4 replications, respectively. Our objectives are to determine: 1) how cordgrass individuals respond to different seasons of burning; 2) length of improvement of fall and spring burns on cordgrass production and nutritional content; 3) effects of fall and spring burning on plant diversity in cordgrass communities; and 4) which season of prescribed burning creates optimal grazing preference on burned over non-burned cordgrass. Outcomes from this project will help land managers develop prescribed burning management strategies for improving forage for livestock and wildlife along the Gulf Coastal Prairie.

51. MANAGEMENT INTENSIVE GRAZING FOR IMPROVED SOIL HEALTH**

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Abstract: We describe an ongoing experiment in which the differential soil quality and soil moisture effects of low density, long-term rotational grazing are to be compared with those of high density, short term rotational ("Management Intensive") grazing (MIG). We will present data regarding above ground biomass, soil moisture, and plant species dynamics between the two systems. Extensive preliminary data regarding soil health (chemical, physical, biological) taken from the research plots ($n = 4$) before the start of the experiment will also be presented. Challenges associated with implementing MIG in subhumid South Texas will also be discussed.

The predominating soil among the plots is a fine, smectitic, hyperthermic leptic vertic Natrustoll.

52. SHORT-TERM IMPLICATIONS OF PRESCRIBED FIRE ON SOFT MAST PRODUCING SPECIES FOUND IN RESTORED PINE WOODLANDS OF THE OUACHITA MOUNTAINS OF WESTERN ARKANSAS**

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Abstract: The use of prescribed fire is integral to restoration of open habitats in the southeast, including shortleaf pine woodlands in the Ouachita Mountains. Fire has many potential benefits for wildlife; however, short-term implications for soft mast production are not fully understood. This study will determine how fire affects soft mast producing plants and its influence on various habitat resources for multiple wildlife species. Sixteen stands were inventoried representing four temporal periods after dormant season prescribed fires: within 1 year of burn, 2 years after burn, 3 years after burn and 5 years after burn. Stands were sampled by establishing 40 0.045 ha plots along 6 to 8 transects per stand and measuring number and biomass of all soft mast. Data collection occurred three times per growing season (June through August) to capture a range of soft mast producing species. Soft mast specimens were collected each month while percent cover of soft mast species was collected in July during the peak growing season. The first year of data collection was completed in August 2015. Soft mast production was highest 3 and 5 years after prescribed fire, with sumacs (*Rhus* spp.), blackberries (*Rubus* spp.) and grapes (*Vitis* spp.) most abundant in these stands. Presence of American beautyberry plants was low across all four stand types (<10% composition); however, when present, fruit count was high. Our preliminary results suggest that burning on a 3–5 year rotation may maximize soft mast production for wildlife species such as eastern wild turkeys and black bears.

53. INSIGHTS INTO NEST-SITE FIDELITY AND SEASONAL SURVIVAL OF THE BEWICK'S WREN (*THRYOMANES BEWICKII*) IN CENTRAL TEXAS**

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Abstract: Bewick's wrens (*Thryomanes bewickii*) have suffered a rapid decline in the eastern U.S., which is suspected to be due to habitat loss and the invasion of house wrens (*Troglodytes aedon*) into their range. Currently, much of the research performed on this species has been performed in the eastern U.S. or on the western coast. However, central Texas is believed to have the largest population of Bewick's wrens in North America, and currently it is the most

understudied. Additionally, several important aspects of the life history of this species are currently unknown, including nest-site fidelity and seasonal survival. As such, the objectives of this project are to estimate: 1) seasonal and annual survival of Bewick's wrens within central Texas; 2) the nest-site fidelity of breeding wrens and their offspring; and 3) the effects of various ecological factors on nesting success of wrens within central Texas. To do this, we have collected nesting parameter data from 60 nest boxes at the Freeman Center during the spring and summer of 2015. Additionally, birds were captured and banded, and re-sights have been performed once a month in order to estimate seasonal and annual survival. Nest-site fidelity will be estimated using the previously mentioned banded birds and nest boxes. Various ecological factors, such as landscape characteristics (e.g. vegetation composition, distance to edge) within 50 to 100 m of the nest box, distance to nearest neighbor (i.e. closest neighboring Bewick's wren nest), and nest success of the previous year, will be examined in this analysis. For 2016 and 2017, we will continue to examine nest-site fidelity and seasonal survival, as well as the possible interaction between mate choice, nesting success, and the degree of site fidelity.

54. WHERE THE ANTELOPE PLAY: FINE-SCALE ANALYSES OF HABITAT USE AND HOME RANGE SIZE OF GPS-COLLARED PRONGHORN IN TEXAS**

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Abstract: Pronghorn antelope (*Antilocapra americana*) are known to be affected by anthropogenic features, such as fences and highways. However, pronghorn movements or habitat use in relation to anthropogenic features has rarely been quantified. We studied pronghorn habitat use in a mosaic of agriculture and livestock production in the Texas Panhandle. We fitted 50 pronghorn with GPS collars during March 2014, 25 at each of 2 sites near Pampa and Dalhart. Locations were recorded from April to September 2014. Spatial analyses revealed that major highways with high traffic volume, such as U.S. Highway 385 in Dalhart and Texas Highway 70 in Pampa, were barriers to movement. All pronghorn crossed low-traffic county and farm-to-market roads readily. Pronghorn used primarily grassland habitats (72.4% total use), and, when in agricultural habitats (16.8% total use), used predominantly winter wheat (46.6% agricultural use) rather than other crops. We accounted for autocorrelation between consecutive locations when fixes were <120 minutes apart to ensure we did not underestimate home range size. The average 95% kernel home range was similar between males and females, but highly variable within genders (male = 1,287.7 ha, SD = 651.4; female = 1,179.1 ha, SD = 734.9). We will expand our analyses to evaluate pronghorn proximity to agriculture, use in relation to availability, and movement distances in the Panhandle, and perform similar analyses for pronghorn collared in the Trans-Pecos in 2015. The resulting data will increase understanding of pronghorn biology and improve management, mitigation of crop damage, and placement of pronghorn-friendly fencing in Texas.

55. EVALUATION OF THE EFFICACY OF NALBUPINE-AZAPERONE-MEDETOMIDINE FOR IMMOBILIZATION OF FERAL SWINE AND THE REVERSAL OF THAT IMMOBILIZATION WITH NALTREXONE AND ATIPAMEZOLE**

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Abstract: The purpose of this study is to evaluate the quality of anesthesia produced by a combination of nalbuphine (a non DEA-controlled opiate agonist/antagonist), azaperone (a butyrophenone neuroleptic sedative) and medetomidine (a potent alpha-two agonist) (NAM) for use in feral swine. Additionally, this study will evaluate the quality of reversal of NAM using naltrexone and atipamezole in feral swine. Appropriate dosage of NAM for feral swine will be determined through a pilot study, during which feral swine will be injected with variants of 50% around an initial dosage of 1.0mL/100lbs body weight until a spectrum of response to the anesthetic has been observed. During January 2016, up to 30 adult feral swine will be captured on a study site north of San Antonio, Texas and anesthetized using NAM. Quality of the anesthesia will be quantified by measuring time to first effect, time to recumbency, ease of handling, and body temperature. Metrics for evaluating quality of anesthesia reversal will include time to first effect, time to autonomous maintenance of recumbency, time to stand, and time to walk. Results will be compared to published results on the efficacy of other anesthetics for immobilization of feral swine and the efficacy of NAM for immobilization in other ungulate species.

56. VARIATION IN SMALL MAMMAL AND VEGETATION COMMUNITY COMPOSITION ACROSS SUCCESSIONAL STAGES FOLLOWING PRESCRIBED BURNING AT A BLACKLAND PRAIRIE IN NORTHEAST TEXAS**

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Abstract: Clymer Meadow Preserve in Texas is one of the largest remaining blackland prairies in the world. Our goal there was to measure species richness and density of small mammals and plants across successional stages following prescribed burning. Data were collected from four treatments of 2, 7, 8, and 20+ years post-burn, each consisting of two plots. Small mammals were collected using 49 Sherman traps per plot, between sunset and sunrise for three nights; animals were ear-tagged and identified to species. Vegetative compositions and densities were determined by averaging 12 randomly selected 0.25 m² quadrats per treatment. We captured 190 individuals during 1,176 trap nights. Species-richness of small mammals was relatively similar across treatments; however, greatest densities occurred in the 7, 2, 8, and 20+ years post-burn

treatments, respectively. Adult hispid cotton rats dominated the 7-year post-burn treatment, which was primarily composed of litter at base heights; Drummond's dropseed, eastern gamagrass, and little bluestem at mid-heights; and willow aster, false boneset, and maximilian sunflower at emergent layers. High hispid cotton rat densities appears to correlate with the presence of densely growing grasses such as Drummond's dropseed and eastern gamagrass, and is apparently dependent on a thick litter layer at base heights. Little bluestem also appears to provide a favored resource for cotton rats, while communities associated with weak cover such as big bluestem appear to be less favored. These results suggest that primary successional stages, which are permitted by prescribed burning, allow for greater abundances and possibly also species-richness of small mammals.

57. BACTERIA PREVALENCE IN SMALL MAMMALS ON PUERTO RICAN DAIRY FARMS**

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Abstract: Emergent infectious disease outbreaks consist largely of zoonoses, which are diseases originating from animals. A widespread zoonosis is Leptospirosis, a potentially fatal disease caused by the pathogenic bacterial spirochetes of the genus *Leptospira*. In Puerto Rico incidences of this disease in humans are increasing and affecting livestock production and health at local cattle farms. Using standard live-trapping techniques mongooses (*Herpestes auropunctatus*) and commensal rodents (*Rattus* and *Mus*) were collected in 2014 from five farms located throughout Puerto Rico. I used qPCR assays targeting the LipL32 diagnostic gene to identify the presence of pathogenic serovars of *Leptospira* in kidney samples of the collected specimens. I discovered 26% prevalence in rodents and no positive samples within the mongooses. Ultimately, these results will be useful for guiding wildlife management strategies to reduce the rate of disease transmission on cattle farms.

58. FALLOW RICE FIELD SEED BANK POTENTIAL ON THE UPPER TEXAS COAST: VIABILITY FOR MOIST-SOIL MANAGEMENT**

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Abstract: The upper Texas coast contains vast areas of wetlands, which provide critical habitats for a large numbers of wintering waterfowl. This region has experienced significant declines in

wetland quantity and quality from a variety of anthropogenic and natural causes. Manipulation of wetland hydrology via inundation and drawdown timing and duration, referred to as moist-soil management, tends to increase production of high quality food resources for wintering waterfowl. Characterizing potential vegetation community response to hydrologic variations in managed wetlands will increase management efficacy to meet existing and future habitat demands. We conducted a seed bank study using 105 core samples collected from 21 fallow rice fields located on Anahuac National Wildlife Refuge in Chambers County, Texas. Samples were mixed, evenly divided, randomly assigned to either moist or inundated treatments, and maintained in a greenhouse for > 150 days. Emerging seedlings were removed from dishes, placed in separate growth containers, and grown until individual seedlings were identifiable. A total of 9,471 seedlings from 65 plant species were identified, 76% of all seedlings were either desirable or highly desirable, based upon previously published waterfowl food values and criteria. During the first 30 days of monitoring, germination rates of desirable and undesirable seedlings were similar ($P > 0.05$) in both inundated and moist treatments. Between 31–90 days, desirable species seedling emergence outpaced ($P < 0.05$) undesirable seedlings, in both treatments. Clearly, fallow rice field seed banks contained valuable waterfowl plants, and these habitats can be successfully managed to enhance critical wintering waterfowl habitats.

59. HUMAN DIMENSIONS OF CONSERVATION PHOTOGRAPHERS IN WILDLIFE MANAGEMENT**

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Abstract: Conservation photography is a powerful tool that uses images of wildlife (often threatened or endangered) and/or critical habitat to raise conservation awareness. The purpose of these images is to capture the beauty of nature through a digital medium which few will ever physically see in the wild while also appealing to the viewer to be a participant for the cause of conservation. By using conservation photography, numerous organizations attempt to champion different environmental causes or at best educate the public about conservation issues they feel are important. A few of these organizations, such as Wildlife in Focus, concentrate on regional locations and offer monetary prizes to photographers of all skill sets with the purpose of drawing attention to conservation issues. These contests are conducted generally on an annual or semi-annual basis and attempt to unite photographers with landowners. Photographers may range in skill from novice to professional while landowners may include small ranches/farms, larger ranches, and conservation areas. This project will gather information from both photographers and landowners to gain an understanding of why they participate in these contests and more importantly what inspires them to photograph nature. By using either a mail-in or online survey, we will analyze the different socio-economic factors of conservation photographers as well as the landowners who offer the use of their property. Furthermore, we hope to discover if photographers and landowners participate in other conservation causes besides conservation photography such as hunting/fishing or conservation/restoration events.

60. EFFECTS OF THERMAL ENVIRONMENT ON THE GROWTH AND HEALTH OF WHITE-TAILED DEER FAWNS (*ODOCOILEUS VIRGINIANUS*) DURING SUMMER**

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Abstract: White-tailed deer (*Odocoileus virginianus*), like all mammals, maintain body temperature by balancing the generation and dissipation of body heat under ambient conditions. High summer temperatures in South Texas may negatively influence the growth of deer, but the magnitude of those effects is largely unknown. We studied the effect of summer temperatures on growth and food consumption of captive fawn white-tailed deer during July–October 2015. Of the 17 fawns born, 8 were randomly assigned to an ambient temperature pen (control), and 9 to a cool-air treatment, where they could access a cooler environment. We recorded food intake, growth rate, and behavior. We hypothesized that fawns with access to the cooled area would be able to dissipate digestive and metabolic heat more readily, and therefore maintain higher intake rates and activity levels. Preliminary results indicate that deer with access to a cooler environment grew at a faster rate than control deer, and weighed 1.1 kg more at 10 weeks of age (age*treatment interaction, $P = 0.064$). Additionally, treatment fawns consumed more milk than control fawns during the first 5 weeks of life (age*treatment interaction, $P = 0.077$). We observed no difference in activity between treatment and control fawns. Results of this study will help managers understand an important environmental constraint for deer in South Texas and will provide insight into habitat and water management projects that could help deer contend with summer heat.

61. TEMPORAL AND SPATIAL DISTRIBUTION OF HISTORIC HUMAN AND CARNIVORE ENCOUNTERS IN BIG BEND NATIONAL PARK**

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Abstract: Encounters with large carnivores can be positive and/or negative for park visitors. An encounter is any interaction with wildlife experienced by a person (track, auditory, sighting, and physical contact); an incident is an encounter involving contact with human property, aggressive behavior, or attack on a person. Better understanding of human-carnivore encounters will allow park managers to mediate between positive encounters and negative incidents. The goal of this study was to consolidate historic reports of human and carnivore interaction in the Big Bend National Park. When a puma (*Puma concolor*) or black bear (*Ursus americana*)

encounter occurs, visitors are asked to fill out a natural history field observation card (Form 10-257). Encounters were grouped and summed by year, month, day of the week, and hour. I mapped each encounter and incident in ArcGIS. There were a total of 3,862 puma encounters and 6,871 black bear encounters recorded before 30 June 2015. Most puma encounters occur in the evening while most black bear encounters occurred during the morning. There was an increase in puma and black bear encounters during winter months. Eight of the top 10 management zones for puma encounters and all of the top 10 management zones for black bear encounters were Chisos Mountain zones. Carnivores play an important role in ecosystem function and are identified by many as symbols of wilderness. Park managers need this type of historic data to continue to conserve these species and address human safety issues.

62. ROOST-SITE SELECTION OF NORTHERN BOBWHITES IN THE EDWARDS PLATEAU**

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Abstract: The roosting habits of northern bobwhites (*Colinus virginianus*) are not well known. Previous researchers have reported that bobwhites roost in open grassland with herbaceous vegetation heights ranging from 30–90 cm. However, information from a pilot study on bobwhites conducted in the Edwards Plateau revealed that the composition of bobwhite roost sites may differ substantially from prior findings. As a result, we initiated a study in 2015 to quantify roost-site selection of bobwhites in the Edwards Plateau. From January–August, bobwhites were radio-marked and located an hour after dark once per week to locate roost sites. We sampled vegetation the following day at the roost site and at a paired random site. Resource selection functions were used to quantify bounds of selection. Unlike bobwhites in other portions of their range, >90% of bobwhite roost sites ($n = 70$) were located in low growing woody cover instead of grassland. Specifically, shinoak (*Quercus pungens* var. *vaseyana*) and regrowth live oak (*Quercus virginiana*) were commonly used. Understanding roosting habits and ecology will aid in making important decisions regarding habitat management and restoration.

63. INFLUENCE OF WOODY COVER ON NORTHERN BOBWHITE SEASONAL SURVIVAL**

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Abstract: Northern bobwhites have relatively low survival rates across their geographic distribution. Predation is a primary cause of the high mortality in bobwhites, and the amount of brush available may have a local impact on bobwhite survival by providing escape cover and protection. Even though many researchers have attempted to determine the woody plant canopy cover requirements for bobwhites, few have attempted to study how woody plant canopy cover may influence bobwhite survival. The objective of this research is to determine if bobwhite seasonal survival (Mar–Aug) is correlated with the amount of woody plant canopy cover used at both the individual location, home-range, and pasture scales. Data was collected during 2009–2015 on 5 private ranches in Goliad, Zavala, Real, and La Salle Counties. We also will use data from a long-term research project (2000–2008) conducted in Brooks County. Radio-marked bobwhites were relocated 3 times/week to monitor survival and woody cover use. We estimated woody canopy cover at bobwhite locations and at paired, random points using the line intercept method. Points taken from bobwhites were uploaded into ArcGIS to estimate woody cover within home-ranges and within the pastures that contained those points. Bobwhite survival will be estimated using the Kaplan-Mayer method. We will use regression analyses to determine if a relationship exists between woody cover use and seasonal survival for each of these scales.

64. REPRODUCTIVE SUCCESS OF BARN SWALLOWS NESTING ON BUILDINGS ALONG THE SH 24 CORRIDOR IN NORTHEAST TEXAS**

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Abstract: Barn swallows (*Hirundo rustica*) are known for using manmade structures such as buildings, bridges and culverts as nesting sites. The reproductive success under bridges and culverts has shown a decline in northeastern Texas apparently in response to the expansion of cave swallows (*Petrochelidon fulva*) into the area. This is believed to be caused by eviction from nesting sites and an increase in brood loss due to increasing density in mixed species colonies. Despite the marked decline in barn swallows nesting under bridges and in culverts, barn swallows are still common in the area and may be relying more on nesting on buildings than occurred previously. This study will investigate the reproductive success of barn swallows nesting on buildings to determine how well these birds are doing. Ultimately the results will be used to determine whether local populations of swallows are showing a stratification of nesting habitat that results in equal reproductive success or whether this stratification is occurring at the detriment to barn swallows by virtue of forcing them to nest in locations where they experience decreased reproductive success.

65. ANTLER CHARACTERISTICS AND TROPHY POTENTIAL OF JUVENILE WHITE-TAILED DEER

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Abstract: Our objective was to determine whether adult antler quality of free-ranging white-tailed deer (*Odocoileus virginianus*) can be predicted from juvenile antler characteristics, thus

allowing early selection for quality animals. From a population of 1,815 known-age bucks in south Texas, we obtained the harvest records of 165 mature (4.5–9.5 years) bucks initially ear-tagged as antlerless fawns (61), hardened antler fawns (34), spike antlered yearlings (39) and branched antlered yearlings (31). To counteract the strong influence of age on antler score ($F_9 = 118.901$, $P < 0.0001$), we used analysis of covariance, with age as the covariant, to determine the relationship between final Boone and Crocket score and juvenile antler characteristics. We found no difference in adult antler scores of antlerless and hardened antler fawns ($F_{1,92} = 0.00$, $P = 0.9550$). Overall, branched antler as yearlings produced about 7 inches more adult antler than spikes ($F_1 = 4.62$, $P = 0.0337$). However, antler scores were dominated by the few ($n = 9$) 7–9 point yearlings that had 17 inches more antler than 3–6 point yearlings when harvested ($F_1 = 9.20$, $P = 0.0033$). Removal these quality yearlings from the analysis reduced the difference between branched and spike antlered yearlings ($F_1 = 2.37$, $P = 0.1265$). With the exception of the few very best yearlings, the age at which a buck is harvested had more effect on antler score than whether the buck had hardened antler as a fawn or branched antlers as a yearling.

66. GREEN ANOLE HABITAT RELATIONSHIPS IN LONGLEAF PINE FORESTS AND THEIR IMPORTANCE IN THE DIET OF NESTING AMERICAN KESTRELS

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Abstract: The green anole (*Anolis carolinensis*) is common within a variety of habitats in the southeastern United States. It is an important prey item for nesting American Kestrels (*Falco sparverius*) in the West Gulf Coastal Plain, accounting for 30% (147 obs.) of prey delivered to nests. We examined green anole habitat use at perch heights ≤ 5 m, particularly in relation to woody shrub-level vegetation, in fire-maintained longleaf pine (*Pinus palustris*) forest stands on the Angelina National Forest in eastern Texas. We surveyed green anoles in two stands within American Kestrel nesting habitat. We established 20 plots per stand with varying shrub densities and surveyed anoles during June (anole breeding season) and August (anole post-breeding season) for three years. An unforeseen prescribed fire in one stand provided an opportunity to examine the effects of fire on anoles and their habitat. Only adults were found during June. Adult detections decreased substantially and juveniles predominated during August. The number of anole detections was positively correlated with the number and volume (m^3) of shrub-level plants (woody shrubs and vines). Shrub-level vegetation was the most commonly used perch substrate by green anoles (80% of all observations). Also, anoles selected shrub-level plants with greater than average width, height, and volume. Larger shrubs provide more display perches and escape routes as well as greater protective cover from predators, and perhaps greater availability of arthropod prey.

67. MIGRATORY BIRDS IN AN URBAN SETTING: A SERIES OF CASE STUDIES

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Abstract: The state of Texas is uniquely situated between wintering and breeding grounds within a major migratory corridor and serves as important stopover habitat for many avian species. The state is also experiencing rapid population growth within its urban centers, referred to as the Texas triangle (the shape formed by connecting Dallas/Fort Worth, Austin, and San Antonio). Increasing urbanization alters the natural functional processes that shape ecosystems and how wildlife select for and utilize habitat. Many species of migratory birds utilize urban centers either for stopover habitat along their migratory routes or as destinations within their summer/winter ranges. Three unique case studies of migratory birds utilizing urbanized habitat in north Texas are presented: a nuisance cattle egret (*Bulbulcus ibis*) rookery within a proposed development site; a breeding pair of cooper's hawk (*Accipiter cooperii*) nesting on an existing office building property; and a sampling of migratory bird species utilizing habitat along a highway right-of-way. Presentations of each case study will include a review of unique urban challenges, actions taken including abatement techniques, and how technology assists in monitoring and management of migratory birds in an urban setting.

68. MODELING NORTHERN BOBWHITE NEST SUCCESS AND BREEDING-SEASON SURVIVAL ON TWO CATEGORIES OF POST-GRAZING HABITAT RECOVERY

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Abstract: Northern bobwhites (*Colinus virginianus*) require habitat structure with substantial grass cover for nesting, predator avoidance, and thermal refuge. During the past 2 decades, many land managers have reduced or completely eliminated livestock across South Texas rangelands with the goal of improving bobwhite habitat. Bobwhite response to post-grazing habitat recovery is unknown. Our objective is to investigate how bobwhites respond to the vegetative changes following removal of grazing. Our study is being conducted on a private ranch in Jim Hogg County, Texas and involves 2 different categories of post-grazing recovery: 1 3,080 acre pasture at 15 years post-grazing, and 1 2,800 acre pasture of 3 years post-grazing. Bobwhites were trapped, radio-collared, and located from April to September 2015 on the 2 experimental units. In 2015, 66 birds and 53 birds were trapped on the 15 years and 3 years post-grazing sites respectively. Similarly, 33 and 19 nests were monitored. Program MARK was used to model nest success and breeding season survival on each site. Nest success on the 15 years post-grazing area was $63\% \pm 0.006$ (SE) compared to $40\% \pm 0.012$ on the recently grazed area, though confidence intervals overlapped. Breeding season survival was $58\% \pm 0.031$ on the 15 years post-grazing site and $44\% \pm 0.042$ at the 3 years post-grazing site with overlapping confidence intervals. Future research will focus on identifying factors causing these differences,

therefore informing managers about bobwhite preferences in post-grazing landscapes and providing ideas for future restoration strategies.

69. WILDLIFE DIVERSITY AND FERAL HOG POPULATIONS IN SOUTHERN BEXAR COUNTY

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Abstract: The expansion of cities has caused rangelands to decline and wildlife to be extirpated and lose valuable habitat. Bexar County (San Antonio) is rapidly expanding and the southern portion of the county is becoming a focal point for expansion. Texas A&M University-San Antonio campus is located in this area and the southern region of the county. The campus contains a large area of rangeland that is fragmented but may be suitable for different wildlife species. Our objective was to begin a long term study that will determine the wildlife diversity on suburban and rural properties located in southern Bexar County as well as attempt to estimate feral hog (*Sus scrofa*) populations. Data was collected using a maximum of four stationary Wildlife Innovations remote sensing cameras at each of the properties. The placement of cameras was selected by visually identifying areas that had wildlife activity, such as trails, disturbances, and water sources. Wildlife species and number of animals were identified in each image. Locations will be compared using wildlife diversity indices and feral hog estimates will be based on presence in images, individual hogs in photos, and documented reproduction estimates. Results from these analyses will provide an initial estimate of wildlife diversity in southern Bexar County. Identifying areas that are source or sinks would provide valuable information for future areas developed and to curtail the development of areas that are sources and contain greater diversity.

70. DEVELOPMENT OF A CARBON DIOXIDE EUTHANASIA TRAILER FOR FERAL SWINE

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Abstract: Range expansion of feral swine (*Sus scrofa*, Linnaeus) continues to be pervasive in the United States. Lethal control of feral swine is an accepted management practice throughout the nation. Indirect lethal control measures (e.g. trapping) often require euthanasia and methods used must be humane, safe, and economical. Though cranial gunshot is an accepted method of euthanasia, in some cases it is not safe, legal for use, or practical. Additionally, an alternate means for euthanasia of wildlife research subjects are needed at the Feral Swine Research Facility on the Kerr Wildlife Management Area (KWMA), Hunt, Texas. Institutional Animal Care and Use Committee (IACUC) protocol at KWMA requires humane euthanasia of test

subjects upon completion of their respective research trials. The American Veterinary Medical Association (AVMA) Guidelines for Euthanasia of Animals approves a gradual fill method of Carbon Dioxide (CO₂) euthanasia for some laboratory animals and livestock species, including domestic swine. Previous research has identified the use of an enclosed dump-bed truck or trailer as a CO₂ chamber for efficient means of euthanizing and disposing of large numbers of domestic swine, however, there is no documentation on the efficacy of such methods on wildlife species. We manufactured a self-contained CO₂ euthanasia chamber on a 4.27m (14') dump trailer for the euthanasia of feral swine. Three euthanasia trials of 5 feral swine ($n = 15$) were conducted at the KWMA. Carbon Dioxide administration began immediately post-loading and commenced for 5 minutes at an average of approximately 18% chamber volume per minute. A 20 minute observation period followed each 5 minute CO₂ wash-in period. Group behavior was monitored through 3 viewing ports on top of the unit. Recorded mortality rates were 100%. Results of this study may have wide spread impacts on wildlife euthanasia protocols for wildlife researchers and state game agencies across the nation.

71. SHORT DISTANCE TRANSLOCATION AS A MANAGEMENT STRATEGY FOR THE ENDANGERED JAMAICAN BOA

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Abstract: The Jamaican Boa (*Chilabothrus* (formerly *Epicrates*) *subflavus*) is a foreign endangered species protected under Jamaican legislation based on declines in much of its historical range. We radiotracked 7 female boas in Cockpit Country Conservation Area (CCCA), Jamaica, from December 2010 to November 2012 to assess the effects of short-distance translocation (SDT) on survivability, home range size and microhabitat use of translocated individuals. A subset of 7 resident Jamaican Boas radiotracked in CCCA from November 2008 to June 2009 was used for comparison to our SDT snake data. No mortalities or significant differences in home range size based on two methods of home range analysis were recorded for SDT as compared to resident female boas in CCCA, although 2 SDT boas did return to their previous home range. Visual detectability was higher for resident as compared to SDT snakes but no significant difference was detected between these two groups use of arboreal and terrestrial locations as both were found to utilize arboreal locations in greater proportion. Using principal component analysis, we found that both resident and SDT boa locations were characterized by tall, canopy layer trees with vines and epiphytes, but SDT boas utilized larger trees with greater epiphyte densities than resident snakes. Our results suggest that translocated, female Jamaican Boas alter their foraging strategies to survive in unfamiliar areas. Our results also showed that short-distance translocation has potential as a management strategy for the conservation of Jamaican Boa populations in CCCA, which can aid in the recovery of this vulnerable species in Jamaica.

72. VARIATION IN THE MELANOCORTIN 1 RECEPTOR (MC1R) GENE AND PLUMAGE DIFFERENCES AMONG NEW WORLD QUAILS

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Abstract: Variation in plumage coloration in many birds is due to mutations that change the amino acid composition in the melanocortin 1 receptor (MC1R) gene. We explored whether such non-synonymous mutations in MC1R were responsible for plumage variation among 6 species of New World quails, including the northern bobwhite (*Colinus virginianus*), scaled (*Callipepla squamata*), California (*C. californica*), Gambel's (*C. gambelii*), mountain (*Oreortyx pictus*), and Montezuma (*Cyrortyx montezumae*) quails. We 1) analyzed the MC1R sequences for non-synonymous mutations, 2) compared the distribution of these substitutions with plumage variation in bobwhites and the taxonomy of New World quails, 3) tested for positive and purifying selection, and 4) assessed the usefulness of MC1R for phylogenetic analysis by reconstructing the evolutionary relationships of New World quail. We observed 31 mutations, including 4 non-synonymous mutations; all were transitions. The distribution of non-synonymous mutations was not concordant with plumage variation or taxonomy, with the exception being a change replacing asparagine with serine that occurred in Montezuma quail. Tests for purifying selection were statistically significant for Gambel's and scaled quails, and the plains and masked bobwhites. Northern bobwhites and Callipepla quails could not be differentiated from one another based on MC1R, whereas phylogenetic reconstruction based on mitochondrial DNA recovered all 6 species as genetically distinct taxa. Our results suggest that among New World quails MC1R 1) is not associated with plumage variation, 2) is highly conserved due to purifying selection, and 3) is not a useful phylogenetic marker in New World quails.

73. SIMULATED EFFECTS OF SEX-RATIO DISPARITY ON POPULATION DYNAMICS OF THE ENDANGERED HOUSTON TOAD

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Abstract: Amphibian populations have been documented to be declining worldwide for the last three decades. Determining the risk of extinction is one of the major goals of amphibian conservation. However, sex-ratios are difficult to determine for amphibians with short, seasonal breeding cycles. The sex-ratio of reproductively mature individuals within a population is an important determinant of population dynamics, particularly for species such as the Houston toad (*Bufo houstonensis*), an endangered species endemic to east central Texas. The species demonstrates differences in the age at sexual maturity for males and females thus causing a large sex-ratio disparity. The objective of our research is to determine how this disparity affects the population dynamics and ultimately, the future of this critically endangered anuran. We conducted a thorough literature review to obtain the best basic demographic data available and developed a stage- and sex-structured population dynamics model for the Houston toad using STELLA®7.0.1. We then applied the model to estimate potential population growth rates under a variety of assumptions about the disparity in age at sexual maturity between males and females and the resulting sex-ratio of reproductively mature individuals within the population. Finally, we evaluated the performance of the model based on published literature. Our results showed that the populations of Houston toad declined when the sex ratio was around 4M:1F and the populations exhibited stability when the sex ratio was around 1M:1F. We will include uncertainty analyses in the model to provide a range of potential sex ratios of Houston toad which supports a stable population.

74. ARTHROPOD RESPONSE TO IRRIGATION OF WILDLIFE HABITAT

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Abstract: Brood habitat characteristics of northern bobwhite (*Colinus virginianus*) remains one of the least understood components of this game bird's ecology. Thus, there is little information available to guide management of brood habitat. Irrigation of habitat to offset drought effects is an uncommon management technique which has received no attention by researchers. This practice could benefit bobwhites by providing food sources through localized areas with high arthropod production in habitat suffering from drought. A private ranch in South Texas installed an irrigation system in an effort to improve bobwhite habitat. In July and August 2015, arthropods were sampled utilizing two collection methods at three habitat categories: irrigated patches, natural brood foraging locations, and available habitat points. These data were analyzed under a completely randomized design framework. Differences in arthropod diversity and biomass were determined between the three habitat categories. This study will determine the efficacy of irrigation in providing an important food source to bobwhite chicks.

75. HABITAT USE OF THE TEXAS TORTOISE ON A LANDSCAPE MANAGED FOR RECREATIONAL HUNTING

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Abstract: The Texas tortoise (*Gopherus berlandieri*), the smallest North American tortoise species, is chiefly associated with the Tamaulipan Biotic Province of southern Texas and northern Mexico, and its distribution appears limited to thorn-scrub communities. The biology of this species remains poorly understood. Knowledge of Texas populations remains very localized, as most literature covers research conducted on coastal populations in Cameron and Willacy counties and an inland population in Dimmit and La Salle counties. Intraspecific variability in life history characteristics necessitates thorough knowledge of a species across its range to guide conservation and management decisions. This species is distributed over a portion of Texas that is characterized by large, private land holdings utilized for cattle grazing and recreational hunting. Habitat management for game species in South Texas involves maintenance of a patchwork of woody cover, herbaceous cover, and bare ground. In 2015, 12 tortoises were followed through radio-telemetry to determine how they utilize a landscape managed for game species. Home range sizes were quite variable and preliminary analysis shows males maintain a larger home range than females. This study will continue in 2016, and research conducted on this population will fill in natural and life history data in an area of their distribution that has not been studied and determine the compatibility of managing for recreational hunting while maintaining landscape characteristics important to Texas tortoises.

76. PREVALENCE OF INFECTIOUS AND NONINFECTIOUS DISEASES IN RIO GRANDE WILD TURKEYS LOCATED IN SOUTHERN TEXAS

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Abstract: Wild turkeys (*Meleagris gallopavo*) are susceptible to a variety of viral and bacterial diseases. However, most of the wild turkey disease research published has been conducted on the eastern wild turkey (*M. g. sylvestris*). Only three studies have been conducted on Rio Grande wild turkeys (*M. g. intermedia*) in south Texas and these studies were conducted more than 30 years ago and were restricted to 2 counties. The results of these research projects indicated that mycoplasmosis, and salmonellosis commonly occur in south Texas wild turkeys, however other disease organisms may also occur in south Texas turkey populations that were

never isolated because they were not thought to occur in wild turkeys 35 years ago. Therefore, the objective of this study is to conduct disease reconnaissance on wild turkeys in at least 4 south Texas counties. In addition to mycoplasmosis and salmonellosis, we will screen for aspergillosis, reticuloendotheliosis, and avian influenza. Additionally, because our study sites are in the midst of a region where cattle fever ticks are a significant concern among landowners, we will also screen wild turkeys for the presence of *Babesia bovis* or *B. bigemina*. We anticipate that our results will not only provide updated information on diseases prevalent in south Texas wild turkey populations but will also help Texas Parks & Wildlife officials make decisions about wild turkey translocations and also potentially help animal health officials and ranchers better understand the dynamics of the cattle fever tick issue in south Texas.

77. WINTER ROOSTING FIDELITY FOR RIO GRANDE TURKEYS IN THE SOUTH TEXAS PLAINS

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Abstract: Roosting cover is often considered a limiting factor for wild turkey (*Meleagris gallopavo*) population on rangelands. We evaluated roost site fidelity of Rio Grande wild turkeys (RGWT, *M. g. intermedia*) to determine if differences exist between roosts selected by age and sex classes of turkeys. The study site is located approximately 19 km South of Hebbronville, Texas in Jim Hogg County within the South Texas Plains eco-region. Roost sites were located via VHF telemetry. A minimum of 30 relocations were obtained for each male ($n = 6$) and female ($n = 8$). Roost sites were located (≤ 3 days apart) initially using homing then triangulated from ≥ 150 -m to avoid disturbance of roosting birds. The data collected will be used to calculate median distances between roost sites for sex and age classes. Fidelity to a roost site will be expressed as a proportion of nights used to the number of total relocations. Our research hypotheses are: 1) roost site fidelity for adults, and hens and juvenile birds will be $> 50\%$ during winter, and 2) roost site fidelity for adult gobblers will be $> 75\%$ during winter.

78. DIFFERENCES IN POULT REARING SEASON HOME RANGES OF WILD TURKEYS IN THE SOUTH TEXAS PLAINS

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Abstract: Seasonal ranges of wild turkeys (*Meleagris gallapavo*) have been documented to vary among sex and age classes. We calculated poult rearing season home range size of radio marked individuals using the Minimum Convex Polygon home range estimator in the South Texas Plains. Home ranges were calculated and compared by sex and age classes. Mean home range of adult males ($n = 2$) was 481.8 ha (SE = 60.8). Mean home range of juvenile males ($n = 4$) was 876.9 ha (SE = 272.7). Average home range of females ($n = 3$) was 199.7 ha (SE = 30.4). Mean home range of males was significantly larger ($P < 0.05$) than mean home range of females. No significant differences were detected in mean home range size between adult and juvenile males. Mean home ranges of juvenile males were significantly ($P < 0.05$) larger than mean home ranges of juveniles females. Home ranges of adult males were significantly ($P < 0.001$) higher than home ranges of females. High mortality and equipment malfunction resulted in small sample sizes and increased variability. Therefore, this study should be re-evaluated with a larger sample size.

79. DETERMINING HOME RANGE AREA CURVE ASYMPTOTES FOR RIO GRANDE WILD TURKEYS IN SOUTH TEXAS

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Abstract: Home range area curves are used to estimate whether an animal's behavior has been adequately captured over a specific time period. Methods of interpreting whether an asymptote has been reached vary across studies. For our study, the objective was to determine whether or not an accurate estimate of home ranges has been reached. We will calculate winter home ranges of radio marked turkeys using 95% Minimum Convex Polygon and 95% Fixed Kernel estimators. We will use SAS NLMIXED to fit area observations to the number of locations using Exponential, Gompertz, Logistic, and Reciprocal functions. We will select the function equation with the best fit to determine an estimated asymptote for each area curve. The adequate number of relocations to determine a home range will be determined when a home range area curve comes within 1 standard error of the estimated asymptote. Recommended minimum sample size should be used to guide sampling strategy as it relates to frequency and not as a cut off point for a specific number of relocations.

80. PRODUCTIVITY OF UNMANAGED WHITE-TAILED DEER POPULATIONS IN SOUTH TEXAS: EFFECTS OF SOIL AND PRECIPITATION

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Abstract: White-tailed deer (*Odocoileus virginianus*) occupy a broad range of habitats throughout North America. The south Texas environment is one of the most extreme and highly variable in terms of precipitation and temperature. The variable environment affects nutrient availability, and ultimately survival, growth, and reproduction of deer. Wildlife managers in the region employ a series of intensive management practices to counter the effects of the environment, but the efficacy of many management strategies is poorly quantified. We assessed body size, condition, weight, antler scores, and lactation rates in unmanaged populations of white-tailed deer on four ranches in south Texas. Deer were captured during autumn of 2011–2015, which spanned periods of extreme drought and exceptional rainfall. As expected, recruitment of yearling deer varied greatly among years, depending on annual precipitation. Counterintuitively, we observed that populations of deer in the more mesic coastal region of south Texas were physically smaller than deer inland. Soil type affected body size and mass, where body size and mass declined for both males and females with increasing percentage of sand in the soil. The results of this study will provide a baseline for managers to use in evaluating the effectiveness of management actions for deer in the south Texas region.

81. RIO GRANDE WILD TURKEY BROOD HABITAT USE IN THE CROSS TIMEBERS REGION OF TEXAS

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Abstract: The Rio Grande wild turkey (*Meleagris gallopavo intermedia*) has the largest population and the widest range of the three turkey subspecies. Which consist of the Rio Grande, Merriam's, and Eastern wild turkeys all found in Texas. However, recent conservation groups have expressed concerns regarding habitat quantity and quality in association with population plateaus and declines in local abundance in some portions of the state. Studies demonstrate that management of Rio Grande wild turkey enhances female and poult survival during the nesting and brood-rearing periods can greatly influence population growth. Our goal

was to determine if female hens select certain habitat types during the brood-rearing period. During a two-year period (2014–2015), we radio-collared 95 hens with GPS backpacks and 8 hens with VHF collars. We would monitor hens >3 times weekly and nesting hens daily. Remote downloads of GPS data was conducted twice a week for nesting hens. We categorized the brood-rearing period as the first 15 days after the poults hatched. Once GPS data was recorded we used the R-code program to produce 95 percent and 50 percent kernels based on the total amount of time the brood spent in an area. The vegetation in this area was recorded by species, dominance and frequency. The dominant plant species was Annual broomweed (*Amphiachyris dracunculoides*) followed by Honey Mesquite (*Prosopis glandulosa*), Texas wintergrass (*Nassella leucotricha*) and Annual sunflower (*Helianthus annuus*). Rio Grande wild turkeys require a habitat that contains an interspersed of wooded and open areas creating large amounts of edge habitat to escape both heat and predators.

82. COMPARISON OF COMMON METHODS USED IN WETLAND SEED BANK ANALYSES

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Abstract: Seed bank characterization benefits the continued management, restoration and creation of wetlands. Many studies have compared the accuracy and effectiveness of seed bank analysis methods, yet literature lacks a comprehensive evaluation of major methods. In this literature review we explored advantages and disadvantages of variations on the two most common methods: seedling emergence and seed extraction. Seedling emergence methods provide information on the readily germinable seed bank, which can aid in the management of desirable plant species in a wetland impoundment, while extraction methods are generally useful for estimating total seed biomass in the soil. We contrasted the time investment and cost of processing each sample between methods, finding the most efficient extraction method to be manual washing. Seedling emergence methods can also be cost efficient, but require a long-term time commitment. A preliminary study is needed to determine appropriate methods and sample size for a study by gaining information about the site and testing greenhouse management practices.

83. MONITORING ENDANGERED SPRINGSNAILS AT BITTER LAKE NATIONAL WILDLIFE REFUGE: HOW MUCH EFFORT IS ENOUGH?

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Abstract: In an effort to derive abundance estimates and population trends for Roswell springsnails (*Pyrgulopsis roswellensis*) and Koster's springsnails (*Juturnia kosteri*), which are endemic to Bitter Lake National Wildlife Refuge, New Mexico, we initiated protocol development in 2014. We randomly selected 12 sample sites from three cienegas; six sites were selected in Bitter Creek, three in Sago Springs, and three in the Snail Unit. At each sample site, three sub-samples (edge, mid-point, center channel) were taken with a benthic sampler. Initial density estimates based on summer 2014 and fall 2014 sampling efforts had poor precision; coefficients of variation (CVs) from the two sampling periods exceeding 100% in all but one instance. Thus, we doubled sampling effort in each cienega and stratified by sub-sample location. Stratification alone improved precision of estimates in cienegas, and reduced overall CVs to 40% and 34% for summer 2014 and fall 2014, respectively. In 2015, doubling the number of sampling locations combined with stratification yielded overall CVs of 22%, 21% and 32%, respectively, for winter, spring, and summer sampling periods. At our current level of sampling (24 locations across three cienegas), we could detect a decline in abundance of 50% ($\alpha = 0.1$) in each cienega. Estimated total abundance of springsnails on the refuge ranged from 8.7 million + 1.9 million (SE) in winter 2015 to 26.9 million + 8.7 in summer 2015. Future efforts will involve evaluating methods to separate the two species concurrent with sampling efforts.

84. ECTOPARASITE SURVEILLANCE OF WILD TURKEYS IN SOUTH TEXAS

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Abstract: Ticks and mites such as northern fowl mite (*Ornithonyssus sylviarum*), red mite (*Dermanyssus gallinae*), and deer tick (*Ixodes scapularis*) are commonly recurring external parasites found in wild turkeys (*Meleagris gallopavo sylvestris*). However, very few surveillance studies have been conducted for Rio Grande wild turkeys (*M. g. intermedia*) in south Texas. Studies have shown that ticks such as the fowl tick (*Argas persicus*), lone star tick (*Amblyomma americanum*) and mites such as the tropical fowl mite (*Ornithonyssus bursa*) occur in other game birds in South Texas so it is likely that some of these ectoparasites occur on South Texas wild turkeys too. Wild turkeys were captured in 4 counties where cattle fever is a

significant concern among ranchers. Therefore, in addition to surveilling wild turkeys for common parasites that occur on gamebirds, we also examined turkeys for cattle fever ticks (*Rhipicephalus boophilus annulatus*) and (*R. b microplus*) as part of the surveillance effort. Ectoparasites were preserved in the field and then identified in the lab. Results of this study will be reported in this presentation.

85. SANDHILL CRANE WINTER HABITAT SELECTION AND FUTURE AVAILABILITY ALONG THE TEXAS GULF COAST

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Abstract: The Gulf Coast subpopulation of sandhill cranes (*Grus canadensis*) winters along the Texas coast where considerable land use changes have occurred over the last few decades. In order to understand how continuing landscape changes from expanding energy industries, changing agricultural practices, and urban growth will impact sandhill crane distributions in this region, more information is needed on their habitat requirements and migration ecology. During November 2015 through January 2016, satellite transmitters ($n = 28$ with ± 18 m accuracy) will be attached to adult sandhill cranes wintering along the Texas coast and will be programmed to take four locations daily. Using these locations, field surveys, and habitat data layers (National Land Cover, National Wetland Inventory, and National Agricultural Statistics Service Cropland Data Layer), we will research wintering ecology, specifically estimate habitat selection and use current rates of landscape change to forecast future availability of suitable habitat along the Texas coast. This information will help inform land management decisions aimed at reducing crop depredation, and help ensure the continued health of the Gulf Coast subpopulation.

86. COLLECTING BASELINE DATA ON WILDLIFE DIVERSITY AND ABUNDANCE IN A FIRE-SUPPRESSED EDWARDS PLATEAU WOODLAND COMMUNITY, MOUNTAIN HOME, TX

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Abstract: Ashe juniper (*Juniperus ashei* Buchh.) dominates rangeland in central Texas, converting grasslands to woodlands and decreasing grassland habitats for many native species. Additionally, many exotic ungulate species have escaped high-fence ranches, and compete with native species for habitat and food resources. Wildlife diversity and abundance was measured on an Ashe juniper-dominated private property where a large herd of invasive, exotic, axis deer

(*Axis axis* Erxleben 1777) was observed, in order to design targeted management plans to increase native wildlife species. Camera traps were deployed over two periods of four and six months; 1,135 trap events were calculated over 152 trap nights and 17 different species were identified. Axis deer were over 10 times more abundant than white-tailed deer (*Odocoileus virginianus* Zimmermann 1780), with 756 trap events total. The most heavily grazed plants were categorized as good and low quality for deer, which suggested an overpopulated herd with poor health and poor range conditions. Three of the four areas surveyed for the deer populations and forage conditions were categorized as heavily grazed, and the fourth as moderately grazed. The white-tailed deer population will likely not increase unless there is a managed reduction in the axis population, in conjunction with habitat improvements such as Ashe juniper removal and planting of native grasses, forbs, and browse species. Because the study area was only 40.47 ha in size, it can only potentially serve as a portion of white-tailed deer herd's suitable habitat. However, it may serve as an important resource for local white-tailed deer.

87. USING ROD SURFACE ELEVATION TABLES TO IDENTIFY MARSH ELEVATION DYNAMICS ON TEXAS NATIONAL WILDLIFE REFUGES

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Abstract: Anthropogenic activities, rising sea level, and salt-water intrusion have substantially reduced the amount of coastal marsh, and the ecological roles of marshland, throughout the Texas Gulf Coast. As these ecosystems degrade, so do the populations of species depending on them. Mitigating these issues requires understanding where marsh reduction is happening, the habitat changes occurring, and their pace. The southwest region of the United States Fish and Wildlife Service (USFWS) is taking an active role in establishing marsh elevation monitoring stations or sentinel sites on Refuges, and tying these data in with a larger inter-agency group dedicated toward monitoring sea-level rise, altered hydrology, and subsidence across the Gulf of Mexico. Specifically, we installed 42 individual rod surface elevation table (RSETs) benchmarks and vegetation monitoring stations at Anahuac, Aransas, Brazoria, McFaddin, and San Bernard refuges along the Texas Gulf Coast. Since the work occurs in close partnership with other agencies, information gained from Texas Refuges will contribute toward understanding rates of sea-level rise, sediment aggradation and vegetation changes across the entire Gulf coast and portions of the eastern seaboard. Due to the dynamic nature of coastal wetlands and pervasive changes in coastal marsh systems, this work will be focused in tidally-influenced coastal marshes. In aggregate, this project will improve conservation planning for the Texas Coast and Refuges, inform management of coastal habitats and species, help socioeconomic planners understand and attend to the human impacts along the Gulf of Mexico, and unravel the interdependencies between these topics in the context of climate change.

88. EVALUATION OF THE SUCCESS AND EFFECTIVENESS OF THE WELDER WILDLIFE FOUNDATION'S RANGELANDS CURRICULUM

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Abstract: The millennial generation is perceived to be less in touch with the outdoors, thus there is a need to provide educational resources and outdoor experiences to address this gap. The Rangelands curriculum was developed by the Welder Wildlife Foundation to teach the fundamental elements of Texas rangelands to students in kindergarten through fifth grades, although lessons can be modified to suit higher level thinking for older students. This science based curriculum goal is to instill in future generations a new appreciation for rangelands and the services they provide for humans and wildlife. The curriculum has been implemented in schools throughout all 20 Texas Education Service Center (ESC) Regions via workshops held at each ESC. Now, with an interest in the curriculum at the national level, the effectiveness of the curriculum needs to be evaluated. In order to evaluate the curriculum, I propose administering a survey and pre- and post-tests, to participating teachers and their students. Teachers will have selected and agree to implement at least 5 lessons from the curriculum. The surveys will evaluate the teachers' opinions regarding the curriculum. Pre- and post-tests administered to students will provide information on knowledge gained from the curriculum, changes in attitudes and opinions regarding rangelands following participation in curriculum lessons and participant's demographic information. Evaluation of results will assist with determining the impact of the curriculum on the academic achievements of students, along with the curriculum's effect on the behaviors, attitudes, and future goals of students and teachers.

89. UTILIZING PATCH BURN GRAZING AND FLORISTIC QUALITY ASSESSMENT IN THE TEXAS BLACKLAND PRAIRIE

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Abstract: In February of 2015 first entry prescribed burns were conducted on approximately 70 acres of each of two, 230 acre pastures in Navarro County, TX. These two pastures are classified entirely as Blackland Ecological Sites in which a tallgrass prairie is the reference climax plant community for all represented soil types. Each is managed under a cow-calf one pasture continuous grazing regime for at least the past 15 years. Important to our goals were whether or not introducing frequent fire back to the landscape and beginning a patch burn grazing management system could increase the abundance of climax tall grass species and perennial forbs. Although each pasture contained similar characteristics of soils, vegetation and management, the variable we expected to affect plant community response to patch burn grazing is the differing cattle stocking rates between the two, 10.45 ac/AUE and 7.67 ac/AUE. In order to measure shifts in the plant community composition over time, as well as differences between burned and un-burned portions of the pastures, we used a Floristic Quality Assessment (FQA) methodology based on Swink and Wilhelm's (1979, 1994) work in the Chicago region and modified for use in the Platte River prairies of Nebraska (Helzer 2012). This methodology uses a plot-wise FQA in which we sampled 100 1-m² plots in each pasture. Within each plot we

recorded all identifiable species within the plot and assigned each species a conservatism score from 0–10. Sampling in this manner can eliminate the subjectivity of vegetative cover scores and estimates. Furthermore, we can assess the frequency of occurrence of various species between plots, years, and pasture as the study continues. July of 2015 was our first sampling season, and we plan to continue sampling in subsequent years. Our first set of data is currently under evaluation.

90. HABITAT SELECTION BY DUCKS WINTERING AT ANAHUAC NATIONAL WILDLIFE REFUGE

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Abstract: Coastal marshes of the northern Gulf of Mexico comprise one of the most important waterfowl wintering areas in North America. Previous research has depicted food use of various wintering waterfowl species. However, quantifiable evidence of habitat selection by wintering ducks is still lacking, particularly at multiple spatial scales. Quantifying habitat use and selection of vegetative communities, food resources, and coastal marsh system type will provide a necessary baseline dataset that can be used during biological planning to set habitat objectives for wintering waterfowl on the upper Texas coast. We measured habitat selection by wintering ducks within Anahuac National Wildlife Refuge, Texas. We conducted aerial waterfowl surveys to track waterfowl chronology and habitat use monthly from October to February, 2014–2015. We visited geographically referenced sites with >500 individual birds and recorded submerged aquatic species (vegetation and invertebrates), salinity, water depth, and other habitat characteristics at each location. We collected the same data at a paired unused random location within each unit. We developed a hierarchical, generalized mixed logistic-model to assess waterfowl habitat selection at multiple spatial scales. The final product will be a habitat selection index for wintering ducks on Anahuac NWR.

91. WHITE-TAILED DEER PREFERENCE FOR CORN WITH 2 ADDITIVES TO IMPROVE PALATABILITY

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Abstract: Bait is an important tool for white-tailed deer (*Odocoileus virginianus*) management. Biologists use bait to conduct population surveys, treat deer with medication, and manage populations by harvesting deer. At the Alkek Ungulate Research Facility at Texas A&M University-Kingsville, we tested captive deer preference to corn with additives designed to improve palatability. Three types of corn were used. One type was whole corn bought locally and used as a control, another type was locally bought whole corn with an additive powder mixed in prior to feeding, and the last was corn with additives premixed at the feed mill. During a 7-day trial, we measured daily the time for deer to first investigate and then eat, number of visitations, and the amount eaten of each corn type. Deer preferred the control corn to the two treatments during the first 2–3 days of the experiment, but by the 7th day they showed no preference. Deer likely preferred the control corn initially because it is routinely fed to these deer. It is possible results of this experiment would have varied if the deer had no previous exposure to whole-kernel corn. Deer are likely to use caution when offered new baits but soon after accepted the 2 two treatment baits.

92. OPTIMIZING EFFORT FOR MONITORING OCCUPANCY OF A SMALL MAMMAL COMMUNITY IN SOUTH TEXAS

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Occupancy estimation that accounts for imperfect detection provides a robust method for monitoring populations that requires fewer assumptions than indices and less effort than monitoring abundance. However, allocation of effort between number of sites (S) and number of sampling occasions (K) can greatly influence efficiency. We used small mammal trapping data from 9 species captured at 76 sampling grids on 2 separate East Foundation ranches in 2014 and 2015 in an occupancy framework and a power analysis to explore the interplay among S , K , and power to detect a 30% decline in occupancy rates. We began by fitting occupancy models to datasets of capture records from each species separately and used the model averaged estimates for our power analyses. Detection probability (p) for a single night of trapping ranged between 0.53 and 0.97; occupancy rates (ψ) ranged from 13% to 95%. The number of sites required to detect a 0.30 decline in occupancy with 3 visits for uncommon species ($\psi < 0.50$) with a power of 0.85 ranged from 190 to 935. The number of sites required for our most common species ($\psi > 0.85$) ranged from 23 to 33. Many small mammal studies aim to detect

and monitor multiple species. An exercise such as ours will help identify which species can feasibly be monitored, and identify the most efficient means to do so.

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