

50th Annual Meeting

of the

Texas Chapter

of

The Wildlife Society



“The First 50 Years—Struggles and Achievements”

19–22 February 2014

Austin, Texas

2013–2014 EXECUTIVE BOARD

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PROGRAM

MICHEAL TEWES AND NOVA SILVY

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JEFF RAASCH

POSTERS

ANNALIESE SCOGGIN AND HEATHER MATHEWSON

MEETING SCHEDULE

Wednesday, 19 February

9:00 a.m.–5:00 p.m.	R for Wildlife Ecologists Workshop	Capitol View Terrace–North
1:00 p.m.–5:00 p.m.	Wildlife Tracking Workshop - Part I	Capitol View Terrace–South

Thursday, 20 February

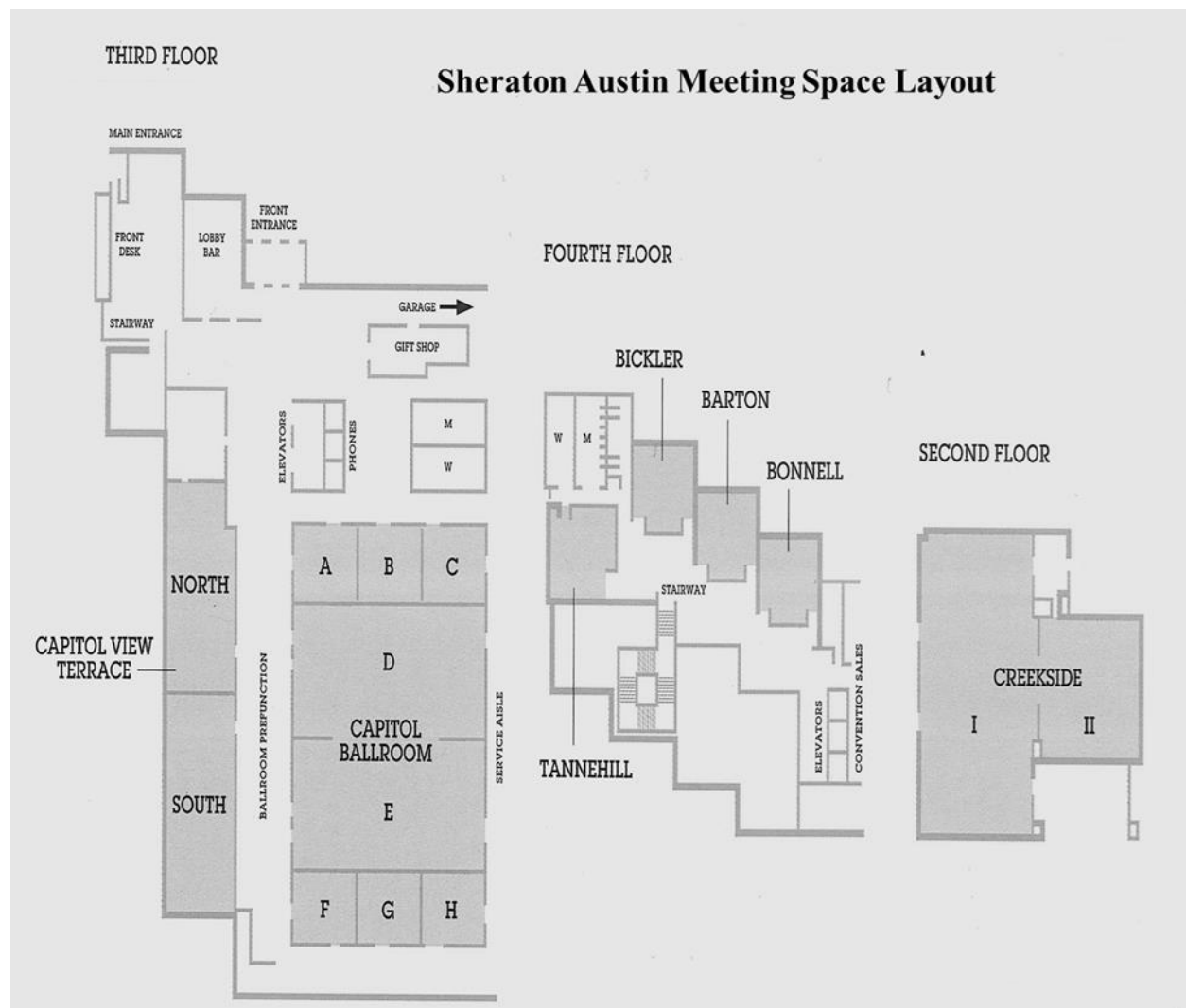
8:00 a.m.–12:00 p.m.	TAMU Agrilife Extension - Wildlife & Fisheries Science Meeting	Jacob Bickler
8:00 a.m.–12:00 p.m.	Wildlife Tracking Workshop -Part II	Main Foyer
9:00 a.m.–12:00 p.m.	Executive Board Meeting	Creekside II
9:00 a.m.–11:30 a.m.	Selling Conservation in a Private Lands State Workshop	Creekside I
12:00 p.m.–4:00 p.m.	Poster Session Set-up	Capitol Ballroom D
12:30 p.m.–2:30 p.m.	Finding Your Dream Wildlife Job Workshop	Creekside
1:00 p.m.–6:30 p.m.	Registration Open	Main Foyer
1:00 p.m.–6:30 p.m.	Raffle & Silent Auction Open	Capitol View Terrace
1:00 p.m.–6:00 p.m.	Presentation Submissions	Main Foyer
1:00 p.m.–3:00 p.m.	TCTWS Business Meeting	Creekside II
1:00 p.m.–5:00 p.m.	James G. Teer Conservation Leadership Institute	William Barton
1:00 p.m.– 6:30 p.m.	Exhibits Open	Capitol View Terrace
2:00 p.m.–6:00 p.m.	Student Plant ID Competition	Capitol Ballroom A–B
2:00 p.m.–6:00 p.m.	Professional Plant ID Competition	Capitol Ballroom C
2:00 p.m.–5:00 p.m.	Texas Quiz Bowl	Capitol Ballroom E–H
3:00 p.m.–4:30 p.m.	Southwest Section TWS Meeting	Creekside II
4:00 p.m.–6:00 p.m.	Poster Session	Capitol Ballroom D
4:00 p.m.–6:00 p.m.	Art & Book Signing	Ballroom Prefunction Area
5:00 p.m.–6:00 p.m.	Texas Wildlife & Fisheries Management Council	Jesse Tannehill
6:00 p.m.–8:00 p.m.	Art & Book Signing	Creekside
6:00 p.m.–6:30 p.m.	Student/Mentor Mixer	Creekside
6:30 p.m.–10:00 p.m.	President's Reception	Creekside & Patio

Friday, 21 February

7:00 a.m.–8:00 a.m.	Student Breakfast	Serranos Restaurant
7:30 a.m.–5:00 p.m.	Registration Open	Main Foyer
7:30 a.m.–10:00 a.m.	Art & Photo Contest Submissions	Main Foyer
7:30 a.m.–5:00 p.m.	Raffle & Silent Auction Open	Capitol View Terrace
7:30 a.m.–7:00 p.m.	Exhibits Open	Capitol View Terrace
8:00 a.m.–5:00 p.m.	James G. Teer Conservation Leadership Institute	William Barton
8:00 a.m.–10:00 a.m.	Plenary Session	Capitol Ballroom A–D
10:30 a.m.–11:45 p.m.	Cottam Award Papers	Capitol Ballroom A–D
10:30 a.m.–5:00 p.m.	Art & Photo Competition Judging	Jacob Bickler & Jesse Tannehill
12:00 p.m.–1:15 p.m.	Lunch	On Your Own
12:00 p.m.–1:30 p.m.	Past President's Luncheon	Creekside I
1:30 p.m.–4:00 p.m.	Concurrent Technical Sessions	Capitol Ballroom
3:00 p.m.–5:00 p.m.	Judge's Art & Photo Critique	Jacob Bickler & Jesse Tannehill
6:00 p.m.–7:00 p.m.	Pre-Banquet Social	Ballroom Prefunction Area
7:00 p.m.–9:30 p.m.	Awards Banquet	Capitol Ballroom

Saturday, 22 February

7:00 a.m.–8:00 a.m.	Fellowship of Christian Conservationists	Creekside II
7:30 a.m.–11:30 a.m.	Registration Open	Main Foyer
7:30 a.m.–11:30 a.m.	Exhibits Open	Capitol View Terrace
7:30 a.m.– 12:00 p.m.	James G. Teer Conservation Leadership Institute	William Barton
8:00 a.m.–12:00 p.m.	Executive Board Meeting	Creekside I
8:15 a.m.–11:00 p.m.	Concurrent Technical Sessions	Capitol Ballroom
12:00 p.m.	Adjourn 50th Annual Meeting	



Friday, 21 February 2014

PLENARY SESSION

Capital BALLROOM

MODERATOR: MICHAEL TEWES

- 8:00: Opening Remarks – 50th Anniversary Meeting**, – Michael Tewes, Program Chair, Texas Chapter of The Wildlife Society
- 8:05: Welcome and Introduction**, – Matt Wagner, President, Texas Chapter of The Wildlife Society
- 8:20: The Call of the Wild: Is Anyone Listening**, – Carter Smith, Director, Texas Parks and Wildlife Department
- 8:50: 77 Years Strong: History and Evolution of The Wildlife Society**, – Wini Kessler, Immediate Past President of The Wildlife Society
- 9:20: The Profession of Wildlife Conservation – Celebrating 50 Years of Progress**, – Jack Ward Thomas, Second President of Texas Chapter of The Wildlife Society
- 9:50: James G. Teer Leadership Institute**, – Selma Glasscock, Assistant Director, Welder Wildlife Foundation
- 10:00: Break–30 MINUTES**

CLARENCE COTTAM AWARD COMPETITION

Capital BALLROOM

MODERATOR: COREY MASON

- 10:30: Exploring the evolutionary distinctiveness of the Attwater's prairie-chicken using multi-locus coalescent analyses**, Stephanie J. Galla, and Jeff A. Johnson
- 10:45: An evaluation of inbreeding, immunocompetence and survival in the critically endangered Attwater's prairie-chicken**, Susan C. Hammerly, and Jeff A. Johnson
- 11:00: Identification of an isolated population of greater sage-grouse in northwest Wyoming**, Sarah E. Schulwitz, Bryan Bedrosian, and Jeff A. Johnson
- 11:15: Landscape effects on gene flow and genetic structure of northern bobwhite in Texas and the Great Plains**, Katherine S. Miller, Leonard A. Brennan, Randy DeYoung, Fidel Hernandez, and X. Ben Wu
- 11:30: Cost and return of supplemental feeding programs for free-ranging white-tailed deer in South Texas**, Darrell White, Kim McCuiston, Ryan Rhoades, David Hewitt, Charles DeYoung, and Clay Mathis
- 11:45: LUNCH–ON YOUR OWN**

SESSION 1A: ECOLOGY OF COLD-BLOODED ANIMALS

Capital BALLROOMS A–C
MODERATOR: JEFF BREEDEN

- 1:30: A herpetological survey of the Texas A&M University–Commerce Created Wetlands in Hunt County, Texas**, Jerrod G. Tynes and Jeffrey G. Kopachena
- 1:45: Amphibian response to experimental woody biomass harvesting guidelines**, Sarah Fritts, Christopher Moorman, and Dennis Hazel
- 2:00: Zooarchaeology and freshwater mussel conservation**, Steve Wolverton
- 2:15: Status and the reintroduction of the Louisiana pine snake**, Josh B. Pierce, D. Craig Rudolph, Steve Reichling, Emlyn Smith, Richard R. Schaefer, and Michael Sealy
- 2:30: Tadpole behavioral responses to Chinese tallow leaf litter**, Cory K. Adams and Daniel Saenz
- 2:45: Habitat suitability, distribution, and population genetics of the South Texas Siren**, Taylor C. LaFortune, Richard J. Kline, and Lucia B. Carreon-Martinez
- 3:00: Break–30 MINUTES**

SESSION 1B: ECOLOGY AND MANAGEMENT OF UNGULATES

Capital BALLROOM D
MODERATOR: TRENT TEINERT

- 1:30: A comparison of vertical bow and crossbow hunter success and wounding loss in Texas**, Scott Bosworth, Sara Resendez, and Tucker Slack
- 1:45: Variation in rumen-reticulum fill in white-tailed deer**, Meredith R. Aiken, Daniel M. Wolcott, Heath D. Starns, Ryan S. Luna, Adam Duarte, and Floyd W. Weckerly
- 2:00: Effects of density and supplemental feed on white-tailed deer activity patterns**, Blaise A. Korzekwa, Timothy E. Fulbright, David G. Hewitt, Charles A. DeYoung, Kim N. Echols, and Don A. Draeger
- 2:15: Age structure and productivity of unmanaged white-tailed deer populations in South Texas**, Kory R. Gann, David G. Hewitt, Timothy E. Fulbright, Alfonso Ortega-Sanchez, Randall W. DeYoung, Thomas W. Boutton, Alfonso Ortega-Sanchez, Jr., and Tyler A. Campbell
- 2:30: Rainfall overrides deer density and supplementary feeding as the major influence on forb community dynamics in South Texas**, Lindsay D. Roberts, Timothy E. Fulbright, David B. Wester, David G. Hewitt, Charles A. DeYoung, Kim N. Echols, and Don A. Draeger
- 2:45: Management of white-tailed deer in the cattle fever tick permanent quarantine area of Zapata County**, Hank C. Birdsall, David G. Hewitt, Greta Schuster, Timothy E. Fulbright, Daniel R. Baca, and Chase R. Currie
- 3:00: Break–30 MINUTES**

SESSION 1C: ECOLOGY AND MANAGEMENT OF CARNIVORES

Capital BALLROOM E

MODERATOR: JOHN YOUNG

- 1:30: Bobcat spatial ecology at a site in the High Plains of Texas**, Lena M. Thurmond, James D. Ray, Raymond S. Matlack, and Richard T. Kazmaier
- 1:45: Use of camera traps to determine mountain lion use of habitat and prey availability in the Davis Mountains, Texas**, Catherine C. Dennison, Patricia Moody Harveson, and Louis A. Harveson
- 2:00: The abundance of ocelots and other mammals on the southern coast of Tamaulipas, Mexico**, Mitchell A. Sternberg, Francisco Illescas, Luis J. Pena, and Thomas W. deMaar
- 2:15: Influence of habitat and coyotes on bobcat populations in South Texas**, G. Wesley Watts III, Arturo Caso, Justin P. Wied, Sasha Carvajal, Lauren D. Balderas, Alfonso Ortega-Sanchez Jr., and Michael E. Tewes
- 2:30: Family relationships and levels of inbreeding derived from pedigree analysis for endangered ocelot subpopulations in South Texas**, Jennifer M. Korn, Jan E. Janecka, Randy W. DeYoung, Arturo M. Caso, Michael E. Tewes, Linda Laack, Jody Mays, Daniel J. Kunz, and Alfonso Ortega-Sanchez
- 2:45: Comparative land-cover use by sympatric ocelot and bobcat in South Texas**, John P. Leonard, Eric L. Rulison, Alfonso Ortega-Sanches, Daniel J. Kunz, Arturo Caso, Justin P. Wied, G. Wesley Watts III, and Michael E. Tewes
- 3:00: Break–30 MINUTES**

SESSION 1D: MONITORING AND MANAGEMENT

Capital BALLROOMS F–H

MODERATOR: NICHOLAS ENWRIGHT

- 1:30: A discussion about monitoring in an adaptive management context**, Stephen J. DeMaso and Barry C. Wilson
- 1:45: The Oaks and Prairies Joint Venture Grassland Restoration Incentive Program**, Jonathan G. Hayes
- 2:00: Introduction to iNaturalist**, Marsha E. May
- 2:15: The mammals of Texas iNaturalist project: crowd-sourcing mammal monitoring**, Jonah W. Evans
- 2:30: The use of iNaturalist to acquire carnivore sightings data in an urban landscape**, Derek J. Broman
- 2:45: The herps of Texas Project on iNaturalist: a tool for managing your observations and supporting conservation**, Andrew G. Gluesenkamp and Cullen Hanks
- 3:00: Break–30 MINUTES**

SESSION 2A: ECOLOGY AND MANAGEMENT OF NONGAME BIRDS

Capital BALLROOMS A–C
MODERATOR: CLIFF SHACKELFORD

- 3:15: Nesting southeastern American kestrels and red-cockaded woodpecker habitat management,** Richard R. Schaefer and Craig Rudolph
- 3:30: Age structure of golden-cheeked warblers in areas of low abundance,** Hannah L. Pruett
- 3:45: Effects of grazing on brood parasitism of black-capped vireos,** Anthony J. Locatelli
- 4:00: American oystercatcher nest and brood survival in Texas,** Lianne M. Koczur, Alexandra E. Munters, Susan A. Heath, Bart M. Ballard, M. Clay Green, Fidel Hernandez, and David B. Wester

SESSION 2B: ECOLOGY AND MANAGEMENT OF UNGULATES

Capital BALLROOM D
MODERATOR: CLARK ADAMS

- 3:15: Population estimates and home range sizes of urban deer in Fair Oaks Ranch, Texas,** Kara B. Campbell, Charles A. DeYoung, Randy W. DeYoung, David G. Hewitt, Richard Heilbrun, Jessica Alderson, and Ryan Schoeneberg
- 3:30: Volunteer urban white-tailed deer survey,** David Nicosia
- 3:45: Investigating grass grazing intensity on biomass of forbs preferred by white-tailed deer,** Stacy L. Hines, Timothy E. Fulbright, Alfonso Ortega-Sanchez, David G. Hewitt, and Thomas W. Boutton
- 4:00: Effects of three white-tailed deer densities and supplemental feeding on height and canopy structure of selected shrubs,** Lindsey M. Phillips, Timothy E. Fulbright, David G. Hewitt, Charles A. DeYoung, David B. Wester, Lindsay D. Roberts, Kim N. Echols, and Don A. Draeger

SESSION 2C: ECOLOGY AND MANAGEMENT OF MAMMALS

Capital BALLROOMS F–H
MODERATOR: CHIP RUTHVEN

- 3:15: An innovative approach to conservation of endangered Florida panther on private lands: creating a Payment for Ecosystem Services,** Jennifer M. Korn, Erin Myers, and Julie Morris
- 3:30: Chronobiology and exogenous factors influencing bobcat activity in South Texas,** Justin P. Wied, Michael E. Tewes, Arturo Caso, Gordon W. Watts III, Eric L. Rulison, Shelby Carter, Timothy M. Buquoi, and Alfonso Ortega-Sanchez

- 3:45: Determining habitat preference in mountain hare and ptarmigan in northeastern Siberia,** Aaron P. White, Heather D. Alexander, and Kenneth Pruitt
- 4:00: Bat community composition and its relationship to stand structure in a bottomland hardwood forest of east Texas,** Carla J. Weinkauff, Christopher E. Comer, Warren C. Conway, and Scott Bosworth

SESSION 2D: ECOLOGY AND MANAGEMENT OF GAME BIRDS

Capital BALLROOM E

MODERATOR: MIKE MILLER

- 3:15: Spring and summer movement patterns of Rio Grande wild turkeys in Texas,** Jesse G. Oetgen, Jennifer Barrow, Kevin D. Mote, Mason D. Conley, and Bret A. Collier
- 3:30: Nest-site characteristics of Rio Grande wild turkey hens in Texas,** Jennifer L. Barrow, Jesse G. Oetgen, Kevin D. Mote, Mason D. Conley, and Bret A. Collier
- 3:45: Movement ecology and habitat selection of Rio Grande wild turkey broods in Texas,** Mason D. Conley, Jesse G. Oetgen, Jennifer Barrow, and Bret A. Collier
- 4:00: Climate change and predicted effects on prairie grouse,** Nova J. Silvy

Saturday, 22 February 2014

SESSION 3A: POPULATION GENETICS

Capital BALLROOMS A–C

MODERATOR: RANDY DEYOUNG

- 8:15: Landscape-scale differentiation in gene flow of mesocarnivores in the Texas Panhandle,** Imogene Davis, Rocky Ward, and Richard T. Kazmaier
- 8:30: Using reduced representation genomic sequencing to characterize individual genetic diversity levels in the Attwater's prairie-chicken,** Jeff A. Johnson
- 8:45: Comparative genetic structure of wild pigs in the Rolling Plains Ecoregion,** Peter E. Schlichting and C. Brad Dabbert
- 9:00: Haplotype characterization of black bear in the Sierra de San Luis, Sonora, Mexico,** Maria G. Camargo-Aguilera, Nalleli E. Lara, Diaz, Carlos A. Lopez-Gonzalez, Cora Varas-Nelson and Melanie Culver
- 9:30: Break–30 MINUTES**

Session 3B: ECOLOGY AND MANAGEMENT OF MAMMALS

Capital BALLROOM D

MODERATOR: MISTY SUMNER

- 8:15: Analysis of international bighorn sheep movements in the Big Bend Region of Texas,** Thomas S. Janke, Patricia Moody-Harveson, Louis A. Harveson, and Froylan Hernandez
- 8:30: Irruptive dynamics in a population of Roosevelt elk,** Heath D. Starns, Mark A. Ricca, Adam Duarte, and Floyd W. Weckerly
- 8:45: Forage quality and nutritional condition of adult female mule deer following habitat enhancements in north-central New Mexico,** Grant E. Sorensen, David W. Kramer, Chase A. Taylor, Mark C. Wallace, Philip S. Gipson, Robert D. Cox, Stewart Liley, and Wayne Armacost
- 9:00: Preliminary observations on distribution patterns of male dama gazelles,** Elizabeth Cary Mungall and Susan M. Cooper
- 9:15: A comparison of the survival of initial and supplemental bighorn sheep translocations to Big Bend Ranch State Park,** Thomas S Janke, Louis A Harveson, and Froylan Hernández
- 9:30: Break–30 MINUTES**

Session 3C: ECOLOGY AND CONSERVATION OF BIRDS

Capital BALLROOMS F–H

MODERATOR: CRAIG FARQUHAR

- 8:15: Ecology and conservation of ocellated turkeys in Campeche, Mexico,** Jon T. McRoberts, Mark C. Wallace, and Philip S. Gipson
- 8:30: Public attitudes regarding monk parakeet nest management,** Janet E. Reed, William A. McIntosh, Robert A. McCleery, Nova J. Silvy, Fred E. Smeins, and Donald J. Brightsmith
- 8:45: Population density and habitat associations of the seaside sparrow on Laguna Atascosa National Wildlife Refuge, Cameron County, Texas,** Jacqueline R. Ferrato, Thomas R. Simpson, Michael F. Small, Joseph A. Veech, and Mark H. Conway
- 9:00: Black-capped vireos in Mexico: review, updates, and suggestions for the future,** Melanie R. Colon, Michael L. Morrison, and Jose I. Gonzalez-Rojas
- 9:15: Post-fledging habitat use and movement patterns of black-capped vireos,** Marisa T. Martinez
- 9:30: Break–30 MINUTES**

SESSION 3D: ECOLOGY AND MANAGEMENT OF GAME BIRDS

Capital BALLROOM E

MODERATOR: ANNALIESE SCOGGIN

- 8:15: Thermal factors affecting scaled quail habitat selection**, Holley N. Kline, Blake Martin, Timothy E. Fulbright, Fidel Hernandez, Eric Grahmann, and Leonard Brennan
- 8:30: Occupancy, survival, and nesting ecology of scaled quail in the South Texas Plains**, Richard H. Sinclair, Preston Harriman, Fidel Hernandez, Holley Kline, Timothy E. Fulbright, Eric D. Grahmann, and Leonard A. Brennan
- 8:45: Parasitic infections in northern bobwhites from the Rolling Plains Ecoregion of Texas and western Oklahoma**, Andrea Bruno, Alan M. Fedynich, and Dale Rollins
- 9:00: Monitoring northern bobwhite recolonization following large-scale wildfires and drought in the Rolling Plains of Texas**, Rebekah Ruzicka, Dale Rollins, and Ken Cearley
- 9:15: Translocation of wild bobwhites into recently depopulated areas in the eastern Rolling Plains of Texas**, Michelle C. Downey, Dale Rollins, Fidel Hernandez, Eric D. Grahmann, Bradley W. Kubecka, Lloyd M. LaCoste, and Barrett A. Koennecke
- 9:30 BREAK—30 MINUTES**

Session 4A: RESEARCH AND MANAGEMENT

Capital BALLROOMS A–C

MODERATOR: BILL BARTUSH

- 10:00: Using LiDAR-derived metrics for wildlife habitat management**, James M. Mueller
- 10:15: A voluntary, incentive based approach for lesser prairie-chicken conservation**, Manuel T. De Leon, Russell O. Castro, Jon L. Ungerer, and Christian A. Hagen
- 10:30: Coordinated grassland bird monitoring and data management in the Oaks and Prairies Joint Venture**, James J. Giocomo, Jon Hayes, Edward J. Laurent, and Troy E. Wilson
- 10:45: The legacy of lead: developing new methods for assessing lead contamination and wildlife exposure risks in Gulf Coast wetland habitats**, Brian V. Kearns, Stephen McDowell, Jena Moon, Warren Conway, and David A. Haukos
- 11:00: East Wildlife Foundation monitoring program: pilot study plans and potential**, Jeremy Baumgardt, Michael Morrison, Leonard Brennan, Julie Groce, Bret Collier, Heather Mathewson, and Tyler Campbell

SESSION 4B: ECOLOGY AND CONSERVATION OF BIRDS

Capital BALLROOM D

MODERATOR: JON PURVIS

- 10:00: Resident and transient wintering strategies of migratory nearctic passerines in the Columbia Bottomlands of southeast Texas,** William D. Ostrand, Wylie C. Barrow, Jennifer Wilson, and James Renfro
- 10:15: The effects of increasing temperatures on black-capped vireo habitat use and reproductive success,** Ronnisha S. Holden
- 10:30: Temperature impact on an endangered songbird's nest productivity in Texas,** Kathryn N. Smith
- 10:45: Helminth infections in northern bobwhites and scaled quail from South Texas,** Andrew C. Olsen and Alan M. Fedynich
- 11:00: Effects of radio transmitter attachment on flight speed and body mass of northern bobwhite,** Byron R. Buckley and Brad Dabbert
- 11:15: Evaluating "radio-handicapping" of northern bobwhites during drought,** Rebekah Ruzicka, Dale Rollins, Lloyd Lacoste, and Fidel Hernandez

SESSION 4C: ECOLOGY AND MANAGEMENT OF GAME BIRDS

Capital BALLROOM E

MODERATOR: JAMES GALLAGHER

- 10:00: Northern bobwhite management: vegetation and arthropod responses to brush reduction by grubbing and stacking,** Carter G. Crouch, Alfonso Ortega-Sanchez, Leonard A. Brennan, Greta L. Schuster, Fidel Hernandez, and David B. Wester
- 10:15: Prioritizing mottled duck habitat for management along the western Gulf Coast. ,** Anastasia Krainyk, Bart M. Ballard, Michael G. Brasher, Barry C. Wilson, Mark W. Parr, Jena A. Moon, and Eric J. Redeker
- 10:30: Late Quaternary changes in the geographic range of the northern bobwhite as inferred by ecological niche modeling,** Damon Williford, Randy W. DeYoung, Rodney L. Honeycutt, Leonard A. Brennan, and Fidel Hernandez
- 10:45 Habitat selection of adult female mottled ducks in the Texas Chenier Plain Region,** Jena A. Moon, David A. Haukos, Warren Conway, and Sarah Lehn
- 11:00: Development favorability analysis for redheads along the lower Texas coast,** Corey J. Lange, Bart M. Ballard, Dan P. Collins, Barry C. Wilson, Eric J. Redeker, and Dale J. James

SESSION 4D: ECOLOGY AND MANAGEMENT

Capital BALLROOMS F–H

MODERATOR: JEFFERY GUNNNELS

- 10:00: Restoration of native plants in areas dominated by buffelgrass and Old World bluestems**, Eric D. Grahmann, Forrest S. Smith, Michael W. Hehman, Timothy E. Fulbright, Blake A. Martin, David B. Wester, and Fidel Hernandez
- 10:15: Conservation of endangered slender rush-pea through active management**, Ashley C. McCloughan, Sandra Rideout-Hanzak, and David B. Wester
- 10:30: Tamaulipan thornscrub habitat restoration at Laguna Atascosa National Wildlife Refuge, Texas**, Krysten N. Dick, Heather D. Alexander, and Jonathan D. Moczygemba
- 10:45: Bird community associations across land cover categories within an urban matrix**, Andrea E. Julian, Thomas R. Simpson, Michael C. Green, and Timothy H. Bonner
- 11:00: Geographic variation in songbird productivity: the golden-cheeked warbler**, Ashley M. Long

POSTER SESSION

THURSDAY, 20 FEBRUARY 2014: 4:00-6:00 P.M.

Capital BALLROOM

CONTACTS: ANNALIESE SCOGGIN & HEATHER MATHEWSON

- 1. Brevetoxicosis exposure of terrestrial wildlife due to red tide events along the southern Texas coastline**, Brian Barrera and Scott E. Henke
- 2. Use of human hair as a wildlife deterrent: fact or fiction?**, Justin Plata, Jesse Alegria, and Scott E. Henke
- 3. Duration of marking tags on American alligators**, Cord B. Eversole, Scott E. Henke, and Randy Powell
- 4. Nuisance American alligators: an investigation into trends and public opinion**, Cord B. Eversole, Scott E. Henke, Jacob L. Ogdee, and Amos Cooper
- 5. The effect of drought on clutch size and hatchling production of American alligators in Texas**, Cord B. Eversole, Scott E. Henke, Randy L. Powell, and Larry W. Janik
- 6. Do American alligators have cannibalistic tendencies?**, Cord B. Eversole, Allen Farge, Brent C. Newman, and Scott E. Henke
- 7. Determining the suitability of the Jamaican boa for translocation**, Brent C. Newman, Susan Koenig, Scott E. Henke, Craig Rudolph, and Eric Redeker
- 8. Brown tree snake invasion risk assessment for the Caribbean**, Brent C. Newman, Scott E. Henke, and David Britton
- 9. Viability of *Baylisascaris procyonis* eggs exposed to fluctuating temperatures at raccoon latrine sites**, Jacob L. Ogdee, Scott E. Henke, and David B. Wester
- 10. Range and distribution of large and meso-mammal populations on Dyess Air Force Base**, Darryll T. Morley, and Grant Lawrence

- 11. Habitat stratification of syntopic nesting barn swallows, cave swallows, and cliff swallows in northeast Texas**, Ashleigh P. Tynes and Jeff G. Kopachena
- 12. Nest material selection in the eastern bluebird in northeast Texas**, Katelyn M. Miller and Jeffrey Kopachena
- 13. A biological survey of the Texas A&M University-Commerce Wetland in Hunt County, Texas**, Jerrod G. Tynes, Ryan Scauzillo, Amanda Turley, Audrey Whaley, and Jeffrey Kopachena
- 14. Bat occurrence in desired forest conditions treated bottomland hardwood forests of the Mississippi Alluvial Valley**, Lorraine P. Ketzler, Christopher E. Comer, Daniel J. Twedt, and Warren C. Conway
- 15. Capture rates of heteromyid species in unique soil land use designations in Jim Hogg County, Texas**, Michelle E. Curtis and Thomas R. Simpson
- 16. Large scale restoration of native vegetation**, Matthew N. Wojda, Timothy E. Fulbright, Fidel Hernandez, David B. Wester, and Eric D. Grahmann
- 17. Season of prescribed burning on Old World bluestems**, Adam E. Toomey, Sandra Rideout-Hanzak, and David B. Wester
- 18. Effect of white-tailed deer experience on response to a new supplemental feed program**, Jay R. Kolbe and David G. Hewitt
- 19. Season-specific land-use by birds of prey in the Llano Estacado**, Kristen Linner and Clint Boal
- 20. Assessment of lesser prairie-chicken use of wildlife water guzzlers**, Trevor S. Gicklhorn, Clint W. Boal, and Philip K. Borsdorf
- 21. Occupancy estimates of ferruginous hawks in the Snake River Birds of Prey Area**, Chris K. Gulick, Ben R. Skipper, and Clint W. Boal
- 22. Modeling the effects of sea level rise on coastal pond availability for redheads along the lower Texas coast**, Corey J. Lange, Bart M. Ballard, Kris L. Metzger, and Daniel P. Collins
- 23. Movement rates of Swainson's hawks migrating from Texas to Argentina**, Laurie M. Groen, Clint Boal, James D. Ray, and Jimmy Walker
- 24. Wildlife response to native grassland restoration in an area dominated by non-native grasses**, Anthony K. Henahan, Shannon Hall, Esteban Lopez, Fidel Hernandez, Eric D. Grahmann, Timothy E. Fulbright, and David B. Wester
- 25. Evaluation of capture techniques on lesser prairie chickens trap injury**, Natasia R. Mitchell, Philip Borsdorf, Charles Dixon, Blake Grisham, David Haukos, and Clint Boal
- 26. Diet and nutrition of female northern pintails wintering along the Texas Coast**, Nathaniel R. Huck, Bart M. Ballard, Kevin Kraai, and Matt R. Kaminski
- 27. Habitat suitability model for the Bell's vireo in northeast Texas**, Amanda C. Turley and Jeffery Kopachena
- 28. Stable isotopes in conservation forensics: what we know and where we need to go**, Stacy L. Hines, Timothy E. Fulbright, Alfonso Ortega-Sanchez, David G. Hewitt, Thomas W. Boutton, and Stephen L. Webb
- 29. Seasonal and geographic variation in the fiber content of forage species in southern Texas**, Ramon Saenz, Henry Hernandez, Stacy L. Hines, Timothy E. Fulbright, Alfonso Ortega-Sanchez, David G. Hewitt, and Thomas W. Boutton
- 30. Nest-site selection and partitioning between northern bobwhite and scaled quail in southern Texas**, Shannon M. Hall, Monika Burchette, Holley Kline, Blake A. Martin, Eric D. Grahmann, Timothy E. Fulbright, Fidel Hernandez, and Michael W. Hehman

31. **Using a double sampling approach to distance sampling during aerial surveys for large mammals**, Mary K. Annala, David G. Hewitt, Randy W. DeYoung, Tyler A. Campbell, and Alfonso Ortega-Sanchez
32. **Potential influence of climatic variables on abundance of rangeland birds**, Maia L. Lipschutz, Leonard Brennan, and Thomas Langschied
33. **Effect of density and supplemental feed on white-tailed deer body size**, John H. Clark, Nathan Cook, David G. Hewitt, Timothy E. Fulbright, Charles A. DeYoung, Kim N. Echols, and Donald A. Draeger
34. **Evaluating the immunocompetence of northern bobwhite quail and scaled quail on the Rolling Plains of Texas**, Drew G. Arnold and Charles B. Dabbert
35. **Effects of density and supplemental feed on sexual segregation in white-tailed deer**, Blaise A. Korzekwa, Timothy E. Fulbright, David G. Hewitt, Charles A. DeYoung, Kim N. Echols, and Don A. Draeger
36. **Camera trap monitoring of water trough visitation in Big Bend Ranch State Park**, Christopher A. Wood, Thomas S. Janke, Louis A. Harveson, and Jose Etchart
37. **Soil microbial characteristics and seed bank dynamics of stock-piled top soils in the western Rio Grande Plains**, Mylea C. Coston, David B. Wester, Veronica Acosta-Martinez, Forrest Smith, Paula Maywald, Sandra Rideout-Hanzak, and Terry Blankenship
38. **Physiological and behavioral responses of white-tailed deer on low-energy diets**, Breanne N. Carr, David G. Hewitt, Randy W. DeYoung, Ryan L. Reitz, and Don B. Frels, Jr.
39. **Trap success and efficiency in the capture of crested guinea fowl**, Weston J. Green and Thomas W. Schwertner
40. **An analysis of northern bobwhite breeding response and overwinter survival to expansion of habitat**, Erika L. Dodd, Ryan Piltz, and Leonard A. Brennan
41. **Breeding bird community dynamics in bottomland hardwood forests of east Texas**, Meredith P. Wilson, Warren C. Conway, Christopher E. Comer, and Scott Bosworth
42. **Effects of surface temperature on bobwhites**, Monika L. Burchette, Shannon M. Hall, Timothy E. Fulbright, Fidel Hernandez, Eric D. Grahmann, and David B. Wester
43. **Effects of tanglehead invasion on ecosystem processes in the Texas Coastal Sandsheet**, Joshua L. Grace, David B. Wester, Veronica Acosta-Martinez, Sandra Rideout-Hanzak, and Alfonso Ortega-Sanchez
44. **Human dimensions of urban water body usage in Lubbock, Texas**, Kristina J. Young, Samantha S. Kahl, Kerry Griffis-Kyle, and Michael Farmer
45. **Pronghorn population dynamics and habitat connectivity in the Texas panhandle**, Nathan P. Duncan, Samantha S. Kahl, Shawn S. Gray, and Christopher J. Salice
46. **Relative abundance and spatial distribution of large and meso-mammal populations on Dyess Air Force Base**, Grant S. Lawrence, Darryl Morley, and Michael Nicodemus
47. **Influence of supplemental feeding on white-tailed deer forage selectivity**, Brandon S. Mitchell, Kory R. Gann, and David G. Hewitt
48. **Selection and use of travel corridors by ocelots and bobcats in South Texas**, Sarah E. Nordlof, Richard Kline, and Mitch Sternberg
49. **Urban development and the urban carnivore**, Julie M. Golla and Julie K. Young
50. **Survey of the Mexican beaver in Big Bend National Park**, Howland J. Reich and Thomas R. Simpson

51. **An evaluation of the effects of prescribed fire, tillage, and herbicide to decrease exotic vegetation and to re-establish native vegetation on old fields within the Blackland Prairie Ecoregion of Texas**, Audrey M. Whaley, Jeff G. Kopachena, and Jim Eidson
52. **The pygmy mouse in Hunt County, Texas**, Ryan C. Scauzillo and Jeffrey G. Kopachena
53. **Nocturnal roosting of reddish egrets**, Lianne M. Koczur, Anastasia Krainyk, and Bart M. Ballard
54. **Management of invasive Old World bluestems to restore native grasslands: where do we go from here?**, Meagan M. Lesak, Jamie L. Foster, Kimberly C. McCuiston, Megan K. Clayton, and Trent Teinert
55. **Strategic habitat conservation grassland bird focus and reference area monitoring**, David O'Donnell, Robert Perez, Jon Hayes, Jim Giocomo, Jason Hardin, and Jeff Raasch
56. **Eastern turkey habitat suitability index for Pineywoods and Post Oak Savannah ecoregions**, Jason Estrella, David O'Donnell, and Jason Hardin
57. **Does microclimate explain spatial variation in lesser prairie-chicken nest survival?**, Blake A. Grisham, Joseph Lautenbach, Reid Plumb, John Kraft, Jonathan Reitz, Dan Sullins, Courtenay Conring, Alixandra Godar, Cody Griffin, Clint Boal, and David Haukos
58. **Monthly variation of small mammal trapping on Dyess Air Force Base, Abilene, Texas**, William B. Morales, Darryll Morley, Grant Lawrence, and Michael A. Nicodemus
59. **Population density and detection probability of two sympatric urban mesopredators in east Texas**, Jason V. Lombardi, Christopher E. Comer, and Daniel G. Scognamillo
60. **Developing a body condition index for mottled ducks on the upper Texas Gulf Coast**, Brian V. Kearns, Patrick Walther, and David A. Haukos
61. **Blood work analysis of Virginia opossum captured on Dyess Airforce Base**, Elliot P. Klar, Darryll Morley, Dale Hembree, and Michael Nicodemis
62. **Delineation of marsh types of the Texas coast from Corpus Christi to the Sabine River**, Nicholas Enwright, Stephen B. Hartley, Michael G. Brasher, Jenneke M. Visser, Michael K. Mitchell, Bart M. Ballard, Mark W. Parr, and Brady R. Couvillion

ABSTRACTS

Cottam Abstracts

10:30: EXPLORING THE EVOLUTIONARY DISTINCTIVENESS OF THE ATTWATER'S PRAIRIE-CHICKEN USING MULTI-LOCUS COALESCENT ANALYSES

STEPHANIE J. GALLA, Department of Biological Sciences, University of North Texas, 1155 Union Circle, Denton, TX 76203, USA

JEFF A. JOHNSON, Department of Biological Sciences, University of North Texas, 1155 Union Circle, Denton, TX 76203, USA

Abstract: Managers of the critically-endangered Attwater's prairie-chicken (*Tympanuchus cupido attwateri*) are considering outcrossing Attwater's with greater prairie-chickens (*T. c. pinnatus*) to increase genetic diversity and alleviate inbreeding depression that has been detected in the Attwater's captive population. With a previous study suggesting that the Attwater's prairie-chicken is as divergent from its conspecific, the greater prairie-chicken as with other prairie grouse species (lesser prairie-chicken [*T. pallidicinctus*]; sharp-tailed grouse [*T. phasianellus*]), additional research investigating the demographic history of prairie grouse and the evolutionary distinctiveness of the Attwater's prairie-chicken is

warranted. In this study, we use 10 loci (mitochondrial, autosomal, and z-linked) along with traditional (i.e., gene tree) and coalescent-based (i.e., species tree) analyses to determine the relationships between North American prairie grouse. Results from this study suggest that North American prairie grouse diverged recently (~450,000 years), with species-level taxa forming well-supported monophyletic clades in species tree analyses. Analyses indicate that the Attwater's prairie-chicken is sister to the greater prairie-chicken, which supports current subspecific taxonomic designations. Further evaluation of the demographic history between Attwater's and greater prairie-chickens using next-generation sequencing and isolation-with-migration analyses is needed to better assess outcrossing as a management option for the critically-endangered Attwater's prairie-chicken.

10:45: AN EVALUATION OF INBREEDING, IMMUNOCOMPETENCE AND SURVIVAL IN THE CRITICALLY ENDANGERED ATTWATER'S PRAIRIE-CHICKEN

SUSAN C. HAMMERLY, Institute of Applied Sciences, Department of Biological Sciences, University of North Texas, Denton, TX, 76201, USA

JEFF A. JOHNSON, Institute of Applied Sciences, Department of Biological Sciences, University of North Texas, Denton, TX, 76201, USA

Abstract: Immunocompetence is often compromised among individuals with reduced genetic diversity; however it is not known to what extent immunocompetence may influence endangered species recovery. The critically endangered Attwater's prairie-chicken (*Tympanuchus cupido attwateri*; APC) has been managed in captivity since 1992 and the current population is based on 17 founding individuals. Each year the wild APC population is supplemented with captive bred individuals, yet survival is low (21%), which could be the result of multiple factors including inbreeding. Here we determine if neutral genetic diversity has decreased in the APC population and if inbreeding depression is present in the captive population. We then explore the consequences of inbreeding in the APC population by investigating the correlation between neutral genetic diversity and individual fitness-related traits, specifically focusing on immunocompetence and survival. To evaluate the role of immunocompetence and inbreeding on post-release survival, all birds were sampled at release in the fall of 2011 and 2012 ($n = 369$). Individual inbreeding coefficients were calculated using 10 microsatellite loci, and immunocompetence was evaluated using multiple techniques to assess both innate and acquired immune response. Preliminary results suggest inbreeding coefficient is a better predictor of an individual's survival during the first 30 days post-release than immunocompetence measures.

11:00: IDENTIFICATION OF AN ISOLATED POPULATION OF GREATER SAGE-GROUSE IN NORTHWEST WYOMING

SARAH SCHULWITZ, Department of Biological Sciences and Institute of Applied Sciences, University of North Texas, Denton, TX 76201, USA

BRYAN BEDROSIAN, Craighead Beringia South, Kelly, WY 83011, USA

JEFF A. JOHNSON, Department of Biological Sciences and Institute of Applied Sciences, University of North Texas, Denton, TX 76201, USA

Abstract: Identifying isolated, small populations is of conservation priority, not only because isolation may result in negative fitness consequences due to small size and inbreeding, but they may also harbor unique genetic diversity important for the longevity of the species. Greater sage-grouse (*Centrocercus urophasianus*) are a widespread obligate species of the sagebrush biome in western North America and have experienced range contraction and steady population declines over the past century. Efforts have been made to identify isolated populations for which protection is warranted to prevent local extirpation. Here, we analyzed 16 microsatellite loci from 300 greater sage-grouse individuals among 9 sample locations throughout Wyoming and northwest Montana to determine the degree of genetic connectivity,

particularly with the Jackson Hole population in southeast Wyoming. Significant population genetic differentiation was observed among populations, including that between Jackson Hole and its nearest neighbor located ~130 km to the south. Despite the Jackson Hole population being centrally located within the overall species' distribution and also well protected within Teton National Park and the National Elk Refuge, it also possessed significantly reduced genetic diversity. This population is fully surrounded by extensive conifer forested mountain ranges nearly devoid of sagebrush habitat. For these reasons, the Jackson Hole populations may have been isolated from other sage-grouse populations for an extended period of time sufficient to allow local adaptation. Instead of considering supplementation to increase genetic diversity per se, managers should focus more attention on maintaining adequate sagebrush habitat allowing the population to increase in size.

11:15: LANDSCAPE EFFECTS ON GENE FLOW AND GENETIC STRUCTURE OF NORTHERN BOBWHITE IN TEXAS AND THE GREAT PLAINS

Katherine S. Miller, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

Leonard A. Brennan, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

Randy DeYoung, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

Fidel Hernández, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

X. Ben Wu, Department of Ecosystem Science and Management, Texas A&M University, College Station, TX, 77843-2138, USA

Abstract: Northern bobwhite (*Colinus virginianus*) populations have declined due to habitat loss and fragmentation. Northern bobwhite have been considered poor dispersers, so biologists expect a moderate population structure and low genetic diversity in fragmented areas. Our goal was to determine how landscape affects the genetic structure of northern bobwhite in Texas and the Great Plains. We collected tissues from 641 northern bobwhites in 23 populations, and amplified 13 microsatellite loci. We determined population structure (F_{ST}) and genetic distance between populations ($Dest$). We used a land cover map (National Bobwhite Conservation Initiative) to develop a landscape resistance matrix. We compared $Dest$ to geographic distance and resistance with Mantel and partial Mantel tests. Populations showed low levels of structure ($F_{ST} = 0.025$). We found moderate correlations to geographic distance ($r = 0.542$, $P < 0.001$) and landscape resistance ($r = 0.416$, $P = 0.001$). There was a significant correlation between $Dest$ and geographic distance when we accounted for resistance ($r = 0.388$, $P < 0.001$), but no significant correlation between $Dest$ and resistance when we accounted for geographic distance. A spatial principal component analysis for South Texas samples revealed a global structure. Low genetic structure and moderate genetic diversity may suggest that more northern bobwhite individuals are dispersing further than previously thought. Other possible explanations lie in the northern bobwhite's fall covey shuffle, their boom-and-bust population cycle, and stochastic events. Habitat is an important factor for northern bobwhite; determining how habitat affects gene flow will help biologists to manage northern bobwhite.

11:30: COST AND RETURN OF SUPPLEMENTAL FEEDING PROGRAMS FOR FREE RANGING WHITE-TAILED DEER IN SOUTH TEXAS

DARRELL WHITE, King Ranch® Institute for Ranch Management, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

KIM MCCUISTION, King Ranch® Institute for Ranch Management, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

RYAN RHOADES, King Ranch® Institute for Ranch Management, Texas A&M University–Kingsville, Kingsville, TX, 78363

DAVID HEWITT, Caesar Kleberg Wildlife Research Institute, Department of Animal, Rangeland, and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363

CHARLES DEYOUNG, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363

CLAY MATHIS, King Ranch® Institute for Ranch Management, Texas A&M University–Kingsville, Kingsville, TX, 78363

Abstract: The objective of this project was to model a white-tailed deer (*Odocoileus virginianus*) herd's response to ad libitum pelleted supplemental feed relative to the cost of supplementation to determine feeding program return on investment (ROI) in South Texas. Derived values and assumptions for the economic model were made from a long term density and supplemental feeding study conducted near Carrizo Springs, Texas. Financial components included market values of free range white-tailed deer, feed, labor, fuel, and equipment depreciation. Critical assumptions include a hypothetical 2023 ha ranch, a 1.2 doe:1 buck ratio, a 0.90 kg/deer/day pelleted feed consumption rate, a 225-day/year feeding period, and a 14% increase in gross B&C score as a result of supplementation of a 16% crude protein pelleted ration valued at \$400/ton, delivered. At a density of 2.42 ha/deer, total annual supplementation program costs were \$101/deer and pelleted feed accounted for 89% of the total cost. A breakeven on supplemental feeding input cost required a harvest rate of 18% of the buck population over 1 year of age assuming all bucks harvested were mature (= 5.5 years of age). Profitability may not be sustainable due to the resulting lower mean B&C scores likely observed at the harvest rates required for profitability. This model suggests that the added input cost of supplemental feeding is not likely cost effective at present market values of white-tailed deer and current feeding costs.

Session Abstracts

SESSION 1A: CONSERVATION AND MANAGEMENT OF COLD BLOODED ANIMALS

1:30: A HERPETOLOGICAL SURVEY OF THE TEXAS A&M UNIVERSITY–COMMERCE CREATED WETLANDS IN HUNT COUNTY, TEXAS

JERROD G. TYNES, Texas A&M University–Commerce, Commerce, TX, 75429, USA

JEFFREY G. KOPACHENA, Texas A&M University–Commerce, Commerce, TX, 75429, USA

Abstract: Texas A&M University–Commerce owns a created wetland just south of the city of Commerce, in Hunt Co., Texas. A herpetological survey was conducted during the spring of 2013 to evaluate the property for its diversity and species richness. Three drift fence arrays were set up on the property and each array consisted of 6 funnel traps. One Y-shaped array was placed on an upland area and 2 linear arrays were placed on different levees in the wetland area. The funnel traps were provisioned with water and covered with shelter boards. Traps were checked daily from March 29, 2013 through April 30, 2013. Eleven species of reptiles and 6 species of amphibians were captured, for a total of 137 captures. The most common reptile was the diamond back watersnake (*Nerodia rhombifer*) with 29 captures. The southern leopard frog (*Rana sphenoccephala*) was the most common amphibian species captured during the survey with 37 captures. The data collected in this survey are discussed relative to previous surveys in northeast Texas.

1:45: AMPHIBIAN RESPONSE TO EXPERIMENTAL WOODY BIOMASS HARVESTING GUIDELINES

SARAH FRITTS, North Carolina State University, Raleigh, NC, 27695, USA

CHRISTOPHER MOORMAN, North Carolina State University, Raleigh, NC, 27695, USA

DENNIS HAZEL, North Carolina State University, Raleigh, NC, 27695, USA

Abstract: Gleaning woody biomass for renewable energy feedstock could alter wildlife habitat. Biomass Harvesting Guidelines (BHG), which specify volume and arrangement of woody debris retained after biomass harvests, have been developed to conserve wildlife habitat and other ecosystem services, but empirical data on wildlife response to woody biomass harvests is lacking. Therefore, we evaluated amphibian response to 6 experimental treatments adapted from retention strategies from existing BHGs with a randomized complete block design in 8 clearcuts in the southeastern coastal plain: (1) biomass harvest with no BHGs, (2) 15% retention with biomass dispersed, (3) 15% retention with biomass clustered, (4) 30% retention with biomass dispersed, (5) 30% retention with biomass clustered, and (6) no biomass harvest. We sampled amphibians using drift fence arrays during the first 3 years after BHG implementation. We captured 18 species of amphibians, with southern toads (*Anaxyrus terrestris*) and eastern narrowmouth toads (*Gastrophryne carolinensis*) comprising > 80% of captures. We used hierarchical N-mixture models to estimate abundance at the drift fence level while accounting for potential effects of treatment, environmental, and observational covariates. No covariates were predictors of abundance of *A. terrestris*. Volume of DWM in the treatment was a predictor of abundance of *G. carolinensis* in 2011 ($P < 0.01$) and 2012 ($P < 0.01$). Short-term effects of woody biomass harvests on toad populations were inconsistent, likely because of the large operational scope of our project. We recommend additional assessment of amphibian responses to woody biomass harvests at multiple spatial and temporal scales.

2:00: ZOOARCHAEOLOGY AND FRESHWATER MUSSEL CONSERVATION

STEVE WOLVERTON, Department of Geography, University of North Texas, Denton, TX, 76210, USA

Abstract: During the last 2 decades archaeologists have argued that paleoecological datasets from prehistoric contexts can be of aid to conservation ecology and wildlife biology. More recently, case studies that use paleo data have been published in mainstream ecology and biology journals. However, the impact of such studies has generally been low. Zooarchaeologists (archaeologists who study animal remains from archaeological samples) suspect that the results of these studies have been impactful in only a few cases for several reasons: (1) paleo data come under suspicion when compared to neoecological data, which are the norm in wildlife biology; (2) with backgrounds in social science, wildlife biologists may question the professional preparation of archaeologists to engage wildlife research; (3) archaeologists (and also paleontologists) may have overstated the value of paleo data; and (4) conservation biologists and wildlife managers encounter pragmatic challenges, which can be termed political ecology, with or without the perspectives lent from seemingly distant academic disciplines. Acknowledging that consideration of zooarchaeological data for purposes of wildlife conservation requires an interdisciplinary perspective, and given the limitations of paleo data, how might such data be of use in conservation ecology and wildlife biology? Two case studies on the paleobiogeography of freshwater mussels in Mississippi and Texas provide an answer to that question. In order to provide useful information for wildlife research, however, zooarchaeologists and conservation biologists must also consider appropriate temporal and spatial scales for conservation, and zooarchaeologists must convincingly demonstrate how problems with data quality can be handled.

2:15: STATUS AND THE REINTRODUCTION OF THE LOUISIANA PINE SNAKE (PITUOPHIS RUTHVENI)

JOSH B. PIERCE, USDA Forest Service, Southern Research Station, Nacogdoches, TX, 75965, USA
D. CRAIG RUDOLPH, USDA Forest Service, Southern Research Station, Nacogdoches, TX, 75965,
USA

STEVE REICHLING, Memphis Zoo, Memphis, TN, 38112, USA

EMLYN SMITH, USDA Forest Service, Kisatchie National Forest, Catahoula Ranger District, Bentley,
LA, 71401, USA

RICHARD R. SCHAEFER, USDA Forest Service, Southern Research Station, Nacogdoches, TX, 75965,
USA

MICHAEL SEALY, US Fish and Wildlife Service, Lafayette, LA, 70506, USA

Abstract: Ongoing surveys suggest that the Louisiana pine snake (*Pituophis ruthveni*) is rapidly declining; and currently occupied habitat is limited to a few small blocks of degraded and highly fragmented habitat. Research suggests that the species requires frequently burned sites with a well developed herbaceous understory capable of supporting populations of its primary prey, Baird's pocket gopher (*Geomys breviceps*). Recent changes in management practices on U. S. Forest Service lands, primarily to enhance red-cockaded woodpecker populations, have resulted in restoration of substantial blocks of suitable habitat, which are now available for reintroduction. A captive population consisting of ~60 individuals has been established from wild-caught snakes from Bienville Parish, LA. The reintroduction site is located on the Catahoula District of the Kisatchie National Forest. Forty-four individuals have been released to date, and 1 snake is currently being head-started that will be released in April 2014. The current protocol is to continue to breed captive snakes and release 50% of available animals as neonates immediately following post-natal shed, while the remaining snakes will be head-started and released the following April. Currently, automated pit tag readers and trapping are the primary monitoring techniques, however canine detection and radiotelemetry, may be used in the future. To date, 4 snakes have been detected the year following release, or later. Production of neonates and release of young will be repeated annually until a viable population is established or it is concluded that further releases are not likely to result in establishment of a population.

2:30: TADPOLE BEHAVIORAL RESPONSES TO CHINESE TALLOW LEAF LITTER

CORY K. ADAMS, Southern Research Station, USDA Forest Service, Nacogdoches, TX, 75965, USA
DANIEL SAENZ, Southern Research Station, USDA Forest Service, Nacogdoches, TX, 75965, USA

Abstract: Recent evidence suggests that Chinese tallow (*Triadica sebifera*), an exotic invasive deciduous tree species, is expanding its range and becoming more abundant where it occurs. This is particularly relevant to amphibian conservation considering that this tree species tends to invade wetlands and has been shown to reduce the survival of aquatic amphibians. Recent experiments have demonstrated that, at relatively low concentrations, Chinese tallow leaf litter kills anuran eggs and larvae by reducing the dissolved oxygen and pH of water. The lethal effect of Chinese tallow leaf litter is short lived and concentrated soon after leaf fall, typically December through February in the Gulf Coastal states. We were interested in determining the sub-lethal effects of Chinese tallow leaf litter on the behavior of overwintering anuran larvae. *Lithobates catesbeianus* and *L. clamitans* are 2 frog species that commonly overwinter as aquatic larvae and extensively overlap in range with invasive Chinese tallow, which may expose them to the deleterious effects of the leaf litter. We conducted experiments where we exposed tadpoles to 4 different concentrations of tallow leaf litter and recorded water chemistry and air gulping behavior. As tallow concentration increased, oxygen and pH decreased. The highest concentrations were nearly anoxic. Both anuran species responded similarly, where tadpoles swam to the water's surface to air

gulp at a significantly higher rate in the treatments with greater tallow concentration. Such changes in behavior induced by Chinese tallow could have consequences on tadpole foraging efficiency and predator avoidance.

2:45: HABITAT SUITABILITY, DISTRIBUTION, AND POPULATION GENETICS OF THE SOUTH TEXAS SIREN

TAYLOR C. LAFORTUNE, The University of Texas at Brownsville, Brownsville, TX, 78520, USA
RICHARD J. KLINE, The University of Texas at Brownsville, Brownsville, TX, 78520, USA
LUCIA B. CARREON-MARTINEZ, The University of Texas at Brownsville, Brownsville, TX, 78520, USA

Abstract: Sirens (*Siren* spp.) are aquatic salamanders with an elongated, eel-like body, external gills, and greatly reduced fore-limbs. Sirens inhabit ephemeral water bodies and are capable of surviving drought conditions because of their unique ability to aestivate. Both extant siren species, the greater siren (*Siren lacertina*) and the lesser siren (*Siren intermedia*), have historically been documented inhabiting the Lower Rio Grande Valley (LRGV) of Texas sympatrically; however, siren species composition and distribution in the LRGV today is unclear. The South Texas siren (large form SP1) is a taxonomically undefined population of siren in the LRGV and is listed as a threatened species by Texas Parks and Wildlife. The objectives of this research are to delineate population distribution, develop a habitat suitability index, and characterize population dynamics of the South Texas siren. Sirens are being sampled from water bodies with minnow traps in 5 counties with historical reports of sirens. Species-specific microsatellite markers for the South Texas siren are being used to determine population differences sampled from each location. Indicator variables such as vegetation, water depth, water quality parameters, and presence of co-occurring taxa are being collected and statistically analyzed in relation to siren presence/absence and body size. Catch-per-unit effort is calculated and used to compare relative population size in each water body. Results of this study will contribute to the sparse knowledge of *Siren* salamander population dynamics and will assist in guiding future land management and conservation initiatives.

SESSION 1B: ECOLOGY AND MANAGEMENT OF UNGULATES

1:30: A COMPARISON OF VERTICAL BOW AND CROSSBOW HUNTER SUCCESS AND WOUNDING LOSS IN TEXAS

SCOTT BOSWORTH, Texas Parks and Wildlife Department, Lindale, TX, 75771, USA
SARA RESENDEZ, Texas Parks and Wildlife Department, Cotulla, TX, 78014, USA
TUCKER SLACK, Texas Parks and Wildlife Department, Tennessee Colony, TX, 75861, USA

Abstract: In 2009, the Texas Legislature legalized the use of crossbows for white-tailed deer hunting during archery-only season statewide with a few exceptions. In order to address potential concerns regarding success rates and wounding loss between vertical bows and crossbows, the Texas Parks and Wildlife Department conducted a 3 year research project on 6 wildlife management areas across 7 counties. No significant difference was found between crossbow and vertical bow hunter success or wounding loss. Two hundred and one of 287 deer hit were recovered, and wounding rates exhibited no significant difference between vertical bow and crossbow hunters. This study suggests that there were no significant differences between crossbow and vertical bow hunter success or wounding loss, thus not warranting adjustments to current white-tailed deer management strategies on state-owned WMAs.

1:45: VARIATION IN RUMEN-RETICULUM FILL IN WHITE-TAILED DEER

MEREDITH R. AIKEN, Department of Biology, Texas State University–San Marcos, San Marcos, TX, 78666, USA

DANIEL M. WOLCOTT, Department of Biology–San Marcos, San Marcos, TX, 78666, USA

HEATH D. STARNES, Department of Biology, Texas State University–San Marcos, San Marcos, TX, 78666, USA

RYAN S. LUNA, Natural Resource Management, Sul Ross University, Alpine, TX, 79832, USA

ADAM DUARTE, Department of Biology, Texas State University–San Marcos, San Marcos, TX, 78666, USA

FLOYD W. WECKERLY, Department of Biology, Texas State University–San Marcos, San Marcos, TX, 78666, USA

Abstract: Rumen-reticulum fill presumably increases when individuals consume diets with high fiber content and when individuals increase food intake to meet greater energetic demands associated with reproduction or decreased body condition. Yet, no one has examined these relationships across multiple sites or assessed whether relationships differ between free ranging animals and captive animals that consume a pelleted diet. To further examine these relationships we assessed whether rumen-reticulum fill (wet and dry) is influenced by the fiber content of the diet, the type of diet (browse forage vs. pelleted diet), and reproductive demands in free ranging and captive white-tailed deer (*Odocoileus virginianus*). We collected female and male white-tailed deer ($n = 254$) in March, October, and November, 2009–2011, in central and South Texas. Sample sizes were 144 free range and 40 captive deer from central Texas and 70 free range deer from South Texas. We measured sex, lactation status and time of kill for each animal. Rumen-reticulum fill (wet and dry), body weight, back fat, as well as dietary acid detergent fiber (ADF) and crude protein (CP) were measured from each animal. We then built linear models to analyze our data and used Akaike Information Criteria corrected for small sample size (AICc) to select models. Dry rumen-reticulum fill was influenced by body condition, reproductive state, and dietary nutrition whereas wet rumen-reticulum fill was influenced by body condition and reproductive state. Wet rumen-reticulum fill reflects the digestive and metabolic capabilities of an animal and dry rumen-reticulum fill reflects the nutritional quality of an animal's diet.

2:00: EFFECTS OF DENSITY AND SUPPLEMENTAL FEED ON WHITE-TAILED DEER ACTIVITY PATTERNS

BLAISE A. KORZEKWA, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

TIMOTHY E. FULBRIGHT, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

DAVID G. HEWITT, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

CHARLES A. DEYOUNG, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

KIM N. ECHOLS, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

DON A. DRAEGER, Comanche Ranch, Carrizo Springs, TX, 78834, USA

Abstract: Provision of supplemental feed and increased deer density may influence behavioral patterns of white-tailed deer (*Odocoileus virginianus*). We hypothesized that movement rates of deer would be negatively related to deer density and increase in the presence of supplemental feed. We fitted 32 deer on 2 ranches in southwest Texas with GPS collars. Collared deer were in 81-ha enclosures that represented low (10 deer/81-ha) and high (40 deer/81-ha) densities and supplemental feed was provided ad libitum to

1 enclosure of each density per ranch. Collars recorded coordinates every 30 min from December 2009 until December 2010. We divided the year into 6 seasons (rut, post-rut, late winter/spring, parturition, late summer/early fall, and pre-rut) and days into 4 periods (night, morning, day, and evening). Although results varied with period, season, and sex, when differences were noted, deer in low density enclosures and deer with access to supplement moved more than deer in high density enclosures and deer in enclosures without supplement. Deer without access to supplement may travel less than deer with supplement in order to conserve energy. Provision of supplemental feed may allow deer to travel greater distances in order to obtain natural vegetation and supplemental feed. Bucks in low density enclosures traveled greater distances than bucks in high density enclosures, perhaps due to reduced social pressures. Even though density and feed influenced movement rates, routine seasonal and crepuscular changes appear to be the most important factors influencing movement rates.

2:15: AGE STRUCTURE AND PRODUCTIVITY OF UNMANAGED WHITE-TAILED DEER POPULATIONS IN SOUTH TEXAS

KORY R. GANN, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

DAVID G. HEWITT, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

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ALFONSO ORTEGA-SANCHEZ, 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, Kingsville, TX, 78363, USA

THOMAS W. BOUTTON, Department of Ecosystem Science and Management, Texas A&M University, College Station, TX, 77843, USA

ALFONSO ORTEGA-SANCHEZ, JR., East Wildlife Foundation, Kingsville, TX, 78363, USA

TYLER A. CAMPBELL, East Wildlife Foundation, San Antonio, TX, 78216, USA

Abstract: Environmental variability may affect productivity of white-tailed deer in South Texas, thus influencing the age structure of deer populations. Understanding the impacts of environmental variability on the productivity and recruitment of unmanaged deer populations will enable landowners to improve their deer management programs. To provide such data in southern Texas, 783 deer were captured from 2011–2013, on an East Wildlife Foundation property on which deer were unmanaged. Above average rainfall in 2010 resulted in high fawn recruitment, as seen by yearling deer (1.5 years old) making up 17% of females and 20% of males captured in 2011. The drought southern Texas experienced in 2011 and 2012 resulted in low fawn recruitment, as seen by yearling deer composing 4% of females and 9% of males captured in 2012, and 8% of females and 9% of males captured in 2013. This variability in recruitment of individuals into the population appears to be mediated by high adult survival. Deer 6.5 years and older composed 30–40% of the females and 34–37% of the males captured from 2011–2013. Recruitment in unmanaged deer populations in South Texas appears to be controlled by precipitation. Frequent drought periods ensure that unmanaged populations rarely grow to high levels, while years with high rainfall result in high recruitment that keeps unmanaged populations from declining. Large numbers of older deer also act to sustain the population until precipitation necessary for reproduction is available. Lowering adult survival through intense harvest could reduce the ability of these populations to persist in reasonable numbers in this highly variable environment.

2:30: RAINFALL OVERRIDES DEER DENSITY AND SUPPLEMENTARY FEEDING AS THE MAJOR INFLUENCE ON FORB COMMUNITY DYNAMICS IN SOUTH TEXAS

LINDSAY D. ROBERTS, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

TIMOTHY E. FULBRIGHT, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

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DAVID G. HEWITT, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

CHARLES A. DEYOUNG, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

KIM N. ECHOLS, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

DON A. DRAEGER, Comanche Ranch, Carrizo Springs, TX, 78834, USA

Abstract: Forbs constitute a significant portion of white-tailed deer (*Odocoileus virginianus*) diets and contain high concentrations of protein and digestible energy; however, little is known about the effects of varying deer densities and the use of supplemental feed on forb communities in semiarid regions. We hypothesized that higher densities of white-tailed deer and supplemental feeding would alter patterns of forb species dominance and reduce forb diversity and evenness in comparison to lower deer densities. We also hypothesized that, over time, herbaceous plant communities with high deer densities and supplemental feed will become less similar to plant communities with low deer densities and no feeding. We estimated percent canopy cover of forbs during June from 2004–2013 on 2 ranches, each with 6–81 ha enclosures, to compare deer densities (10, 25, and 40 deer/81 ha), and supplemental feeding treatments (feed vs. no feed). We used percent canopy cover to compute the Berger-Parker index of dominance, Shannon's diversity index, evenness, and the Sorenson similarity index. Forb dominance index varied ($P < 0.001$) from 0.21 in a wet year (2012) to 0.64 during severe drought (2011), but the index was similar among deer densities ($P = 0.59$) and feeding ($P = 0.20$). Forb species diversity and evenness likewise varied among years ($P < 0.001$) but were similar among densities ($P = 0.33$ and $P = 0.13$, respectively) and between feed treatments ($P = 0.23$ and $P = 0.26$, respectively). Composition of plant communities among deer densities and feeding treatments remained similar during 2004–2013. Variation in rainfall has a far more profound influence on forb communities in southwestern Texas than differences in deer density and supplemental feeding.

2:45: MANAGEMENT OF WHITE-TAILED DEER IN THE CATTLE FEVER TICK PERMANENT QUARANTINE AREA OF ZAPATA COUNTY

HANK C. BIRDSALL, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX 78363, USA

DAVID G. HEWITT, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX 78363, USA

GRETA SCHUSTER, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX 78363, USA

TIMOTHY E. FULBRIGHT, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX 78363, USA

DANIEL R. BACA, United States Department of Agriculture–Animal and Plant Health Inspection Services, Zapata, TX 78076, USA

CHASE R. CURRIE, San Pedro Ranch, Carrizo Springs, TX 78834, USA

Abstract: White-tailed deer are intermediate hosts for the cattle fever tick (CFT), a problem exacerbated by high deer densities. Management of white-tailed deer within the CFT permanent quarantine area of Zapata County by the USDA is necessary to prevent the spread of CFT. In Zapata County, small property sizes and traditional management of white-tailed deer have led to high deer densities, skewed sex ratios, and a paucity of mature bucks. Helicopter surveys in the CFT quarantine zone revealed 6 does for every buck and <2.5% mature bucks. In order to decrease deer density in the quarantine zone, we have engaged in outreach programs with local landowners and monitoring of the deer population. Landowner outreach programs have included educational deer management conferences for landowners and distribution of pamphlets (in English and Spanish) on habitat management, buck aging, and herd management. Furthermore, we are currently working toward organizing a deer management cooperative. Monitoring efforts have included aerial surveys of white-tailed deer on private and government land, browse counts, and estimation of population size through mark-resight analysis of deer at medicated bait sites. In addition, we successfully convinced the International Boundary and Water Commission to allow a youth doe and pig hunt through the Texas Youth Hunting Program on government-owned land that hasn't been hunted in fifty years. If our efforts to change public opinion on deer management are successful we will arrive at long-term, sustainable deer densities that will benefit the USDA's CFT eradication efforts and provide quality mature bucks for harvest.

SESSION 1C: ECOLOGY AND MANAGEMENT OF CARNIVORES

1:30: BOBCAT SPATIAL ECOLOGY AT A SITE IN THE HIGH PLAINS OF TEXAS

LENA M. THURMOND, Department of Life, Earth and Environmental Sciences, West Texas A&M University, Canyon, TX, 79016, USA

JAMES D. RAY, Babcock & Wilcox Technical Services Pantex, LLC, Pantex Plant, Amarillo, TX, 79120, USA

RAYMOND S. MATLACK, Department of Life, Earth and Environmental Sciences, West Texas A&M University, Canyon, TX, 79016, USA

RICHARD T. KAZMAIER, Department of Life, Earth and Environmental Sciences, West Texas A&M University, Canyon, TX, 79016, USA

Abstract: We studied bobcats on and around the 7,289-ha Pantex Plant near Amarillo, Texas (Carson County). This area is on the High Plains and is comprised primarily of short grass prairie habitat and agricultural lands. Natural structures and vertical cover is limited. We captured 23 individuals a total of 34 times. Eleven of these captures were females with 8 being adults and 12 of the captures were male with 10 being adults. Adults were fitted with a Tellus brand GPS collar programmed to record locations every 2 hours which was later modified to every 6 hours to maximize battery life. This resulted in 17,478 total locations and an average of 971 locations per individual (Range: 35–4,486). Home ranges (100% MCP) of females averaged 11,160 ha (Range: 5,450–20,406 ha) and were semi-exclusive. Male home ranges averaged 11,408 ha (Range: 291–40,747 ha) and overlapped with several females. Bobcats made extensive use of both natural and anthropogenic habitat features including prairie dog towns, playas and wetlands, roads, railroads, culverts, buildings, etc. These home ranges are larger than many previous studies, suggesting that this area may represent low quality habitat.

1:45: USE OF CAMERA TRAPS TO DETERMINE MOUNTAIN LION USE OF HABITAT AND PREY AVAILABILITY IN THE DAVIS MOUNTAINS, TEXAS

CATHERINE C. DENNISON, Borderlands Research Institute, Sul Ross State University, Alpine, TX, 79832, USA

PATRICIA MOODY HARVESON, Borderlands Research Institute, Sul Ross State University, Alpine, TX, 79832, USA

LOUIS A. HARVESON, Borderlands Research Institute, Sul Ross State University, Alpine, TX, 79832, USA

Abstract: Knowledge of the availability and habitat use of the prey base in an area is important baseline data for understanding the predator-prey dynamics that occur on a landscape. Camera traps provide the ability to survey both mountain lions (*Puma concolor*) and their prey base, which consists of a wide variety of species, in a manner that is more economically feasible than with traditional survey techniques. We used an array of camera traps to evaluate species diversity and the relative abundance and spatial distribution of mountain lions and their prey in the Davis Mountains of Texas. We found feral hogs (*Sus scrofa*) to be the most abundant species, composing 23% of the total animals observed. Feral hogs and grey fox (*Urocyon cinereoargenteus*) were the most widespread species, each observed at 33 of 38 camera locations. We found variation in species diversity and evenness between camera locations and a negative correlation between hog density and species evenness was observed. Resource selection was evaluated for 4 criteria: elevation, ecological site, fine scale terrain ruggedness, and broad scale terrain ruggedness. Variations in resource selection were observed between and amongst species of herbivores and predators. With knowledge of mountain lion habitat use and the availability of prey, resource managers can better assess the effects mountain lion predation may have on a specific species, which will allow for better management of those species.

2:00: THE ABUNDANCE OF OCELOTS AND OTHER MAMMALS ON THE SOUTHERN COAST OF TAMAULIPAS, MEXICO.

MITCHELL A. STERNBERG, U.S. Fish and Wildlife Service, Alamo, TX, 78516, USA

FRANCISCO ILLESCAS, CDEN, Brownsville, TX, 78520, USA

LUIS J. PENA, Gladys Porter Zoo, Brownsville, TX, 78520, USA

THOMAS W. DEMAAR, Friends of Laguna Atascosa NWR, Los Fresnos, TX, 78566, USA

Abstract: Wildlife cameras were deployed using visual and scent attractants in a 35 km x 35 km coastal band in southern Tamaulipas, Mexico, to document the relative abundance of medium and large mammals and then to estimate the size of the ocelot population on targeted ranches. Fourteen cameras on 9 ranches documented 15 species in 599 trap-nights from September to December 2012. Ocelots and jaguars were found at 71% and 29%, respectively, of camera sites. Javelina and raccoon had high relative abundances and ocelot, jaguar, and jaguarundi were less abundant. A high abundance of ocelot on several ranches warranted an additional study to estimate the size of the population and to determine its ability to serve as a source to provide ocelots for translocation to populations in Mexico and Texas in need of genetic rescue.

2:15: INFLUENCE OF HABITAT AND COYOTES ON BOBCAT POPULATIONS IN SOUTH TEXAS

G. WESLEY WATTS III, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville, Kingsville, TX, 78363, USA

ARTURO CASO, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville, Kingsville, TX, 78363, USA

JUSTIN P. WIED, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA
SASHA CARVAJAL, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA
LAUREN D. BALDERAS, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA
ALFONSO ORTEGA-SANCHEZ, JR., East Wildlife Foundation, Kingsville, TX, 78363, USA
MICHAEL E. TEWES, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

Abstract: Habitat diversity and environmental productivity are 2 common metrics of ecosystem health. The large area requirements and trophic level position of carnivores allow them to serve as indicators of community health for the habitat they occupy. The generalist resource selection of bobcats (*Lynx rufus*) makes these carnivores a suitable indicator of lower trophic level community health. In February 2012, we initiated camera surveys of the carnivore communities on 3 ranches of the East Wildlife Foundation: Buena Vista, San Antonio Viejo, and Santa Rosa. Each sampling grid was composed of 24–30 camera stations. The main objective was to examine the variation in bobcat populations among camera stations and ranches. We are currently evaluating the influence of several factors on bobcat occupancy including habitat characteristics and coyote (*Canis latrans*) occurrence. This information will be relevant to landowners who want to manage for biodiversity.

2:30: FAMILY RELATIONSHIPS AND LEVELS OF INBREEDING DERIVED FROM PEDIGREE ANALYSIS FOR ENDANGERED OCELOT SUBPOPULATIONS IN SOUTH TEXAS

JENNIFER M. KORN, FWC, Venus, FL, 33852, USA
JAN E. JANECKA, TAMU, College Station, TX, 77843, USA
RANDY W. DEYOUNG, TAMUK-CKWRI, Kingsville, TX, 78363, USA
ARTURO M. CASO, TAMUK-CKWRI, Kingsville, TX, 78363, USA
MICHAEL E. TEWES, TAMUK-CKWRI, Kingsville, TX, 78363, USA
LINDA LAACK, USFWS, Los Fresnos, TX, 78566, USA
JODY MAYS, USFWS, Los Fresnos, TX, 78566, USA
DANIEL J. KUNZ, TPWD, Austin, TX, 78744, USA
ALFONSO ORTEGA-SANCHEZ, JR., East Foundation, Corpus Christi, TX, 78411, USA

Abstract: Research has indicated that endangered ocelots (*Leopardus pardalis*) in Texas exist as 2 genetically isolated subpopulations: (1) Yturria Ranch (Yturria) and East El Sauz Ranch (East) in Willacy County (Willacy), and (2) Laguna Atascosa National Wildlife Refuge (LANWR) in Cameron County. We assigned parentage (80% and 95%) to 140 possible offspring during 1984–2013 and then used assignments to construct a partial pedigree. The pedigree was used to detect family relationships, estimate the inbreeding coefficient (F), and identify if individuals monopolized the breeding. Most assigned parents produced only 1–2 offspring, but 2 individuals in LANWR (1 female, 1 male) produced 17% and 25% of sampled offspring at 95% confidence, respectively. In Willacy, 1 female produced 17% of the offspring at 95% confidence. Inbreeding coefficients were similar between subpopulations (mean: Willacy = 0.014, LANWR = 0.014; max: Willacy = 0.27, LANWR = 0.25). Six inbred relationships were detected on LANWR, and 8 inbred relationships were detected in Willacy. Moderate movement rates occurred within Willacy, while only 1 assignment occurred between LANWR and Willacy. An offspring from LANWR was assigned a sire from Yturria, and may be the only recorded gene flow between the 2 subpopulations in about 30 years of research. Ocelots in Willacy are likely part of a larger unsampled population, while LANWR remains isolated and continues to lose diversity and become more genetically

differentiated. With such low levels of diversity, rare to non-existent dispersal, increasing isolation, and high road mortality, the ocelot faces extirpation in Texas without immediate conservation management strategies.

2:45: COMPARATIVE LAND-COVER USE BY SYMPATRIC OCELOT AND BOBCAT IN SOUTH TEXAS

JOHN P. LEONARD, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

ERIC L. RULISON, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

ALFONSO ORTEGA-SANCHEZ, JR, East Wildlife Foundation, Kingsville, TX 78363, USA

DANIEL J. KUNZ, Texas Parks and Wildlife Dept., Alice, TX 78333, USA

ARTURO CASO, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

JUSTIN P. WIED, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX 78363, USA

G. WESLEY WATTS III, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX 78363, USA

MICHAEL E. TEWES, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX 78363, USA

Abstract: The ocelot (*Leopardus pardalis*) is a federally-listed endangered species confined to 2 isolated breeding populations in the United States. Throughout its range in the United States, it is sympatric with the bobcat (*Lynx rufus*). We compared habitat use of ocelot and bobcat using telemetry data collected over 3 years. From 2011 to 2013, 10 ocelots (5M, 5F) and 13 bobcats (7M, 6F) were trapped and collared on the East El Sauz Ranch, Willacy County. We attached VHF radio collars to 6 ocelots and 11 bobcats, and GPS collars to 4 ocelots and 2 bobcats. We recovered data from 2 of the GPS collars placed on ocelots and from both of the GPS collars placed on bobcats, recording a maximum of 1 diurnal location event for each individual. We programmed GPS collars according to several different track schedules in order to evaluate habitat use and movements at multiple scales. We calculated 50% and 95% fixed kernel home range estimates for each individual. We used land-cover data from the Coastal Change and Analysis Program (C-CAP) developed by NOAA (National Oceanographic and Atmospheric Administration) to quantify major land-cover types comprising ocelot and bobcat home ranges. We conducted a multivariate analysis to determine if core land-cover components differ between species and sexes.

SESSION 1D: MONITORING AND MANAGEMENT

1:30: A DISCUSSION ABOUT MONITORING IN AN ADAPTIVE MANAGEMENT CONTEXT

STEPHEN J. DEMASO, Gulf Coast Joint Venture, U.S. Fish and Wildlife Service, Lafayette, LA, 70506, USA

BARRY C. WILSON, Gulf Coast Joint Venture, U.S. Fish and Wildlife Service, Lafayette, LA, 70506, USA

Abstract: Monitoring is an integral part of science-based wildlife management. However, the lack of common terms for discussing monitoring as it applies to wildlife management and research often results in miscommunication. We offer some concepts and definitions regarding wildlife and habitat monitoring. These concepts and definitions have been helpful for furthering monitoring discussions within the Gulf

Coast Joint Venture bird conservation partnership. We discuss how monitoring is used in the context of a population and habitat-based adaptive management framework. We offer these concepts and definitions more broadly to potentially help others advance their monitoring discussions.

1:45: THE OAKS AND PRAIRIES JOINT VENTURE GRASSLAND RESTORATION INCENTIVE PROGRAM

JONATHAN G. HAYES, Oaks and Prairies Joint Venture, La Grange, TX, 78945, USA

Abstract: For more than 50 years grassland bird populations throughout Texas have been steadily declining. Many factors contribute to these population declines, but the primary cause is loss of available suitable habitat needed to sustain these species. The Oaks and Prairies Joint Venture (OPJV) Grassland Restoration Incentive Program (GRIP) is a partnership-based, strategic pilot project designed to restore grassland bird habitat on private lands. GRIP utilizes state and private funding to provide financial incentives to private landowners in support of ongoing efforts to reach OPJV partnership established grassland bird population and habitat objectives in identified focus counties. GRIP is objective-driven, geographically focused, flexible, adaptive, collaborative, and locally-driven, featuring population monitoring and conservation tracking at multiple scales to support management decisions. These characteristics will enable the program to successfully deliver substantial amounts of improved grassland bird habitat in a way that has the highest potential for impacting grassland bird populations at the landscape level. OPJV began accepting GRIP project proposals on 1 November 2013, and will accept proposals indefinitely on a rolling enrollment basis depending upon continued partner funding. OPJV partner organization professionals in focus counties are encouraged to work with private landowners to submit project proposals. More information is available at www.opjv.org.

2:00: INTRODUCTION TO INATURALIST

MARSHA E. MAY, Texas Parks and Wildlife Department, Austin, TX, 78744, USA

Abstract: iNaturalist.org is an online website and mobile application that allows you post observations of any species along with photos and sound recordings. When you post an observation, the iNaturalist community is encouraged to validate or add to your identification. In effect, iNaturalist is a tool that uses crowdsourcing for the generation and validation of natural history observations. Each observation documents the basic who, what, when, and where essential for creating data out of a naturalist's observations. Observers have the option to add additional information through customizable fields. When the basic information is completed, and the identification is validated by the community, an observation becomes "research grade". In addition, observers have the option to add observations to projects where they will receive validation from experts associated with the project. Through projects, observers gain access to a higher standard of validation and the opportunity to contribute to conservation efforts. In this presentation, we will review how to create an iNaturalist observation, validate other observations, add your observations to a project, and explore observations made by other naturalists. In addition, we will review how you can set up a "place" and manage a life or regional list on iNaturalist. Several Texas Parks and Wildlife biologists developed the following projects in iNaturalist: Hummingbirds of Texas, Herps of Texas, Mammals of Texas, Texas Box Turtle Survey, Texas Freshwater Mussels, and Texas Whooper Watch.

2:15: THE MAMMALS OF TEXAS INATURALIST PROJECT: CROWDSOURCING MAMMAL MONITORING

JONAH W. EVANS, Texas Parks and Wildlife, Alpine, TX, 79830, USA

Abstract: Texas Parks and Wildlife created a “Mammals of Texas” project on the iNaturalist website to help monitor mammal distributions across the state. This project allows the public to submit photo-vouchered observations of mammals, which are then verified by experts to ensure data accuracy. The observations become valuable learning opportunities for the public and permanent data points for researchers. While still in the early stages, over 1,200 observations of more than 100 species have been recorded by 115 observers. Crowdsourcing wildlife data collection with iNaturalist is allowing Texas Parks and Wildlife to greatly expand efforts to monitor mammals despite increasingly limited resources. Universities, students, and citizen scientists can participate in this project, view the data, and access a community of experts dedicated to learning, sharing knowledge, and contributing valuable information to mammal research.

2:30: THE USE OF INATURALIST TO ACQUIRE CARNIVORE SIGHTINGS DATA IN AN URBAN LANDSCAPE

DEREK J. BROMAN, Texas Parks and Wildlife Department, Cedar Hill, TX, 75106, USA

Abstract: Detecting the presence of cryptic, secretive, and territorial mammals in an urban landscape is a difficult task, especially if that data is needed to satisfy short-term requirements. Data collected by citizen science, however, can occur across most geographic scales and in areas difficult to sample using traditional techniques. To meet data needs, I created a project on iNaturalist.org called “DFW Carnivores” as a medium for collecting and storing citizen science observations of carnivores throughout the Dallas-Fort Worth Metroplex (DFWM) Metroplex. Short- and long-term objectives of the iNaturalist project include soliciting bobcat sightings for testing and validating products from an ongoing collaborative urban bobcat study (e.g. habitat models and maps) and documenting the presence and distribution of rare carnivores, respectively. Various strategies were implemented to address the unique challenges that arise when requesting observations of mammals that evoke strong public opinion and emotion. To prevent potential issues and maintain/increase public participation, steps were taken to address public concern by utilizing the standard features of an iNaturalist project. I also recognized the value of involving the large number of conservation partners in the DFWM to increase awareness and contribution to the project. Actively campaigning for their assistance had a positive impact on the project also while strengthening professional partnerships. Three months after its creation, the DFWM Carnivores iNaturalist project has over 180 observations of wild carnivores over the past 3 years, including 57 bobcat sightings.

2:45: THE HERPS OF TEXAS PROJECT ON INATURALIST: A TOOL FOR MANAGING YOUR OBSERVATIONS AND SUPPORTING CONSERVATION

ANDREW G. GLUESENKAMP, Texas Parks and Wildlife Department, Austin, TX, 78619, USA

CULLEN HANKS, Texas Parks and Wildlife Department, Austin, TX, 78619, USA

Abstract: iNaturalist is a powerful tool that allows you to post and organize your photographs in a way that generates data for conservation organizations. In addition, since the platform is designed to validate and provide feedback on species identification, it is a valuable tool for developing your skills as a naturalist. Texas Parks and Wildlife, in collaboration with The University of Texas and Texas A&M University, started the Herps of Texas Project in the Fall of 2013 with the goal of compiling information on the distribution of reptiles and amphibians in Texas. This presentation will review how to explore data on iNaturalist, as well as post and manage your observations with photographs or sound recordings. It will also review the results from the first year for Herps of Texas, highlighting the breadth of data collected, and examples of valuable observations.

SESSION 2A: ECOLOGY AND MANAGEMENT OF NONGAME BIRDS

3:15: NESTING SOUTHEASTERN AMERICAN KESTRELS AND RED-COCKADED WOODPECKER HABITAT MANAGEMENT

RICHARD R. SCHAEFER, USDA, Forest Service, Southern Research Station, Nacogdoches, TX, 75965, USA

CRAIG RUDOLPH, USDA, Forest Service, Southern Research Station, Nacogdoches, TX, 75965, USA

Abstract: Habitat management for the endangered red-cockaded woodpecker (*Picoides borealis*) benefits a number of species of conservation concern. The southeastern American kestrel (*Falco sparverius paulus*) is a resident subspecies of the southeastern United States, reaching the western limit of its range in the west gulf coastal plain. This subspecies has declined in many areas, and there has been little research in the western portion of its range. A majority of kestrel nests (83%) were located in forest stands managed for red-cockaded woodpeckers. We compared nest site ($n = 42$) and random site ($n = 42$) habitat variables. Habitat surrounding kestrel nest trees includes lower basal area of pine canopy trees, fewer midstory hardwoods, less canopy and midstory closure, greater herbaceous and woody ground cover, and less bare soil and leaf litter. Diameter at breast height was greater for nest trees than random trees. Shrub height was similar between nest sites and random sites, but shrub density was greater around nest sites. These habitat characteristics are typical at sites where forest thinning and prescribed fire are used to manage habitat for red-cockaded woodpeckers. We recorded 412 prey deliveries (males = 225, females = 187) to nest sites by breeding kestrels. Most vertebrate prey was delivered by males (85%), with green anoles (*Anolis carolinensis*) being the most common prey item ($n = 121$). Females delivered mostly invertebrates (88%), and grasshoppers were the most common prey item ($n = 55$).

3:30: AGE STRUCTURE OF GOLDEN-CHEEKED WARBLERS IN AREAS OF LOW ABUNDANCE

HANNAH L. PRUETT, Department of Wildlife & Fisheries, Texas A&M University, College Station, TX, 77840, USA

Abstract: Understanding how habitat use and reproductive performance vary among age classes is important to understanding population structure and viability. Habitat conditions can affect occupancy and productivity of many songbirds, including golden-cheeked warblers (*Setophaga chrysoparia*). Thus, it is important to know which members of the population are using habitat of varying conditions. Existing demographic literature on golden-cheeked warblers focuses on populations where warblers occur in high abundance. I examined the age structure of golden-cheeked warblers in areas of low abundance to determine if there are patterns of differential habitat use based on age in this species. Over 2 breeding seasons, I monitored 14 lower quality habitat patches within central Texas. I assessed date of arrival and patch occupancy, territory establishment, pairing success, fledging success, and age of birds within each patch. I compared my observations to those same measurements in 10 higher quality habitat plots. Males arrived in low quality sites on average 5 days later (10 March) and tended to be younger (62% SY, $n = 8$) than those males that established territories in high quality sites (5 March, 30% SY, $n = 23$). I aged 31 territorial males on my study sites. While pairing success was lower on the low quality sites, fledging success remained similar. Understanding which portions of the warbler population are using patches of varying condition could lead to the detection of potential demographic drivers in habitat selection and could inform future management.

3:45: EFFECTS OF GRAZING ON BROOD PARASITISM OF BLACK-CAPPED VIREOS

ANTHONY J. LOCATELLI, Texas A&M University, College Station, TX, 77845, USA

Abstract: Anthropogenic land change can have tremendous direct and indirect effects on biota. A prevalent land change in Texas is conversion of land to grazing. Grazing facilitates foraging opportunities for brown-headed cowbirds (*Molothrus ater*), a brood parasite. Cowbirds can reduce productivity of their hosts, causing some host species to decline in abundance. The black-capped vireo (*Vireo atricapilla*) is an endangered songbird with most of its breeding range occurring in areas of livestock and other ungulate grazing. Brown-headed cowbird parasitism has contributed to the black-capped vireo's endangered status. I investigated relationships between brown-headed cowbird parasitism of black-capped vireo nests and grazing system type (grazed or wild ungulate only), landscape variables (e.g. amount of grassland within 3 km of a nest), and grazing intensity (represented by distance to water). Grazing system type and amount of grazing in the landscape influenced probability of parasitism. I expect results to be useful for land managers who could adjust grazing regimes for the benefit of black-capped vireos or to identify high priority situations for brown-headed cowbird control measures.

4:00: AMERICAN OYSTERCATCHER NEST AND BROOD SURVIVAL IN TEXAS

LIANNE M. KOCZUR, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

ALEXANDRA E. MUNTERS, Department of Biology, Texas State University, San Marcos, TX, 78666, USA

SUSAN A. HEATH, Gulf Coast Bird Observatory, Lake Jackson, TX, 77566, USA

BART M. BALLARD, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

M. CLAY GREEN, Department of Biology, Texas State University, San Marcos, TX, 78666, USA

FIDEL HERNANDEZ, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

DAVID B. WESTER, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

Abstract: The American oystercatcher (*Haematopus palliatus*) is listed as a Species of High Concern in the U.S. Shorebird Conservation Plan due to a small population size and annual-cycle threats. Previous studies of the American oystercatcher have focused on Atlantic Coast populations; however, nothing is known about the reproductive success of the western Gulf Coast population. The objective of this study was to determine nest and brood survival of American oystercatchers in Texas. We monitored 337 nests and 121 broods on the Gulf Coast of Texas from 2011–2013. Overall daily survival rate (DSR) of nests was 0.971 ($SE = 0.002$) and DSR of broods was 0.986 ($SE = 0.002$). Temporal effects were important in explaining variation in survival, with survival decreasing as the season progresses. Known causes of nest and brood loss included overwash, depredation, and starvation. This study provides extensive baseline data on the reproductive success of the American oystercatcher along the western Gulf Coast.

SESSION 2B: ECOLOGY AND MANAGEMENT OF UNGULATES

3:15: POPULATION ESTIMATES AND HOME RANGE SIZES OF URBAN DEER IN FAIR OAKS RANCH, TEXAS

KARA B. CAMPBELL, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

CHARLES A. DEYOUNG, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

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RICHARD HEILBRUN, Texas Parks and Wildlife Department, San Antonio, TX, 78254, USA

JESSICA ALDERSON, Texas Parks and Wildlife Department, San Antonio, TX, 78254, USA

RYAN SCHOENEBERG, Texas Parks and Wildlife Department, San Antonio, TX, 78254, USA

Abstract: Increasing urban sprawl leads to more human-wildlife conflicts. To formulate effective management recommendations, reliable estimates of wildlife population sizes are needed. Fair Oaks Ranch, Texas, spans 5,105 ha, 43 km north of San Antonio, and has an overabundant white-tailed deer (*Odocoileus virginianus*) population. Our objective was to determine a population estimate and home range size for white-tailed deer throughout Fair Oaks Ranch. We captured 458 deer (M:F = 178:280) during January–April 2012 and January–March 2013 using drop-nets baited with corn throughout the city. Captured deer were sexed, aged, and given unique ear-tag combinations. Thirty-six males and 32 females were fitted with VHF transmitters and located weekly (Apr–Aug 2012, Jan–Aug 2013) using a receiver and portable antenna. Mean 95% fixed kernel home range was 23.5 ± 4.8 (SE) and 15.9 ± 2.2 ha for males and females, respectively, in 2012 and 109.3 ± 21.4 and 35.1 ± 5.8 ha for males and females, respectively, in 2013. For population estimates marked and unmarked deer were counted along 3 pre-determined driving transects throughout the city. Using mark-resight models in Program MARK, 14 sampling periods generated population estimates of 876 ± 43 (SE) to $1,767 \pm 71$ white-tailed deer. We also conducted distance sampling along the same driving routes during 5 surveys and calculated population estimates using Program DISTANCE. DISTANCE estimates ranged from 964 ± 186 (SE) to $1,500 \pm 214$ deer. Distance surveys produced acceptable estimates allowing population monitoring to continue without the need for marked animals. This information will allow us to model the effectiveness of different management strategies, such as removal or contraception.

3:30: VOLUNTEER URBAN WHITE-TAILED DEER SURVEY

DAVID NICOSIA, Remme Corporation, San Marcos, TX, 78666, USA

Abstract: Facilitated Volunteered Geographic Information (VGI), crowd-sourced data that includes a geographical reference that is solicited for a specific purpose, holds great promise for environmental resource monitoring, yet a major limitation of VGI is unknown information quality. Prior to initiating a VGI project, it is difficult to know if the collected data will be useful for the intended project purpose. This research explored the use of computer simulation to inform the design and implementation of a facilitated VGI project, specifically an urban neighborhood white-tailed deer survey. The project was conducted in 2 phases; a computer simulation phase followed by a simulation validation phase including a VGI neighborhood deer survey. During the simulation phase 5 different data collection methods were tested, each subject to various types and amounts of uncertainty and under permutations of 4 levels of volunteer participation and 3 levels of deer density. Additional simulation refined and optimized data collection methods. Results from the simulation phase guided development of the facilitated VGI neighborhood deer survey. Volunteer observations were aggregated to estimate the neighborhood deer population. An Infrared Triggered Camera (ITC) deer survey was conducted coincident with the volunteer survey. The VGI population estimate was 72% of the ITC population estimate. Simulation was useful for testing alternative data collection methods, optimizations to data collection methods and the relative performance of those methods under differing conditions of deer density and participation. Simulation

also results informed interpretation of VGI results, but simulation was not useful for predicting volunteer behavior or participation level.

3:45: INVESTIGATING GRASS GRAZING INTENSITY ON BIOMASS OF FORBS PREFERRED BY WHITE-TAILED DEER

STACY L. HINES, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Science, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

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ALFONSO ORTEGA-SANCHEZ, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Science, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

DAVID G. HEWITT, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Science, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

THOMAS W. BOUTTON, Department of Ecosystem Science and Management, Texas A&M University, College Station, TX, 77843, USA

Abstract: There have been few studies completed on the impacts of grass grazing intensity on preferred forbs for white-tailed deer (*Odocoileus virginianus*). The objective of this project was to determine the relationship between grass grazing intensity and utilization of and standing crop of forbs preferred by white-tailed deer. Fifty 1.5 m² vegetation enclosures, with a paired outside plot, were randomly allocated for installation at each of 6 (2,500-ha) study sites on East Wildlife Foundation ranches in South Texas. In autumn 2012 and 2013, vegetation biomass was determined in the following categories (1) grasses; (2) forbs preferred by deer; and (3) forbs not preferred by deer. We did not detect a relationship between grazing intensity and preferred forb standing crop because of high variation in the data set and effects of drought ($P > 0.05$). In 2012, as the number of large ungulate species increased, so did ungulate grazing intensity. However, there was no difference in number of ungulate species and grazing intensity in 2013. The lack of change in grass utilization between years can be attributed to drought and prolonged history of heavy grazing. However, management of cattle and nilgai densities in 2013 resulted in decreased utilization when more than 1 large ungulate was present. Our results will help answer the question if grass removal, and at what level of grazing intensity, increases the standing crop of forbs preferred by white-tailed deer.

4:00: EFFECTS OF THREE WHITE-TAILED DEER DENSITIES AND SUPPLEMENTAL FEEDING ON HEIGHT AND CANOPY STRUCTURE OF SELECTED SHRUBS

LINDSEY M. PHILLIPS, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

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KIM N. ECHOLS, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

DON A. DRAEGER, Comanche Ranch, Carrizo Springs, TX, 78834, USA

Abstract: The maximum white-tailed deer (*Odocoileus virginianus*) population that southwestern Texas can support without negative vegetation impacts is unknown. Supplemental feed may alter white-tailed deer foraging habits, which may reduce browsing pressure on vegetation or increase selective foraging on more palatable vegetation. Our objective was to determine the impacts of different white-tailed deer densities and provision of supplemental feed on select shrub species. Three white-tailed deer densities were established in 6 81-ha enclosures for 10 consecutive years on each of 2 ranches, with target densities of 10, 25, and 40 deer/81 ha. Three enclosures per ranch received supplemental feed, while 3 did not. In 2013, height and canopy volumes of 120 guayacan (*Guaiaacum agustifolium*), blackbrush acacia (*Acacia rigidula*), and granjeno (*Celtis pallida*) were measured, with blackbrush acacia and granjeno split into 2 height classes (1.5 m). There was no effect ($P > 0.05$) of white-tailed deer density or supplemental feed on blackbrush acacia canopy volume in either size class, granjeno 1.5 m in the high density enclosures had larger ($P < 0.05$) canopies below 1.5 m than those in medium and low density enclosures. Supplemental feed did not affect canopy volume of granjeno >1.5 m ($P > 0.05$), and density and supplemental feed effects were independent ($P > 0.05$). High densities of white-tailed deer appear to increase canopy volume of granjeno, possibly through compensatory growth due to browsing.

SESSION 2C: ECOLOGY AND MANAGEMENT OF MAMMALS

3:15: AN INNOVATE APPROACH TO CONSERVATION OF ENDANGERED FLORIDA PANTHER ON PRIVATE LANDS: CREATING A PAYMENT FOR ECOSYSTEM SERVICES

JENNIFER M. KORN, FWC, Venus, FL, 33852, USA

ERIN MYERS, USFWS, Naples, FL, 34114, USA

JULIE MORRIS, Wildlands Conservation, Inc, Venice, FL, 34285, USA

Abstract: Habitat loss has contributed greatly to the decline of the endangered Florida panther (*Puma concolor coryi*). The breeding population appears to currently be restricted to lands south of the Caloosahatchee River in southern Florida, but private lands north of the River are critical to successful panther expansion. Landscape-scale habitat protection is needed to provide corridors for dispersing panthers, as well as habitat for a future resident breeding population in the expansion area. Implementing a Payment for Ecosystem Services (PES) would incentivize landowners to maintain existing native habitat and restore native habitat on their lands. Additionally, the PES program would incorporate a reimbursement for livestock depredation by panthers. We recommend a novel approach for depredation losses, by building the costs into the PES, eliminating the need for individual requests for payment. This reduces both time and costs associated with processing individual requests. In ArcMap, we highlighted lands with the greatest conservation value to panther conservation using the following inputs: panther locations (telemetry, mortalities, and verified sightings), a least costs path panther habitat model combined with regional Priority 1 Critical Lands and Waters Project (CLIP) lands, public conservation lands, and private lands in conservation programs. This analysis of panther habitat connectivity will be used to create habitat metrics by which to score private lands into payment tiers. With over 50% of occupied panther range under private ownership, it is essential to assist landowners with management actions that not only protect their private interests, but ensure the protection of the Florida panther.

3:30: CHRONOBIOLOGY AND EXOGENOUS FACTORS INFLUENCING BOBCAT ACTIVITY IN SOUTH TEXAS

JUSTIN P. WIED, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA
MICHAEL E. TEWES, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA
ARTURO CASO, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA
GORDON W. WATTS III, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA
ERIC L. RULISON, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA
SHELBY CARTER, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA
TIMOTHY M. BUQUOI, Feline Research Center, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA
ALFONSO ORTEGA-SANCHEZ, JR., East Wildlife Foundation, San Antonio, TX, 78216, USA

Abstract: Chronobiology is an important discipline that enables researchers to understand behavioral, ecological, and physiological patterns of a target species. Many cues influence these patterns and can have profound impact on the interpretation of the study variables. We have used information collected from >10,000 camera nights generated from 7 ranches over the past 4 years to assess bobcat (*Lynx rufus*) activity patterns in South Texas. Activity occurred primarily during crepuscular and nocturnal periods. The role of exogenous factors such as light, photoperiod, temperature, and lunar phase are correlated with the observed patterns. Finally, the influence of circadian and circalunar cues will be explored in this study.

3:45: DETERMINING HABITAT PREFERENCE IN MOUNTAIN HARE AND PTARMIGAN IN NORTHEASTERN SIBERIA

AARON P. WHITE, Department of Biological Sciences, The University of Texas at Brownsville, Brownsville, TX, 78520, USA
HEATHER D. ALEXANDER, Department of Biological Sciences, The University of Texas at Brownsville, Brownsville, TX, 78520, USA
KENNETH PRUITT, Department of Biological Sciences, The University of Texas at Brownsville, Brownsville, TX, 78520, USA

Abstract: Arctic ecosystems are composed of a matrix of habitat patches at varying successional stages that support different animal communities. However, information on animal habitat preferences in northeastern Siberia is limited to primarily range maps. These maps present locations where certain species may be found without providing small scale distributions combined with information on vegetation communities. Background information regarding preferred habitat types and plant animal interactions is required in order to answer more complex questions. Animals like mountain hare (*Lepus timidus*) and ptarmigan (*Lagopus* spp.) can be found throughout Siberia and both species feed heavily on willow (*Salix* spp.). Because of the preference for willow, we expect to find evidence of hare and ptarmigan presence to be commonly associated with vegetation communities containing higher densities of willow. During summer 2013, habitat use in 6 different vegetation communities was examined. Communities encompassed boreal forests of varying successional stages and tundra. A browse survey using a point centered quarter method was used to determine the extent of browse on major shrub species within each vegetation community. Scat surveys were conducted to identify presence absence of animals within habitat types. Results from this study will add information on habitat preference for mountain hare

and ptarmigan, which can be used to later determine the impact these animals have on future successional processes.

4:00: BAT COMMUNITY COMPOSITION AND ITS RELATIONSHIP TO STAND STRUCTURE IN A BOTTOMLAND HARDWOOD FOREST OF EAST TEXAS

CARLA J. WEINKAUF, Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University, Nacogdoches, TX, 75962, USA

CHRISTOPHER E. COMER, Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University, Nacogdoches, TX, 75962, USA

WARREN C. CONWAY, Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University, Nacogdoches, TX, 75962, USA

SCOTT BOSWORTH, Texas Parks and Wildlife, Old Sabine Bottom Wildlife Management Area, Lindale, TX, 75771, USA

Abstract: Management of bottomland hardwood forest for bat habitat can be complex. Although forest stand structure and composition affect chiropteran communities by affecting roosting and foraging habitat, these relationships are poorly understood for most species. We characterized the bat community and related it to key stand structural characteristics at the Old Sabine Bottom Wildlife Management Area (OSBWMA) in Smith County, Texas. We conducted acoustic sampling using Pettersson D500X monitors from 19 April 2013 to 26 August 2013, for a total of 129 sampling nights and 871 trap nights. We located 56 sampling points in a 450 m grid across the study area. Each point was sampled for 6–10 consecutive nights during each of 2 separate calendar time frames (early and late season) of approximately 9 weeks each. At each location we measured canopy closure, stem density, and basal area to characterize stand structure and composition. We used program PRESENCE to determine detection probability and occupancy by species and to identify stand characteristics that influenced these variables. Over this time period 35,617 potential bat calls were recorded with 11,155 (31%) identifiable to species by consensus vote using Sonobat™ software. This included calls of 10 bat species. The most common species included evening bats (*Nycticeius humeralis*), Seminole and eastern red bats (*Lasiurus* sp.), tricolored bats (*Perimyotis subflavus*), hoary bats (*Lasiurus cinereus*), silver-haired bats (*Lasionycteris noctivagans*), and southeastern myotis (*Myotis austroriparius*). We then compared bat occurrence with forest stand structural characteristics to determine how fine-scale habitat features influence bat activity.

SESSION 2D: GAME BIRD ECOLOGY & MANAGEMENT

3:15: SPRING AND SUMMER MOVEMENT PATTERNS OF RIO GRANDE WILD TURKEYS IN TEXAS

JESSE G. OETGEN, Texas Parks and Wildlife Department, Weatherford, TX, 76088, USA

JENNIFER BARROW, Texas Parks and Wildlife Department, Decatur, TX, 76234, USA

KEVIN D. MOTE, Texas Parks and Wildlife Department, Brownwood, TX, 76801, USA

MASON D. CONLEY, Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX, 77843, USA

BRET A. COLLIER, Institute of Renewable Natural Resources, Texas A&M University, College Station, TX, 77843, USA

Abstract: Rio Grande wild turkey (*Meleagris gallopavo intermedia*) population dynamics have been studied extensively across Texas, however, little is known about their spring and summer movement patterns. During 2012 and 2013, we tracked 50 Rio Grande turkey hens and 11 toms on 3 study sites

within the Cross Timbers and Prairies Ecoregion of Texas. Each site represented a unique set of habitat conditions; burned by Possum Kingdom wildfire complex of 2011, unburned conditions typical of the region, and a fragmented landscape surrounding the Lyndon B. Johnson National Grasslands. GPS transmitters recorded the location of each turkey at least once an hour from February to October each year. Hens dispersed from winter flocks on approximately 15 March each year. Distance traveled from core fall\winter area to spring/summer area varied from less than 1 up to 10 miles. During the pre-nesting period, turkeys traveled up to 7,000 m/day with a noticeable decrease during the laying period. Hens often initiated nests in locations which were previously unvisited. During incubation, hens rarely traveled more than 50 m from the nest. These results indicate that while daily movements increase significantly prior to nest initiation, nest site selection may be a function of something other than a hen's comparison of suitable nest sites. Additionally, habitat improvements targeting wild turkeys should be conducted within 3 miles of suitable roost areas and provide adequate food, water, and cover within 50 m of nest sites.

3:30: NEST-SITE CHARACTERISTICS OF RIO GRANDE WILD TURKEY HENS IN TEXAS

JENNIFER L. BARROW, Texas Parks and Wildlife Department, Decatur, TX, 76234, USA

JESSE G. OETGEN, Texas Parks and Wildlife Department, Weatherford, TX, 76088, USA

KEVIN D. MOTE, Texas Parks and Wildlife Department, Brownwood, TX, 76801, USA

MASON D. CONLEY, Department of Wildlife and Fisheries, Texas A&M University, College Station, TX, 77843, USA

BRET A. COLLIER, Institute of Renewable Natural Resources, Texas A&M University, College Station, TX, 77843, USA

Abstract: Rio Grande wild turkey (*Meleagris gallopavo intermedia*) nesting habitats and nest-site characteristics have been studied in various regions of Texas, but little is known about nest site attributes in the Cross Timbers and Prairies region of the state. We tracked Rio Grande turkeys on 3 study sites within Cross Timbers and Prairies Ecoregion of Texas. Each site represented a unique set of habitat conditions; burned by Possum Kingdom wildfire complex of 2011, unburned conditions typical of the region, and a fragmented landscape of private land intermixed with public property of the Lyndon B. Johnson (LBJ) National Grasslands. GPS transmitters recorded the location of each turkey at least once an hour from February–October 2012 and March–October 2013. Locations identify dates that hens began laying, incubating, when/if nests were abandoned, and, if nests were successful, dates at which brood-rearing began. Nests were inspected at least once during the incubation period. Data collected included number of eggs, diameter and height of nest cover, and dominant species of cover. Seventy nests were located, with 10.0% hatching success. Our results suggest that woody cover is important in nest site selection, although a particular species of woody cover does not appear to be selected for. Our results also suggest that diameter and height of nest cover are not a determining factor for nest site selection.

3:45: MOVEMENT ECOLOGY AND HABITAT SELECTION OF RIO GRANDE WILD TURKEY BROODS IN TEXAS

MASON D. CONLEY, Texas A&M University, College Station, TX, 77840, USA

JESSE G. OETGEN, Texas Parks and Wildlife Department, Weatherford, TX, 76088, USA

JENNIFER BARROW, Texas Parks and Wildlife Department, Decatur, TX, 76234, USA

BRET A. COLLIER, Institute of Renewable Natural Resources, Texas A&M University, College Station, TX, 77843, USA

Abstract: Quantifying space use represents a vital component in animal habitat selection studies and provides the foundation for a wide variety of research and management applications. Rio Grande wild turkeys (*Meleagris gallopavo intermedia*) are a gregarious, highly nomadic species with movements fluctuating during various life-history strategies. Of primary interest in habitat selection studies of

brooding wild turkey hens is identifying habitats selected immediately post hatch as these locations are likely represent optimal foraging and cover conditions. Here, we document movements of GPS tagged Rio Grande wild turkey hen movements during the 2 week brooding period when poults are in the pre-flight stage. Overall, female wild turkey movements were short (less than 200 m/day), typically centered in and around the nesting site, and increased slightly as the number of days since hatch increased. Additionally, brooding hens showed an affinity for woody vegetation while poults are in the pre-flight stage (less than 2 weeks) but as poults aged, hen-poult group movements increasingly selected for more diverse vegetation types. Our results indicate that perhaps hen nest site selection may be driven by perceived brooding habitat within the surrounding areas.

4:00: CLIMATE CHANGE AND PREDICTED EFFECTS ON PRAIRIE GROUSE

NOVA J. SILVY, Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX, 77843, USA

Abstract: Climate change is having significant impacts on insect phenology, with warmer environmental temperatures contributing to a progression toward earlier emergence. Spring is springing forward: spring events, like bird and butterfly migrations, flower blooming times, and frog mating have been advancing by about 3 days per decade over the past 30 years. The emergence of grasshoppers has advanced by approximately 4 days per decade since 1959, while each degree C corresponds to an advancement of roughly 10 days. This earlier grasshopper emergence does not coincide with hatching of prairie grouse chicks which leads to a shortage of food and death of chicks. With spring coming earlier, red imported fire ants (*Solenopsis invicta*) are emerging earlier and pose a greater risk to insect food sources of Attwater's prairie chicken (*Typanuchus cupido attwateri*) chicks. Prairie grouse breeding and subsequent hatching of chicks is tied to photoperiod and is not affected as much by warming temperatures. I do not believe prairie grouse can evolve fast enough to compensate for this rapid climate change and believe this is currently leading to declining populations.

Saturday, 22 February 2014

SESSION 3A: POPULATION GENETICS

8:15: LANDSCAPE-SCALE DIFFERENTIATION IN GENE FLOW OF MESOCARNIVORES IN THE TEXAS PANHANDLE

IMOGENE DAVIS, Department of Life, Earth and Environmental Sciences, West Texas A&M University, Canyon, TX, 79016, USA

ROCKY WARD, Department of Life, Earth and Environmental Sciences, West Texas A&M University, Canyon, TX, 79016, USA

RICHARD T. KAZMAIER, Department of Life, Earth and Environmental Sciences, West Texas A&M University, Canyon, TX, 79016, USA

Abstract: Previous research indicates that the Great Plains region of the United States affects the movement and gene flow of mesocarnivore populations, but it is not known if the unique physiographic features of the Texas Panhandle, the southern extent of the Great Plains, affect the genetic structure of wildlife populations. We hypothesized that the Caprock Escarpment in Texas is a barrier to gene flow in bobcats, coyotes, and grey foxes, and thus creates genetically distinct populations in the High Plains and Rolling Plains of Texas. We expected bobcats and coyotes to display landscape-mediated genetic structure specifically related to the Escarpment, but that grey foxes would exhibit more common signs of panmixia. Samples collected from live-trapped and postmortem animals from January 2013 through January 2014

were analyzed on an individual basis to determine the landscape-scale differentiation in gene flow and population structure for each species. For preliminary results we used the statistical package STRUCTURE to identify populations and assign individuals to a population of origin, AMOVA to determine the molecular variation of individuals, and examined isolation by distance for each mesocarnivore species.

8:30: USING REDUCED REPRESENTATION GENOMIC SEQUENCING TO CHARACTERIZE INDIVIDUAL GENETIC DIVERSITY LEVELS IN THE ATTWATER'S PRAIRIE-CHICKEN

JEFF A. JOHNSON, Institute of Applied Sciences, Department of Biological Sciences, University of North Texas, Denton, TX, 76203, USA

Abstract: Next-generation sequencing (NGS) is a method for generating a large amount of genomic data at ever-increasing speed and reduced cost. However, our ability to generate such data at the population level is still hampered by our ability to process the huge mass of data in a way that is useful for population management, especially for non-model organisms that lack a completely sequenced annotated genome for referencing purposes. Instead of sequencing the entire genome of each individual, multiple methods have been developed that generate a reduced representation genomic library, thereby allowing pooling of samples to produce population-level data while taking advantage of the ability to producing millions of sequence reads in a single run. One such method, described as double-digest restriction site associated DNA sequencing (ddRADseq), subsamples the genome at homologous locations to identify and type single nucleotide polymorphisms (SNPs) evenly spaced throughout the genome. Few studies, however, have applied this method to in endangered species, and it is not known if ddRADseq is useful for generating sufficient genomic data for further downstream population genetic analyses. Here, we use ddRADseq to generate and quantify genomic diversity among 75 individual Attwater's prairie-chickens (*Tympanuchus cupido attwateri*) from the captive release program in 2012. A total of 136 million sequence reads were generated using an Illumina HiSeq 2500 platform, of which 125,000 to 250,000 potential loci were characterized, depending on sequencing coverage criteria (10x and 3x coverage, respectively). However, after eliminating loci that were monomorphic (~47% of loci) while focusing only on those loci that were identified in all 75 individuals, a total of between 4,000 and 7,000 polymorphic loci were identified, depending on criteria used to process the dataset de novo, or without a reference genome for alignment. Despite a significant decrease in the total number of loci following bioinformatic processing, a large number of SNPs have been identified, and we are currently exploring their correlation with fitness.

8:45: COMPARATIVE GENETIC STRUCTURE OF WILD PIGS IN THE ROLLING PLAINS ECOREGION

PETER E. SCHLICHTING, Texas Tech University, Lubbock, TX, 79409, USA
C. BRAD DABBERT, Texas Tech University, Lubbock, TX, 79409, USA

Abstract: The identification of appropriate management units is an issue that is central to wildlife management. Management units consist of distinct sub-populations that should be treated as 1 population and management actions scaled accordingly. This knowledge can inform harvest regulations, areas of high conservation priority, and landscape features that affect dispersal. Neutral genetic markers are one way to identify management units which can be collected inexpensively and quickly. Microsatellites and single nucleotide polymorphisms (SNPs) have been used extensively for identifying genetic structure but their relative explanatory power has rarely been tested. The objectives of this study were to identify

management units for an invasive species, wild pigs, across an entire ecoregion and to compare between using microsatellite markers, SNPs, and a combination of the two. We sampled 149 pigs across the Rolling Plains Ecoregion of Texas at 13 microsatellite and 93 SNP loci. Two Bayesian assignment programs (Structure and TESS) identified 3 management units for pigs throughout the sampling region. The combination of microsatellites and SNPs provided the clearest results but each marker type alone also identified 3 distinct management units. Results indicate a nearly continuous population with high rates of genetic exchange. This population recently expanded into the Rolling Plains Ecoregion and the high rates of overlap may be attributed to this fact.

9:00: HAPLOTYPE CHARACTERIZATION OF BLACK BEAR (*URSUS AMERICANUS*) IN THE SIERRA DE SAN LUIS, SONORA, MEXICO

MARIA G. CAMARGO AGUILERA, Universidad Autonoma de Queretaro, Queretaro, 76010, Mexico
NALLELI E. LARA DIAZ, Universidad Autonoma de Queretaro, Queretaro, 76010, Mexico
CARLOS A. LOPEZ GONZALEZ, Universidad Autonoma de Queretaro, Queretaro, 76010, Mexico
CORA VARAS-NELSON, University of Arizona, Tucson, USA
MELANIE CULVER, University of Arizona, Tucson, USA

Abstract: Understanding the genetic structure of a species increases our knowledge of their ecology and evolution, as well as aiding in the development of management and conservation strategies aimed at maintaining long-term viable populations. Black bears (*Ursus americanus*) have been present in North America for over 3 million years, currently extending from Canada to northern Mexico. However, during glacial period of the Pleistocene, the distribution of temperate forests and associated black bears populations shifted and were markedly reduced, apparently a key factor in the present genetic structure of black bear populations. Previous studies of mitochondrial sequence diversity in black bears indicate the presence of 2 highly divergence clades in North America: a western coastal clade and a continental clade. Within the continental clade there are 2 distinct subclades, the Western and the Eastern. Recent investigations suggest that both of these subclades are found in northern Mexico and are geographically separated. In the present study, we examined the haplotype diversity of mitochondrial DNA (control region) from 335 black bear fecal samples collected over 5 years (2006–2012) in the Sonora, Mexico. A total of 120 sequences were obtained and results of neutrality of the control region identified 10 different haplotypes which contained both western and eastern subclades of the continental clade. These results suggest, that the Sierra Madre Occidental of Mexico served as a refugia for black bear populations during glacial periods of the Plietocene which later colonized central and eastern North America.

Session 3B: ECOLOGY AND MANAGEMENT OF MAMMALS

8:15: ANALYSIS OF INTERNATIONAL BIGHORN SHEEP MOVEMENTS IN THE BIG BEND REGION OF TEXAS

THOMAS S. JANKE, Borderlands Research Institute, Sul Ross State University, Alpine, TX, 79832, USA
PATRICIA MOODY-HARVESON, Borderlands Research Institute, Sul Ross State University, Alpine, TX, 79832, USA
LOUIS A. HARVESON, Borderlands Research Institute, Sul Ross State University, Alpine, TX, 79832, USA
FROYLAN HERNANDEZ, Texas Parks and Wildlife Department, Alpine, TX, 79830, USA

Abstract: From the early 1900's until about the 1950's, bighorn sheep (*Ovis canadensis*) substantially declined in numbers across North America. Some subspecies went completely extinct (i.e., *O. c. auduboni*) whereas others were extirpated from their local areas (i.e. Texas). Beginning in the late 1950's, Texas and other areas began restoration efforts. Since that time, nearly 650 sheep have been transplanted to 8 of the historic 16 mountain ranges throughout the Trans-Pecos. Current populations for Texas are estimated to be around 1500 individuals, close to estimates from the late 1800's. Beginning in 2010, restoration efforts for bighorn in the Bofecillos Mountains began with a transplant of 46 sheep from Elephant Mountain WMA. Since that time, a total of 141 sheep have been transplanted down to this mountain range. Seventy-eight of the 141 sheep were fitted with GPS collars prior to reintroduction. The movements of the sheep have been monitored for the last 3 years. Distances of >50 km have been recorded in multiple directions of the release site. Of the recovered collars, >14 sheep have crossed into Chihuahua, Mexico at some point. Interestingly, Chihuahua, like Texas, also had their native wild sheep extirpated from the local mountain ranges. Analysis of the international movements and the areas traversed will be discussed. Restoration and management implications on both sides of the border also will be addressed.

8:30: IRRUPTIVE DYNAMICS IN A POPULATION OF ROOSEVELT ELK

HEATH D. STARNS, Department of Biology, Texas State University, San Marcos, TX, 78666, USA
MARK A. RICCA, U.S. Geological Survey, Western Ecological Research Center, Davis, CA, 95616, USA

ADAM DUARTE, Department of Biology, Texas State University, San Marcos, TX, 78666, USA
FLOYD W. WECKERLY, Department of Biology, Texas State University, San Marcos, TX, 78666, USA

Abstract: Abstract: Population irruptions have been well documented in insular populations of ungulates. These studies have aided in our understanding of the relative roles of density-dependent and -independent factors on irruptive population dynamics. Still, few investigations have assessed these impacts on continental populations of large ungulates, particularly elk (*Cervus elaphus*). The paucity of information on large ungulate irruptions is due in part to the limited availability of long-term data sets on these long-lived populations. We used a 17-year time series (1997-2013) of Roosevelt elk (*C. e. roosevelti*) counts in Redwood National Park in northwestern California to document a population irruption and assess the influence of population size and climatic variation on elk recruitment. We used partial correlation analysis to estimate effects of climatic variation (monthly precipitation, mean monthly minimum and maximum temperature, lagged 1 and 2 years) and female elk abundance on recruitment (juvenile:female ratios). When accounting for variation in abundance, mean monthly minimum temperature during winter (Jan–Apr) and the rainy season (Oct–Apr) significantly affected recruitment. These variables were negatively correlated with recruitment at both time lags. When accounting for variation in climatic variables, density-dependent effects lagged 2 years significantly affected recruitment. The population grew rapidly after release into the study area, with a subsequent decline in abundance, eventually reaching equilibrium at a lower than peak abundance. This pattern conforms to an irruptive model. Density-dependent factors appear to be the primary driver of Roosevelt elk population dynamics in a relatively mild climate.

8:45: FORAGE QUALITY AND NUTRITIONAL CONDITION OF ADULT-FEMALE MULE DEER FOLLOWING HABITAT ENHANCEMENTS IN NORTH-CENTRAL NEW MEXICO

GRANT E. SORENSEN, Department of Natural Resources Management, Texas Tech University, Lubbock, TX, 79409, USA

DAVID W. KRAMER, Department of Natural Resources Management, Texas Tech University, Lubbock, TX, 79409, USA

CHASE A. TAYLOR, Department of Natural Resources Management, Texas Tech University, Lubbock, TX, 79409, USA
MARK C. WALLACE, Department of Natural Resources Management, Texas Tech University, Lubbock, TX, 79409, USA
PHILIP S. GIPSON, Department of Natural Resources Management, Texas Tech University, Lubbock, TX, 79409, USA
ROBERT D. COX, Department of Natural Resources Management, Texas Tech University, Lubbock, TX, 79409, USA
STEWART LILEY, New Mexico Department of Game and Fish, Santa Fe, NM, 87507, USA
WAYNE ARMACOST, NRA Whittington Center, Raton, NM, 87740, USA

Abstract: Mule deer (*Odocoileus hemionus*) populations have declined throughout the western United States. Poor quality habitat, reduced food availability, drought, and predation are some factors implicated in limiting mule deer populations in north-central New Mexico. In 2010, the 33,000 acre National Rifle Association Whittington Center (WC) located south of Raton, New Mexico implemented a habitat enhancement program intended to increase mule deer populations. We assessed habitat management by investigating forage quality, deer nutritional condition, and cause-specific mortality following treatments. We documented quality of key browse species along with live animal indices at time of capture. We radio marked 36, 16, and 3 adult-female mule deer during the winter of 2011, 2012, and 2013 respectively. Deer were monitored daily for survival, and cause was determined for each mortality. Growing season browse quality ranged from 12.11% crude protein (CP) to 25.01% CP across all species and treatments. Total ingesta-free body fat (IFBF) levels in March ranged from 2.96% to 10.85%. Predation was the most common cause of mortality (85%; $n = 22$) with mountain lion (*Puma concolor*) accounting for 68.2% of predation events. No significant correlation existed between IFBF and fate of adult-female mule deer ($P = 0.3188$), indicating a weak role of IFBF in mule deer mortality on the WC. Browse protein was sufficient for maintenance requirements and IFBF levels are congruent to those recorded on similar studies in the area. Our results indicate a stronger role of predation rather than nutritional condition in the survival of adult-female mule deer in north-central New Mexico.

9:00: PRELIMINARY OBSERVATIONS ON DISTRIBUTION PATTERNS OF MALE DAMA GAZELLES

ELIZABETH CARY MUNGALL, Texas Woman's University, Denton, TX, 76204, USA
SUSAN M. COOPER, Texas A&M AgriLife Research, Uvalde, TX, 78801, USA

Abstract: A year-long GPS radio collaring study is being conducted on Stevens Forest Ranch in West Texas by the Second Ark Foundation with collaboration of the Exotic Wildlife Association. Five adult dama gazelle males (*Nanger dama ruficollis*) are localizing in predictable zones distinct from each other while 2 males just nearing adulthood cross in and out of these zones. The biggest male, presumably monopolizing good habitat, is using only about 75% as much space as the 2 other adult males (451.34 ha compared to 594.49 and 613.33 ha). The 2 maturing males range more widely (2678.17 and 4559.10 ha). Although this is a non-native population, several attributes of the pasture simulate native conditions: dry climate, subsistence on natural forage, predators, large space. With approximately 9,000 ha of varied terrain, the animals can move with minimal restriction by fences. Before becoming endangered, native dama gazelles trekked from their stronghold in the Sahel into the Sahara after rains. Lack of conspicuous movements for the adult males in West Texas may reflect their more uniform environment. When collars drop off at the conclusion of the study year, the 4,000 GPS locations per collar will be analyzed for vegetation and topography correlations as well as for range overlap. Of special interest for managers will be the maximum area used by each buck. This is being watched as an index of the amount of space which satisfies the needs of normal males under West Texas conditions.

9:15: A COMPARISON OF THE SURVIVAL OF INITIAL AND SUPPLEMENTAL BIGHORN SHEEP TRANSLOCATIONS TO BIG BEND RANCH STATE PARK

THOMAS S. JANKE, Borderlands Research Institute, Sul Ross State University, Alpine, TX, 79832, USA

LOUIS A. HARVESON, Borderlands Research Institute, Sul Ross State University, Alpine, TX, 79832, USA

FROYLAN HERNANDEZ, Texas Parks and Wildlife Department, Alpine, TX, 79830, USA

Abstract: Beginning in 1959, translocation efforts initiated in Texas to restore desert bighorn (*Ovis canadensis mexicana*) to their historic habitats. Since the first out-of-state translocation, 640 sheep have been relocated throughout 8 of the historic 16 mountain ranges, 494 of which have been from re-established Texas stock. In December of 2010 and 2011, a total of 141 sheep was transplanted to the Bofecillos Mountains of Big Bend Ranch State Park. Of those sheep, 78 (24 rams, 54 ewes) were fitted with mortality-sensitive GPS radio collars. Over the last 3 years, the collared sheep have been monitored on a weekly basis. Mortality cases and sites have been investigated and documented. Known fate survival has been calculated using the Kaplan-Meier method. A survival comparison between release years and sex will be discussed along with possible environmental factors and management implications influencing them.

Session 3C: ECOLOGY & CONSERVATION OF BIRDS

8:15: ECOLOGY AND CONSERVATION OF OCELLATED TURKEYS IN CAMPECHE, MEXICO

JON T. MCROBERTS, Department of Natural Resources Management, Texas Tech University, Lubbock, TX, 79409, USA

MARK C. WALLACE, Department of Natural Resources Management, Texas Tech University, Lubbock, TX, 79409, USA

PHILIP S. GIPSON, Department of Natural Resources Management, Texas Tech University, Lubbock, TX, 79409, USA

Abstract: The ocellated turkey (*Meleagris ocellata*) is a gallinaceous bird endemic to the Yucatan Peninsula of Mexico and northern Belize and Guatemala. Little is known about the species, with most published literature descriptive and anecdotal in nature. Throughout their range, ocellated turkeys are a common food source for subsistence hunters and are a popular sport-hunting trophy, thus providing a source of income for an economically depressed area. The paucity of ecological and management information, and the importance of the species to the livelihood of local communities, created the need for research to better manage ocellated turkey populations. During 2010–2013, we captured 70 ocellated turkeys in Campeche, Mexico using cannon nets and walk-in traps. Our objectives were to document survival and cause-specific mortality factors, home range sizes, and movement and dispersal patterns. We took morphometric measurements from captured turkeys to better describe the species and equipped birds with a 95-g VHF backpack-style radio transmitter. We tracked birds from January–June and found that felids were the most common predator of radio-marked birds. We also determined that ocellated turkey movements were often tied to reproductive life-history traits and home range sizes appeared to vary seasonally. We used our findings to develop methods appropriate for researching ocellated turkeys in a jungle environment. It is our hope that information gained from our study will allow more effective,

applied conservation practices to benefit ocellated turkey populations and local communities that depend on the species.

8:30: PUBLIC ATTITUDES REGARDING MONK PARAKEET NEST MANAGEMENT

JANET E. REED, Texas A&M University, College Station, TX, 77843, USA

WILLIAM A. MCINTOSH, Texas A&M University, College Station, TX, 77843, USA

ROBERT A. MCCLEERY, University of Florida, Gainesville, FL, 32611, USA

NOVA J. SILVY, Texas A&M University, College Station, TX, 77843, USA

FRED E. SMEINS, Texas A&M University, College Station, TX, 77843, USA

DONALD J. BRIGHTSMITH, Texas A&M University, College Station, TX, 77843, USA

Abstract: Electric utility structures are a prominent landscape component in the United States, providing a contemporary nesting substrate for some avian species. While the majority are native, the monk parakeet (*Myiopsitta monachus*) was introduced. When monk parakeets build their twig nests on electrical structures, economic damage often follows. Wildlife managers employ various strategies to prevent this, which often provokes strong public opposition. Using the Theory of Planned Behavior, we employed a sociological survey evaluating 8 demographic variables and 4 sociopsychological factors as predictors of opposition responses to nest management. Forty-three invitees participated in our survey for an 11% response rate. Most participants were white-Caucasian, 45 years old, living in homes with property values >\$100,000, and had some or more tertiary education. Most were unknowledgeable about, inexperienced with, and unsure about the potential or known impacts of monk parakeets. Participants indicated the least opposition to nest removal and structural modification during nonbreeding season. When opposing, they were most likely to (1) express opinions to family and friends or through social media and (2) initiate or sign a petition. Participants appeared influenced by: their desire for monk parakeets to feed at their bird feeders or nest in their yard; people and groups who were important to them; and their perceived ease of responding and acting. We suggest wildlife managers develop a public education program about monk parakeet biology and the economic impacts of their nesting habits on electric utility structures. We recommend nest removal and structural modification during nonbreeding season.

8:45: POPULATION DENSITY AND HABITAT ASSOCIATIONS OF THE SEASIDE SPARROW ON LAGUNA ATASCOSA NATIONAL WILDLIFE REFUGE, CAMERON COUNTY, TEXAS

JACQUELINE R. FERRATO, Wildlife Ecology Program, Department of Biology, Texas State University, San Marcos, TX, 78666, USA

THOMAS R. SIMPSON, Wildlife Ecology Program, Department of Biology, Texas State University, San Marcos, TX, 78666, USA

MICHAEL F. SMALL, Wildlife Ecology Program, Department of Biology, Texas State University, San Marcos, TX, 78666, USA

JOSEPH A. VEECH, Wildlife Ecology Program, Department of Biology, Texas State University, San Marcos, TX, 78666, USA

MARK H. CONWAY, 2106 Emerald Lake Drive, Harlingen, TX, 78550, USA

Abstract: In 2000, a resident population of Texas seaside sparrows (*Ammodramus maritimus*) was identified at Laguna Atascosa National Wildlife Refuge on the lower Texas coast, extending its known breeding distribution further south than previously described. We studied this breeding population of Texas seaside sparrows on the Laguna Atascosa National Wildlife Refuge to obtain population density estimates and describe habitat associations. We estimated seasonal density during 1 year using a distance sampling approach. We identified plant species and estimated percent ground cover using a 20 x 50 cm

frame placed systematically along bird survey transects. Seaside sparrow density estimates by season were 3.49/ha (CV = 8.27) for spring 3.59/ha (CV = 18.16) for summer, 4.07/ha (CV = 9.69) for fall, and 1.91/ha (CV = 21.92) for winter. Our density estimates were lower than those found along the northeastern Atlantic Coast of the United States but higher than other estimates in Texas. The dominant plant species along the intertidal zone transect where we detected seaside sparrows included saltwort (*Batis maritima*), saltgrass (*Distichlis spicata*), and sea oxeye daisy (*Borrchia frutescens*). Previous studies indicated cordgrasses (*Spartina* spp.) to be a dominant plant species strongly associated with seaside sparrows and a predictor of nest success. However cordgrasses were absent from the intertidal zone where seaside sparrows were detected during my study. Habitat associations should be revised to include the plant community found in this study.

9:00: BLACK-CAPPED VIREOS IN MEXICO: REVIEW, UPDATES, AND SUGGESTIONS FOR THE FUTURE

MELANIE R. COLON, Department Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX, 77843, USA

MICHAEL L. MORRISON, Department Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX, 77843, USA

JOSE I. GONZALEZ ROJAS, Laboratory of Ornithology, Universidad, Autonoma de Nuevo Leon, San Nicolas de los Garza, Mexico

Abstract: The black-capped vireo (*Vireo atricapilla*) is an endangered songbird that breeds in Texas, Oklahoma, and northeastern Mexico and winters exclusively in western Mexico. Recovery criteria for this species requires there is at least 1 stabilized breeding population in Mexico and that sufficient and sustainable habitat exists to support vireos on their wintering grounds. At the time of listing, habitat loss and degradation and reduced reproductive success from brood parasitism were considered the major threats to vireo populations. However, little was known about vireos breeding in Mexico or how these threats might affect them. The species has since been recommended for downlisting, but information regarding vireos breeding and wintering in Mexico is still limited. In 2009, Texas A&M University and Universidad Aut3noma de Nuevo Le3n began a collaborative research project to help fill some of the gaps in our knowledge of vireos in Mexico. This effort has included statewide surveys on the breeding grounds in Coahuila, Nuevo Le3n, Tamaulipas, and San Luis Potosi as well as territory mapping and nest monitoring at a subset of locations. Statewide surveys were also conducted on the wintering grounds from Sinaloa south to Chiapas. Here I present a review of past work, updates on current work, and suggestions for future research.

9:15: POST-FLEDGING HABITAT USE AND MOVEMENT PATTERNS OF BLACK-CAPPED VIREOS

MARISA T. MARTINEZ, TAMU, College Station, TX, 77843, USA

Abstract: Knowledge of habitat needs during the post-fledging period is relatively limited for most avian species. When young transition from parental care to self-sufficiency and cope with novel demands in their environment, their risk of fatality is high due to lack of experience in foraging and avoiding predators. The numerous ecological pressures on fledglings accentuate the importance of appropriate habitat during this vulnerable period. To understand this life stage in the endangered black-capped vireo (*Vireo atricapilla*), I investigated post-fledging habitat use at 3 sites on the Balcones Canyonlands National Wildlife Refuge and surrounding private properties in central Texas. Between May and August 2013, I conducted 302 habitat use surveys to document fledgling locations, vegetation species usage, and behavior. I sampled vegetation at a subset of detection points to characterize the stand features of

fledgling-occupied areas. To assess the landscape features of these areas, I will perform a landcover classification analysis to measure percent coverage of landcover types. In addition, I quantified movements by calculating the distance banded fledglings travelled from the nest and between detections. I will use these results to evaluate several hypotheses of post-fledging dispersal and inform landowners of fledgling habitat requirements that can be incorporated with current management practices in order to enhance productivity for all life-stages of the vireo.

SESSION 3D: ECOLOGY AND MANAGEMENT OF GAME BIRDS

8:15: THERMAL FACTORS AFFECTING SCALED QUAIL HABITAT SELECTION

HOLLEY N. KLINE, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Kingsville, TX, 78363, USA

BLAKE MARTIN, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Kingsville, TX, 78363, USA

TIMOTHY E. FULBRIGHT, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Kingsville, TX, 78363, USA

FIDEL HERNANDEZ, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Kingsville, TX, 78363, USA

ERIC GRAHMANN, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Kingsville, TX, 78363, USA

LEONARD BRENNAN, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Kingsville, TX, 78363, USA

Abstract: The thermal environment is known to be important in northern bobwhite (*Colinus virginianus*) habitat selection, but the importance of this variable in habitat selection by scaled quail (*Callipepla squamata*) is unexplored. Studies have traditionally focused on operative temperature as the driving factor in habitat selection by animals when other variables, such as ground surface temperature, could also be important. We hypothesized that high ground surface temperatures would affect scaled quail habitat use, with avoidance of surface substrates with temperatures $> 40^{\circ}\text{C}$. We conducted field studies on 2 private ranches in LaSalle, County near Cotulla, Texas. We radio-marked and relocated 51 birds 3 times per week. At the time of relocation, we recorded surface temperature, wind speed, ambient temperature, operative temperature, and relative humidity at each bird location and at paired randomly generated locations. Additionally, we determined vegetation cover using the line intercept method. We used conditional multinomial logistic regression with backwards variable selection to determine explanatory variables important in habitat selection. Surface temperature, operative temperature, vegetation cover, and time of day were important variables in habitat selection ($P < 0.0001$). The temperature of substrates upon which quail travel, as well as vegetation cover and operative temperatures throughout the day may be important factors in explaining micro-habitat selection in arid regions.

8:30: OCCUPANCY, SURVIVAL, AND NESTING ECOLOGY OF SCALED QUAIL IN THE SOUTH TEXAS PLAINS

RICHARD H. SINCLAIR, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

PRESTON HARRIMAN, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

FIDEL HERNANDEZ, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

HOLLEY KLINE, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

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ERIC D. GRAHMANN, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

LEONARD A. BRENNAN, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

Abstract: Scaled quail (*Callipepla squamata*) populations are in decline across their range and little is known about their ecology in southern Texas where this decline has been most evident. Across the South Texas Plains, reduced woody plant diversity from root plowing, the invasion of native plant communities by non-native grasses, and regional reductions in livestock stocking rates have possibly led to decreased habitat for scaled quail. The objectives of our study were to (1) test the effects of these 3 factors on scaled quail occupancy and document (2) seasonal survival, and (3) nest success. Our study was conducted from April–August (2013) on 2 sites in La Salle County, Texas. We estimated occupancy and probability of detection of scaled quail using 30, presence-absence survey points on each site where vegetational variables were measured. We also monitored scaled quail survival and nest success by relocating quail ($n = 51$ birds) 2-3 days/week using radiotelemetry. Uncorrected occupancy estimates showed that scaled quail occupied 19% of survey points. Sites with scaled quail had an apparent seasonal ($n = 164$ days) survival averaged 67% and apparent nest success averaged 41%, with a mean clutch size of 10 eggs ($n = 26$ nests). Our study will provide landowners and managers important information for the management and conservation of scaled quail in South Texas.

8:45: PARASITIC INFECTIONS IN NORTHERN BOBWHITES FROM THE ROLLING PLAINS ECOREGION OF TEXAS AND WESTERN OKLAHOMA

ANDREA BRUNO, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

ALAN M. FEDYNICH, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

DALE ROLLINS, Texas AgriLife Research, Texas A&M University, San Angelo, TX, 76901, USA

Abstract: Northern bobwhite (*Colinus virginianus*) populations are steadily declining throughout the Rolling Plains ecoregion, a once highly productive area for the species. Seldom do researchers consider parasitic infections as factors in decline. In an attempt to gain new information on the role parasitic infections play in bobwhite ecology, a 3-year helminth and disease survey was conducted throughout the Rolling Plains. The objectives of this study are to survey for the presence of *Trichomonas gallinae* (a protozoan causing mortality in dove species), assess helminth infection, and identify potential pathological responses caused by the eyeworm *Oxyspirura petrowi*. Northern bobwhites were trapped and euthanized in August and October of 2011, 2012, and 2013 ($n = 167$) and examined for helminths. Eye tissue from infected and uninfected bobwhites was collected for pathological analyses. Samples for *T. gallinae* were taken from 381 live bobwhites during trapping. *T. gallinae* infections were not found. Eleven species of helminths were found of which *Aulonocephalus pennula*, *O. petrowi*, and *Tetrameres pattersoni* were the most frequently occurring species. Statistical analyses will compare the most frequently occurring parasites' prevalence and abundance to host age, host sex, month, year, body weight, and their interactions. Results from histological analyses of the eyeball, Harderian glands, and nasolacrimal tissues infected with *O. petrowi* also will be presented. The present study will advance our understanding of helminth parasites that occur in bobwhites across the Rolling Plains ecoregion in Texas and western Oklahoma and provide an assessment of their role in potentially impacting bobwhites.

9:00: MONITORING NORTHERN BOBWHITE RECOLONIZATION FOLLOWING LARGE-SCALE WILDFIRES AND DROUGHT IN THE ROLLING PLAINS OF TEXAS

REBEKAH RUZICKA, Texas AgriLife Research and Extension Center, San Angelo, TX, 76901, USA
DALE ROLLINS, Texas AgriLife Research and Extension Center, San Angelo, TX, 76901, USA
KEN CEARLEY, Texas AgriLife Research and Extension Center, Amarillo, TX, 79104, USA

Abstract: During the spring and summer of 2011 severe wildfires consumed over 300,000 ha of prime quail habitat throughout the Rolling Plains of Texas. To gain a greater understanding of northern bobwhite recolonization following wildfire and drought, we conducted spring call counts for 3 years (2011–2013) post-fire in adjacent burned and non-burned habitats on 8 sites and 7 different fires. We established permanent transects of 11–16 km perpendicular to the fire line with listening stations every 1.5 km and covered an approximately equal amount of burned and non-burned land. We counted the number of bobwhites heard calling at each listening station during a 5-min interval 3 times for each site from May through July in 2011, 2012, and 2013. We quantified the soil type at each permanent listening station and drought severity of each site using the Palmer Modified Drought Index. We used a general linear model to describe the number of bobwhites heard calling as a function of the year, drought severity, fire treatment (burn, edge, or non-burned), and soil type.

9:15: TRANSLOCATION OF WILD BOBWHITES INTO RECENTLY DEPOPULATED AREAS IN THE EASTERN ROLLING PLAINS OF TEXAS

MICHELLE C. DOWNEY, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA
DALE ROLLINS, Texas AgriLife Research, Texas A&M University, San Angelo, TX, 76901, USA
FIDEL HERNANDEZ, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA
ERIC D. GRAHMANN, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA
BRADLEY W. KUBECKA, Rolling Plains Quail Research Ranch, Rotan, TX, 79546, USA
LLOYD M. LACOSTE, Rolling Plains Quail Research Ranch, Rotan, TX, 79546, USA
BARRETT A. KOENNECKE, Rolling Plains Quail Research Ranch, Rotan, TX, 79546, USA

Abstract: Northern bobwhite (*Colinus virginianus*) populations are declining throughout Texas. This decline is particularly disconcerting given populations are decreasing in areas with apparently ample habitat such as the Rolling Plains. Our goal is to examine the efficacy of translocating wild-trapped bobwhites into recently depopulated habitat in the eastern Rolling Plains as a method of augmenting population size. During March 2013, we translocated 202 bobwhites from 6 locations within the Rolling Plains to 2 release sites (400 ha each) in Stephens and Shackelford counties. We will quantify seasonal survival, site fidelity, and reproduction of radio-marked translocated bobwhites. In addition, we will compare bobwhite relative abundance and density estimates among control and release sites to evaluate the efficacy of translocation. Ninety-five radio-marked females were released in March 2013, and as of 1 November 2013, 60% have died. Nest success was 42% ($n = 72$ nests) in 2013, and 28% of nesting hens attempted 2 or more clutches. Further translocations of approximately 300 bobwhites per year are planned for March 2014 and 2015. This research will provide valuable insight on bobwhite population restoration techniques in the Rolling Plains of Texas.

9:30 BREAK–30 MINUTES

Session 4A: RESEARCH AND MANAGEMENT TECHNIQUES FOR WILDLIFE

10:00: USING LIDAR-DERIVED METRICS FOR WILDLIFE HABITAT MANAGEMENT

JAMES M. MUELLER, U.S. Fish and Wildlife Service, Balcones Canyonlands National Wildlife Refuge, Marble Falls, TX, 78654, USA

Abstract: Airborne LiDAR (Light Distance and Ranging) has been used frequently in Texas in recent years to determine base elevations for improving maps of flood risks. These data sets can be processed to yield a broad array of forest canopy structure metrics that are important for wildlife management. I describe how LiDAR-derived data are being used to modify habitat management objectives for the golden-cheeked warbler in juniper-oak woodlands. At Balcones Canyonlands National Wildlife Refuge, canopy cover measured at 3 m was identified as an important predictor of golden-cheeked warbler occupancy and density. I used zonal statistics in ArcGIS to describe the status of canopy cover across the 7,500 ha managed for this species. I then assessed the successional stage of each tract based on woody cover. Canopy cover was >80%, indicating the highest quality habitat, for about 44% of the warbler management area. About 23% of the warbler management area had canopy cover between 60 and 80%, indicating a successional stage approaching the highest quality of habitat. LiDAR can be used to assess forest structure in greater detail than ever before possible, but it requires specialized skills and programs to efficiently process the raw data for the desired summary geospatial layers that can be used by wildlife biologists.

10:15: A VOLUNTARY, INCENTIVE BASED APPROACH FOR LESSER PRAIRIE-CHICKEN CONSERVATION

MANUEL T. DE LEON, United States Department of Agriculture, Natural Resources Conservation Service, Lubbock, TX, 79414, USA

RUSSELL O. CASTRO, United States Department of Agriculture, Natural Resources Conservation Service, Temple, TX, 76501, USA

JON L. UNGERER, United States Department of Agriculture, Natural Resources Conservation Service, Marysville, KS, 66508, USA

CHRISTIAN A. HAGEN, Department of Fisheries and Wildlife, Oregon State University, Bend, OR, 97701, USA

Abstract: The lesser prairie-chicken (*Tympanuchus pallidicinctus*; LEPC) population has declined dramatically throughout its historical range. Estimated population declines within the occupied range, including Colorado, Kansas, New Mexico, Oklahoma, and Texas, exceed 90 percent. Approximately 95% of the LEPC's habitat is in private ownership and management within this occupied range. In Texas' portion of the occupied range, this figure closely approaches 100%. In 2010, the Natural Resources Conservation Service (NRCS), long known for assisting private landowners with conservation concerns, implemented the Lesser Prairie-Chicken Initiative (LPCI). The LPCI is a conservation initiative that targets conservation planning, implementation, and funding to improve LEPC habitat while promoting sustainable ranching operations. We present details of the LPCI, including participant requirements, eligible conservation practices, acres benefitted to date, and an outlook to 2014 and beyond.

10:30: COORDINATED GRASSLAND BIRD MONITORING AND DATA MANAGEMENT IN THE OAKS AND PRAIRIES JOINT VENTURE

JAMES J. GIOCOMO, Oaks and Prairies Joint Venture, Round Rock, TX, 78665, USA

JON HAYES, Oaks and Prairies Joint Venture/TPWD, LaGrange, TX, 78945, USA

EDWARD J. LAURENT, Connecting Conservation, Atlanta, GA, 30316, USA
TROY E. WILSON, Migratory Bird Program, Southeast Region, U.S. Fish AND Wildlife Service,
Atlanta, GA, 30345, USA

Abstract: The Oaks and Prairies Joint Venture (OPJV) is a partnership of agencies, organizations, and individuals working together in an adaptive management framework to plan for and facilitate bird habitat conservation activities in the 60 million acre area of the Edwards Plateau and Oaks and Prairies Bird Conservation Regions in Oklahoma and Texas. Coordinated, mission-based bird population monitoring is needed at multiple scales to evaluate the effectiveness of conservation actions at the landscape scale. Currently, there exist many different bird monitoring programs and protocols addressing various monitoring priorities, but to address management issues at landscape levels, there is a need for partnership-based, coordinated data management, data entry, data integration, visualization, and analysis tools. The Avian Knowledge Network can provide existing data management capacity, low cost methods, and flexible data security protocols for a foundation and building blocks of a Coordinated Bird Monitoring in the South West. The OPJV grassland bird monitoring programs started in 2013 (Fall Northern Bobwhite Covey Counts) and 2014 (Spring county-based roadside point counts) provide examples of how a local Coordinated Bird Monitoring partnership will use the tools in the Avian Knowledge Network through the new Eastern Avian Data Center to achieve partner conservation objectives at the landscape and national scales.

10:45: THE LEGACY OF LEAD: DEVELOPING NEW METHODS FOR ASSESSING LEAD CONTAMINATION AND WILDLIFE EXPOSURE RISKS IN GULF COAST WETLAND HABITATS

BRIAN V. KEARNS, Kansas State University, Manhattan, KS, 66506, USA
STEPHEN MCDOWELL, Stephen F. Austin State University, Nacogdoches, TX, 75962, USA
JENA MOON, USFWS, Sabine Pass, TX, 77655, USA
WARREN CONWAY, Stephen F. Austin State University, Nacogdoches, TX, 75962, USA
DAVID A. HAUKOS, Kansas State University, Manhattan, KS, 66506, USA

Abstract: Lead contamination is an extremely prominent issue in western Gulf Coast National Wildlife Refuge (NWR) areas, affecting both habitat and wildlife. Sources of anthropogenic lead are potentially numerous, but the use of lead shot for waterfowl hunting during the twentieth century until the ban in 1991 presents a known problem in the environment. Additionally, hunt club properties that were eventually included in NWRs contained significant lead. Although lead shot deposition from waterfowl hunting has all but ceased, current lead dynamics and potential other sources of contamination in these highly impacted ecosystems remain largely unknown. This has become of increasing concern because of continued documented relatively high levels of lead exposure in mottled ducks in Texas. We assessed the risk of lead exposure in the mottled duck, an at-risk non-migratory waterfowl species native to the Texas Gulf Coast. Mottled duck habitat use and movement data were collected via satellite and VHF radio telemetry from 2006-2012. To assess exposure risk, lead levels in soil on Anahuac and McFaddin NWRs were assessed through stratified sampling protocols and isotope analysis, and were modeled using geospatial techniques. Lastly, a novel technique using species distribution models and multivariate statistics was employed to assess landscape level indicators of lead exposure to direct management efforts. Our results demonstrate continued risk for this species for lead exposure, and suggest directed management practices to reduce the presence of potential ecological traps that are contributing to declines.

11:00: EAST WILDLIFE FOUNDATION MONITORING PROGRAM: PILOT STUDY PLANS AND POTENTIAL

Jeremy Baumgardt, Texas A&M Institute of Renewable Natural Resources, Kingsville, TX 78363, USA
Michael Morrison, Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX 77843, USA

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

Julie Groce, Texas A&M Institute of Renewable Natural Resources, 4040 Broadway, Suite 360 San Antonio, TX 78209

Bret Collier, Texas A&M Institute of Renewable Natural Resources, College Station, TX 77843, USA

Heather Mathewson, Texas A&M Institute of Renewable Natural Resources, College Station, TX 77843, USA

Tyler Campbell, East Wildlife Foundation, 200 Concord Plaza Dr., Suite 410, San Antonio TX 78216, USA

Abstract: East Wildlife Foundation (EWF) properties encompass over 87,000 ha (215,000 acres) across 6 properties in South Texas and consist primarily of rangelands and working cattle ranches. The properties have a long history of cattle grazing and ranching activities. Since the creation of EWF in 2007, the focus of management activities on these ranches has shifted to include research and wildlife conservation as significant objectives within an overriding mission of demonstrating the interconnected relationship among wildlife conservation, ranching, and private land stewardship. Future ranching and land management practices will likely be driven in part by wildlife conservation and the responses of wildlife populations to management actions. Thus, EWF has deemed it a priority to develop and implement a monitoring program to evaluate trends in the distribution and abundance of flora and fauna across their properties. In this presentation we outline an initial framework for a monitoring program on EWF properties and study plans for the 2014 pilot season that will be used to develop long-term sampling methods for the future. Additionally, we will discuss the potential for improved understanding of ecological relationships from long-term data and the application of these data for future land management decisions and wildlife conservation activities.

SESSION 4B: ECOLOGY AND CONSERVATION OF BIRDS

10:00: RESIDENT AND TRANSIENT WINTERING STRATEGIES OF MIGRATORY NEARCTIC PASSERINES IN THE COLUMBIA BOTTOMLANDS OF SOUTHEAST TEXAS

WILLIAM D. OSTRAND, Texas Gulf Coast Bird Observatory, Lake Jackson, TX, 77566, USA

WYLIE C. BARROW, National Wetlands Research Center, USGS, Lafayette, LA, 70506, USA

JENNIFER WILSON, Texas Mid-coast National Wildlife Refuge Complex, US Fish and Wildlife Service, Brazoria, TX, 77422, USA

JAMES RENFRO, Mid-coast National Wildlife Refuge Complex, 2547 County Road 316, Brazoria, TX 77422, USA

Abstract: We report on the result of a 10 year winter banding study of passerine birds conducted in the Big Pond bottomland hardwood unit of the San Bernard National Wildlife Refuge. The data were collected by volunteers and this study is an example of citizen science. Previous work on wintering passerines has determined that 2 wintering strategies are common. Within species birds may be obligatory

transient, resident, or some portion of both strategies. We sought to determine if field data (weight, sex, age, presence or absence of fat, and month first captured) collected from trapped birds was related to resident behavior. To quantify these potential associations we took an information-theoretic modeling approach. We also sought to rank species by their tendency towards residency. Recapture was assumed to be an indication of established residence. Of 10 species analyzed, recapture of 3 was significantly related to field data at $P = 0.05$ (ruby-crowned kinglet [*Regulus satrapa*], yellow-rumped warbler [*Dendroica coronate*], and swamp sparrow [*Melospiza georiana*]). Recapture models varied greatly however, sex was consistently excluded from the best models. Residency as determined by mean number of recaptures during a bird's lifetime ranked as follows: American goldfinch (*Carduelis psaltria*) and American robin (*Turdus migratorius*) 0, yellow-rumped warbler 0.07a, eastern phoebe (*Sayornis nigricans*) 0.19ab, gray catbird (*Dumetella carolinensis*) 0.23ab, Lincoln's sparrow (*Melospiza lincolnii*) 0.25ab, ruby-crowned kinglet 0.26b, hermit thrush (*Catharus guttatus*) 0.34bc, swamp sparrow 0.37bc, orange-crowned warbler (*Vermivora celata*) 0.59cd, white-throated sparrow (*Zonotrichia albicollis*) 0.76d, and house wren (*Troglodytes aedon*) 0.77d. (Species sharing a common letter, shown following average recaptures, were not significantly different at $P = 0.05$).

10:15: THE EFFECTS OF INCREASING TEMPERATURES ON BLACK-CAPPED VIREO HABITAT USE AND REPRODUCTIVE SUCCESS

RONNISHA S. HOLDEN, Texas A&M University, College Station, TX, 77840, USA

Abstract: Microclimate, specifically temperature variability, is a significant factor when addressing habitat requirements for various animal species. Habitat use and reproductive success are 2 m we should consider when assessing the amount of useable space an individual has within its habitat. This study examines the effects of temperature variability on habitat use and reproductive success in the black-capped vireo (*Vireo atricapilla*, hereafter vireo). I predict to see a negatively correlated trend between increases in temperature in association with both habitat use and reproductive success. I predict that as temperatures increase the useable habitat space will become limited, specifically; vireos will use higher vegetation classes in response to increasing temperature. To examine these objectives I placed temperature data loggers at 20 points on a 200 x 200-m spacing grid to record temperature. I placed data loggers in vegetation at these points and then categorized the vegetation into 3 different height classes. The data loggers recorded hourly temperature readings at each location from 20 March to 1 August. I mapped and monitored 36 vireo territories every 3–5 days and in addition monitored 28 vireo nests to access reproductive success. Preliminary data analysis is in progress to examine habitat use of the 3 height classes in association with temperature ranges. Findings of this study will help land managers maintain time unlimited useable space for vireo habitat during their breeding season.

10:30: TEMPERATURE IMPACT ON AN ENDANGERED SONGBIRD'S NEST PRODUCTIVITY IN TEXAS

KATHRYN N. SMITH, Texas A&M University, College Station, TX, 77843, USA

Abstract: Climate change is generating drier, hotter years in Texas. The extent of the effects of these changes on wildlife is not well understood but is likely synergistic. For breeding birds, extreme temperature and precipitation variation affect egg viability and nest survival. Warmer temperatures, in particular, can decrease the number of young fledged per successful nest; however, the mechanism behind this decrease is not well understood. One hypothesis is that ambient temperature during laying influences the number of viable eggs in a clutch. Black-capped vireo (*Vireo atricapilla*) nest survival increases with higher adult attentiveness during incubation, but it is unknown if hotter temperatures are decreasing

overall attentiveness or productivity. I hypothesized that higher temperatures will lead to lower nest productivity because of either (1) decreased egg hatching due to lower adult attentiveness during incubation or (2) suboptimal temperatures during the laying period decrease egg viability. I used nest video data collected at multiple study sites across Texas from 2008 to 2013 and corresponding weather data from the Southern Regional Climate Center to compare egg incubation lengths and average daily maximum temperature while controlling for variation in precipitation and brood size. I also compared egg viability with ambient temperature during the laying period also while considering exposure to direct sunlight based on vertical vegetation cover above the nest.

10:45: HELMINTH INFECTIONS IN NORTHERN BOBWHITES AND SCALED QUAIL FROM SOUTH TEXAS

ANDREW C. OLSEN, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

ALAN M. FEDYNICH, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

Abstract: There is recent interest in studying the diseases and parasites that may negatively affect northern bobwhites (*Colinus virginianus*) and scaled quail (*Callipepla squamata*) in Texas and across their range. Helminth parasites have the ability to regulate gamebird populations as demonstrated in European red grouse (*Lagopus lagopus scoticus*). South Texas, an area with some of the largest contiguous tracts of quail habitat, has had limited research on parasites of quails. To learn more, a sample of 91 northern bobwhites and 12 scaled quail from South Texas was collected from hunters during the 2012–2013 hunting season. An additional 34 northern bobwhite heads were also collected and examined. Eighty-five percent of the whole northern bobwhites and all the scaled quail were infected with helminths. The most prevalent helminth species in northern bobwhites were the cecal nematode *Aulonocephalus pennula* (85%) and the eyeworm *Oxyspirura petrowi* (8%). The most prevalent helminth species in scaled quail were *A. pennula* (100%) and the acanthocephalan *Oncicola canis* (42%). One of the scaled quail was infected with 3 *O. petrowi*, which is the first report of this parasite in scaled quail from South Texas. Our research provides additional information about helminth infections in northern bobwhites occurring in South Texas and some of the first data on helminth infections in scaled quail from South Texas.

11:00: EFFECTS OF RADIO TRANSMITTER ATTACHMENT ON FLIGHT SPEED AND BODY MASS OF NORTHERN BOBWHITE

BYRON R. BUCKLEY, Texas Tech University, Lubbock, TX, 79409, USA

BRAD DABBERT, Texas Tech University, Lubbock, TX, 79409, USA

Abstract: Radio transmitter effects on northern bobwhites (*Colinus virginianus*) have proven to be a hot button topic with contradictory articles present in scientific literature. Our objective was to evaluate the effects of 3 different transmitter attachment types on transmitter retention as well as potential impacts on body mass and flight speed. We raised and flight conditioned 80 quail from a pen reared breeding colony and placed them in a 45 m x 7.6 m x 4.5 m open air “flight” pen with natural environmental and vegetation conditions for the duration of the study. Each bird was randomly assigned to 1 of 4 treatments: modified bib, modified backpack, modified leg harness or control (leg band only). We weighed each bird weekly for body mass changes and induced each bird to fly so that we could measure flight speed (overall flight speed) and flush speed (explosive acceleration speed). Kaplan-Meier estimates for transmitter retention were highest for backpack attachment (100%) followed by bib (86.7%) then leg (26.3%) attachments ($\chi^2 = 25.5$, $P < 0.001$). There was no difference in initial body weights ($P = 0.863$), change in body mass between treatments ($P = 0.216$) or flight speed ($P = 0.357$). Body mass dropped during the first week after moving all quail to the larger flight pens. Flush speeds were slower ($P < 0.001$) for all

birds wearing transmitters when compared to control birds. Radio transmitters had little effect on flight speed or change in body weight in the long term. However, quail with transmitters attached exhibited an initial loss in body weight and a consistently slower flush speed. Undeniably, this experiment occurred in an artificial setting, but a decrease in flush speed and body mass (post transmitter attachment) could increase quail susceptibility to avian or terrestrial predators under wild conditions. Attaching transmitters weighing less than 5% of the body mass for avian species (i.e., bobwhites) may potentially reduce negative effects.

11:15: EVALUATING “RADIO-HANDICAPPING” OF NORTHERN BOBWHITES DURING DROUGHT

REBEKAH RUZICKA, Rolling Plains Quail Research Ranch, Rotan, TX, 79546, USA

DALE ROLLINS, Rolling Plains Quail Research Ranch, Rotan, TX, 79546, USA

LLOYD LACOSTE, Rolling Plains Quail Research Ranch, Rotan, TX, 79546, USA

FIDEL HERNANDEZ, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

Abstract: The negative effects of radio-tagging on northern bobwhite (*Colinus virginianus*) survival (i.e., “radio-handicapping”) has prompted debate amongst scientists in the quail community. The central assumption of telemetry, that radio collars do not negatively bias survival, must be met in order for the survival estimates to be representative of the population. We investigated the acute (i.e., 28 days post-release) and chronic (i.e., season) effects of radio-tagging on northern bobwhite survival over a 5-year period (2008–2012) on the Rolling Plains Quail Research Ranch, Fisher County, Texas. We hypothesized that effects on survival would most likely be manifested during periods of high stress; therefore we tested for differential influences on survival during times of drought. To test for chronic effects, we modeled apparent survival for radio-tagged versus leg-banded only bobwhites that were trapped twice a year during the 5-year period. We will use drought as a time-varying predictor in the Cormack-Jolly-Seber model of Program MARK. Acute effects will be determined by using live-dead information from the radio-tagged bobwhites to estimate daily survival in a Program MARK nest survival framework for 28 days post-release. By using time-since-release as a covariate in our models, we will test for differential survival during 1-, 2-, 3-, 5-, 7-, and 14-day intervals when compared to survival outside of those intervals.

SESSION 4C: ECOLOGY AND MANAGEMENT OF GAME BIRDS

10:00: NORTHERN BOBWHITE MANAGEMENT: VEGETATION AND ARTHROPOD RESPONSES TO BRUSH REDUCTION BY GRUBBING AND STACKING

CARTER G. CROUCH, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

ALFONSO ORTEGA-SANCHEZ, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

LEONARD A. BRENNAN, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

GRETA L. SCHUSTER, Department of Agriculture, Agribusiness and Environmental Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

FIDEL HERNANDEZ, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

DAVID B. WESTER, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

Abstract: Mechanical treatment of brush is a common practice in the management of northern bobwhite (*Colinus virginianus*) habitat. Of the available options, grubbing is a more selective brush management practice and allows targeting of mesquite (*Prosopis glandulosa*) and huisache (*Acacia farnesiana*). Grubbing may be used to clear brush and open lanes for hunting northern bobwhite. We initiated this study on the Santa Gertrudis Division of the King Ranch (Kleberg county, Texas). The objective of this study was to determine the effects of grubbing and stacking on vegetation and arthropod communities important to bobwhite. We anticipated an increase in food plants and arthropods following soil disturbance, as well as an increase in invasive grasses, and nesting cover. Vegetation was sampled prior to treatment in July 2012 and post treatment in November, March and July 2013. Arthropods were sampled monthly using sweep net and D-Vac sampling. We did not detect a treatment effect on food forbs, but documented a positive response of food grasses. We found no treatment effect on invasive grasses or on nesting cover. We detected no effects of treatment on nesting cover. Treatments did not have an effect on total arthropod abundance; however, we did find fluctuations of arthropod biomass as well as effects of treatments on individual orders. Although we saw a temporary increase in some bobwhite foods, we reject the hypothesis that grubbing improves habitat or food sources. Treatments had more of a neutral effect on bobwhite habitat.

10:15: PRIORITIZING MOTTLED DUCK HABITAT FOR MANAGEMENT ALONG THE WESTERN GULF COAST

ANASTASIA KRAINYK, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

Abstract: The mottled duck (*Anas fulvigula*) is a year-round resident of the Gulf of Mexico Coast. Its steady population decline has earned it a "Red" status on the Audubon WatchList and a species of concern among state and federal agencies. Nesting and brood-rearing habitat loss and degradation is the most important threat to Western Gulf Coast (WGC) populations. Decision Support Systems (DSS) are tools that aide stakeholders in decision making processes by consolidating available biological and ecological knowledge and taking into account temporal and spatial variation at the landscape level. We used available biological knowledge of mottled duck nesting and brood rearing requirements to develop a DSS model that will aid managers in targeting areas for conservation and management. We developed 3 spatially explicit models that identify (1) currently suitable mottled duck nesting and brood-rearing habitat prioritized for protection, (2) patches of nesting habitat that require management to become suitable, and (3) wetlands that require management to become suitable. We estimated over 1.2 million ha of currently suitable nesting habitat for mottled ducks along the WGC. We also found that there are about 275,300 ha of suitable brood rearing habitat in the WGC. Approximately 34% of the currently suitable nesting habitat and 45% of the currently suitable brood-rearing habitat is located in the Chenier Plain Initiative Area. These spatial maps will be used to drive habitat management in the Western Gulf Coast that is tailored towards increasing mottled duck numbers.

10:30: LATE QUATERNARY CHANGES IN THE GEOGRAPHIC RANGE OF THE NORTHERN BOBWHITE AS INFERRED BY ECOLOGICAL NICHE MODELING

DAMON WILLIFORD, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

RANDY W. DEYOUNG, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

RODNEY L. HONEYCUTT, Natural Science Division, Pepperdine University, Malibu, CA, 90263, USA

LEONARD A. BRENNAN, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

FIDEL HERNANDEZ, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

Abstract: The northern bobwhite (*Colinus virginianus*) is a small, terrestrial species of New World quail that was historically distributed throughout much of the eastern United States and Mexico. Recent studies have shown that the northern bobwhite has a weak genetic structure and displays evidence of recent expansion, which may have occurred after the last major glaciation (20,000 years ago). To evaluate conclusions based on genetic data, we maximum entropy to model how the northern bobwhite's geographic distribution changed over the past 130,000 years. We used historical climate data collected 1950–2000 to create a historic (baseline) model based, which was then used to predict the distribution of the northern bobwhite under climatic conditions of the Last Glacial Maximum (LGM; 21,000 years ago) and the Last Interglacial (LIG; 130,000 years ago). Our results suggested that the northern bobwhite was largely absent from the United States during the Last Glacial Maximum, but was distributed over large areas of Mexico. Our model suggests that the geographic range of the northern bobwhite was restricted to coastal areas (Mexican Pacific, Gulf, and Atlantic Coasts) during the Last Interglacial, which was warmer than present. The maximum entropy model supported the genetic data, and indicates that the northern bobwhite underwent a rapid northward expansion at the end of the Pleistocene. The Last Interglacial model suggests that the northern bobwhite may be negatively impacted future global warming.

10:45: HABITAT SELECTION OF ADULT FEMALE MOTTLED DUCKS IN THE TEXAS CHENIER PLAIN REGION

JENA A. MOON, USFWS- Region 2 Inventory and Monitoring Program, Winnie, TX, 77665, USA

DAVID A. HAUROS, USGS-Kansas Cooperative Fish and Wildlife, Manhattan, KS, 66502, USA

WARREN CONWAY, Stephen F. Austin State University, Nacogdoches, TX, 75965, USA

SARAH LEHNEN, USFWS- Region 2 Inventory and Monitoring Program, Albuquerque, NM, 87102, USA

Abstract: Mottled duck habitat use has been documented to be highly variable by past studies, with varied wetland types, land management practices and salinity regimes. Loss and degradation of mottled duck coastal habitats is the leading cause for mottled duck decline in the Chenier Plain Region. Urbanization, erosion, subsidence, conversion to agriculture, saltwater intrusion, invasive establishment, loss of disturbance, sea level rise, and heavy metal accumulation have played a role in the decline of quantity and quality habitats available to mottled ducks. Managers need to have a better understanding of the role of habitat selection by mottled ducks to improve management. We measured habitat selection by mottled ducks within the Texas Chenier Plain Region (TCPR) at local and landscape scales. We captured mottled ducks via night lighting during summers 2009–2011. Females were radio-tagged with a solar satellite PTTs. We used the Argos system to collect data on date, time, latitude, longitude, and location class for each tagged female. Habitats considered locally available were limited to a 95% kernel density estimate for each individual, and landscape scale availability was merged home ranges for all individuals.

Habitat selection analyses were completed using a generalized linear mixed modeling approach and lme4 package in R. Seasonal habitat selection varied based on average salinity and vegetative class within home ranges, with greatest sensitivity to salinity during breeding and brooding periods. Within season habitat use was extrapolated to identify potential high quality habitats based on local-scale selection patterns in the TCPR.

11:00: DEVELOPMENT FAVORABILITY ANALYSIS FOR REDHEADS ALONG THE LOWER TEXAS COAST

COREY J. LANGE, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

BART M. BALLARD, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

DAN P. COLLINS, United States Fish and Wildlife Service, Southwest Regional Office, Albuquerque, NM, 87103, USA

BARRY C. WILSON, U.S. Fish and Wildlife Service, Gulf Coast Joint Venture, Lafayette, LA, 70506, USA

ERIC J. REDEKER, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

DALE J. JAMES, Ducks Unlimited, Inc., Ridgeland, MS, 39157, USA

Abstract: An estimated 80% of the world's redheads (*Aythya americana*) winter in the Laguna Madre each year. Freshwater ponds adjacent to the Laguna Madre provide an important source of freshwater for redheads, and their availability can affect the species distribution and foraging effects on shoalgrass, their primary food. Redhead distribution data collected during the winters of 2000–2003, and 2012–2013 will be used to create a development favorability analysis for the lower Texas coast. We ranked ponds used by wintering redheads based on 5 criteria, including their distance to foraging areas, amount of foraging area within 10 km of a pond, their proximity to other suitable wetlands, number of surveys that redheads were observed on each pond, and the hydroperiod of the coastal. We also transferred these ranks to the areas between freshwater ponds and foraging areas with areas incurring cumulative ranks when there was overlap. This model will be used to depict which areas along the lower Texas coast are most important for

SESSION 4D: ECOLOGY AND MANAGEMENT

10:00: RESTORATION OF NATIVE PLANTS IN AREAS DOMINATED BY BUFFELGRASS AND OLD WORLD BLUESTEMS

ERIC D. GRAHMANN, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

FORREST S. SMITH, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

MICHAEL W. HEHMAN, Hixon Ranch, Cotulla, TX, 78363, USA

TIMOTHY E. FULBRIGHT, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

BLAKE A. MARTIN, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

DAVID B. WESTER, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

FIDEL HERNANDEZ, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

Abstract: Buffelgrass (*Pennisetum ciliare*) and Kleberg bluestem (*Dichanthium annulatum*) dominate millions of acres across South Texas. Where these species dominate, plant species richness is lower, invertebrates are less abundant, and grassland birds including northern bobwhites (*Colinus virginianus*) are less common. In 2008, we initiated a long-term research project on the Hixon ranch in La Salle County, Texas to test a variety of treatments that included combinations of fire, herbicide application, mechanical treatment, and the reseeding of native plants with the goal of improving wildlife habitat in invaded areas. All treatments were subject to flexible management due to the variable South Texas environment. Our experiment was a randomized complete block design with treatments replicated twice in buffelgrass and twice in Kleberg bluestem. Treatments incorporating grass-specific herbicides, prescribed fire, and 1-time soil disturbance events had short lived (< 3 years) effects on non-native grass cover. However, treatments incorporating repeated soil disturbance to deplete the non-native plant soil seedbank, and then planting a diverse mix of native plant species, achieved > 99% reduction in non-native grass cover and > 80% cover of native plants from < 5 % initially observed ($P = 0.035$). There were no bobwhites seen on site for the first 2 years of this study; however in fall 2013, bobwhite density was estimated at 1 bird/0.8 ha. Our successful treatments will be monitored into the future to determine treatment longevity. We are also beginning a larger study to test the successful methods in pasture-scale (> 80 ha) settings.

10:15: CONSERVATION OF ENDANGERED SLENDER RUSH-PEA THROUGH ACTIVE MANAGEMENT

ASHLEY C. MCCLOUGHAN, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

SANDRA RIDEOUT-HANZAK, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

DAVID B. WESTER, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

Abstract: Slender rush-pea (*Hoffmannseggia tenella*) is an endangered herbaceous legume found only in Kleberg and Nueces Counties, Texas. Its most critical threats are habitat disturbance and invasive grasses, primarily Kleberg bluestem (*Dichanthium annulatum*). We are conducting trials using herbicide and manual removal treatments of slender rush-pea neighbors, prescribed burning of slender rush-pea plants and neighbors, and control (no treatment) treatments. In the herbicide treatment, neighbors within 1 m of 34 randomly-selected slender rush-pea plants were removed with herbicide application, a treatment that eliminated both aboveground and belowground competition. In a second treatment aboveground biomass of neighbors within 1 m of 33 randomly-selected slender rush-pea plants was clipped to maintain a local environment free of shade; in this treatment, however, belowground interactions with neighbors continue. The third treatment involved prescribed burning in small plots surrounding and including 33 slender rush-pea plants, while 33 control plants receive no treatment. The first year of study shows that slender rush-pea individuals responded positively at some point during monitoring to herbicide and manual removal of neighbors by growing more leaves and stems ($P < 0.01$; $P = 0.03$, respectively). However, these treatments have had no effect in the first year on length of longest stem, flower production or plant survival. Initial data from burned plants indicate a significant difference in the number of stems and flowers ($P = 0.05$). Plant morphometrics, survival and reproductive indicators are being collected. Data will help assess the value of management practices designed to conserve slender rush-pea.

10:30: TAMAULIPAN THORNSCRUB HABITAT RESTORATION AT LAGUNA ATASCOSA NATIONAL WILDLIFE REFUGE, TEXAS

KRYSTEN N. DICK, The University of Texas at Brownsville, Brownsville, TX, 78520, USA
HEATHER D. ALEXANDER, The University of Texas at Brownsville, Brownsville, TX, 78520, USA
JONATHAN D. MOCZYGEMBA, The US Fish and Wildlife Service, Laguna Atascosa National Wildlife Refuge, Los Fresnos, TX, 78566, USA

Abstract: Tamaulipan thornscrub ecosystems provide critical habitat for numerous fauna, including the federally endangered ocelot (*Leopardus pardalis*). These ecosystems consist of diverse, short-statured, drought-resistant shrubs found throughout semi-arid, sub-tropical regions of northeastern Mexico and southern Texas. As a result of urbanization, agriculture, and invasion by exotic grasses, this ecosystem currently occupies > 1% (200,000 km²) of its original range. The loss and fragmentation of these ecosystems has perpetuated the endangerment of ocelot populations in the United States, and the U.S. Fish and Wildlife Service (USFWS) is working to restore thornscrub habitat. USFWS at Laguna Atascosa National Wildlife Refuge in southern Texas has planted thousands of Tamaulipan thornscrub seedlings of approximately 40 species. In 2013, 1,200 of these seedlings were treated with 3 restoration treatments (herbivore exclosures, seedling protective tubes, and invasive grass herbicide) used singly and in combination. Basal diameter, seedling height, browse intensity, and invasive grass cover were measured on each seedling immediately following treatment, in January, May, and September 2013, and will be assessed subsequently at 4-month intervals for a 2-year period. Initial results suggest that seedlings growing in protective tubes grow taller and have lower mortality than those outside tubes. Findings from this research will be used to develop management protocol to restore thornscrub habitat.

10:45: BIRD COMMUNITY ASSOCIATIONS ACROSS LAND COVER CATEGORIES WITHIN AN URBAN MATRIX

ANDREA E. JULIAN, Texas State University, San Marcos, TX, 78666, USA
THOMAS R. SIMPSON, Texas State University, San Marcos, TX, 78666, USA
MICHAEL C. GREEN, Texas State University, San Marcos, TX, 78666, USA
TIMOTHY H. BONNER, Texas State University, San Marcos, TX, 78666, USA

Abstract: Urban areas are man-made ecosystems that have increased in size and complexity in the past century. The definition of an urban area is loosely defined as a human-dominated ecosystem. I surveyed the avifaunal community of San Marcos, Texas over a period of 1 year and compared species and guild diversity to land cover within its urban matrix. San Marcos is a medium sized city (population ~50,000) that was established in 1851. Since that time, land and waterways with the city have been manipulated by humans for habitation and industrial purposes. To understand how avifaunal communities are associated within the urban matrix of San Marcos, I surveyed birds using point counts during each season over a period of 1 year at 40 locations within its urban center and periphery. Species diversity and evenness indices were calculated. A guild analysis was also conducted in an attempt to understand how land use types influenced community structure. Species diversity and evenness was found to be highest in sites with the least amount of impervious cover and lower at sites with the greatest amount of impervious cover. Both land use type and season were found to be significant in effecting species diversity and evenness. The guild analysis indicated that functional homogenization is occurring as species located within the ground foraging guild represented the majority of species and individual sightings across all seasons and sites, regardless of land cover type.

11:00: GEOGRAPHIC VARIATION IN SONGBIRD PRODUCTIVITY: THE GOLDEN-CHEEKED WARBLER

ASHLEY M. LONG, Texas A&M University, College Station, TX, 77843, USA

Abstract: Vegetation structure and composition, which vary in relation to site-specific abiotic conditions, may directly affect avian productivity. Recent research indicated that tree species composition may influence the reproductive biology of the federally endangered golden-cheeked warbler (*Setophaga chrysoparia*; warbler hereafter), a songbird that breeds exclusively in oak-juniper woodlands of Texas. From 2011–2013, I examined relationships between Ashe juniper (*Juniperus ashei*) and warbler productivity within oak-juniper woodland dominated by different species of oak. In the central portion of the warbler's breeding range, pairing and fledging success were not well-related with percent Ashe juniper composition, regardless of dominant oak species. However, metrics associated with Ashe juniper height were important indicators of warbler productivity in post oak (*Quercus stellata*) dominated woodlands, where I found pairing and fledging success to be highest when the variation in Ashe juniper height was between 1.5 and 3.5 m. In the western portion of their breeding range, average percent Ashe juniper composition in warbler territories was ~20% lower than found elsewhere and was an important predictor of fledging success. In Lacey oak (*Q. laceyi*) dominated woodlands of this region, fledging success increased with increasing percent Ashe juniper. My results indicate that the importance of percent canopy composition and height heterogeneity to warbler productivity may depend on geographic location and dominant oak species within oak-juniper woodland. Extrapolating local wildlife-habitat relationships to range-wide conservation planning is common, but may be a suboptimal strategy for the golden-cheeked warbler.

Poster Abstracts

(Number at beginning of title is number on poster board)
(*To be judged; **To be judged and undergraduate poster)

1. BREVETOXICOSIS EXPOSURE OF TERRESTRIAL WILDLIFE DUE TO RED TIDE EVENTS ALONG THE SOUTHERN TEXAS COASTLINE**

BRIAN BARRERA, CKWRI / TAMUK, Kingsville, TX, 78363, USA
SCOTT E. HENKE, CKWRI / TAMUK, Kingsville, TX, 78363, USA

Abstract: Blooms of the red tide dinoflagellate, *Karenia brevis*, that produces neurotoxins called brevetoxins, have caused mortalities of millions of marine animals in the Gulf of Mexico each year. The dinoflagellate bioaccumulates in water, sea plants, invertebrates, fish, sea turtles, and sea mammals. Brevetoxin-related morbidity and mortality of terrestrial wildlife has been suspected, but evidence of such events has been lacking. We conducted 2.5 km transects along South Padre Island and Laguna Atascosa Wildlife Refuge to quantify marine life mortalities and potential exposure of terrestrial wildlife to brevetoxins during periods with and without red tide events in 2013. Seaweed, striped mullet, silver mullet and pinfish were commonly found washed up on the beach. Scavengers of marine animals included 3 species of mammals, 1 reptile species, and 27 species of birds. On average, scavengers outnumbered marine mortalities 13 to 1. Red tide impacts on terrestrial wildlife are significant.

2. USE OF HUMAN HAIR AS A WILDLIFE DETERRENT: FACT OR FICTION?*

JUSTIN PLATA, Department of Animal, Rangeland and Wildlife Sciences, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX 78363, USA
JESSE ALEGRIA, Department of Animal, Rangeland and Wildlife Sciences, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX 78363, USA
SCOTT E. HENKE, Department of Animal, Rangeland and Wildlife Sciences, Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX 78363, USA

Abstract: Hunting camp lore states that human hair can be used as a wildlife deterrent. This concept even was in the Hollywood movie “The Rookie” starring Dennis Quaid, in which human hair was used to keep white-tailed deer from grazing a newly-planted baseball field. We placed sling feeders that dispensed corn 4 times daily at 4 sites in southern Texas and mounted Reconyx remote infrared cameras at each site to obtain photographs with dates and times of every animal that approached. Two sites were randomly selected to scatter human hair on the ground around the feeders as a test of this concept. Species, number of visits/night/species, and time spent at the feeders by each species will be recorded and analyzed.

3. DURATION OF MARKING TAGS ON AMERICAN ALLIGATORS*

CORD B. EVERSOLE, CKWRI / TAMUK, Kingsville, TX, 78363, USA
SCOTT E. HENKE, CKWRI / TAMUK, Kingsville, TX, 78363, USA
RANDY POWELL, Dept. Biology, TAMUK, Kingsville, TX, 78363, USA

Abstract: Tagging techniques have been used extensively on crocodilians and have included passive integrated transponder tags, foot webbing tags, and tail tags. Tag retention can be compromised if tags become entangled in numerous potential underwater obstructions, such as sunken trees, logs, and fishing line, which ultimately would bias estimates of survival and population size. Therefore, our objectives were to determine retention rates of commonly used tags for alligators, and to determine the most cost and time effective tagging strategies for alligators. Alligators (*Alligator mississippiensis*) were captured at Brazos Bend State Park during 2012 and were marked with a numbered and colored tag inserted in the tail, a numbered Kemco tag placed in the webbing between toes, a MUSICC PIT tag inserted subcutaneously at the base of the tail, and a numbered and colored Floy T-bar Anchor fish tag inserted at the base of the skull. In 2013, 43 of the original 206 alligators were recaptured and assessed for tag retention. PIT and fish tag retention was 97% and 93%, respectively. Fish tags were 7–18X faster (i.e., person-minutes) to place on alligators than the other tags. In addition, fish tags were visible without recapture of the alligator and the cost per tag for fish tags was not considered prohibitive. We recommend fish tags as the primary tagging strategy for alligators.

4. NUISANCE AMERICAN ALLIGATORS: AN INVESTIGATION INTO TRENDS AND PUBLIC OPINION*

CORD B. EVERSOLE, CKWRI / TAMUK, Kingsville, TX, 78363, USA
SCOTT E. HENKE, CKWRI / TAMUK, Kingsville, TX, 78363, USA
JACOB L. OGDEE, CKWRI / TAMUK, Kingsville, TX, 78363, USA
AMOS COOPER, TPWD, Port Arthur, TX, 77640, USA

Abstract: The rebound of the American alligator (*Alligator mississippiensis*) has initiated rapid growth of populations throughout its range. This recent growth has caused an influx of human-alligator conflict. The

numbers of conflict complaints have increased dramatically following the species' recovery. We quantified 5,838 nuisance alligator reports from 2000 to 2011 to develop more site specific strategies of management, and to determine where management should be focused to minimize this conflict. We also surveyed the general public's attitude toward and knowledge of the American alligator as a technique to better understand human dimensions for nuisance alligator management in Texas. Counties of concern, with 80% of total nuisance reports, were Jefferson (16%), Fort Bend (14%), Matagorda (11%), Brazoria (10%), Harris (7%), Jackson (5%), Orange (5%), Chambers (5%), Calhoun (5%), and Liberty (3%) counties. We found that of the nuisance alligators reported 45% were male, 18% were female, and 38% were reported as unknown. The largest size cohort consisted of individuals that were 1.5 meters (5 ft.) in length (18%) and most reports occurred in May (21%). The most common nuisance situation was conflict that occurred in residential areas (24%), and the most common conflict resolution was lethal removal by state contracted nuisance alligator hunters (50%). A large majority of the general public would support an alligator removal program if alligators became a nuisance, but were unwilling to have alligators relocated near their homes. Visitors with more education (> B.S. degree) were more willing to support lethal control of the American alligator. We determined the general public has a cursory understanding of the American alligator, and that an alligator educational program targeted to the residents of the northern Texas Gulf Coast could help reduce the number of human-alligator conflicts.

5. THE EFFECT OF DROUGHT ON CLUTCH SIZE AND HATCHLING PRODUCTION OF AMERICAN ALLIGATORS IN TEXAS*

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SCOTT E. HENKE, CKWRI / TAMUK, Kingsville, TX, 78363, USA

RANDY L. POWELL, Dept. Biology, TAMUK, Kingsville, TX, 78363, USA

LARRY W. JANIK, Janik Alligators LLC, El Campo, TX, 77437, USA

Abstract: The American alligator (*Alligator mississippiensis*) has made a remarkable recovery throughout its range during the last half-century. This recovery is attributed to management practices that are based on sound research. However, little research has focused on nest characteristics, nest success, and production of hatchling alligators in Texas. We quantified hatching success of 902 American Alligator nests collected from the wild during 2007–2012. Nests were hatched in farm facility incubators under optimum conditions to determine potential hatchling production of wild nests. The clutch size (mean \pm SE; 37.1 ± 0.3 ; $F = 0.55$, $df = 4$, 897, $P > 0.70$) and the number of infertile eggs per nest (5.2 ± 0.2 ; $F = 0.63$, $df = 4$, 897, $P > 0.64$) did not differ by years, but fewer ($F = 9.29$, $df = 4$, 897, $P < 0.0001$) hatchling alligators were produced in 2011 (18.1 ± 0.9) than the other years (23.5 ± 0.4), presumably due to drought conditions experienced during 2011.

6. DO AMERICAN ALLIGATORS HAVE CANNIBALISTIC TENDENCIES?*

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ALLEN FARGE, CKWRI / TAMUK, Kingsville, TX, 78363, USA

BRENT C. NEWMAN, CKWRI / TAMUK, Kingsville, TX, 78363, USA

SCOTT E. HENKE, CKWRI / TAMUK, Kingsville, TX, 78363, USA

Abstract: American alligators (*Alligator mississippiensis*) are considered opportunistic predators with cannibalistic tendencies. Past research suggest that as much as 65% of alligator mortality is due to cannibalism. We hypothesize that if alligators were cannibalistic, they would depredate hatchlings, which hatched during the previous 2 months prior to our collection. We analyzed stomach contents from 62 wild American alligators collected during the 2012 harvest season (i.e., September) from rivers, lakes, and

ponds in southeastern Texas. Alligators were separated by sex and size class (< 2 m and > 2 m). Food habits are reported as aggregate percent volume. Twenty items were identified as diet items of alligators. We found only 2 instances of alligator (i.e., tail sections) as a stomach content item. In both cases, the estimated size of the consumed alligator was similar to the size of the alligator that contained the alligator tail section, which suggests the incident occurred during a conflict rather than a predatory event. Prey items consumed by alligators differed between sexes and size classes. Smaller-sized males ate more reptiles such as red-eared slider turtles (*Trachemys scripta*) and diamondback water snakes (*Nerodia rhombifer*); whereas, smaller-sized females ate more fish such as alligator gar (*Lepisosteus spatula*). Larger-sized females ate more birds such as reddish egrets (*Egretta rufescens*) and teal (*Anas* spp.); whereas, larger-sized males ate more mammals such as raccoons (*Procyon lotor*) and feral hogs (*Sus scrofa*). Perhaps prey abundance of other diet items within our study area was sufficient to avoid eliciting cannibalistic behaviors within alligators.

7. DETERMINING THE SUITABILITY OF THE JAMAICAN BOA FOR* TRANSLOCATION

BRENT C. NEWMAN, CKWRI / TAMUK, Kingsville, TX, 78363, USA
SUSAN KOENIG, Windsor Research Centre, Jamaica, Trelawny, Jamaica
SCOTT E. HENKE, CKWRI / TAMUK, Kingsville, TX, 78363, USA
CRAIG RUDOLPH, USDA Forest Service, Nacogdoches, TX, 75965, USA
ERIC REDEKER, CKWRI / TAMUK, Kingsville, TX, 78363, USA

Abstract: The Jamaican boa (*Epicrates subflavus*) is endemic to Jamaica and is the island's largest native terrestrial predator. It is currently listed as Vulnerable by the International Union for Conservation of Nature and is listed under Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. The objectives of this study are to better understand the movements, home range size and site fidelity of translocated Jamaican boas to determine if translocation is a viable conservation strategy. Eleven snakes were telemetrically monitored from August 2011 to July of 2012 in Cockpit Country Conservation Area in northwest central Jamaica. Home range and habitat use analysis were performed in ArcMap 10.1 using the Adaptive Kernel method. Male snakes had larger core (0.50) and total home range (0.95) than female snakes. Male snakes did not overlap each other at the 0.50 kernel home range, but 2 of the 3 males overlapped with at least 1 female. Based on preliminary results, we do not recommend translocation as an appropriate conservation strategy.

8. BROWN TREE SNAKE INVASION RISK ASSESSMENT FOR THE CARIBBEAN*

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SCOTT E. HENKE, CKWRI / TAMUK, Kingsville, TX, 78363, USA
DAVID BRITTON, USFWS, Arlington, TX, 76019, USA

Abstract: The brown tree snake (*Boiga irregularis*) is a mildly venomous, rear-fanged constrictor that is native to Australasia. These snakes were unintentionally introduced to the island of Guam sometime after World War II, possibly on a cargo shipment from Australia. Due to population explosions around 1960, the brown tree snake is now an exotic invasive causing significant economic, biological, and human health problems on Guam. Brown tree snakes have been unintentional hitchhikers in planes, ships, and cargo coming from Guam and have been found in Hawaii, Texas, Oklahoma, Florida, and Alaska, that highlights their invasive potential. Recent risk assessment models for brown tree snakes indicate the southeastern United States has a high potential risk for establishment if the snake is accidentally introduced. It is assumed the Caribbean also would be at risk of potential establishment by brown tree snakes, but

such an assessment has not been conducted. However, due to the climatic suitability for brown tree snakes in the Caribbean, the high potential prey abundance on islands of the Caribbean, and the United States military presence in the Caribbean, and Latin America the potential risk of invasion and establishment by brown tree snakes in the Caribbean is possible.

9. VIABILITY OF BAYLISASCARIS PROCYONIS EGGS EXPOSED TO FLUCTUATING TEMPERATURES AT RACCOON LATRINE SITES*

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SCOTT E. HENKE, CKWRI / TAMUK, Kingsville, TX, 78363, USA
DAVID B. WESTER, CKWRI / TAMUK, Kingsville, TX, 78363, USA

Abstract: *Baylisascaris procyonis* is a large zoonotic nematode that occurs in the small intestine of raccoons (*Procyon lotor*), of which the larvae can cause visceral, ocular, and neural larva migrans within intermediate hosts. However, eggs of *Baylisascaris procyonis* desiccate and die at 65 C (150 F). Humans, especially children, have become infected through contact with raccoon latrines, which commonly include tree crevices, woodpiles, barns, and attics. Therefore, we placed temperature and humidity data loggers on the ground in full sun and in the shade, in attics with and without exhaust fans, in woodpiles, in barns, and in closed cars parked in the sun in southern Texas. Data loggers recorded temperature and humidity every 30 minutes during 2012 to determine the likelihood of survival of *Baylisascaris procyonis* eggs at the various potential latrine sites. The hottest month during 2012 was August with a maximum temperature of 42 C (107 F) and 15 days where temperatures exceeded 38 C (100 F; = 2.2 hrs/day; range 0.5–6 hrs/day). However, no potential latrine site exceeded 65 C at any time throughout the year. A car parked in the sun came the closest to the lethal limit (i.e., 62 C, 144 F), but only for 1 hour. Southern Texas is one of the furthest southern locations in the contiguous United States and has one of the warmest known climates. Unfortunately it is not hot enough for an extended period to kill eggs of *Baylisascaris procyonis*, making it possible for such eggs to accumulate within an environment.

10. RANGE AND DISTRIBUTION OF LARGE AND MESO-MAMMAL POPULATIONS ON DYESS AIR FORCE BASE*

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GRANT LAWRENCE, Abilene Christian University, Abilene, TX, 79699, USA

Abstract: Habitat fragmentation and the spread of urban environments are a major threat to native wildlife populations. We chose Dyess Air Force Base to study these effects due to its unique interface of urban, military, and native environments. Using the scent-station method, we distributed 42 stations, with 5 different scents, bobcat urine, coyote urine, bobcat gland, catnip, skunk musk and a control. These stations were placed throughout the installation in a grid format to record the relative abundance and distribution of large and meso-mammal populations on base. We discovered 4 large mammal species: *Lynx rufus*, *Canis latrans*, *Axis axis*, and *Sus scrofa* and 8 meso-mammal species: *Mephitis mephitis*, *Didelphis virginiana*, *Procyon lotor*, *Urocyon cinereoargenteus*, *Lepus sylvaticus*, *Erethizon dorsatum*, *Dasypus novemcinctus*, and *Felis catus* inhabiting Dyess AFB. Some of the prominent findings were that *L. rufus* showed an equal attraction to bobcat gland as it did to the skunk musk. *C. latrans* showed a preference to catnip over coyote urine. The most effective of all lures appeared to be catnip, but showed no significant difference. One anomaly that was found was with *L. sylvaticus*, showing it preferred the scent of bobcat urine in that the law of nature would seem to conclude the opposite.

11. HABITAT STRATIFICATION OF SYNTOPIC NESTING BARN SWALLOWS, CAVE SWALLOWS, AND CLIFF SWALLOWS IN NORTHEAST TEXAS*

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JEFF G. KOPACHENA, Texas A&M University–Commerce, Commerce, TX, 75428, USA

Abstract: Historically, barn swallows (*Hirundo rustica*), cave swallows (*Petrochelidon fulva*), and cliff swallows (*Petrochelidon pyrrhonota*) nested on different substrates in natural environments. Barn swallows and, later, cliff swallows adopted buildings, bridges, and culverts as their primary nesting sites during American industrialization. Very recently, the cave swallow, whose range was limited by the distribution of nesting sites in caves, also has adopted bridges and culverts as nesting sites. This has resulted in the rapid expansion of cave swallows into northeast Texas. Concurrent to this range expansion, barn swallow populations in culverts and bridges seem to have dropped dramatically. The purpose of this study was to determine if the species are stratifying their habitat in order to avoid interspecific competition. Based on preliminary analyses the study showed that cave swallows show a strong preference for culverts whereas cliff swallows preferred high I-Beam bridges. Barn swallows, on the other hand, did not show any clear preferences for nesting substrate type. The possible reason for this will be discussed.

12. NEST MATERIAL SELECTION IN THE EASTERN BLUEBIRD IN NORTHEAST TEXAS*

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JEFFREY KOPACHENA, Texas A&M University–Commerce, Commerce, TX, 75428, USA

Abstract: While there is considerable research on nest site selection for the eastern bluebird (*Sialia sialis*), there is remarkably little information on the choice of nesting materials used by the species. Eastern bluebirds are cavity nesters that construct a nest that is composed of plant materials. Many bird species select plants that contain compounds that are known to reduce the impacts of ectoparasites. Since eastern bluebird nests can be infected with ectoparasites, and since ectoparasites can strongly influence nest success, it is possible that bluebird parents also might select plant materials that reduce the impact of ectoparasites. This study will investigate whether eastern bluebirds show preferences for particular plant types in constructing their nests and whether any of the chosen plants might reduce ectoparasites in the nest.

13. A BIOLOGICAL SURVEY OF THE TEXAS A&M UNIVERSITY–COMMERCE WETLAND IN HUNT COUNTY, TEXAS*

JERROD G. TYNES, Texas A&M University–Commerce, Commerce, TX, 75429, USA
RYAN SCAUZILLO, Texas A&M University–Commerce, Commerce, TX, 75429, USA
AMANDA TURLEY, Texas A&M University–Commerce, Commerce, TX, 75429, USA
AUDREY WHALEY, Texas A&M University–Commerce, Commerce, TX, 75429, USA
JEFFREY KOPACHENA, Texas A&M University–Commerce, Commerce, TX, 75429, USA

Abstract: The Texas A&M University–Commerce wetland and prairie preserve is a 45 acre tract of land that was established in 2006 for research and educational purposes. This study consists of surveys of the biotic components that have colonized the area. Four surveys were done; mammals, herps, bluebirds, and plants. Small mammal surveys were conducted from February 2013 through March 2013 using Sherman traps twice a week. Herp surveys were conducted from 29 March 2013 through 30 April 2013 using drift fence arrays that were checked daily. Bluebird surveys of nest box occupancy were done biweekly from 5 March 2013 through 22 April 2013. Plant surveys were done using quadrats along belt transects. Survey locations were mapped and data analyzed spatially in GIS. The results of the 2013 survey will be compared with results from a survey of the same area conducted in 2008.

14. BAT OCCURRENCE IN DESIRED FOREST CONDITIONS TREATED BOTTOMLAND HARDWOOD FORESTS OF THE MISSISSIPPI ALLUVIAL VALLEY*

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CHRISTOPHER E. COMER, Stephen F. Austin State University, Nacogdoches, TX, 75962, USA
DANIEL J. TWEDT, US Geological Survey, Memphis, TN, 38141, USA
WARREN C. CONWAY, Stephen F. Austin State University, Nacogdoches, TX, 75962, USA

Abstract: Desired Forest Conditions (DFCs) are a set of management guidelines proposed by the Lower Mississippi Valley Joint Venture for managing bottomland hardwood forests for priority wildlife species. Active management treatments to achieve DFCs may include single tree and group selection timber harvests, thinnings, and patch clearcuts. DFC treatments have been shown to benefit songbirds, but the effect of increased vertical complexity on other forest fauna, including bats, has not been previously studied. To examine bat community response to DFC treatments, we surveyed 7 National Wildlife Refuges (NWRs) and 7 Wildlife Management Areas (WMAs) in the Mississippi Alluvial Valley from Louisiana, Mississippi, and Arkansas. Within each area, we surveyed treated stands (bottomland hardwood forest treated following DFC guidelines within the past 12 years) and reference stands. We conducted acoustic sampling using Petterson D500X acoustic recording devices from 15 April 2013 to 9 August 2013. At each study site, we used 2 paired devices in each of 3 treatment and 3 control units for 6 consecutive nights. Our detection probability and occupancy were calculated using program PRESENCE. We identified echolocation calls to species using a combination of SonoBat™ version 3.1 Northeast software and manual verification of call sonographs. Eight species were identified. Seminole and eastern red bats (*Lasiurus* sp.), evening bats (*Nycticeius humeralis*), and tri-colored bats (*Perimyotis subflavus*) were the most common species.

15. CAPTURE RATES OF HETEROMYID SPECIES IN UNIQUE SOIL LAND USE DESIGNATIONS IN JIM HOGG COUNTY, TEXAS*

MICHELLE E. CURTIS, Wildlife Ecology Program, Department of Biology, Texas State University, San Marcos, TX, 78666, USA
THOMAS R. SIMPSON, Wildlife Ecology Program, Department of Biology, Texas State University, San Marcos, TX, 78666, USA

Abstract: Phylogenetic work and species distributions constitute the majority of research to date for members of the Heteromyidae in South Texas and Mexico. However, little published information is available on habitat associations for heteromyids in South Texas. Three species of heteromyids, the hispid pocket mouse (*Chaetodipus hispidus*), Merriam's pocket mouse (*Perognathus merriami*), and the Gulf Coast kangaroo rat (*Dipodomys compactus*), were captured using Sherman live traps on a 3,294 ha site in Jim Hogg County, Texas. We placed traps within each unique soil/land use combination for 3 consecutive nights to determine presence and abundance. *Perognathus merriami* was the most abundant species in each soil/land use combination. A MANOVA analysis indicates there are significant differences in capture rates for total heteromyids among the soil/land use combinations ($P = 0.0037$). ANOVA analyses (with adjusted alpha level) indicate there are significant differences in capture rates for *P. merriami* within the soil/land use combinations ($P = 0.0253$), but not for *C. hispidus* ($P = 0.128$) or *D. compactus* ($P = 0.0364$). The shrub/scrub-Delmita association (shrubland with well drained soils) had the highest heteromyid capture rate. The shrub/scrub-Nueces-Sarita combination (shrubland with moderately well drained soils) had the lowest heteromyid capture rate. We are currently analyzing microhabitat parameter data (e.g., vegetative composition and percent cover) associated with each heteromyid species. These data could be beneficial in the development of management strategies for these species, especially for *D. compactus*, a heteromyid with restricted range.

16. LARGE SCALE RESTORATION OF NATIVE VEGETATION*

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TIMOTHY E. FULBRIGHT, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

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ERIC D. GRAHMANN, Caesar Kleberg Wildlife Research Institute, Department of Animal and Wildlife Sciences, Texas A&M University–Kingsville, Kingsville, TX, 78363, USA

Abstract: Abstract: Many native rangelands across southern Texas have been degraded by an influx of invasive, non-native grass species such as buffelgrass (*Pennisetum ciliare*) and Kleberg bluestem (*Dicanthium annulatum*). These species can reduce plant species richness, degrade wildlife habitat, and disrupt natural nutrient cycling and fire regimes where they dominate. Although the negative effects of invasion by these species are well known, there are few studies focused on the restoration of degraded wildlife habitat in areas where these grasses have become dominant. The objective of our study is to determine the effectiveness of restoring a 120-ha pasture dominated by buffelgrass and Kleberg bluestem with native vegetation on a private ranch in La Salle, County, Texas. Specifically, we will document soil nutrient, seed-bank, and vegetation community change throughout the restoration process and compare this to an area that will not be restored (experimental control). Following methods from the success of pilot research, in January 2014, we will keep the area to be restored in a bare soil state by repeat disking using Rome disking implement (1 m diameter discs) until we deplete the seed bank of non-native grasses. This area will then be seeded to a diverse mixture of ecotypically adapted native grasses and forbs. Results from this research will aid in future rangeland restoration projects throughout southern Texas and invaded grasslands worldwide.

17. SEASON OF PRESCRIBED BURNING ON OLD WORLD BLUESTEMS*

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Abstract: Non-native Old World bluestems are an increasing threat to native vegetation and wildlife conservation throughout the Texas Plains and Gulf Coast Prairies. Particularly, Kleberg bluestem (*Dicanthium annulatum* [Forssk.] Stapf) has created vast acreages of monocultures, and land managers have experienced difficulties restoring native perennial grass community. The purpose of this research is to determine how varying the season of prescribed burning affects the relationships between Kleberg bluestem and other native vegetation. This study is being conducted at the South Pasture Research Facility in Kleberg County, Texas. We have established 10 permanent plots with grazing exclosures, each approximately 10 m², to investigate the influence of season of burning on vegetative fire effects. Four plots are being treated with summer burns and 4 plots with winter burns while the remaining 2 plots will receive no burning treatment. Using permanently fixed quadrats and marked individuals, mortality and recruitment metrics are being sampled before and after burning treatments. Further sampling is being conducted to assess shifts in community composition and any associations between neighboring species, as well as individual perennial grass morphology and herbaceous community production. Data collection

and summer burning have already been conducted and preliminary results are being analyzed. By studying the effects of different seasons of prescribed burning, we hope to improve current understanding of the best use of fire for managing invasive, non-native grasses.

18. EFFECT OF WHITE-TAILED DEER EXPERIENCE ON RESPONSE TO A NEW SUPPLEMENTAL FEED PROGRAM*

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Abstract: Providing white-tailed deer with supplemental feed is a common practice throughout Texas and can influence productivity and survival. Transplanting deer to new properties is an increasingly common management technique, and access to supplemental feed is likely to increase success of transplant programs. However, transplanted deer may be subordinate to native deer and thus have poor access to supplemental feed. Furthermore, deer with no history of supplemental feed use also may be slow to use supplemental feed. In March 2013, deer with previous experience eating supplemental feed and others with no such experience were relocated into research enclosures that already contained deer. The objective of this study was to assess feed-site visitation as influenced by a deer's prior experience with supplemental feed and whether it had been moved to a new area or not. Camera surveys were conducted in 4, 81-ha enclosures, during 1-week long periods every other week for 10 weeks beginning in May 2013. Cameras were placed in 4, 60 deer enclosures that had either 1 or 3 feed-sites. The number of visitations to feed sites by all tagged deer was tallied. The results of the study found that deer that had not been previously exposed to supplemental feed and had been moved occurred most frequently at feed-sites. Deer that had not been moved and previously exposed to supplemental feed occurred least frequently at feed-sites. Our results suggest deer that have been trans-located will not have difficulty accessing supplemental feed sites. Deer without previous access to supplement may have had a higher probability of being photographed at feed sites because their body condition was lower, providing high motivation to visit feed sites. These findings are relevant to land owners and managers attempting to improve deer health and population dynamics.

19. SEASON-SPECIFIC LAND-USE BY BIRDS OF PREY IN THE LLANO ESTACADO*

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Abstract: Birds of prey are especially susceptible to collisions with wind turbines. Understanding season-specific associations of raptors across different land-uses can inform risk-based siting plans for wind energy development. From December 2012–November 2013, we conducted monthly raptor surveys along a 1.6 km wide 154 km long route among 5 land-cover categories: textile agriculture, grain agriculture, grazed rangeland, ungrazed grassland, and other. We detected 15 species and 831 individual raptors. As a group, raptors used the land categories disproportionately to their availability in all seasons. In general, ungrazed grasslands were used more than expected, grazed rangeland slightly more than expected, and textile agriculture less than expected. Grain agriculture use appeared to be season-specific. However there were species-specific differences in cover-type use among seasons. For example, American Kestrels (*Falco sparverius*) used land-use categories in proportion to their availability in spring and fall, but not in winter and summer. Additionally, there were switches in cover-type use; kestrels used grasslands more than expected except in winter when they switched to harvested grain fields more than expected. Analyses

are ongoing, and we will present complete results for 6 species for which we had sufficient samples for analyses.

20. ASSESSMENT OF LESSER PRAIRIE-CHICKEN USE OF WILDLIFE WATER GUZZLERS*

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Abstract: Abstract: Man-made water sources are a common wildlife management tool in arid regions, but their value for wildlife populations is not well understood. The value of water as a conservation tool for lesser prairie-chickens (*Tympanuchus pallidicinctus*) is unknown. We assessed if lesser prairie-chickens would use commercially available wildlife water guzzlers and if there was any apparent selection between 2 design types. We confirmed that lesser prairie-chickens would use bird friendly designed wildlife water guzzlers. Although both designs were used, we found significantly greater use of a design that had a wider water trough and ramp built into the tank cover compared to a design that had a longer, narrower trough extending from the tank. Although we did not assess the physiological need of surface water by lesser prairie-chickens, we were able to verify they will use wildlife water guzzlers to access surface water. If it is found surface water is beneficial for lesser prairie-chickens, game bird friendly designed guzzlers may be a useful conservation tool the species.

21. OCCUPANCY ESTIMATES OF FERRUGINOUS HAWKS IN THE SNAKE RIVER BIRDS OF PREY AREA*

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Abstract: We modeled occupancy estimates for ferruginous hawks (*Buteo regalis*), a large, prairie dwelling raptor of widespread conservation concern, in the Snake River Birds of Prey National Conservation Area, Idaho. We surveyed 50 randomly located fixed radius plots for 1 hour, 3 times each during May 2012 and 2013. We used occupancy modeling to evaluate the effects of year, utility pole presence, and distance to cliffs on occupancy estimates. Temperature, time, utility pole presence, and year were used to estimate probability of detection. Using these covariates, we evaluated a set of 10 a priori models. Our top model included the effect of utility pole presence on probability of detection. Our probability of detecting ferruginous hawks when utility poles were present was more than twice that when utility poles were absent, and estimates of occupancy were 0.95 and 0.37, for plots with and without utility poles, respectively. Models including effects of year, time, temperature, and proximity to cliffs received little support. Our data suggests utility poles affect occupancy and detection, and possibly current distribution, of ferruginous hawks.

22. MODELING THE EFFECTS OF SEA LEVEL RISE ON COASTAL POND AVAILABILITY FOR REDHEADS ALONG THE LOWER TEXAS COAST*

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Abstract: During the winter, the Laguna Madre is home to nearly 80 percent of the world's redheads (*Aythya americana*). Redheads feed almost exclusively on shoalgrass (*Halodule wrightii*) in the Laguna Madre, but need to fly to coastal freshwater ponds in order to maintain their osmotic equilibrium. Many of the coastal ponds that redheads use adjacent to the Laguna Madre are near sea level, so the threat of rising sea levels could have a drastic effect on their distribution and availability. We are using a SLAMM (Sea Level Affecting Marshes Model) model to investigate changes in coastal pond availability and distribution under different sea level rise scenarios. By creating this model we can predict areas most affected by rising sea levels and be proactive in areas where management can be implemented to mitigate coastal pond loss.

23. MOVEMENT RATES OF SWAINSON'S HAWKS MIGRATING FROM TEXAS TO ARGENTINA*

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Abstract: The Swainson's hawk (*Buteo swainsoni*) breeds across the prairie grasslands of North America and is a species of conservation concern in many states. Each autumn the population migrates en masse from North America to their wintering grounds in Argentina, and returns in the spring for a round trip distance that may exceed 22,000 km. Previous studies used satellite telemetry to identify the wintering grounds and investigate migratory pathways of Swainson's hawks. Yet many ecological questions remain regarding the migration ecology of the species. We have attached GPS Platform Transmitter Terminals to 24 male and female Swainson's hawks nesting in the panhandle of Texas to develop a better understanding of the species ecology. These units provide 6–8 daily fixes with a location accuracy of 18 m, speed, heading, and altitude data. Data analyses are ongoing, but we will use these data to report gender-specific movement rates and routes of 24 individual Swainson's hawks during 2 autumnal migrations and 1 vernal migration.

24. WILDLIFE RESPONSE TO NATIVE GRASSLAND RESTORATION IN AN AREA DOMINATED BY NON-NATIVE GRASSES*

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Abstract: Numerous studies have documented the detrimental effects that invasive, non-native plants have on native plant communities and specific wildlife taxa. However, little is known regarding the wildlife community response to large-scale, native grassland restoration of these areas. We initiated a study in April 2013 in LaSalle County, Texas to document wildlife response to the restoration of a native-plant community in an area (120 ha) dominated by buffelgrass (*Pennisetum ciliare*). Our study design consists of documenting wildlife community response pre-, during, and post-restoration on 2 sites: a treatment site (restored area), a negative control (non-native grass area), and a positive control (native-plant area). We hypothesized that wildlife (small mammals, grassland birds, and pollinators) would use the restored site more than the negative control, but equal to the positive control. We monitored wildlife response using 10 trail cameras within the restoration and negative control sites. Cameras were active in 5, 2-week intervals and moved to different random locations during each interval. All native wildlife was counted up to 15 m from the cameras. Preliminary pretreatment data indicate the mean number of wildlife photographs was similar (95% CI) between the restoration and negative control sites. Wildlife detections averaged 2.5 photos/24-hr period between both pastures. Determining wildlife response to large-scaled rangeland restoration will assist wildlife managers in accessing the feasibility of this practice on southwestern grasslands dominated by non-native grass species.

25. EVALUATION OF CAPTURE TECHNIQUES ON LESSER PRAIRIE CHICKENS TRAP INJURY*

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Abstract: Ethical treatment of research animals is required under the Animal Welfare Act. This includes trapping methodologies that reduce unnecessary pain and duress. Traps used in research should optimize animal welfare conditions within the context of the proposed research study. Several trapping techniques are used in the study of lesser prairie-chickens, despite lack of knowledge of trap injury caused by the various methods. We captured 144, 40, and 217 lesser prairie-chickens using drop-nets, rocket-nets, and walk-in funnel traps, respectively, in New Mexico and Texas, 2006–2012. We recorded few injuries with rocket (2%) and drop-nets (6%), but trap injuries were common in walk-in funnel traps (23%). All trap injuries related to rocket and drop nets were broken feathers (primaries, secondaries, and tail feathers). Conversely, walk-in funnel traps ranged from cuts and scrapes on the head, cere, and patagium to broken feathers. Frequency and intensity of injuries in walk-in funnel traps are due to the passive nature of these traps (sit and wait) and indirect capture of individuals not needed for research. Comparatively, rocket and drop nets allow observers to target birds for capture and require immediate removal of the captured individuals from the trap. Based on our results, we recommend researchers monitor and remove birds from walk in funnels before they injure themselves, move traps to target birds and reduce recaptures, limit

the number of consecutive trapping days on a lek, and use proper netting techniques with quick, efficient, trained handling.

26. DIET AND NUTRITION OF FEMALE NORTHERN PINTAILS WINTERING ALONG THE TEXAS COAST*

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Abstract: Northern pintails were historically one of the most common ducks in North America. However, currently pintails are over 50% below management goals. Up to 78% of central flyway pintails winter along the Texas Coast, but habitats along the coast are being lost due to changes in land use. This loss of habitat can potentially affect pintail's ability to access food resources and possibly result in decreases in body condition, survival, and subsequent reproductive success. Our goal is to estimate the composition and energy content of the diet of female pintails wintering in freshwater and saltwater habitats along the upper, central, and lower portions of the Texas coast. We collected 102 female pintails in the first year of collection; 87 of which had diet items in their upper digestive tract. Preliminary results suggest that shoalgrass (*Halodule wrightii*) and *Bittium* spp. were the most common foods item of pintails foraging in saltwater habitats, comprising over 50 percent of the diet. In freshwater habitats, female pintails consumed primarily wetland plant seeds, particularly from *Polygonum* spp. and *Panicum* spp. Further data collection and laboratory analyses of nutrient and energy content of foods should provide insight into how female northern pintails rely on habitats along the Texas coast during winter, and allow managers a better perspective on their habitat management needs.

27. HABITAT SUITABILITY MODEL FOR THE BELL'S VIREO IN NORTHEAST TEXAS*

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Abstract: Bell's vireo (*Vireo bellii*) is a shrub land bird species that has been listed as near endangered by the IUCN. Most research/conservation efforts have focused on the subspecies *Vireo bellii pulsilis* since it was listed as endangered in 1986. However, very little research has been done on the near endangered subspecies *Vireo bellii bellii*, whose habitat range includes parts of north east Texas. This study focuses on the development of a habitat suitability model for *V. b. bellii*, using Geographic Information Systems (GIS) for spatial analysis of habitat variables. The model will allow for identification of potential nest sites and habitat for this species leading to more focused conservation and habitat preservation efforts.

28. STABLE ISOTOPES IN CONSERVATION FORENSICS: WHAT WE KNOW AND WHERE WE NEED TO GO*

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Abstract: Stable isotopes, varying forms of an atom, could potentially be used as a tool in conservation forensics to help determine or rule out geographic origins of animals, plants, and products made from them that are illegally taken and enter the black trade market. The objective of this review was to determine which stable isotopes could be used to determine geographic location, therefore be useful as a tool in conservation forensics. Carbon (d13C), hydrogen (d2H), oxygen (d18O), and strontium (d87Sr) would be useful in conservation forensics as their signatures vary geographically. Sulfur, d34S, and calcium, d44Ca, isotopes may have the potential to determine geographic origin. Global patterns of nitrogen isotope signatures, d15N, have been found, but caution should be exercised when using d15N alone because of high variability. The use of multiple stable isotopes could increase the likelihood of identifying a smaller geographic location. The application of stable isotopes for conservation forensics is in its infancy, and may not be an exact science in terms of assignment of plants or animals to specific populations. However, it could provide valuable tools to help conservation officers locate areas of high biological diversity in need of protection from illegal harvest and trade, and provide supporting evidence in criminal cases.

29. SEASONAL AND GEOGRAPHIC VARIATION IN THE FIBER CONTENT OF FORAGE SPECIES IN SOUTHERN TEXAS*

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Abstract: Fiber consists of 4 components with varying digestibility listed in order from most digestible to non-digestible as pectin, hemicellulose, cellulose, and lignin, respectively. By analyzing fiber, one can distinguish which forage yields higher digestibility, therefore influencing intake of forage. If available forage has more non-digestible fiber during a particular season or site, then this would lead to less in-take of the available forage. The objective of this study was to determine if fiber differed among forage species, sites, or seasons. In autumn 2012 and spring 2013, grass, forb, browse, and succulent species were collected for fiber analysis on 6 study sites on East Foundation ranches in South Texas. By understanding fiber components of available forage, it can help ranch managers determine possible utilization of forage during different seasons and locations.

30. NEST-SITE SELECTION AND PARTITIONING BETWEEN NORTHERN BOBWHITE AND SCALED QUAIL IN SOUTHERN TEXAS*

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Abstract: Northern bobwhite (*Colinus virginianus*) and scaled quail (*Callipepla squamata*) have overlapping geographic ranges in southern Texas. These species use different habitats, but it is unknown whether or not nest-site selection differs between the species where their habitat overlaps.. The objective of this study was to compare nest-site substrate and overhead woody cover presence between northern bobwhite and scaled quail nests where the species are sympatric. Our study took place on 3 ranches in La Salle County, Texas during 2009–2013. Fifty-one scaled quail and 65 bobwhites were radio-marked and relocated 2–3 days/week. Nest data, including nesting substrate and woody cover presence was collected on 34 northern bobwhite and 20 scaled quail nests. Eighty-five percent of bobwhite nests were found in bunchgrasses whereas 70% of scaled quail nests were located in pricklypear (*Opuntia lindheimeri*). In addition, 53% of bobwhite nests and all scaled quail nests were found in association with woody cover. We found significant partitioning of nesting resources of these 2 species. Understanding how scaled quail and northern bobwhite partition resources will aid landowners and managers in the management of habitat where both species exist.

31. USING A DOUBLE SAMPLING APPROACH TO DISTANCE SAMPLING DURING AERIAL SURVEYS FOR LARGE MAMMALS*

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Abstract: Aerial surveys are an efficient technique for observing animals over large areas. The East Wildlife Foundation (EWF) seeks to use aerial surveys to monitor large mammals on their properties in South Texas. During aerial surveys only 15–80% of the population is counted, biasing population estimates low, making attention to observer bias crucial. Distance sampling can be used to account for animals unseen, but only under the assumption that all animals on the transect are observed. Because sightability on the transect is not 100% during aerial surveys, distance sampling conducted in conjunction with a double observer technique is an approach that has been used to correct for the undercount in marine mammals, wild horses, and white-tailed deer. This approach can be achieved by recording separate observations of the front and rear observers in an aircraft. To execute this technique, surveys will be flown for 3 years on the EWF properties. During the surveys, we will count white-tailed deer, nilgai, cattle, feral hogs, and collared peccary. We will record species, sex, age class, number in group, activity level, GPS

location, and distance from the transect line. After exercising the double observer technique for distance sampling, we will provide the EWF with information to guide them in establishing a long-term monitoring program for large mammals.

32. POTENTIAL INFLUENCE OF CLIMATIC VARIABLES ON ABUNDANCE OF RANGELAND BIRDS*

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Abstract: This analysis was conducted to examine long-term trends in the abundance of birds along 9 breeding bird survey transects on 4 King Ranch and 3 East Wildlife Foundation properties in South Texas. Point counts were conducted from 2005 to 2013 using the traditional breeding bird survey methodology. Simple linear regressions using SAS software compared independent variables such as annual average precipitation, annual average temperature and the Palmer Drought Severity Index (PDSI) values to the dependent variables (mean number of all species and each of 5 target species counted at all points along a single transect per year). No over-all trends were observed in data pooled over all ranches. Average annual precipitation correlated significantly with mean number of birds observed/transect/year ($r^2 = 0.86$, $P = 0.0241$) on 1 transect, the number of northern bobwhite observed on 2 transects ($r^2 = 0.49$, $P = 0.0537$; $r^2 = 0.58$, $P = 0.0291$), and bronzed cowbirds on 1 transect ($r^2 = 0.69$, $P = 0.0246$). PDSI correlated significantly with the mean number of birds observed/transect/year on 1 transect ($r^2 = 0.94$, $P = 0.0061$) and mourning doves on 1 transect ($r^2 = 0.60$, $P = 0.0232$). Temperature correlated significantly with bronzed cowbird abundance on 1 transect ($r^2 = 0.72$, $P = 0.0152$) and mourning dove abundance on 2 transects ($r^2 = 0.63$, $P = 0.0224$; $r^2 = 0.64$, $P = 0.0177$). Analysis of differences in abundance among habitat types and feeding groups may help determine how different bird species and groups react to climate.

33. EFFECT OF DENSITY AND SUPPLEMENTAL FEED ON WHITE-TAILED DEER BODY SIZE*

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Abstract: Abstract: Body size of mature white-tailed deer (*Odocoileus virginianus*) has been shown to be linked to the deer's early life environment. Furthermore, maternal and grandmaternal nutritional status during gestation plays an important role in individual life development potential. While the effect of the

nutritional status of the 2 previous generations affects an individual's mature body size, the magnitude of nutritional effects and the effects of deer density are still poorly understood. In 2004 deer were captured from 2 ranches in South Texas and placed into 1 of 6 (81-ha) enclosures on each ranch. Each ranch had a factorial array of 3 deer densities (10, 25, and 40 deer/enclosure) and 2 feed treatments (pelleted supplement and no supplement). We captured and harvested deer twice a year from winter 2004-spring 2013 and recorded body measurements for every deer handled. Our objective was to investigate the effect of deer density and improved nutrition on body length and hind foot-length; any changes in average deer body size will be a function of the interaction between nutrition, density, and time lag effects from past generations. By using measurements only from deer born into the enclosures, we will gain insight into the effects of early life environment on body size and generational effects of deer management practices on deer body size.

34. EVALUATING THE IMMUNOCOMPETENCE OF NORTHERN BOBWHITE QUAIL AND SCALED QUAIL ON THE ROLLING PLAINS OF TEXAS*

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Abstract: Quail populations in Texas are currently declining with some surveys reporting record lows during 2013. This decline has caused many to suggest disease processes may be involved. There are currently several good investigations of disease exposure in quail. However, identification alone will not be sufficient to advance our knowledge of the disease hypothesis, or to most effectively develop strategies for dealing with potential problems. If disease processes play a role in limiting quail population growth, it also is likely that environmental factors reduce the ability of the quail immune system to function properly making them more susceptible to infection with disease agents they encounter or carry. We have started an effort to increase our understanding of the influence of environmental factors (e.g., weather, nutrition, etc.) and life history factors (e.g., molt, reproductive cycle) on the quail immune system. We collected biological samples from wild northern bobwhites and scaled quail between 2009 and 2013. We used these samples to evaluate variability in quail innate and humoral immunocompetence during different seasons, years, and locations. We also examined relationships between immunocompetence and factors such as bird age, body weight, and gender. We will report on our initial results concerning wild quail immunocompetence in the Rolling Plains of Texas.

35. EFFECTS OF DENSITY AND SUPPLEMENTAL FEED ON SEXUAL SEGREGATION IN WHITE-TAILED DEER*

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Abstract: Sexual segregation is common among polygynous ruminants and may be influenced by the provision of supplemental feed and increased density. We hypothesized that supplementally fed white-tailed deer (*Odocoileus virginianus*) at low densities will experience greater spatial partitioning due to males being more dominant at feed sites and does having more resources to choose from than deer at high densities without supplement. We also hypothesized that spatial partitioning will be evident during parturition and absent during the rut. We placed GPS collars on 32 deer located on 2 southwest Texas ranches in December 2009. Two pairs of 81-ha enclosures on each ranch had densities of 10 deer/81-ha and 40 deer/81-ha. One enclosure of each pair included supplemental feed, which was provided ad libitum. Collars recorded coordinates every 30 minutes until December 2010. We divided the year into 6 seasons (rut, post-rut, late winter/spring, parturition, late summer/early fall, and pre-rut) and days into 4 periods (night, morning, day, and evening). To determine the amount of spatial partitioning, the distance between each buck and each doe was calculated. We found that supplementally fed bucks and does were 27% ($P = 0.003$) and 15% ($P = 0.027$) closer in proximity to one another during the night and evening, respectively, than during other periods of day. Supplementally fed bucks and does in high density enclosures tended to be less segregated than the other combinations of density and feed ($P = 0.070$). These results suggest that intersexual competition due to increased density and social factors at supplemental feed sites does not increase sexual segregation.

36. CAMERA TRAP MONITORING OF WATER TROUGH VISITATION IN BIG BEND RANCH STATE PARK*

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Abstract: Numerous studies have shown that water is critical in the survival and success of a species, especially in arid desert environments. In December of 2010, 46 bighorn sheep (*Ovis canadensis*) were transplanted from Elephant Mountain WMA to Big Bend Ranch State Park in an effort to begin restoring sheep to part of their historic range. In April of 2011, 3 guzzler systems, each with 2 wildlife-friendly troughs, were strategically installed within the state park in areas deemed suitable for sheep and other wildlife. In December of 2011, camera traps were placed at each of the 6 troughs in order to monitor water visitation. Over the last 2 years, more than 20,000 photos have been obtained from the trough sites. The objectives of this study were to determine: (1) heterogeneity of species visitation; (2) timing of day and year for water site visitation/utilization; (3) and capture success of the cameras. An overview of each of the objectives' outcomes will be discussed.

37. SOIL MICROBIAL CHARACTERISTICS AND SEED BANK DYNAMICS OF STOCK-PILED TOP SOILS IN THE WESTERN RIO GRANDE PLAINS*

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Abstract: Increased energy extraction has impacted rangelands throughout the western U.S. Ecological restoration can be enhanced with proper management of affected top soils. Little information exists on effects of stockpiling on soil microbial community composition and functionality and seed bank dynamics. The objectives of this research are to assess microbial responses and seed bank dynamics in stockpiled top soils as a function of stockpile age and depth. Three study sites are located in the western Rio Grande Plains, Texas. Stock piles are sampled at different depths as they age; seed banks are examined under greenhouse conditions. Samples from stock piles are evaluated for microbial community structure according to ester linked-fatty acid methyl ester (EL-FAME) profiles, enzyme activities of C and P cycling, and selected chemical properties. Stockpiling top soils has immediate impacts on microbial biomass carbon and nitrogen as well as on microbial community composition. These effects depend on soil series and depth of sampling; additionally, biological characteristics of stockpiles change over time differently than do biological characteristics of intact (undisturbed) soils. Results will aid in developing guidelines for restoration of landscapes that are impacted by energy development.

38. PHYSIOLOGICAL AND BEHAVIORAL RESPONSES OF WHITE-TAILED DEER ON LOW-ENERGY DIETS*

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Abstract: Dietary energy is important to animal growth and maintenance, but is often limiting in forage of white-tailed deer in Texas. The purpose of this study is to quantify activity patterns and physiological responses of deer given a low-energy versus a standard diet. We tested the hypothesis that deer maintained on a low-energy diet will compensate with reduced activity levels, slower growth rates, and lower body condition scores than deer maintained on a standard energy diet. Research was performed at the Kerr Wildlife Management Area, west of Kerrville, Texas. Data was recorded on 40 deer maintained on a low-energy diet (LE), < 2.0 kcal/g digestible energy, and 36 deer maintained on a standard diet (SE), > 2.6 kcal/g digestible energy (diets were isonitrogenous). Activity level between treatments did not differ in January ($P > 0.26$) or March ($P > 0.61$), but LE deer consumed 18% more feed than SE deer. After 1 year on the treatment, SE deer gained 7.8 kg more body weight than LE deer (20.4 kg vs. 12.6 kg). Body length growth for SE deer was 9.5 cm greater than for LE deer. Growth of the deer's hind foot length did not differ between treatments ($P > 0.19$). Body condition score for SE deer was 18% higher than LE deer. These results demonstrate that differences in energy intake have dramatic implications for deer body growth and suggest that energy intake may be a concern for deer management in semi-arid regions of Texas, where high-energy foods are limited during droughts.

39. TRAP SUCCESS AND EFFICIENCY IN THE CAPTURE OF CRESTED GUINEA FOWL*

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Abstract: Relatively little has been published about the crested guineafowl (*Guttera pucherani*). What has been published has relied on field observation and vocalization playback trials. No study to date, however, has relied on the trapping of birds to obtain data. Within the Mbuluzi Game Reserve in Swaziland, data was collected to determine the most efficient, effective, and safe trapping method for the capture of crested guineafowl between 2 methods used in the capture of similar birds, the drop net and the walk-in trap. To study these 2 methods, 5 different aspects of trapping were examined: number of birds caught, cost per bird, man-hours per bird, injury caused by each method, and post capture survival. Travel time to each site, set up time, observation time was recorded to include in the calculation of man-hours per bird caught. After birds were caught, they were examined and sorted into injury categories based on the severity of their wounds. Post-capture survival was determined by the use of radio telemetry. Birds were tracked daily and the stress of trapping was determined to have some effect on their survival if they died within 2 weeks of being trapped. No difference in injury or post capture mortality was detected between the 2 trap methods; however, the drop-net caught more birds and took less man-hours per bird to do while being more expensive per bird.

40. AN ANALYSIS OF NORTHERN BOBWHITE BREEDING RESPONSE AND OVERWINTER SURVIVAL TO EXPANSION OF HABITAT*

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Abstract: Northern bobwhite (*Colinus virginianus*; hereafter bobwhite) populations have been on the decline across their range in the United States. Habitat loss due to brush encroachment, exotic grasses, and heavy grazing has led to fewer available home ranges for many wildlife species, including bobwhites. However, the bobwhite populations in South Texas have remained steady when compared to the populations in other parts of the country. This is, in part, is due to the continued management of usable bobwhite habitat that produces successful nests and contributes to over-winter survival. We plan on initiating a new study in which we compare bobwhite habitat use, overwinter survival, and nesting success on 2 spatially independent sites on a private ranch in Duvall and Jim Hogg counties. Site 1 has been managed for bobwhites since 2005 while Site 2 has been heavily grazed by cattle and has not been managed for wildlife for > 50 years. Currently, the percentage of brush and exotic grasses is greater on Site 2, which we theorized would limit habitat use by bobwhites therefore lower bobwhite abundance and density. In 2014, the ranch plans to undergo a multi-year history of intensive management thereby creating an expansion in usable bobwhite space which we hypothesize will increase bobwhite abundance, overwinter survival, and nesting success on Site 2. Our hypotheses are that: (1) We will initially find a greater density and abundance of bobwhites on Site 1, (2) nesting success and overwinter survival will increase on Site 2 following the land management implementation, and (3) bobwhite populations will increase on Site 2. Nonetheless, because of drought in South Texas during the past 2 years, pre-treatment bobwhite population densities were extremely low during April 2013. Data collected has shown Site 1 contained approximately 1 bird per 8 acres and Site 2 contained approximately 1 bird per 7 acres. This data disproves our first hypothesis as the obtained data indicated little difference in abundance and population between the 2 sites. Our goal is track the response of bobwhites to brush management that will be implemented on Site 2, and compare this response to how bobwhites use habitat on Site 1, that had a multi-year history of intensive management to meet their annual life-cycle needs. Beginning in April 2012, we will weigh, mark, and fit bobwhites with radio transmitters. GPS locations will be taken bi-

weekly to illustrate habitat use, overwinter survival, and nesting success before and after habitat manipulation.

41. BREEDING BIRD COMMUNITY DYNAMICS IN BOTTOMLAND HARDWOOD FORESTS OF EAST TEXAS*

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Abstract: Bottomland hardwood forests are considered to be one of the most ecologically diverse and complex ecosystems in North America, supporting numerous avian species. Songbird abundance and diversity are influenced by both vegetation heterogeneity and landscape conditions. Natural disturbances such as drought, fire, windthrow, and hurricanes can create complex vertical and horizontal structure that improves songbird nesting and foraging success and positively impact community structure. We surveyed the breeding songbird community in the bottomland hardwood forest at Old Sabine Bottom Wildlife Management Area (OSBWMA) during and after a major drought in 2011. A total of 97 point count surveys were completed at least twice per year from 2011 to 2013. Over the past 3 years, 52 species were detected, of which 49 species are believed to nest on the OSBWMA. The most frequently detected birds were northern cardinals (*Cardinalis cardinalis*), red-eyed vireos (*Vireo olivaceus*), northern parulas (*Setophaga americana*), tufted titmice (*Baeolophus bicolor*), blue-gray gnatcatchers (*Poliophtila caerula*), indigo buntings (*Passerina cyanea*), and white-eyed vireos (*Vireo griseus*). Following the 2011 drought, we expect greater densities of species associated with understory habitats, and lower densities of species within closed canopy mature habitats. This research will provide insight to the effects of natural or anthropogenic disturbances on breeding bird community ecology for future conservation and management in these unique forested systems.

42. EFFECTS OF SURFACE TEMPERATURE ON BOBWHITES*

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Abstract: Northern bobwhites (*Colinus virginianus*) avoid portions of the landscape with operative temperatures greater than 39 degrees Celsius. Past research indicates that an average of 24 percent of the habitat in South Texas could become unavailable to birds because of high summer temperatures. Although bobwhite habitat use is clearly affected by operative temperature, the relationship between habitat use and ground surface temperature is unknown. Our objectives are to (1) determine the effects of soil and litter surface temperatures on bobwhite habitat selection, and (2) assess brood site selection in regards to surface selection. Our study area is located on the Hixon Ranch in La Salle County, Texas. Sixty-one birds from 2 study pastures, 109.3 and 84.9 ha in size, were radio-collared and tracked 3 times per week from May-September 2013. At relocation sites, 5 surface temperatures were recorded with a laser

thermometer; 5 temperatures also were recorded 20 m away in a random cardinal direction from the bird relocation. Relative probability of a site being used by a bobwhite declined with increasing surface temperature, as use was less than 50 percent at surface temperatures greater than 38 degrees Celsius, which is similar to past research. This study demonstrates that surface temperatures are an important variable in determining the influence of the thermal environment on habitat selection by bobwhites and could be a simple tool for quail managers to assess the thermal qualities of bobwhite habitat.

43. EFFECTS OF TANGLEHEAD INVASION ON ECOSYSTEM PROCESSES IN THE TEXAS COASTAL SANDSHEET*

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Abstract: South Texas has experienced increases of several invasive grasses including tanglehead (*Heteropogon contortus* [L.] P. Beauv. ex Roem & Schult.). There is relatively little research concerning the effects of tanglehead on ecosystem processes such as energy cycling, nutrient cycling, and microbial soil processes in this region. To examine the effects of tanglehead invasion on microbial soil processes we are currently evaluating microbial community size and structure in 3 different types of vegetation communities in the Texas Coastal Sandsheet, representing a tanglehead invasion gradient including: (1) native plant community, (2) tanglehead-native mixture, and (3) tanglehead dominant. Soil microbial communities were evaluated for microbial biomass C (MBC) and N (MBN) as well as community structure via FAME profiles. Soil MBC was greater in native plant communities than both tanglehead mixture and dominated communities. Soil MBN was also greater in native plant communities than both tanglehead mixture and dominated communities. Mean microbial composition and fungi:bacteria ratio differed between tanglehead dominated and native vegetation communities. Nonmetric multidimensional scaling ordination reveals shifts in the microbial community composition related to changes in bacteria and fungal abundance. The changes in microbial community size and structure suggest potential changes in soil quality and microbial functioning due to tanglehead invasion. Further research will help to determine the extent of these effects on wildlife habitat, and how to more efficiently focus habitat management and restoration efforts in South Texas.

44. HUMAN DIMENSIONS OF URBAN WATER BODY USAGE IN LUBBOCK, TEXAS*

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Abstract: As urban areas expand to accommodate population growth, urban planners are tasked with building ecological and public friendly Urban Green Spaces (UGS). These same spaces usually provide habitat to urban-dwelling wildlife. Historically, water bodies with UGS are intended for people to perform many different recreational activities. The purpose of this study is to identify resident utilization of the parks with water bodies for recreational purposes. Water bodies in Lubbock, Texas, are utilized for flood control and integrated into UGS for aesthetic enhancement and currently do not allow swimming. In the absence of swimming I hypothesize that people use these areas most often for personal exercise and to walk pets. This study will be performed over a 24-month period. Multiple visual site surveys will be conducted in 6 month increments according to North American seasonal cycles, spring and summer, fall and winter. The surveys will be conducted Sunday through Saturday and will capture hourly time points from 6 a.m. to 9 p.m. for each seasonal increment. During these surveys I will visually assess and capture recreational activities in progress and wildlife presence at 24 pre-selected sites. The results of this study can aid direction of future studies on wildlife impact due to human activity presence in UGS. In addition, knowledge of UGS amenity preferences by public users can help urban planners to enhance management while preserving ecological services wildlife utilize in such spaces.

45. PRONGHORN POPULATION DYNAMICS AND HABITAT CONNECTIVITY IN THE TEXAS PANHANDLE*

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Abstract: Pronghorn (*Antilocapra americana*) populations have the potential to fluctuate significantly due to environmental and anthropogenic influences. Habitat loss, in conjunction with varying forage availability, precipitation, and natural mortalities could explain some of the factors affecting pronghorn population variation. To assess the magnitude of population change pronghorn herd units in Texas are monitored every other year by the Texas Parks and Wildlife Department (TPWD) to determine the population size and distribution of pronghorn populations as well as to determine harvest recommendations. This study aims to evaluate the population-level effects of harvest or climate on population dynamics and to determine the quantity and connectivity of pronghorn habitat. To identify the impact of anthropogenic and climatic factors on pronghorn population growth and distribution in the panhandle, this study will (1) develop a model of pronghorn population dynamics, using both hunter-harvest and climatic data to inform the model, (2) generate a presence-only spatial model of suitable habitat for pronghorn in the panhandle, and (3) determine the potential connectivity between suitable pronghorn habitat patches. The resulting population, habitat, and connectivity models can assist the TPWD and local managers in directing regional pronghorn conservation actions towards herd units with struggling, isolated populations and will offer management recommendations to mitigate the effect of man-made barriers to pronghorn movement.

46. RELATIVE ABUNDANCE AND SPATIAL DISTRIBUTION OF LARGE AND MESO-MAMMAL POPULATIONS ON DYESS AIR FORCE BASE*

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Abstract: Habitat fragmentation and the spread of urban environments are a major threat to native wildlife populations. We chose Dyess Air Force Base to study these effects due to its unique interface of urban, military, and native environments. Using the scent-station method, we distributed 42 stations throughout the installation with 5 different scents: bobcat urine, coyote urine, bobcat gland, catnip, skunk musk and a control. These stations were placed in a grid format to record the relative abundance and distribution of large and meso-mammal populations on base. We discovered 4 large mammal species: *Lynx rufus*, *Canis latrans*, *Axis axis*, and *Sus scrofa* and 8 meso-mammal species: *Mephitis mephitis*, *Didelphis virginiana*, *Procyon lotor*, *Urocyon cinereoargenteus*, *Lepus sylvaticus*, *Erethizon dorsatum*, *Dasypus novemcinctus*, and *Felis catus* inhabiting Dyess AFB. Our data suggests both coyotes and bobcats exhibit spatial avoidance and adjust their habitat selection to avoid anthropocentric activity. Spatial avoidance was not observed in all species as the heavily trafficked golf course was the site with the highest frequency of mammalian activity. The collected data also show that bobcat ranges shrink during coyote mating season due to the territorial nature of coyotes. Our figures suggest large and meso-mammal populations are capable of adaptation to urban and military activities in addition to naturally occurring stimuli in their native habitat.

47. INFLUENCE OF SUPPLEMENTAL FEEDING ON WHITE-TAILED DEER FORAGE SELECTIVITY*

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Abstract: Managers provide supplemental feed to white-tailed deer without knowing the impacts feeding may have on forage selection by deer. Knowing how the provision of supplemental feed affects forage selection by deer is important to determine the effects of deer foraging on the vegetation community. The provision of supplemental feed may alleviate nutritional constraints of deer, allowing deer to seek out and consume only the most nutritious forages available, potentially leading to the reduction or disappearance of these plants. Alternatively, the provision of supplemental feed may increase consumption of low quality, chemically defended plants by (1) providing deer with means to detoxify plant secondary metabolites; or (2) inducing rumen acidosis, causing deer to increase their consumption of poor quality forages, slowing fermentation rates and increasing rumen pH. We examined the effects of supplemental feeding on forage selectivity using 8 captive, adult deer (4 males and 4 females). One group of 4 deer (2 males and 2 females) was fed a diet of alfalfa hay, representing high quality forbs, and guajillo (*Acacia berlandieri* Benth), representing low quality shrubs, fed ad libitum. The other group of 4 deer was fed the same diet, with the addition of a pelleted supplement. The intake of feedstuffs was measured for 14 days. After the first trial period, the diets of each group were switched and intake was measured for an additional 14 days. Intake of all feedstuffs was determined on a dry matter basis. Determining the effects of supplemental feeding on white-tailed deer forage selection will improve our understanding of the interactions between white-tailed deer and vegetation on rangelands in South Texas.

48. SELECTION AND USE OF TRAVEL CORRIDORS BY OCELOTS AND BOBCATS IN SOUTH TEXAS*

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Abstract: Habitat destruction and fragmentation are 2 of the largest threats to wildlife habitat in South Texas. Maintaining connectivity of fragmented habitat by travel corridors may play a key role in the population recovery of ocelots and management of other wildlife in the United States. Widening and installation of wildlife crossings on Farm-to-Market Road 106, a rural road with moderate human disturbance near Laguna Atascosa National Wildlife Refuge, is planned for 2014. Camera traps are used to analyze ocelot and bobcat use and preference for multiple travel corridor types to test the hypothesis that ocelots and bobcats will use the same corridor types (drainage ditches, resaca [oxbow lake] edges, narrow brush strips) when options for travel are restricted. The proposed wildlife crossing sites are compared to sites with minimal human disturbance to determine behavioral effects, such as avoidance or repeated use of a specific corridor type, of human disturbance on corridor selection. Corridors are characterized by size and vegetation composition to define predictor variables. Broader impacts of this study include analysis of ocelot and bobcat interactions in areas of restricted vegetation where habitat partitioning may not be possible and aid in placement of future wildlife crossings in a human-dominated landscape.

49. URBAN DEVELOPMENT AND THE URBAN CARNIVORE*

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Abstract: Urban expansion is encroaching on wildlife habitat at an increasing rate. Wildlife are either adapting to or fleeing from this rapid environmental change. Carnivores are of special concern because of their essential role in ecosystems and their possible effects on human health, well-being, and livelihoods. Urban wildlife research is a relatively young field, only becoming prevalent in the last twenty years. Studies are now evaluating how wild mammalian predators such as coyotes (*Canis latrans*), dingoes (*Canis lupus dingo*), bears (*Ursus* sp.), mountain lions (*Puma concolor*), bobcats (*Lynx rufus*), hyenas (*Hyaenidae* sp.), badgers (*Mustelidae* sp.), foxes (*Vulpes* and *Urocyon* sp.), and raccoons (*Procyon lotor*) have increased in prevalence in highly urbanized areas. Texas also is experiencing increased urban carnivores, with bobcat and coyote reports becoming common in most urbanized areas, such as the Dallas/Fort Worth metroplex (DFWM). Understanding how species adapt to urban expansion is essential for making appropriate management and conservation decisions in regions of potential conflict. To this extent, we review the status of urban carnivores across the globe, and how research findings can be applied to urban carnivores in Texas. This review establishes the foundation for a study to evaluate the population dynamics and ecology of urban bobcats in the DFWM. Our goal is to address how bobcats, an elusive and rarely studied urban carnivore, live among humans in a highly urbanized landscape. This comprehensive review of urban carnivore research will improve our understanding of how people affect wildlife and how wildlife affects people.

50. SURVEY OF THE MEXICAN BEAVER IN BIG BEND NATIONAL PARK

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Abstract: The Rio Grande River forms the 176 km boundary of Big Bend National Park with Mexico and is home to the southwestern subspecies of North American beaver (*Castor canadensis mexicanus*). The last survey on the Mexican beaver in Big Bend National Park was conducted in 1976 by J. Connor and B.

Feeley. Our objectives are to document centers of beaver activity and estimate the population of beaver in Big Bend National Park. We surveyed the Rio Grande River from the mouth of Terlingua Creek to the mouth of Boquillas Canyon by float trips using kayaks, canoes, and river rafts. On the float trips, we recorded water depth, type of vegetation, and sign of active beaver colonies (presence of beaver tracks, scat, and cuttings). To date, we have extensively surveyed 54.5 miles of the Rio Grande River in Big Bend National Park, from Terlingua Creek to Black Dike and Talley to Boquillas Canyon. From data gathered on float trips, we have created an ArcGIS map showing bathymetry of the river, vegetation profiles, and active beaver sign. Over 95 active beaver dens have been located, indicating a healthy population of beaver in the park. Information generated from this project will be used by the National Park Service in implementing several management practices to restore the river and riparian area to a more natural state. Practices include the removal of the exotic plant and animal species as well as planting and managing for native plant species such as cottonwoods and willows.

51. AN EVALUATION OF THE EFFECTS OF PRESCRIBED FIRE, TILLAGE, AND HERBICIDE TO DECREASE EXOTIC VEGETATION AND TO RE-ESTABLISH NATIVE VEGETATION ON OLD FIELDS WITHIN THE BLACKLAND PRAIRIE ECOREGION OF TEXAS

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Abstract: Due to agricultural practices and urban development, only 4% of tallgrass prairie remains in North America. The objective of this research is to determine the effectiveness of the implementation of prescribed fire, tillage, and herbicides as restoration methods for aiding in the re-establishment of native tallgrass prairie vegetation. A split plot randomized block design is being used to expose subplots to fire, herbicide, and tillage. In June 2013, baseline cover and frequency for all existing vegetation was collected using a quadrat sampling method. In June 2013, a 7.5% glyphosate solution was applied to subplots that had been randomly assigned herbicide treatment. In October 2013, prescribed fire was applied to subplots that had been randomly assigned fire treatments. In December 2013, tillage will be applied to randomly assigned subplots. In January 2014, a native seed mixture will be planted in all subplots. In June 2014, data will be collected using the same quadrat sampling method previously used in June 2013. The data will be examined for the extent to which pre-existing vegetation recovered from the treatments and the extent to which native species have become established. The results of this study will be used to develop management recommendations for re-establishment of native species on tame pastures.

52. THE PYGMY MOUSE IN HUNT COUNTY, TEXAS

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Abstract: The northern pygmy mouse (*Baiomys taylori*) has been experiencing a range expansion. In the Dallas-Fort Worth Metroplex, it was recorded in Dallas county in 1957, but was believed to not be found in counties east of Dallas County and north of Freestone County. In 2008 it was discovered in northwestern Hunt County at Clymer Meadow. A small mammal survey was conducted in March of 2013 on the Texas A&M University-Commerce Wetland and Prairie Preserve using 200 Sherman traps. During the 800 trap night session, 6 northern pygmy mice were captured: 2 males and 4 females. Other studies conducted have shown a correlation with fulvous harvest mice (*Reithrodontomys fulvescens*), during this study the fulvous harvest mouse was the most captured with 25 individuals. This is the second

documented case of the northern pygmy mouse in Hunt County and has demonstrated its expansion eastward. Due to its close proximity to Delta and Hopkins counties, a future study should be conducted to examine for the presence of northern pygmy mice in those counties.

53. NOCTURNAL ROOSTING OF REDDISH EGRETS

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Abstract: The reddish egret (*Egretta rufescens*) is North America's rarest and least studied heron and is currently a species of concern according to the U.S. Fish and Wildlife Service and is listed as threatened in Texas. The United States population is estimated at ~2,000 breeding pairs, with approximately 900–950 pairs occurring in Texas. The paucity of information about habitat requirements of reddish egrets has focused on breeding and foraging, and therefore management efforts for this species may be lacking important information on the range of habitats necessary during all portions of the annual cycle. In order to examine the roosting behavior and roost site selection of egrets, we attached satellite transmitters to 22 adults that were breeding in the Laguna Madre, Texas. Preliminary results show that egrets exhibit site fidelity within and among-years. Based on year-round locations, we will be able to identify parameters that may affect roost site selection in this species. This is a current data need by the reddish egret Recovery Group and will contribute to current conservation efforts.

54. MANAGEMENT OF INVASIVE OLD WORLD BLUESTEMS TO RESTORE NATIVE GRASSLANDS: WHERE DO WE GO FROM HERE?

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Abstract: Old World bluestems (*Dichanthium annulatum* and *Bothriochloa ischaemum*; OWB) are classified as invasive plant species that are encroaching native rangelands in Texas, especially in the South Texas region. Historically, OWB were planted for grazing on rangelands and erosion control along roadsides. A review of past research and management aimed at controlling OWBs will be presented. Currently, no individual control method has proven to effectively eliminate OWB. Therefore, we have designed a study to evaluate combinations of treatment methods landowners and managers could use to manage these invasive grasses. We will use primary and secondary treatments (triplicate plots) in a factorial design (4 x 5) to integrate multiple management practices and determine the most effective treatment combination. Primary treatments include summer fire, herbicide, glyphosate + reseeding with native species, and control. The secondary treatments will be to plow, mow, fertilize, plow + seed with natives and a control. The experiment will be conducted at 6 different sites, in 4 counties, representing different soil types and climatic conditions in South Texas. Cover and botanical composition of plots and yield of OWB will be estimated monthly over 2 years to determine which treatment combinations are the

most effective. A handbook will be developed to disseminate the findings. Knowledge of applying multiple treatments to manage OWB will provide landowners and managers with information to make more informed management decisions when attempting to control the spread of OWB that are dominating rangelands and producing poor quality wildlife habitat in South Texas.

55. STRATEGIC HABITAT CONSERVATION GRASSLAND BIRD FOCUS AND REFERENCE AREA MONITORING

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Abstract: Texas Parks and Wildlife Department is working with Oaks and Prairies Joint Venture (OPJV) on a multi-year grassland bird population monitoring program and conservation tracking system to assess the impact of grassland bird habitat restoration efforts in focus areas throughout Texas. Reference areas, chosen based on proximity and similarity of landscape configuration to the focus areas, but currently have no targeted habitat restoration efforts, also are now being monitored as a control. The population monitoring builds on 2012 surveys with northern bobwhite fall covey call counts that were conducted in November 2013 at randomly selected roadside points located in a designated grassland bird focus area and its corresponding reference area, in Colorado and Austin counties. A total of 16 covey call point counts was conducted, in the focus area, with a mean of 2 covey detections per point. A total of 15 covey call point counts was conducted, in the reference area, with a mean of 1.47 covey detections per point. This monitoring also will continue with spring grassland bird surveys and will be expanded to include 2 other priority focus areas. Plans are to continue these monitoring efforts for the next 10 years as a part of the Northern Bobwhite Conservation Initiative's effort to implement coordinated grassland bird monitoring across the range of the northern bobwhite.

56. EASTERN TURKEY HABITAT SUITABILITY INDEX FOR PINEYWOODS AND POST OAK SAVANNA ECOREGIONS

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Abstract: Texas Parks and Wildlife Department (TPWD) is experimenting with re-stocking of eastern turkeys in the Pineywoods and Post Oak Savanna Ecoregions. TPWD staff constructed a GIS-based Habitat Suitability Index (HSI) as a tool to assist in the siting and monitoring of re-stocking efforts. The HSI was developed to objectively evaluate spatial data representing the environmental conditions that are favorable to eastern turkeys. The HSI evaluated eastern turkey habitat based on 3 criteria: (1) Edge habitat (ecotones), (2) Human avoidance/disturbance, and (3) Land use/Land cover (LULC; Broad vegetation types). The LULC values were based on the professional opinions of TPWD and National Wild Turkey Federation biologists responsible for the management of wild turkeys and their habitat in east Texas. Values were established for availability of food, brood, roost, nest, and escape/loaf cover types within a particular vegetation type. The habitat criteria input values were reclassified and normalized into raster layers with 30-m resolution. Composite HSI scores were then calculated from those input rasters to show spatial ranking of suitable habitat. Additional analysis will be conducted to investigate connectivity of suitable habitat crucial to the dispersal and long term sustainability of Eastern wild turkey populations.

57. DOES MICROCLIMATE EXPLAIN SPATIAL VARIATION IN LESSER PRAIRIE-CHICKEN NEST SURVIVAL?

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Abstract: The range of the lesser prairie-chicken exists along diverse longitudinal precipitation and latitudinal temperature gradients. Ambient temperature and humidity are factors known to influence lesser prairie-chicken nest survival in sand shinnery oak prairies. Although this information is lacking across the distribution of the species it may explain regional variation in nest survival witnessed among several studies. We used iButton® data loggers to record temperature and humidity at nests in mixed, sand shinnery oak, and short-grass prairies, 2010–2013. Dataloggers were programmed to record 1 measurement every 10 minutes at 16 nests in shinnery oak prairie (Texas and New Mexico), 10 in short-grass prairie (Kansas and Colorado), and 17 in mixed grass prairie (Kansas). We hypothesize that nest survival will be influenced more by environmental conditions in the southern and western periphery of the range (sand shinnery oak prairie) compared to northern (short-grass prairie) and eastern expanses (mixed-grass prairie) of the species distribution. We developed several a priori models using the nest survival model in Program MARK to estimate daily and incubation period survival for all nests. There was a considerable amount of model selection uncertainty among our candidate models, but maximum daily temperature and minimum daily relative humidity were negatively correlated to nest survival for all study areas. Preliminary analyses indicate support for our hypothesis that abiotic conditions appear to exert strong influences on lesser prairie-chicken nest survival in the southwestern region, but reduced influences in the northern and northeastern extents of their distribution.

58. MONTHLY VARIATION OF SMALL MAMMAL TRAPPING ON DYESS AIR FORCE BASE, ABILENE, TEXAS

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Abstract: The urbanization of an area presents native species with new and unique challenges to survival. We chose to study Dyess Air Force Base because it provides a unique mix of rangelands and heavily urbanized/military environments. We placed Sherman traps in 9 transects, each containing 10 traps, in varying ecosystems around Dyess AFB. Traps were set for 3 nights every month, apart from times of inclement weather, starting in October 2012 and ending in September 2013. We were successful in

trapping 166 specimens of 6 different species: *Peromyscus maniculatus* (120), *Sigmodon hispidus* (8), *Chaetodipus hispidus* (7), *Baiomys taylorii* (4), *Reithrodontomys montanus* (15), *Neotoma micropus* (12) inhabiting Dyess AFB. Our data shows that of the species captured *P. maniculatus* is the most common species of small mammal found on Dyess AFB and is most likely a primary prey species for any carnivores or raptors that live on or near Dyess AFB. The ecosystem producing the most number of specimens on Dyess AFB was the short grass prairie region included in the sampling area. Also *B. taylorii* was only captured in the short grass prairie region. We were most successful trapping during the month of April 2013; we had an average of 13.3 specimens per night (60 traps). Our least successful trapping session was October 2012 with a catch rate average of 2 specimens per night.

59. POPULATION DENSITY AND DETECTION PROBABILITY OF TWO SYMPATRIC URBAN MESOPREDATORS IN EAST TEXAS

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Abstract: Over the last 20 years, cities across eastern Texas like Nacogdoches have seen consistent human population increases, which have increased the rate of urban and exurban development and consequent habitat fragmentation. The northern raccoon (*Procyon lotor*) and Virginia opossum (*Didelphis virginiana*), sympatric across the majority of their geographic range are commonly associated with urban areas. Their ability to exploit anthropogenic resources increases the potential for both positive and negative human-wildlife interactions and the need to identify variables likely to affect abundance, population density and detection probability of these species. During August and September 2013, we conducted a 10-day mark-recapture study to estimate abundance, population density and detection probability of raccoons and opossums in Nacogdoches, Texas. We set a trapping web of 30 live cage traps across a 1.76 km² square grid within the city limits of Nacogdoches, with 3–4 traps per 0.3 km². After 300 trap nights, we captured 15 raccoon (8 males; 7 females) and 9 Virginia opossum (4 male; 5 female) individuals. We used spatially explicit capture-recapture models using Inverse Prediction and Maximum Likelihood (ML) estimators in R program Secr to estimate density and abundance. Estimated ML population density was 18.3 raccoons per km² with a capture probability of 0.0579 and 4.6 opossums per km² with a capture probability of 0.1364. Our findings report the first estimate of population density for Virginia opossums living within an urban area. Raccoon density, while higher than most estimates for rural locations, was on the lower end of known urban population densities for raccoons.

60. DEVELOPING A BODY CONDITION INDEX FOR MOTTLED DUCKS ON THE UPPER TEXAS GULF COAST

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Abstract: Body condition, or an individual's ability to address present and future metabolic needs, is an important measure of organismic health. For waterfowl, body condition provides a useful index for assessing energy usage during different life history periods and potentially a measure of response to disturbed ecosystems. The mottled duck (*Anas fulvigula*), a waterfowl species native to the Texas Gulf Coast, is relatively poorly studied in respect to these dynamics and presents a unique case because of its

non-migratory life-history strategy that does not impose the same metabolic costs as in many closely related waterfowl species. Additionally, as a species of conservation concern, traditional methods of fat content estimation (a commonly used proxy for body condition) that involve destructive sampling are less viable. The goal of this study was to produce a body condition index for the mottled duck using a small number of birds ($n = 25$) donated by hunters at check stations or collected by law enforcement efforts on the Texas Chenier Plain National Wildlife Refuge Complex from 2005–2007. Morphometric measurements were taken, and ether extraction was used to determine fat content. A hierarchical modeling approach was used to determine the external morphometrics that best represented fat content in this species and provide a predictive equation that represents this relationship. The mottled duck condition model created here can be used by managers and biologists to better monitor population status and health without the need to destructively sample individuals, an important criterion for species at risk.

61. BLOOD WORK ANALYSIS OF VIRGINIA OPOSSUM CAPTURED ON DYESS AIRFORCE BASE

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Abstract: Understanding the basic parameters related to the health of a population are pertinent to developing plans and management strategies for a species. This study collected and analyzed blood samples from Virginia opossum (*Didelphis virginiana*) captured in an urban environment on Dyess Airforce Base (DAFB), in order to observe nutrient levels and measurements of several factors within a complete blood count (CBC). External measurements also were taken in order that correlations might be found between blood abnormalities and external physical condition. Several nutrient levels were found to be outside standard parameters including glucose that may indicate high stress levels or kidney function impairment, albumin, which may be askew to do testing inaccuracy, Alkaline Phosphatase, which may indicate liver issues along with muscle and/or red blood cell damage, and Aspartate Aminotransferase that may indicate poor liver health. Several measures within the CBC were found to be outside normal limits including white blood cell counts, which may show increased immune response due to elevated infection rates, low hemoglobin and platelet counts, along with elevated neutrophil and monocyte levels, also indicating possible bacterial infection. Understanding variances in blood aspect levels could lead to the discovery of the source of health deficiencies in these opossums.

62. DELINEATION OF MARSH TYPES OF THE TEXAS COAST FROM CORPUS CHRISTI TO THE SABINE RIVER

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Abstract: Researchers require marsh vegetation type classifications (i.e., fresh, intermediate, brackish, and salt) for modeling habitat capacities and needs of marsh reliant taxa (e.g., waterfowl and alligator). The U.S. Geological Survey National Wetlands Research Center has produced a classification of marsh vegetation types along the mid- and upper Texas coast from Corpus Christi to the Sabine River. Classification and regression tree analyses were used to classify marsh types from a combination of 1,000 reference points, multitemporal satellite imagery from 2009–2011, lidar data, contemporary land cover classifications, and other spatially-explicit variables believed to influence the extent and distribution of marsh vegetation. Image objects were generated from segmentation of high resolution imagery acquired in 2010, and were used to refine the classification. Overall accuracy of the classification was 91% (95% CI: 89.2–92.8) with a kappa statistic of 0.79 (95% CI: 0.77–0.81). We created an alternative classification of only 3 marsh types, in which intermediate and brackish marsh were combined. Overall accuracy this classification was 91% (95% CI: 89.2–92.8) and the kappa statistic was 0.83 (95% CI: 0.81–0.85). Mean user's accuracy for the 4 marsh type and 3 marsh type classifications was 65.4% and 75.6%, respectively, while mean producer's accuracy was 56.7% and 65.1%. This project demonstrated the effectiveness of a consistent and repeatable methodology for delineating salinity zones of Texas coastal wetlands at a landscape scale. This classification will enable state agencies and conservation partnerships to develop and/or refine conservation plans for priority coastal resources.

63. MANIPULATING GAME-BASED LEARNING FOR TEXAS ECOLOGICAL PROCESSES IN EDUCATION

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Abstract: Game-based learning is a new and fast growing tool for use in K-12 and higher education. The game Minecraft currently has over 12 million players of all ages worldwide. The current project involves using Minecraft as an educational tool for many Texas related subjects including wildlife, botany, hydrology, architecture, geography, and navigation. The game's ability to alter graphics and simple coding enables a manipulation for a variety of parameters (animals and plant species, soil types, natural ore, building materials). These are used to represent real world organisms and environmental variables at a level that any player can comprehend and interact with. This sets up a situation in which the user can develop a deeper cognitive understanding of how ecological processes in Texas interact and respond to disturbances. This, in turn, could assist in bridging the gap in between understanding the physical world in Texas and human impacts on it. Assisting students understand these variables at an earlier stage could progress the basic foundation we set for every level of learning.

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