PRAIRIE GROUSE TECHNICAL COUNCIL

BARTLESVILLE, OK

4-7 NOVEMBER 2019

Welcome to the 33rd Biennial Prairie Grouse Technical Council Meeting

Oklahoma, where the wind comes sweepin' down the plain
And the wavin' wheat can sure smell sweet
When the wind comes right behind the rain

Oklahoma, Ev'ry night my honey lamb and I
Sit alone and talk and watch a hawk
Makin' lazy circles in the sky

We know we belong to the land
And the land we belong to is grand!

Welcome fellow Prairie Grouse enthusiasts to Oklahoma, where the wind truly does comes sweeping down the plains. When most people think of Oklahoma, they likely often think of the Rodgers and Hammerstein musical, football, oil, football, the state's odd shape, football, the land rush, and did we mention football? But Oklahoma is also home to both Greater and Lesser Prairie-Chickens. The Prairie Grouse Technical Council has twice previously met in western Oklahoma, the heart of Lesser Prairie-Chicken country, in 1969 and again in 2001.

While visiting Oklahoma, we hope you take the time to walk through some native tallgrass prairie where the big bluestem towers over your head, and can visit some of the many history museums highlighting Native Americans and the petroleum industry.

The George Miksch Sutton Avian Research Center is honored to host the 33rd PGTC. The Sutton Center began in 1983. One of the first major conservation efforts at the Sutton Center was the extremely successful recovery of the Bald Eagle in the southeastern United States. The Sutton Center itself has been involved in some form of prairie grouse research or conservation for nearly 25 years, and with the 2015 merger with the Society of Tympanuchus Cupido Pinnatus, Ltd. (STCP), those conservations efforts span nearly 60 years. The experience and passion of Sutton Center biologists has led to other endangered species recovery efforts, including the Attwater's Prairie-Chicken and the Masked Bobwhite. We planned a visit to both facilities. Thanks for coming!

33rd Prairie Grouse Technical Council Sponsors

ConocoPhillips
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George M. Sutton Avian Research Center
Oklahoma Department of Wildlife Conservation
U. S. Fish and Wildlife Service, Oklahoma Ecological Services
Oklahoma State University, Natural Resources and Ecology Management

Acknowledgements:

As everyone who has ever assisted with putting a meeting like this together knows, it takes a lot of effort from a lot of people to make it happen. We especially want to acknowledge the tireless efforts of the following individuals in planning the 33rd PGTC meeting:

Brett Cooper – Oklahoma Department of Wildlife Conservation
Patricia Echo-Hawk – U. S. Fish and Wildlife Service
Audra Fogle – G. M. Sutton Avian Research Center
Karen Kilbourne – G. M. Sutton Avian Research Center
Lena Larsson – G. M. Sutton Avian Research Center
Carla Potts – G. M. Sutton Avian Research Center
Aaron Pratt – G. M. Sutton Avian Research Center
Dan Reinking – G. M. Sutton Avian Research Center
Steve Sherrod – G. M. Sutton Avian Research Center
Don Wolfe – G. M. Sutton Avian Research Center

The following individuals lead or assist with the various field trips:
Paula Blackwell – Woolaroc Museum and Wildlife Preserve
Dwayne Elmore – Oklahoma State University
R. D. Farr – Chapman Ranch
Bob Fraser – Woolaroc Museum and Wildlife Preserve
Bonnie Gibson – G. M. Sutton Avian Research Center
Bob Hamilton – The Nature Conservancy
Tayler Harlow – G. M. Sutton Avian Research Center
Sarah Harren – G. M. Sutton Avian Research Center
David Londe – Oklahoma State University
Harvey Payne – G. M. Sutton Avian Research Center Board Member
Dan Reinking – G. M. Sutton Avian Research Center
Jimmy Rutledge – Chapman Ranch
Brittney Tayrien – G. M. Sutton Avian Research Center

Hamerstrom Award Committee:
Max Alleger
R. J. Gross
Don Wolfe

John Toepfer Prairie Grouse Research Scholarship Selection Committee:
Aaron Pratt (Chair)
Gary Huschle
Mike Schroeder
Greg Septon
Dan Svedarsky
Don Wolfe

About the John Toepfer Prairie Grouse Research Scholarship

Dr. John Toepfer devoted 50 years to research and conservation of prairie grouse and mentored dozens of students. He unselfishly provided resources, encouragement, and advice to students and colleagues, and encouraged long-term field studies rather than purely academic research. To honor John's life and to continue his legacy of supporting prairie grouse students, the G. M. Sutton Avian Research Center, and a number of John's colleagues and friends, established the John Toepfer Prairie Grouse Research Scholarship fund. This fund will provide opportunities for continued work on the prairie grouse John committed his life to saving and will ensure the availability of perpetual support for graduate students studying prairie grouse.

John's career was varied and covered a lot of ground, starting with a BS and MS degree at University of Wisconsin – Stevens Point working with Ray Anderson and Fred and Fran Hamerstrom. He also would later receive his PhD at Montana State University studying prairie chickens. John worked over several states but primarily with prairie grouse in the Midwest. From 1996 – 2015, he served as Research Consultant with the Society of Tympanuchus Cupido Pinnatus, Ltd. conducting field research on prairie chickens in Wisconsin and across their range. This was a group that was stewarded by the Hamerstroms. John served on the Attwater's Prairie-Chicken Recovery Team and on the Board of the North American Grouse Partnership. He received The Hamerstrom Award from the Prairie Grouse Technical Council and the Minnesota Award from the Minnesota Chapter of the Wildlife Society.

John would use his photo of a prairie chicken sunrise and the question, "Is the sun rising for the prairie chicken...," as a springboard to challenge managers, conservationists, and students on whether their actions were creating a brighter future for the well-being of prairie chickens. This award will be given in recognition that with future professionals as those represented by the award's recipients then indeed "the sun is rising" on the future of prairie grouse. The only minimum criteria for consideration is that the applicant be a student actively researching prairie grouse and plan to attend and present their research findings at the upcoming Prairie Grouse Technical Council meeting. It will be viewed positively if the applicant exhibits a passion that is consistent with what John would have expected from a true student of prairie grouse.

If you would like to honor John's contribution to prairie grouse research and conservation, please donate to the scholarship fund. Tax-deductible contributions can be made to the John Toepfer Prairie Grouse Research Scholarship by donations to Sutton Avian Research Center. Define with the donation that it goes towards the scholarship. Credit card donations can be made on the website suttoncenter.org and checks can be mailed to G. M. Sutton Avian Research Center, P.O. Box 2007, Bartlesville, OK 74005.

PROGRAM

Monday, 4 November

18:00	-	20:00	Opening reception (finger foods, drinks)	

Tuesday, 5 November

AM Moderators: Rick Baydack, Mike Schroeder

8:00	-	8:50	Welcome – J.D. Strong, Director, Oklahoma Department of Wildlife Conservation; Jonna Polk, Field Supervisor, US Fish and Wildlife Service Oklahoma Office; Harvey Payne, Sutton Avian Research Center Board Vice Chair; Don Wolfe, Senior Biologist, Sutton Avian Research Center	
8:50	-	9:10	John Haufler	Greater prairie-chicken and sharp-tailed grouse as flagships for grassland conservation: a report of the Interstate Working Group
9:10	-	9:30	Dave Dahlgren	Dusky grouse, the prairie grouse of the mountains
9:30	-	9:45	Break	Featured posters: Aaron Pratt - Subspecies status of sharp-tailed grouse in southern Wyoming Melissa Chelak - Forest grouse regulations in North America
9:50	-	10:10	Charlotte Roy	Neonicotinoids on the landscape: evaluating avian exposure to treated seeds in Minnesota
10:10	-	10:20	Geoffrey Gould*	An experimental test of the relationship between color ornaments and parasite load in the lesser prairie-chicken
10:20	-	10:50	John Magera	Attwater's prairie-chicken recovery post-Harvey status update
10:50	-	11:10	Mike Morrow	Use of predator-deterrent fences to increase Attwater's prairie-chicken nest success
11:10	-	11:30	Bonnie Gibson	Captive breeding and raising of prairie-chickens for release into the wild, with experimental methodologies potentially applicable for breeding other galliformes
11:30	-	12:15	Lunch	
12:20	-	13:45	Depart for tours: Groups A, B, C to prairie-chicken facility, Groups D, E, F to masked bobwhite/Sutton main	
13:45	-	15:00	Groups switched: A, B, C tour masked bobwhite, D, E, F prairie-chicken facility	
15:00	-	17:30	Woolaroc: Group A, B, C start with museum, D, E, F start with lodge	

Wednesday, 6 November

AM Moderators: Patricia Echo-Hawk, K.C. Jensen

8:10	-	8:40	Chris O'Meilia	Lesser prairie-chicken: USFWS's actions past, present, and future
8:40	-	9:00	Jon Haufler	North American Grouse Partnership: Twenty years of grouse conservation
9:00	-	9:20	Kristin Bondo	Infectious disease and parasitological survey of lesser prairie-chickens in the sand shinnery oak prairie ecoregion
9:20	-	9:40	Randy Rodgers	A brief history of human impacts on the lesser prairie-chicken

9:40	-	9:55	Break	Featured posters: Andy Gregory - Are agent-based models worth the hype? Michael Whitson - Lesser prairie-chicken habitat selection and nest success response to various prescribed burning and grazing regimes in eastern New Mexico
10:00	-	10:20	Mike Schroeder	Impacts of the temporary loss of CRP on greater sage-grouse in Washington State
10:20	-	10:40	Lance McNew	The effects of livestock grazing on sharp-tailed grouse in the northern Great Plains
10:40	-	11:00	Jeff Tibbits	The Oklahoma land access program
11:00	-	11:20	David Londe	Habitat selection and thermal ecology of greater prairie-chicken broods
11:30	-	12:30	Lunch	
12:30	-		Depart for field trip to Osage County tallgrass prairie	
13:30	-	16:00	Tours of Joseph H. Williams Tallgrass Prairie Preserve & Chapman Ranch	
16:00	-	17:00	Lead ammunition shooting demonstration at John Dahl WMA	
17:00	-		Vans back to Bartlesville	

Thursday, 7 November

AM Moderators: Brett Cooper, Dwayne Elmore

8:10	-	8:40	Brett Cooper	Rangewide prairie grouse updates
8:40	-	9:00	Randy Rodgers	40 years of counting lesser prairie-chickens in Hamilton County, KS
9:00	-	9:20	Jackie Augustine	Evaluation of unmanned aerial vehicles for surveys of lek-mating grouse
9:20	-	9:40	Danielle Berger	Nebraska's prairie grouse: abundance, production and their historical drivers
9:40	-	9:55	Break	Featured poster: Chelsea Wright - Role of foot stomping during female mate choice and species recognition in prairie-chickens
10:00	-	10:20	Christian Hagen	Prairies, people, and chickens too -- a retrospective from nearly a decade of voluntary conservation
10:20	-	10:40	Nicholas Parker	Lesser prairie-chicken and grassland response following intense wildfire in Kansas
10:40	-	11:00	Bram Verheijen	How can breeding stage-specific estimates of movements and space use of female lesser prairie-chickens aid conservation efforts?
11:00	-	11:20	Liam Berigan	Dispersal, habitat use, and eventual settlement of translocated lesser prairie-chickens
11:30	-	12:30	Lunch	

PM Moderator: Christian Hagen, Dan Svedarsky

12:30	-	12:50	Elisabeth Teige	Assessing a lesser prairie-chicken translocation in the sand sagebrush prairie ecoregion
12:50	-	13:10	Brandon Gibson	Releasing captive-raised greater prairie-chickens into the wild
13:10	-	13:30	Kade Lazenby	Manipulating grouse populations: translocation, reintroduction, and transference of methods

13:30 - 13:50	Jacquelyn Gehrt	The comings and goings of lesser prairie-chickens: intrinsic and extrinsic influences on female nest attendance
13:50 - 14:10	Carly Aulicky	Not just dusty data: what can we learn from range-wide analyses of lesser prairie-chicken morphology?
14:10 - 14:25	Break	Featured posters: Hilary Syvertson - Assessing impacts of landscape use on winter ring-necked pheasant survival and mortality risk Sprih Harsh - Spotting ring-necked pheasants: Factors impacting population and distribution in South Dakota
14:30 - 14:50	Andy Gregory	Greaters, lessers, or guessers: genetic analysis suggests low levels of hybridization among prairie grouse in west-central KS
14:50 - 15:10	Stephanie Manes	The right tool for the right job: tips for using conservation easements to prevent prairie grouse habitat fragmentation
15:10 - 15:45	John Toepfer Memorial (Mountain Dew toast, various John stories)	
15:45 - 16:30	Business meeting	
18:00 - 21:00	Evening banquet, silent auction, awards, keynotes by Noppadol Paothong	

**Current John Toepfer Prairie Grouse Research Scholarship recipient*

FIELD TRIPS

Tuesday, 5 November – Tours to the Sutton Avian Research Center main office/Masked Bobwhite breeding facility and Attwater's Prairie-Chicken breeding facility, and to Woolaroc Museum and Wildlife Preserve. Vans will depart promptly at 12:20. No personal vehicles please.

Due to logistical constraints, we request that all conference attendees board vans according to the letter on their name tag (A, B, C, D, E, F), and stay with that group throughout the remainder of the day. The Sutton Center houses breeding programs for two of the most critically endangered species in North America. Groups A, B, C will first go to the Attwater's Prairie-Chicken breeding facility, while groups D, E, F will first go to the Sutton Center Headquarters and Masked Bobwhite breeding facility. Upon arrival, each subgroup will begin at a different location, and will rotate after 15-20 minutes, with various Sutton Center staff providing information and leading tours. Then, groups will switch between facilities. As biosecurity is critical, all attendees will be required to wash/sanitize hands and step through footbaths when entering each breeding facility. Please try to avoid leaning against walls and contacting any structure or surface. After all attendees have rotated through the headquarters and breeding facilities, all groups will be transported to the Woolaroc Museum and Wildlife Preserve.

Sutton Center Headquarters and Masked Bobwhite Breeding Facility (12:20-15:00): Located on a 40-acre hilltop southwest of Bartlesville, this has been the home of the Sutton Center since its founding in 1983. What was once an 8,000 square-foot residence owned by Harold Price is now our administration building. Several large barns and labs were initially constructed for Sutton Center's previous program to raise Bald Eagles for release, and have housed birds used in our

education programs. Two of these buildings now house our captive breeding program for the endangered Masked Bobwhite.

Sutton Center Attwater's Prairie-Chicken Breeding Facility (12:20-15:00): Situated on 78 acres southeast of Bartlesville, this facility has been built over the past five years to accommodate large-scale captive-raising of endangered Attwater's Prairie-Chickens and incorporates large outdoor netted enclosures over native prairie for acclimating prairie-chickens to life in the wild prior to release.

Woolaroc Museum and Wildlife Preserve (15:00-17:30): Former country residence and personal museum of Phillips 66 founder Frank Phillips, this 3,700-acre property established in 1925 contains a variety of native and exotic wildlife as well as the ultimate weekend wildlife lodge that Frank once used to close business deals with visiting corporate titans, and a large museum with an astonishing collection of western paintings and sculptures, Native American artifacts, Colt firearms and much, much more. The name Woolaroc is a portmanteau of the words *woods*, *lakes* and *rocks* which make up much of the local scenery. An elaborate prankster, Frank Phillips would sometimes play up Oklahoma's "wild west" reputation by hiring "bandits" to "rob" his big-city guests on their way in to the ranch, before reuniting them with their possessions at the lodge. You will enjoy private access on a day when the museum and lodge are normally closed. Groups A, B, C will begin at the Woolaroc Museum, and then take a short walk or ride vans to the Woolaroc Lodge at 16:30. Groups D, E, F will start that the Woolaroc Lodge, and can then walk or ride vans to start the Woolaroc Museum tour at 16:30. Also, be sure to check out the mounted Waterfowl Exhibit at the Bunkhouse (short walk from the Lodge) that was part of an extensive lifelong collection by Sam Daniel (former Sutton Board Member and supporter, recently deceased).

Wednesday, 6 November – Tours of the Joseph H. Williams Tallgrass Prairie Preserve (WTPP) and Chapman Ranch, and a shooting demonstration with lead and copper ammunition. Vans will depart promptly at 12:30. No personal vehicles please.

At 13:30, after a one hour drive, we will stop at the WTPP Research Station (restrooms, water, and snacks available) where Harvey Payne will give a history of the preserve as well as tidbits from his vast knowledge of the Flint Hills. Please note that there will not be any restroom facilities available for the rest of the afternoon.

At 14:15, vans will depart from the Research Station, and make various stops on the WTPP and Chapman Ranch where RD Farr, Jimmy Rutledge, Dwayne Elmore, and David Londe will discuss ecology of the Flint Hills, ecology of Greater Prairie-Chickens, management practices on the Chapman Ranch, and ongoing Greater Prairie-Chicken research and conservation efforts.

At 16:30, all attendees will gather at the John Dahl Wildlife Management Area, owned and managed by the Oklahoma Department of Wildlife Conservation for a shooting demonstration with lead and copper ammunition. Don Wolfe will discuss the issues, and do the shooting. Please note that a valid Oklahoma Hunting License or Conservation Passport is required to access all WMAs, thus the actual shooting will take place immediately adjacent to a public road, and the

ballistic gel blocks will be brought back for closer examination. Both hunting licenses and short term conservation passports can be purchased online at wildlifedepartment.com for those who would like to support the Oklahoma Department of Wildlife Conservation.

Joseph H. Williams Tallgrass Prairie Preserve: The Nature Conservancy owns and manages this preserve of about 40,000 acres, the largest remaining protected tract of native tallgrass prairie in the world, and home to over 2,000 free-ranging bison. Situated at the southern terminus of the Flint Hills region, most of which lies in Kansas, this area is at the core of the remaining range of Greater Prairie-Chickens in Oklahoma, and is also home to numerous other species dependent on tallgrass prairie habitat. The core of the preserve was formerly part of the Chapman-Barnard Ranch, whose foreman was the rodeo champion Ben Johnson, and whose son, Ben Johnson, Jr., appeared as a cowboy in more than 300 movies. Tulsa businessman Joseph H. Williams, the honoree after whom the preserve is named, was also instrumental in the early fundraising efforts of the Sutton Center at its establishment and is a Sutton Center Board Director Emeritus.

Chapman Ranch: The Chapman Ranch is the "other half" of the former Chapman-Barnard Ranch, consisting of over 40,000 acres. The wise, science-based management of tallgrass prairie by private ranches, as practiced on the Chapman Ranch, is vitally important for the persistence and well-being of Greater Prairie-Chickens and other tallgrass prairie avifauna.

Lead Ammunition Shooting Demonstration: With the Sutton Center's long history of helping save the Bald Eagle through captive rearing and reintroductions, we are continuing to help conserve this species through education about the hazards of lead poisoning in eagles and other wildlife. We offer shooting demonstrations that show firsthand the difference in using traditional lead bullets versus solid copper bullets by shooting each into ballistic gelatin. Only a few tiny lead fragments in a deer carcass can poison a scavenging eagle, as well as contaminate meat intended for human consumption. Our demonstration provides a convincing display of reasons why hunters should voluntarily choose solid copper ammo.

ORAL PRESENTATION ABSTRACTS

GREATER PRAIRIE-CHICKEN AND SHARP-TAILED GROUSE AS FLAGSHIPS FOR GRASSLAND CONSERVATION: A REPORT OF THE INTERSTATE WORKING GROUPS

JONATHAN HAUFLER, Ecosystem Management Research Institute, Seeley Lake, MT 59868

Two interstate working groups (IWG's) have been developing conservation plans for greater prairie-chickens and sharp-tailed grouse for the past 4 years. These groups include involvement from 14 state wildlife agencies as well as the U.S. Fish and Wildlife Service and the North American Grouse Partnership. The work recognizes that these two species serve as excellent flagships for grassland conservation due to their need for large blocks of high quality grasslands that will also support many other grassland-associated species. In addition to identifying these associated species, the IWG's are developing recommendations for monitoring, habitat management, desired population and habitat goals, and potential core conservation areas for each species. Future work will seek to engage a broad coalition of other grassland conservation initiatives to advance coordinated delivery of grassland conservation actions.

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Notes:

THE PRAIRIE GROUSE OF THE MOUNTAINS

DAVID DAHLGREN[1], STEPHANIE LANDRY[1], SKYLER FARNSWORTH[1], MICHEL KOHL[1], R. DWAYNE ELMORE[2], and ERIC THACKER[1]

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Dusky grouse have been characterized as forest grouse and harvest management has largely been combined with other forest grouse species. However, duskies are phylogenetically closer to prairie grouse and their life history is more similar to prairie grouse. We also found behavioral similarities. Marked dusky grouse moved > 30 km between seasonal habitats. Site fidelity to seasonal habitat was extremely high, even when large movements occurred. During breeding surveys we detected male dusky grouse associated with each other in same area, perhaps an "expanded lek." Dusky grouse select more open habitat, especially shrub-steppe, during the breeding and summer seasons. Dusky grouse are more k-selected compared to other forest grouse, and have relatively small clutch sizes (~ 6 eggs) and high annual survival (> 0.60). Dusky grouse populations are not consistently monitored and, generally, there is no conservation currently geared toward the species. Even. Considering the similarities of dusky grouse with prairie grouse and sage-grouse and the significant conservation issues faced by the latter, we believe dusky grouse require more research and conservation attention than they have received to date.

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Notes:

NEONICOTINOIDS ON THE LANDSCAPE: EVALUATING AVIAN EXPOSURE TO TREATED SEEDS IN MINNESOTA

C. L. ROY* and P. COY, Minnesota Department of Natural Resources, Grand Rapids, MN 55744 USA, D. CHEN, Southern Illinois University Carbondale, Carbondale, IL 62901 USA, M. JANKOWSKI, US Environmental Protection Agency, Seattle, WA 98101 USA, J. PONDER, University of Minnesota, St. Paul, MN 55108 USA

Neonicotinoid pesticides are commonly applied to corn, soybean, and wheat seeds. Treated seeds could be available to wildlife through spillage during planting or through seeds on or near the soil surface after planting. We examined exposure of wild birds to neonicotinoids in agricultural landscapes of Minnesota. We quantified seed availability at the soil surface in recently planted fields and the rate of seed spills during planting, and documented wildlife eating treated seeds with trail cameras. During 2 springs, we observed 329 spills during landscape-scale surveys in 76 townships. At the field-scale, 25 of 71 fields had exposed seeds on the soil surface and 12 fields had spills. In videos, numerous birds, as well as mammals, consumed treated seeds. Forty-seven of 59 (80%) greater prairie-chicken and 97 of 109 (89%) sharp-tailed grouse fecal samples collected from leks had detectable concentrations of $\geq$1 neonicotinoid. Thirty-four of 45 (76%) greater prairie-chicken livers and 74 of 81 (91%) sharp-tailed grouse livers from hunter-harvested birds contained detectable concentrations of $\geq$1 neonicotinoid. Thus, treated seed was widely available on the landscape, was consumed by wildlife, and neonicotinoids were detectable in prairie grouse samples during spring and fall.

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Notes:

AN EXPERIMENTAL TEST OF THE RELATIONSHIP BETWEEN COLOR ORNAMENTS AND PARASITE LOADS IN THE LESSER PRAIRIE-CHICKEN (*TYMPANUCHUS PALLIDICINCTUS*)

G.M. GOULD, Department of Ecology, Evolution and Organismal Biology, The Ohio State University, Columbus, OH.
J.K. AUGUSTINE, Department of Ecology, Evolution and Organismal Biology, The Ohio State University at Lima, Lima, OH.

Color signaling is an important form of animal communication. The signaling function of color may provide honest information regarding condition and qualities such as endoparasite infection. Although grouse such as the Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) exhibit cryptic plumage, males of this species display brightly colored ornaments during breeding displays. The prominent display of these ornaments suggests that they fulfill an important signalling function. We performed an experiment in Kansas in which we captured males and administered either an anti-helminth agent or water and took color readings of combs and air sacs. We recaptured individuals and obtained another set of color readings. We used a mixed model framework for repeated measures to compare color change in the experimental (N=10) and control (N=8) groups. After controlling for capture date, we found strong evidence for a significant difference in components of comb coloration between the two groups with experimental males having higher saturation and non-UV hue. Our results suggest that comb color may serve as an honest signal of parasite infection which could influence male and female behavioral responses. We also demonstrate that blood profiles change following anti-helminth treatment and could be used to assess the health of individuals within or between populations.

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Notes:

ATTWATER PRAIRIE-CHICKEN RECOVERY POST-HARVEY STATUS UPDATE

JOHN MAGERA, Refuge Manager, Attwater Prairie Chicken NWR, Eagle Lake, TX 77434

Concern about the status of the Attwater prairie-chicken (APC) recovery program following hurricane Harvey in 2017 was widespread. Media outlets across the nation reached out to the refuge staff and recovery team members following the storm to determine the effects, and in some cases, forecast the extinction of the APC due to hurricane Harvey. Although the impact of the hurricane on the wild population was significant, that is only part of a broader story about managing the APC recovery program through a period of unprecedented severe weather events. Thanks to decades of work by dozens of people and institutions involved in the recovery program, positive trends in APC recovery continue. We will provide a brief history of the population, lessons learned following a series of unprecedented weather events, and provide a look ahead at what to expect in the future for APC recovery.

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Notes:

USE OF PREDATOR-DETERRENT FENCES TO INCREASE ATTWATER'S PRAIRIE-CHICKEN NEST SUCCESS

MICHAEL E. MORROW*. Attwater Prairie Chicken National Wildlife Refuge, Eagle Lake, TX, USA
JOHN E. TOEPFER (deceased). Society of Tympanuchus Cupido Pinnatus, Ltd., Ada, MN, USA

We evaluated predator-deterrent fences to protect individual prairie-chicken nests, first in a pilot study with greater prairie-chickens Tympanuchus cupido pinnatus, and then on endangered Attwater's prairie-chickens T. c. attwateri. We compared nest success, proportion of eggs that hatched in successful nests, and nest abandonment between fenced and unfenced nests. Fencing increased greater prairie-chicken apparent nest success from 54% (n = 59) to 78% (n = 18) ($P < 0.07$). For Attwater's prairie-chickens, fencing increased daily survival rate (DSR) from 0.9156 (n = 24) in 1997–2011 to 0.9923 (n = 224) during 2000–2017. Fences were typically placed around Attwater's nests during the first few days ($\bar{x}$ = 3.2 d ± 0.3 SE; n = 215) of the 26-d incubation period, increasing estimated nest success from 13% (0.9156^{23}) to 84% (0.9923^{23}). Fencing did not increase abandonment ($P_{1\text{-tailed}} > 0.27$) or decrease the proportion of eggs that hatched in successful nests ($P_{1\text{-tailed}} > 0.98$). Logistic regression revealed little support for stage of incubation when fences were placed, fence size, or their interaction in predicting nest abandonment or proportion of eggs that hatched. Predator-deterrent fences were useful for substantially increasing Attwater's prairie-chicken nesting success, and may represent a viable management strategy for increasing nesting success for other populations of ground-nesting birds with high conservation value.

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Notes:

CAPTIVE BREEDING AND RAISING OF PRAIRIE-CHICKENS FOR RELEASE INTO THE WILD, WITH EXPERIMENTAL METHODOLOGIES POTENTIALLY APPLICABLE FOR BREEDING OTHER GALLIFORMES

BONNIE GIBSON*, TAYLER HARLOW, LENA C. LARSSON, STEVE K. SHERROD, Sutton Avian Research Center, P.O. Box 2007, Bartlesville, OK 74005, USA

Propagation of captive Galliformes has proved complicated and difficult, and production of birds that show high survival and significant reproduction in the wild is a challenge. Utilizing original and novel methods for breeding and managing captive galliformes, the Sutton Avian Research Center is experimenting with techniques at a dedicated facility in Oklahoma. With the intention of breeding Attwater's prairie-chickens (APC) for release, greater prairie-chickens (GPC) have served as surrogates to test efficacy of prospective designs and methodology. Experimental methods include: 1) natural breeding 2) efforts toward breeding imprinted birds for artificial insemination; 3) establishment of outdoor captive booming grounds offering female mate and nest site choices; 4) establishment of indoor breeding areas in which pairs are selected based on genetics. Other techniques tested include use of natural food like clover, dandelions, and insects to attempt to establish a wild grouse gut microbiota. After three experimental years of breeding GPC, the first APC eggs were transferred from Texas facilities to Oklahoma in spring 2019. The APC offspring produced will serve as our breeding flock for 2020. We intend to continue experimental research with the greater prairie-chickens, as the production and release of the Attwater's prairie-chicken in Texas is critical for securing sustainable populations in the wild.

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Notes:

LESSER PRAIRIE-CHICKEN: UNITED STATES FISH AND WILDLIFE SERVICE'S ACTIONS PAST, PRESENT, AND FUTURE

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The objective of this talk is to provide a general overview of past, present, and possible future actions by the U.S. Fish and Wildlife Service (Service) using its authorities to support conservation of the lesser prairie-chicken, *Tympanuchus pallidicinctus,* and meet statutory obligations of the agency. Service actions are only a portion of significant past and on-going work on the species. This presentation will only discuss actions that are connected to a specific statutory obligation of the Service to administer. Much of the information on past and present actions was gathered from the Service's Environmental Conservation Online System (ECOS; ecos.fws.gov), communication with Service staff, and the statutory and policy framework of Service authorities, as derived from the Service's Mission and the Endangered Species Act. Service work on the species began in 1995, with receipt of a petition to list, and includes a range of regulatory processes and determinations, as well as conservation tools designed to provide benefits to lesser prairie-chickens through partnerships and permits with public and private landowners, land managers, industry and state wildlife agencies. To date there have been many statutory actions completed under Service authority, as well as potential opportunities for tools not yet utilized (e.g., Habitat Conservation Plans, mitigation credit transactions through Conservation Banking).

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NORTH AMERICAN GROUSE PARTNERSHIP: 20 YEARS OF GROUSE CONSERVATION

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The North American Grouse Partnership (NAGP) is a non-profit organization formed in 1999 with the mission of promoting the conservation of all 12 species of North American grouse and the habitats necessary for their survival and reproduction. Over the past 20 years, NAGP has produced numerous accomplishments including development of a grassland conservation plan for prairie grouse, policy input on Farm Bills to benefit grouse, recommendations for conservation actions for sage-grouse and lesser prairie-chickens, initiation of interstate working groups for greater prairie-chickens and sharp-tailed grouse, recommendations for grouse mitigation programs, policy input on critical legislation and agency activities, and various other actions. This talk will highlight some of these accomplishments, describe current issues that NAGP is emphasizing, and discuss future directions for grouse management.

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INFECTIOUS DISEASE AND PARASITOLOGICAL SURVEY OF LESSER PRAIRIE-CHICKENS IN THE SAND SHINNERY OAK PRAIRIE ECOREGION

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The impact that pathogens and parasites have on prairie grouse populations is unclear. During 2018–19, we conducted an infectious disease and parasitological survey of Lesser Prairie-Chickens from Texas and New Mexico. From live-captured birds, blood smears (n=31) were collected and examined for hematozoa, and serum and swabs (n=9) were tested for exposure and/or infection with select pathogens recognized as important to prairie grouse. Six frozen archived birds were necropsied for helminths, and 31 cecal droppings collected from leks were tested for select helminth eggs using PCR. All blood samples tested negative for exposure to *Salmonella* and *Mycoplasma*, and the viruses causing Newcastle disease, avian influenza, and infectious bronchitis. *Plasmodium pedioecetae* was detected in 19% of blood smears. The helminths, *Dispharynx nasuta*, *Oxyspirura petrowi*, and *Aulonocephalus pennula*, were found in necropsied birds. Of these, only *O. petrowi* and *A. pennula* eggs were detected in cecal droppings. These results provide important baseline information on infectious agents and parasites that currently infect Lesser Prairie-Chickens in this region.

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A BRIEF HISTORY OF HUMAN IMPACTS ON THE LESSER PRAIRIE-CHICKEN

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Little is known of the Lesser Prairie-Chicken (LPCH) prior to European settlement. The decimation of bison herds in the 1870's may have provided grazing rest for southern plains grasslands, possibly improving habitat conditions for LPCH. The infusion of scattered agriculture that followed also provided new food resources. LPCH reached such abundance in the late 1800's and early 1900's that market hunting flourished. Continued conversion of native prairie to croplands and intensified livestock grazing eventually caused habitat conditions to deteriorate. Coupled with severe drought, the result was the Dust Bowl of the 1930's, during which LPCH were nearly extirpated from much of their range. Sandy-soil habitats too difficult to farm provided some refuge for LPCH and their numbers increased in the 1940's, 50's and early 60's, aided by the federal Soil Bank program. But abundant groundwater below sandy-soil habitats incentivised their rapid conversion to cropland once pivot-irrigation systems were introduced in the mid-1960's. Oil and gas infrastructure, particularly in the Permian Basin of TX and NM, destroyed much additional LPCH habitat. Ongoing development of new energy, transportation, and agricultural infrastructure continue to fragment and degrade remaining LPCH habitats. Long-term fire suppression has allowed invasive trees to consume millions of additional acres of prairie. Highly-invasive Old World Bluestems (*Bothriochloa spp*.) are transforming many native grasslands into near-monocultures. Extreme weather magnified by climate change also threatens the LPCH.

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IMPACTS OF THE TEMPORARY LOSS OF CRP ON GREATER SAGE-GROUSE IN WASHINGTON STATE

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Greater sage-grouse (*Centrocercus urophasianus*) have been studied in Washington since 1970. Although sage-grouse clearly are a sagebrush obligate throughout their distribution, research in Washington has shown that they frequently use lands enrolled in the Conservation Reserve Program (CRP), especially when CRP is configured with native sagebrush-dominated habitat. CRP, which typically consists of abundant perennial bunchgrass and scattered sagebrush, is often used for nesting and wintering. Furthermore, the abundance of CRP appears to be positively correlated with long-term changes in populations. We modelled sage-grouse occupancy in eastern Washington based on distribution and abundance of landscape features (including CRP), development, and topography. In addition to the area of native sagebrush-dominated habitat and CRP, we also found that patch configuration and proximity to major roads and transmission lines constrained the occupation of potential habitat. We also predicted the impacts of alternate management scenarios, including the potential loss of CRP. Starting in 2011, the sage-grouse distribution in north-central Washington was impacted by substantial changes in CRP: (1) CRP was converted to cereal grain; (2) CRP was converted from one type of CRP to a different type of CRP; and (3) cereal grain was converted to CRP. The result of the conversion was that substantial area that was supporting sage-grouse was, at least temporarily, unsuitable. As predicted in the modelling exercise, the population of greater sage-grouse declined.

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THE EFFECTS OF LIVESTOCK GRAZING ON SHARP-TAILED GROUSE IN THE NORTHERN GREAT PLAINS

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Grazing is the predominant land use across western North America and directly affects the structure, composition, and productivity of grasslands. Sharp-tailed grouse (*Tympanuchus phasianellus*) require large and complex areas of habitat, making them an ideal indicator species for grassland habitats. Poor range management has been implicated in the decline of prairie-grouse, including sharp-tailed grouse, throughout North America, but the effects of specific grazing regimes on sharp-tailed grouse populations have not been studied. During 2016–2019, we monitored 130 radio-collared female sharp-tailed grouse in eastern Montana to assess whether conservation-based grazing regimes improve vital rates and population performance of sharp-tailed grouse. We evaluated three grazing systems: traditional season-long grazing, within-season rotational grazing, and rest-rotation grazing with deferment. In contrast to previous research, we found no evidence that 1) grazing system affected the composition and structure of habitat in our study area, and 2) important population vital rates were influenced by grazing system. Overall our results suggest that at moderate stocking rates ($\leq$ 2 AUM ha^{-1}), rest-rotation grazing did not contribute to pasture-level habitat heterogeneity and that both the selective foraging of cattle and inherent topographic and edaphic variability in our study area were stronger drivers of heterogeneity at spatial scales relevant to sharp-tailed grouse. However, precipitation and rangeland production potential (e.g., ecological site type) likely mediate the effects of livestock grazing on prairie-grouse.

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THE OKLAHOMA LAND ACCESS PROGRAM

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The Oklahoma Land Access Program (OLAP) is a walk-in recreational access program administered by the Oklahoma Department of Wildlife Conservation. The primary focus is to provide walk-in recreational access throughout the state for hunting, fishing, stream access, and wildlife viewing. The program opened in 2017 and currently has ~70,000 acres of walk-in access. In northwest OK, enrollments consist primarily of native rangeland with an emphasis on Northern Bobwhite opportunity. OLAP lease rates are based on land cover quality, and in response many OLAP-enrolled landowners are altering their rangeland management practices to benefit upland game birds. Future plans for the OLAP include a daily permit controlled access category for close-to-metro opportunities and sensitive areas.

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HABITAT SELECTION AND THERMAL ECOLOGY OF GREATER PRAIRIE-CHICKEN BROODS

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Alternative management strategies that result in heterogeneous grasslands have been put forward as important conservation strategies for grassland birds. These practices result in grasslands composed of a mosaic of seral stages that differ in vegetation composition and structure and can influence the availability of resources important to grassland birds. In particular, Greater prairie-chickens (*Tympanuchus cupido)* have been shown to respond positively to these practices as this species will use different seral stages for different parts of its life cycle. Relatively few studies have focused on habitat selection of female greater prairie-chickens with broods. The objectives of our study are to investigate brood selection for vegetation structure and thermal cover in a grassland managed for heterogeneity with fire and grazing. Broods showed strong selection for patches that had been burned and grazed in the previous 12 months. Within recently burned patches, selection for vegetation structure did not differ from what was available on the landscape at locations where broods were located in the mornings; however, afternoon locations had greater grass cover and visual obstruction, and less bare ground. Additionally, brood locations appeared to be thermally buffered compared to morning and random landscape locations, with afternoon sites experiencing fewer temperature extremes. These results underline the importance of grassland heterogeneity for wildlife habitat selection at both patch and within-patch levels.

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RANGE-WIDE PRAIRIE GROUSE UPDATES

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The current range-wide status will be presented for Greater Prairie-chicken (*Tympanuchus cupido*), Lesser Prairie-chicken (*Tympanuchus pallidicinctus*), and Sharp-tailed Grouse (*Tympanuchus phasianellus*).

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40 YEARS OF COUNTING LESSER PRAIRIE-CHICKENS IN HAMILTON COUNTY, KANSAS

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Lek surveys of lesser prairie-chickens (LPCH) were run annually by the author on 20 square-miles of sand-sagebrush prairie in Hamilton County, KS from 1979 to 2019. Leks within 1 mile of two 5-mile segments of unpaved road were detected by listening at each of 11 stations beginning 40 minutes before sunrise, from March 20 to April 20. After the listening runs (2 each spring) or on subsequent mornings, leks were located on foot, flushed, and counted no later than 90 minutes after sunrise. Leks were usually flushed on 2 separate mornings with the higher count selected. Over 41 springs, LPCH leks were located on 61 sites (shifts < 100 m excluded), averaging 5.4 leks and 72.2 birds per year. Mean duration of lekking activity (n = 86) was 2.6 years, with one site occupied 39 consecutive springs. Lek-site shifting was common, mainly due to annual variation in vegetation communities as determined by precipitation and grazing patterns. LPCH density also played a role in lek-site shifting. Flush counts were greater at more-persistent lek sites. Average LPCH counts declined 82% from the first decade (1979-88) to the last (2010-2019) and each population peak since 2000 was lower than the previous peak, despite no habitat conversions. Periodic droughts and increased grazing intensity associated with a Savory-type grazing system begun in the late 1990's have driven this decline.

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EVALUATION OF UNMANNED AERIAL VEHICLES FOR SURVEYS OF LEK-MATING GROUSE

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Unmanned aerial vehicles, or drones, are being utilized by wildlife biologists to monitor populations of birds and mammals. Lek-mating prairie-chickens (*Tympanuchus spp.*) seem amenable to drone-based surveys because they are relatively large, and display in groups on hilltops with sparse vegetation. The goal of this study was to determine what flight characteristics maximize prairie-chicken detection on drone video footage, and to document the birds' reactions to the drones. We tested three sizes of rotary-winged drones, flown at three heights, with three different camera angles by flying them over known prairie-chicken display locations. We determined that the most prairie-chickens were detected using video footage from smallest drone, flown at a height of 100m, with a 10º camera angle. However, ground-based surveys routinely detected more birds than could be detected on drone footage. Prairie-chickens returned quickly after flushing, similar to their reaction to avian predators. In order to develop guidelines for the ethical use of drones in wildlife research, there is a need for quantifying taxa-specific disturbance caused by drones. This study starts to close this knowledge gap by documenting disturbance to upland, lek-mating grouse of conservation concern, and suggest that the focal species' reaction to natural predators may provide clues as to how it may react to drones.

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NEBRASKA'S PRAIRIE GROUSE: ABUNDANCE, PRODUCTION AND THEIR HISTORICAL DRIVERS

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The Nebraska Game and Parks Commission (NGPC) has monitored the state's prairie grouse populations since the 1950s using spring lek counts and wing-ratio data collected from hunters in the fall. While these indices have been used to evaluate short-term trends in abundance and production, no one has used the data to assess long-term historical population trends. Our research modeled spatial and temporal trends of greater prairie-chicken and sharp-tailed grouse abundance and production in Nebraska using NGPC's historical prairie grouse monitoring data. We explored the relationships between these trends and potential population drivers including drought, bird of prey numbers, grazing pressure and land use change approximated using various indices. The indices show evidence that prairie-chicken populations have increased and sharp-tailed grouse have declined in the Sandhills since the 1950s. Population drivers vary in time and space. The relationship between population trends and drivers will help to guide future prairie grouse management in Nebraska.

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PRAIRIES, PEOPLE, AND CHICKENS TOO -- A RETROSPECTIVE FROM NEARLY A DECADE OF VOLUNTARY CONSERVATION

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Native prairies are one of the most threatened ecosystems in the continental USA with historical and current conversions to tillage agriculture. The remaining fragments have and continue to endure the stressors of woody encroachment, energy development, drought, and changes in land use. Commensurate with the loss of functional prairies has been declines in grassland obligate species, including prairie grouse (*Tympanuchus* spp.). The lesser prairie-chicken (*T. pallidicinctus*) is no exception and has been central to conservation efforts of the southern Great Plains since the late 1990s. Because >95% of the lesser prairie-chicken habitat is privately owned, strategies for conservation delivery varied among entities. In 2010, the Lesser Prairie-Chicken Initiative (LPCI) was launched by USDA Natural Resources Conservation Service with the goal provide a shared vision of conservation of the Southern Great Plains to benefit the species and improve sustainability of working ranches. Since its inception, LPCI has enrolled, >500 landowners and 1.3 mil acres and collaborated with universities in the region to evaluate the outcomes of these actions. We discuss lessons learned from the past 9 years, with respect to implementation, communication, and the science needed to sustain such efforts in working landscapes.

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LESSER PRAIRIE-CHICKEN AND GRASSLAND RESPONSE FOLLOWING INTENSE WILDFIRE IN KANSAS

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In 2017, the Starbuck Fire burned 2,521 km^2 in Kansas and Oklahoma, encompassing key portions of the already fragmented Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) distribution. While the effect of prescribed fire on Lesser Prairie-Chickens has been studied, response to intense and extensive wildfires remains unclear. Data on Lesser Prairie-Chicken space use, movement, survival, and associated vegetation were collected at the study site prior to the fire (2014-2016), and for two years post-fire (2018-2019). Preliminary results indicate a significant decrease in vegetation height, visual obstruction, and percent cover of grass, forbs, and shrubs; important factors in providing reproductive habitat. In 2018, male lek attendance decreased 66%, with a further 43% decrease in 2019. Adult survival has remained constant, but nest survival has trended downward post-fire. The overall short-term effects of the fire appear negative; however, these intense fires provide the possibility for long-term benefits by slowing woody encroachment, increasing plant diversity, and therefore improving overall habitat availability.

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HOW CAN BREEDING STAGE-SPECIFIC ESTIMATES OF MOVEMENTS AND SPACE USE OF FEMALE LESSER PRAIRIE-CHICKENS AID CONSERVATION EFFORTS?

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Large-scale loss and fragmentation of grassland landscapes have decreased population numbers of lesser prairie-chickens (*Tympanuchus pallidicinctus*) by ~90 % since the late 1800s. Management of lesser prairie-chickens is complex because habitat needs vary greatly among the lekking, nesting, brooding, and post-breeding stages of the breeding season. Moreover, movements and space use during these stages remain unclear and could be further complicated by spatiotemporal variation in annual temperatures and precipitation. During 2013-2018, we equipped female lesser prairie-chickens with VHF (n = 111) or satellite transmitters (n = 172) at five field sites in Kansas and Colorado and quantified breeding stage-specific movements and space use with kernel density estimators or Brownian bridge movement models. Daily movements and home range sizes of female lesser prairie-chickens with satellite transmitters were greatest during lekking (2074 m/day; 430 ha) and smallest during the brooding stage (780 m/day; 228 ha) when hen movements were restricted by chick mobility. Daily movements varied among regions and years and were greatest in highly fragmented northwest Kansas and years with less precipitation. Breeding stage-specific estimates of movements and space use of lesser prairie-chickens will help managers determine the spatial distribution of breeding habitat on the landscape. Furthermore, understanding annual variation in movements and space use is crucial when estimating minimum habitat patch sizes for specific breeding stages.

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DISPERSAL, HABITAT USE, AND EVENTUAL SETTLEMENT OF TRANSLOCATED LESSER PRAIRIE-CHICKENS

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Successful translocation of prairie grouse relies on site fidelity, which is complicated by their tendency to disperse after translocation. A multi-agency effort attempted to overcome this issue through translocating lesser prairie-chickens (*Tympanuchus pallidicinctus*) to the Cimarron and Comanche National Grasslands in southwestern Kansas and southeastern Colorado. We used satellite telemetry to parse extensive (>100 km moved, 17.2 km mean displacement) dispersal movements post-translocation and determined that encountering large patches of grassland or nearby conspecifics did not end the dispersal movement. Instead, dispersal was mediated by the lesser prairie-chicken's reproductive cycle. Male lesser prairie-chickens randomly moved among leks until the conclusion of the breeding season, at which point they settled near an established lek. Females ended their dispersal movement immediately before nesting, often regardless of the quantity of nearby grassland or proximity to nearby birds. This led to birds nesting in areas with variable nest site quality, frequently at sites far from leks (mean 3.6 km), release points, and National Grasslands. This suggests a negative effect of long-distance dispersal on nesting success and stresses the importance of limiting female dispersal movements. Unfortunately, release-site selection (either in regard to conspecific proximity or nearby grassland) will likely not be able to limit this innate dispersal movement. Instead, managers should ensure translocated populations are large enough to compensate for the negative effects of post-translocation dispersal.

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ASSESSING A LESSER PRAIRIE-CHICKEN TRANSLOCATION IN THE SAND SAGEBRUSH PRAIRIE ECOREGION

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The lesser prairie-chicken (*Tympanuchus pallidicinctus*) has experienced severe population declines. The Sand Sagebrush Prairie Ecoregion of southwestern Kansas and southeastern Colorado historically contained the largest concentration of lesser prairie-chickens in the southwestern Great Plains with estimates peaking in the 1980s. By 2016, there was an estimated decrease of 98% across the ecoregion, with only 4 known leks with <20 males remaining on the Cimarron and Comanche National Grasslands in Kansas and Colorado, respectfully. To supplement populations within this ecoregion, 413 lesser prairie-chickens were translocated from 2016-2019, originating from northwestern Kansas, to the National Grasslands. Providing the opportunity to observe lek formation and persistence, investigate population demography, and assess fidelity of birds translocated to the Sand Sagebrush Prairie Ecoregion, a total of 204 male and 209 female lesser prairie-chickens were translocated and monitored with SAT-PTT and VHF transmitters. During 2017-2019, 126 nests were attempted including renests, with 34 successful nests. In spring 2019, 12 known leks were active with 72 males. Monitoring will continue through spring 2020 to further assess the translocation.

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RELEASING CAPTIVE-RAISED GREATER PRAIRIE-CHICKENS INTO THE WILD

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We experimented with releasing captive greater prairie-chickens (GPC; *Tympanuchus cupido pinnatus*), raised at the Sutton Avian Research Center in Oklahoma, into their original source population in Rock County, Nebraska. The captive-raised GPC served as surrogates to test techniques that will be used for the recovery of the endangered Attwater's prairie-chicken (APC; *T. c. attwateri*). Preparing the young birds for life in the wild included limited contact with humans and a comparatively natural environment in large flight pens. Health screening followed the APC protocol, and the diet transitioned from commercial pellets to vegetables and grains in preparation for natural food available in the wild. Upon arrival in Nebraska, GPC were held in acclimation pens constructed near an active booming ground for 10–19 days before being released in favorable weather. During 2017–2018 we released 103 (2017: n = 48; 2018: n = 55) GPC over four releases from September to November. All released GPC were marked with VHF radio-transmitters for monitoring. Concurrently with our 2017 releases, we monitored 19 locally captured wild juvenile GPC. We will present comparisons of movements, survival rates, and causes of mortality between captive-raised and wild GPC. Variation relative to timing of release will also be presented.

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MANIPULATING GROUSE POPULATIONS: TRANSLOCATION, REINTRODUCTION, AND TRANSFERENCE OF METHODS

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Grouse species around the world are considered imperiled. As populations decrease managers often attempt interventions such as translocations to arrest declines, increase numbers, or reestablish populations. Most grouse translocation projects have lacked intensive monitoring efforts necessary to provide key learning processes and adaptive management. Often reproductive and survival rates of translocated females has been relatively low, especially breeding season the year of translocation. Our methods will be developed based on three different projects dealing with imperiled populations of greater sage-grouse in south-west North Dakota, west-central Utah, and the Bi-State population in California. These studies incorporated: 1) marking and monitoring of vital rates and movement of translocated grouse, 2) soft-releases using remote release boxes/pens, and 3) brood translocations (California and North Dakota). Our objective is to translocate 75 sharp-tailed-grouse per year from southeast North Dakota to the lower peninsula of Michigan where sharp-tailed grouse have been extirpated. We will translocate grouse during the breeding and brooding season of 2020 to 2023. All translocated individuals will be radio-marked, including chicks. Our objective is to promote discussion regarding the transference of methods from greater sage-grouse augmentations to the reintroduction of sharp-tailed grouse in the lower peninsula of Michigan.

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THE COMINGS AND GOINGS OF LESSER PRAIRIE CHICKENS: INTRINSIC AND EXTRINSIC INFLUENCES ON FEMALE NEST ATTENDANCE

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DANIEL S. SULLINS, Department of Horticulture and Natural Resources, Kansas State University, 1602 Throckmorton Hall, Manhattan, KS 66502, USA

Incubation breaks to forage are necessary for any nesting bird, but can increase mortality risk of the nest and attending bird. We examined potential mechanisms that lesser prairie-chickens (*Tympanuchus pallidicinctus*) use to manage time away from the nest and potentially increase nest success. Using GPS locations of lesser prairie-chicken females at 92 nests in 4 study areas in Kansas and Colorado during 2013-2015, we related patterns in incubation breaks by female lesser prairie-chickens to nest fate and evaluated how vegetation, weather, and female body composition influence female presence at nest. Additionally, we described habitat used and movements by females during incubation breaks. Vegetation height, percent litter cover, and daily maximum temperature affected both female presence at nest and nest fate. There was a clear temperature threshold at about 80° F, beyond which, females were more likely to leave the nest. The number of breaks taken by females decreased as the incubation period progressed, and the distance traveled by females during nesting breaks increased during subsequent nesting attempts. These conclusions aid in understanding the tradeoffs that an incubating female must face between her survival and her nest's fate and how intrinsic and extrinsic factors affect her decisions.

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NOT JUST DUSTY DATA: WHAT CAN WE LEARN FROM RANGE-WIDE ANALYSES OF LESSER PRAIRIE-CHICKEN MORPHOLOGY?

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DAVID HAUKOS, U.S. Geological Survey, Kansas Cooperative Fish and Wildlife Research Unit, Kansas State University, 205 Leasure Hall, Manhattan KS 66502

Morphologic data are ubiquitous, allowing morphometrics to offer unique insight into temporal and spatial effects in selection pressures such as climate across a species' range. In particular, morphology can reflect resource availability during periods of growth and directly relate to individual potential energy reserves through body mass. Lesser prairie chicken (*Tympanuchus pallidicinctus*) populations are subject to a dramatic east to west precipitation gradient with the species' range subdivided into four distinct ecoregions differing in resource availability. Additionally, as a lek breeding species, morphometric characteristics may be subject to sexually selective pressures that differ by ecoregion or influence allocation of resources to different physical features during periods of growth. We analyzed wing chord, mass, pinnae, tarsus, and tail morphometric data from studies conducted in the mid-1980s to current across the species range. We tested models for ecoregion, age, and sex effects due to significant morphological differences between age and sex classifications. We estimated nutritional reserves, lipid and fat content, using ash-weight validated equations and morphometrics collected across the lesser prairie-chicken range. Mass explains most morphological variation for males and females among all four ecoregions. Mass, wing chord, pinnae, and tail length of birds in the Sand Shinnery Oak ecoregion are influenced more by climatic conditions of the preceding year than other ecoregions. Preliminary results indicate that females adaptively increasing percent body fat in years of drought. The range-wide analyses of lesser prairie-chicken morphology data offer understanding of available nutrient resources and environmental differences across the species' range.

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GREATERS, LESSERS, OR GUESSERS: GENETIC ANALYSIS SUGGESTS LOW LEVELS OF HYBRIDIZATION AMONG PRAIRE GROUSE IN WEST-CENTRAL KS

A.J. GREGORY, School of Earth, Environment, and Society, Bowling Green State Univ. Bowling Green, OH 43403 USA.

Lesser Prairie-Chicken populations have been in decline, and the largest and most stable populations currently exist in Kansas. Since 2005, Lesser Prairie-Chickens have been expanding their range, putatively due to increased CRP enrollment. As a result, there is now a zone of Greater and Lesser Prairie-Chicken sympatry in west central Kansas. The co-occurrence of both species, and the observation of both species displaying at the same lek sites, has raised concern over the degree to which hybridization might impact the conservation of Lesser Prairie-Chickens. From 2015-2017 we collected and analyzed genetic material from 68 Greater, Lesser or "Guesser" Prairie-Chickens. Our genetic sample included 50 individuals of unknown genetic providence, including 6 potential hybrids from the zone of sympatry, and 10 Greater Prairie-Chickens and 8 Lesser Prairie-Chicken samples collected outside the zone of sympatry. We used a combination of microsatellite and targeted mitochondrial and genomic gene sequencing to investigate rates of hybridization among the two species. We found that 86% of individuals tested had the same genetic species identity as their morphological identity, including the six putative hybrid also being genetically hybrid. Eight individuals were morphometrically Greater Prairie-Chicken, but genetically hybrid, and two individuals were morphometrically Lesser Prairie-Chickens, but genetically hybrid. This suggests a slight directional bias toward female Lesser's mating with male Greater's, and also suggests that hybrids can backcross with either species. The next step of this analysis is to investigate the degree to which landscape features influence rates and directions of hybridizations among Prairie-Chickens in Kansas.

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THE RIGHT TOOL FOR THE RIGHT JOB: TIPS FOR USING CONSERVATION EASEMENTS TO PREVENT PRAIRIE GROUSE HABITAT FRAGMENTATION

S. A. MANES*, Ranchland Trust of Kansas, Inc., 6031 SW 37th St., Topeka, KS 66614 USA.

Quantity or Quality? Such is the dilemma prairie grouse managers often face when deciding the most effective use of limited conservation funding. A growing body of research indicates that the outright loss, fragmentation and development of remaining prairie grouse habitat is the predominant threat to declining populations. Yet, the majority of state and federal wildlife agency funding for prairie grouse targets indices of vegetation quality on ever-shrinking islands of occupied habitat. Voluntary conservation easements are the optimal tool to restrict or extinguish development rights to protect the conservation value of land. Unfortunately, many managers still presume that conservation easements are a niche effort that's not scalable and is underfunded, incompatible with mineral development, politically unpopular and inaccessible to them. Presented are updates on new sources of conservation easement funding, improved Farm Bill rules for accessing them, and the results of a targeted 10-year program to secure conservation easements for Greater Prairie-chicken (*Tympanuchus cupido*) in central Kansas.

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POSTER PRESENTATION ABSTRACTS

FOREST GROUSE REGULATIONS IN NORTH AMERICA

MELISSA S. CHELAK, JUSTIN SMALL, DAVID K. DAHLGREN

Utah State University

Forest grouse span across most of the northern latitudes of North America. They include species such as the ruffed grouse (*Bonasa umbellus*), spruce grouse (*Falcipennis canadensis*), sooty grouse (*Dendragapus fulginosus*), and dusky grouse (*Dendragapus obscurus*). Taxonomically, these species are far removed and have life history traits that are quite different from one another. However, in many states and provinces, they are hunted similarly within the same aggregate bags with the same season dates and limits. We performed a review of data gathered from all North American states and provinces provided on their websites and recorded species, delineated hunt area, season dates, whether it was an aggregate or split bag, the bag limit, and possession limit. In this poster, we will summarize our research in progress that includes some of the regulations across all states and provinces containing hunted forest grouse populations to highlight differences and similarities across North American regulations. This research aims to illustrate these similarities and differences as well as provide recommendations for managing them based more on their life history traits rather than proximity and overlapping distributions.

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ARE AGENT-BASED MODELS WORTH THE HYPE?

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Individual-based, or agent-based (ABM), models are frequently employed to test hypotheses about how wildlife will respond to climate change, anthropogenic disturbance, and proposed management actions. The promise of such models is that they can accurately predict complex wildlife×landscape×climate dynamics. If true, this is a powerful tool for managers to test out the potential benefit or folly of proposed management actions prior to initiating the time and cost of putting such actions into practice. We developed an ABM to predict Greater Prairie-Chicken population dynamics across the Flint Hills of Kansas using the flexible ABM platform HexSim. We created our model using data from 2001-2015. We then waited three years…and tested the validity of our model against the KDWPT annual lek survey data for 2018. For comparison, we used a State Space model implemented with R2jags to analyze the lek count data from the same time period, and to estimate Greater Prairie-Chicken abundance, finite rate of population growth (lambda), and the reproductive rate (r) from 2015-2018. We found that the ABM results more accurately predicted abundance and yielded statistically indistinguishable estimates of lambda and r from the State Space model over the 2015-2018 time period. These findings suggest that ABM's are worth they hype and provide robust estimates of changes in abundance and latent vital rates. Moreover, because these parameter estimates are an emergent property of individual interactions with conspecifics and the landscape, the potential impact of management actions can be simulated to give managers a glimpse into a future with and without management.

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SPOTTING RING-NECKED PHEASANTS: FACTORS IMPACTING POPULATION AND DISTRIBUTION IN SOUTH DAKOTA

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Much of animal ecology is about investigating abundance and occurrence of species based on surveys of spatially referenced sample units. In Midwest, ring-necked pheasant (*Phasianus colchicus*) population has declined since 1960s. We used data from pheasant brood route surveys (2011-2015) conducted by South Dakota Game Fish and Park to estimate pheasant abundance, an economically and culturally important species to the state. These roadside surveys are conducted annually along 110, 48-km survey routes from 25 July to 15 August. For this analysis, we subset each 48-km route into 30, 1.6-km routes, each of which was associated with the count of pheasants. We also used Cropland Data Layer (CDL) to categorize land cover land use across the state. We developed binomial-Poisson hierarchical models to evaluate land cover relationships to pheasant count and occupancy and to construct predictive species distribution models of their relative abundance. Abundance was modeled as a function of areas under different land cover land use at a spatial extent of 500 m around 1.6-km route while detectability was modeled as a function of dates and observer of the surveys. Abundance along routes under the most parsimonious model (lowest AIC of 626.81) was estimated to be 39,175 while occupancy was estimated to be 0.73. Abundance was negatively influenced by area under row crop and positively influenced by area under grass. Detection was positively influenced by both dates and observer of surveys.

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SUBSPECIES STATUS OF SHARP-TAILED GROUSE IN SOUTHERN WYOMING

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The sharp-tailed grouse (STGR; *Tympanuchus phasianellus*) population in southern Wyoming inhabits relatively undisturbed, natural landscapes and provides a unique opportunity to study these prairie grouse in their natural communities. Currently, there is uncertainty as to which subspecies this population may be ascribed: Columbian (*T. p. columbianus*) or plains (*T. p. jamesii*) STGR. The nearest known Columbian STGR can be found in eastern Idaho, whereas the nearest plains STGR are found in eastern Wyoming. Understanding STGR subspecies designations in southern Wyoming is important from many conservation and management standpoints including identifying areas used by this subspecies prior to major anthropogenic disturbance. We will use genetic and morphometric approaches to evaluate the subspecies status of STGR in southern Wyoming. We collected genetic and morphometric data from 356 individuals in southern Wyoming (subspecies unknown) in 2017 and 2018, 106 individuals in eastern and northern Wyoming (known plains STGR) in 2019, and genetic (only) samples from 108 known Columbian STGR harvested in eastern Idaho in 2018. We will compare genetic relatedness and morphometric differences between the three populations to help understand what subspecies the population in southern Wyoming is most closely related to. Understanding the subspecies status could help inform managers as to what vegetation conditions were historically used by the subspecies forming this population and guide management efforts to help achieve these conditions.

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ASSESSING IMPACTS OF LANDSCAPE USE ON WINTER RING-NECKED PHEASANT SURVIVAL AND MORTALITY RISK

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Since the established introduction of ring-necked pheasants (*Phasianus colchicus*) to South Dakota in 1908, populations have been highly variable. However, recent pheasant abundance indices suggest persistent population declines since 2008, raising concerns about population viability. Although nesting habitat is a hypothesized limiting factor for pheasants, notable adult mortality has occurred during unfavorably harsh winters, thereby reducing potential breeding and nesting populations. The purpose of our study was to better understand overwinter survival and cause-specific mortality risk for adult female pheasants in eastern South Dakota. We monitored 321 females over 13 weekly intervals from January to April in each of 3 years, 2017-2019 and estimated annual survival using Kaplan-Meier with staggered-entry. Anderson-Gill models were used to estimate mortality risk of landscape use from predation and weather events. Overall, 110 females died during winter with avian predation as the primary cause. Survival was a function of snow depth and was lowest during 2019 ($\hat{S}$: 0.40; 95% CI: 0.32–0.49) and highest during 2017 ($\hat{S}$: 0.81; 95% CI: 0.70–0.89) and 2018 ($\hat{S}$: 0.66; 95% CI: 0.57–0.74). We found that females occupying harvested fields were notably vulnerable to avian predation compared to other landscape types (hazard ratio=3.47; 95% CI: 1.14–10.57). Additionally, females occupying cattail wetlands were less vulnerable to weather-related mortality than those occupying tallgrass habitat (hazard ratio=0.37; 95% CI: 0.14–0.98). We recommend that wildlife agencies prioritize habitat management strategies for pheasants that maximize protective cover and minimize exposure to predation and weather extremes during winter.

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LESSER PRAIRIE-CHICKEN HABITAT SELECTION AND NEST SUCCESS RESPONSE TO VARIOUS PRESCRIBED BURNING AND GRAZING REGIMES IN EASTERN NEW MEXICO

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Occupied range and abundance of lesser prairie-chickens (*Tympanuchus pallidicinctus*; LEPC) have severely declined since the late 1980s. Historically, wildfires, free-ranging herbivore grazing, and varying environmental conditions were ecological drivers creating plant community and habitat mosaics used by LEPC. Anthropogenic alteration of these drivers has resulted in fragmentation, degradation, and reduced quality and quantity of selected habitats. Such reductions increase the importance of improving habitat management efficacy and efficiency. In eastern New Mexico, the species occupies areas of the Sand Shinnery Oak (*Quercus havardii*) Prairie Ecoregion (SSOP). Our research will quantify vegetation and invertebrate response, estimate LEPC nesting success and habitat selection, which have not been documented within the SSOP, and assess beef-herd production and health in response to various prescribed fire and grazing regimes.

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ROLE OF FOOT STOMPING DURING FEMALE MATE CHOICE & SPECIES RECOGINATION IN PRAIRIE-CHICKENS

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Sonation consists of locomotion-induced sounds that have evolved for special communication and are produced using specialized morphological features. Prairie-chickens (*Tympanuchus spp.*) use sonation produced by foot stomping during elaborate courtship display that includes other behavioral, morphological, and acoustic components. In this study, we determine whether the foot stomping in lesser (*T. pallidicinctus)* and greater (*T. cupido)* prairie-chickens plays a role in female mate choice and species recognition. If sonation is used for female choice, then there should be individual variation in sonation measurements. If sonation is used for species recognition, then lesser and greater prairie-chickens should have different sonation attributes. This study was located on privately grazed pastures in western Kansas, where ranges of the two species overlap. Observers in blinds located 10m from the lek recorded the drumming noise with a directional microphone placed between males' territories. Acoustic properties of the foot-stomping sonation (number of foot stomps, length of stomping bout, stomping rate) were measured using Raven Lite on ten bouts of foot stomping per individual male of both species. If foot stomping signal is used for female mate choice, then we predict that females will select males with a higher number of stomps. If the stomping signal is used for species recognition, then the number of stomps or their rate will differ between species.

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MINUTES FROM 2017 BUSINESS MEETING

RJ Gross opened the 2017 business meeting

Minutes from previous meeting were approved by Rick Baydack motions and Nova Silvy seconds the motion.

RJ continues to talk about the budget for 2017:

Income	
Remaining funds	18,000.00
Registration	9,595
MISC	325
Auction Proceeds	1,080
Total Income	29,000.00
Expenses	
Ramada	10,089.50
Bus Rentals for Field Trip	1,500
Auction Items	364.07
Shirts	2,446.88
Total Expenses	14400.45
BALANCE	14599.55

- Steve Belinda talked about spread sheet and returned to RJ and money will be put into savings and can be used for next conference

NEW BUSINESS:

Dan Svedarsky talked about updating the website and since it was hosted by the grouse partnership, who do we communicate with? Right now, you communicate with Steve Belinda and he is working on updating the website. If people would like to see certain things on website send an email. Add in history of previous conferences. Max Alleger could update the website (archived at the historical society in Missouri) and work with Jerry. Send the history to a permanent storage.

RJ talked about next meeting. Don Wolfe volunteered Oklahoma for 2019 conference. He talked about what to expect (new facilities available for field trips and traveling information). Probably October time frame, but maybe November. Rick Baydack motions for November and Lance McNew seconds motion.

Steve wants to possibly try and update and make doing this conference easier for people to put together. He discusses this by talking about Memorandum of Agreement between the North American Grouse Partnership and the Prairie Grouse Technical Council. Dave Dahlgren is confused about the Technical council and Steve talks about voting on people to fill positions and have an executive committee (current state and last three hosts (KC Jensen mentioned)). Bylaws

need to be found and sent to Steve. New state is the chair (Don in Oklahoma) and the last three become the council (Don, RJ, and Max Alleger). Make expectations clear so more people can come to conferences (science world and other branches).

Dan Svedarsky wants to know if there is a connection with outreach to reach out to others. Steve talks about how outreach isn't as strong as he wants it to be and how he wants to work on getting the word out and getting more organizations involved in PGTC "activities". Trying to obtain new partnerships and keep older partnerships to play a role in this organization and bring funding, networking, and advice. (Chapter fees? Membership fees? (Like Ducks Unlimited) Abandoned ideas since it was never successful). Rob Manes talked about attempting to get this out and it was unsuccessful.

Dave Dahlgren said to thank RJ. Logan, Utah will host the International Grouse Symposium in November. Contact Dave or Don Wolfe for the Grouse News mailing list. Trying to get a lot of different talks for this conference, so send in abstracts to Dave. Grouse News is not a peer reviewed publication.

Nova Silvy motioned to conclude the business meeting and KC Jensen seconded to conclude.

STATE REPORTS

Minnesota - Charlotte Roy

2018 Spring Grouse Surveys

The Minnesota DNR coordinates ruffed grouse (*Bonasa umbellus*) and sharp-tailed grouse (*Tympanuchus phasianellus*) surveys each spring with the help of wildlife staff and cooperating federal, tribal, and county agencies. In 2018, ruffed grouse surveys were conducted between 5 April and 15 May. Mean ruffed grouse drums per stop (dps) were 1.5 statewide (95% confidence interval = 1.3–1.7) and decreased (29%) from the previous year. High points in the population cycle occur on average every 10 years, and surveys this year indicate that the peak occurred last year, with counts similar to the previous peak in 2009. In more southern portions of ruffed grouse range, survey results were more similar to last year. Spring was very late in 2018, and it is possible that the drumming survey was conducted earlier than the peak in drumming this year. However, other factors likely also contributed to the decline in counts. Sharp-tailed grouse surveys were conducted between 21 March and 20 May 2018, with 1,503 birds (males and birds of unknown sex) observed at 161 leks. The mean numbers of sharp-tailed grouse/lek were 7.3 (5.4–9.6) in the East Central (EC) survey region, 9.8 (8.8–10.9) in the Northwest (NW) region, and 9.3 (8.4–10.3) statewide. Comparisons between leks observed in consecutive years (2017 and 2018) indicated a 23% decline in birds/lek statewide ($t = 3.9$, $P = 0.0001$) and a 24% decline in the NW region ($t = 3.5$, $P = 0.0006$), but the 22% decrease in the EC region ($t = 1.8$, $P = 0.09$) was not statistically significant, likely due to the smaller number of leks surveyed in that region.

2019 Spring Grouse Surveys

The Minnesota DNR coordinates ruffed grouse (*Bonasa umbellus*) and sharp-tailed grouse (*Tympanuchus phasianellus*) surveys each spring with the help of wildlife staff and cooperating federal, tribal, and county agencies. In 2019, ruffed grouse surveys were conducted between 15 April and 17 May. Mean ruffed grouse drums per stop (dps) were 1.5 statewide (95% confidence interval = 1.3–1.7) which is similar to last year. High points in the population cycle occur on average every 10 years, and surveys indicate that the last peak occurred in 2017, with counts similar to the previous peak in 2009. Sharp-tailed grouse surveys were conducted between 18 March and 5 May 2019, with 1,555 birds (males and birds of unknown sex) observed at 152 leks. The mean numbers of sharp-tailed grouse/lek were 7.2 (5.4–9.5) in the East Central (EC) survey region, 11.0 (9.7– 12.3) in the Northwest (NW) region, and 10.2 (9.1–11.4) statewide. Comparisons between leks observed in consecutive years (2018 and 2019) indicated similar numbers of birds/lek statewide ($t = 0.5$, $P = 0.65$) and in the NW region ($t = 0.05$, $P = 0.96$, $n = 101$). In the EC region, a 23% decrease in birds/lek observed in consecutive years occurred but was not statistically significant ($t = 1.7$, $P = 0.10$, $n = 31$), likely due to the smaller number of leks surveyed in the EC region and the impact that sample size has on the statistical power to detect differences between years.

2018 Prairie-Chicken Population Survey

Greater prairie-chickens (*Tympanuchus cupido pinnatus*) were surveyed in all 17 survey blocks during the spring of 2018. Observers located 59 booming grounds and counted 630 males and

birds of unknown sex in the survey blocks. They located 148 booming grounds, 1,354 male prairie-chickens, and 164 birds of unknown sex throughout the prairie-chicken range. Estimated densities of 0.09 (0.06–0.11) booming grounds/km2 and 10.7 (8.6–12.8) males/booming ground within the survey blocks were similar to densities during recent years and during the 10 years preceding modern hunting seasons (i.e., 1993–2002), but have declined since the standardized survey began in 2004. All population indices began to decline in 2008, but seem to have stabilized in recent years at a lower level.

2019 Prairie-Chicken Population Survey

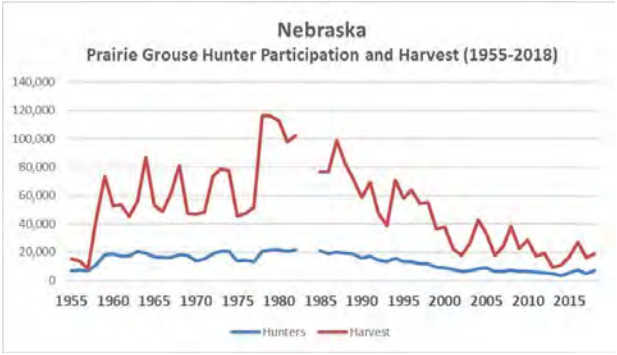
Greater prairie-chickens (*Tympanuchus cupido pinnatus*) were surveyed in all 17 survey blocks during the spring of 2019. Observers located 45 booming grounds and counted 497 males and birds of unknown sex in the survey blocks, which is a decline of more than 20% in the number of leks and birds counted compared to last year. Including areas outside the survey blocks, observers located 113 booming grounds, 1,039 male prairie-chickens, and 115 birds of unknown sex throughout the prairie-chicken range. Estimated densities of 0.06 (0.05–0.08) booming grounds/km2 and 11.0 (8.5–13.6) males/booming ground within the survey blocks were similar to densities during recent years and during the 10 years preceding modern hunting seasons (i.e., 1993–2002). All population indices began to decline in 2008, but seem to have stabilized in recent years at a lower level.

2018 Prairie-Chicken Harvest Survey

The Minnesota DNR conducts a postcard survey of Greater Prairie-chicken (*Tympanuchus cupido pinnatus*) hunters each year to estimate hunter numbers and harvest, and to evaluate hunter success and satisfaction. In 2018, 104 hunters were estimated to have gone afield and harvested 82 prairie-chickens and 36 sharp-tailed grouse (*Tympanuchus phasianellus*) during prairie-chicken hunts. Hunter success (0.51) and satisfaction (4.0 on a scale of 1-5) were similar to recent years and consistent with improvement following changes to the permit areas and season (i.e., longer length and earlier dates) in 2013.

Nebraska – John Laux

Prairie Grouse Hunting and Harvest Trends



Prairie grouse hunting activity and harvest (GPC and STG combined) have been estimated through our Hunter Success Survey (HSS), which dates back to 1955. Harvest peaked in 1979 (116,303 birds) and reached an all-time low in 2013 (9,571 birds) following a severe drought. Hunter numbers have followed similar trends – with a peak in 1982 (21,901 hunters) and low in 2014 (3,427 hunters). According to the HSS, approximately 6,664 hunters harvested an

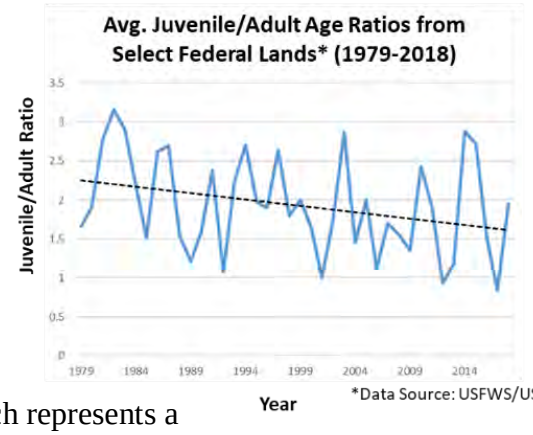
estimated 18,706 prairie grouse (in aggregate) during the 2018-19 season. Over the past 10 hunting seasons (2009-2018), residents have comprised 72% of the total hunters, on average.

Population Surveys

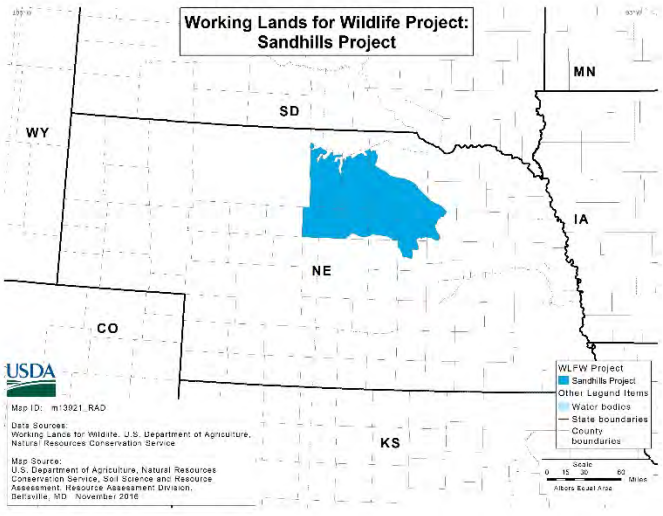
NGPC is currently working with the Rainwater Basin Joint Venture (RWBJV) and University of Nebraska-Lincoln (UNL) to develop a statewide prairie grouse monitoring protocol for Nebraska. These efforts will aid in estimating current population sizes for GPC and STG and will result in a suite of decision support tools that will improve conservation delivery efforts (projected start date = spring 2020).

Wing Collection Surveys

Prairie grouse wings have been collected at wing drop boxes from Valentine NWR, Crescent Lake NWR, Samuel R. McKelvie National Forest, and the Bessey Ranger District, Nebraska National Forest (Halsey, NE) by U.S. Fish and Wildlife Service and U.S. Forest Service staff from 1979-present. Collectively, these areas offer >323,000 acres of publicly accessible land and represent some of the premier prairie grouse hunting destinations in Nebraska. During the 2018-19 season, over 600 wings were voluntarily submitted by hunters on these federal lands (90% STG/10% GPC). Juvenile/adult age ratios in 2018 varied slightly among the federal properties (1.81-2.13) and averaged 1.95 juveniles/adult overall, which represents a relatively "good" or "average" production year. This was considerably higher than that observed in 2017 (avg. = 0.84 juveniles/adult), when much of the Sandhills region experienced severe drought conditions. Age ratios have yet to be calculated for 2019 but "below average" production is expected across the Sandhills due to the cool, wet weather experienced in May and June. Overall, average age ratios on these select federal lands have been slightly declining over time (see trend line in figure above).



Habitat Initiatives



Working Lands for Wildlife (WLFW) – Sandhills Project: The WLFW initiative in the eastern Sandhills region represents a collaborative effort to conserving grassland habitat on working lands. Through a partnership amongst the USDA-Natural Resources Conservation Service, RWBJV, NGPC, Pheasants Forever, U.S. Fish and Wildlife Service, Sandhills Task Force, and UNL, technical and financial assistance is provided to ranchers to improve the health of native

rangelands and benefit target wildlife species – which include greater prairie-chickens and American burying beetles. During the first two years of the initiative, 17 projects were completed positively impacting >23,000 acres. There are an additional 12 projects (>9,000 acres) currently in progress in 2019. Most projects include some form of eastern red cedar control (mechanical removal and/or prescribed fire) and prescribed grazing management.

Oklahoma - Brett Cooper

Lesser prairie-chicken leks per square trended toward decrease from 2018 to 2019 (0.149; 0.088) using internal metrics. Males per lek was higher from 2018 to 2019 (4.4; 5.4). A total of 47 leks were detected from ground surveys in 2018 and 52 leks in 2019.

The population estimate for the Lesser prairie-chicken range-wide conservation plan Mixed Grass ecoregion indicated a trend toward increase in 2018 and had a similar estimate in 2019.

Greater prairie-chicken leks per square mile trended toward decrease from 2018 to 2019 (0.107; 0.088) using internal metrics. Males per lek was higher from 2018 to 2019 (12.5; 15.25). A total of 54 leks were detected from ground surveys in 2018 and 51 leks in 2019.

This decreasing trend mirrors aerial survey population estimate results from 2015 and 2018 (1,820; 483).

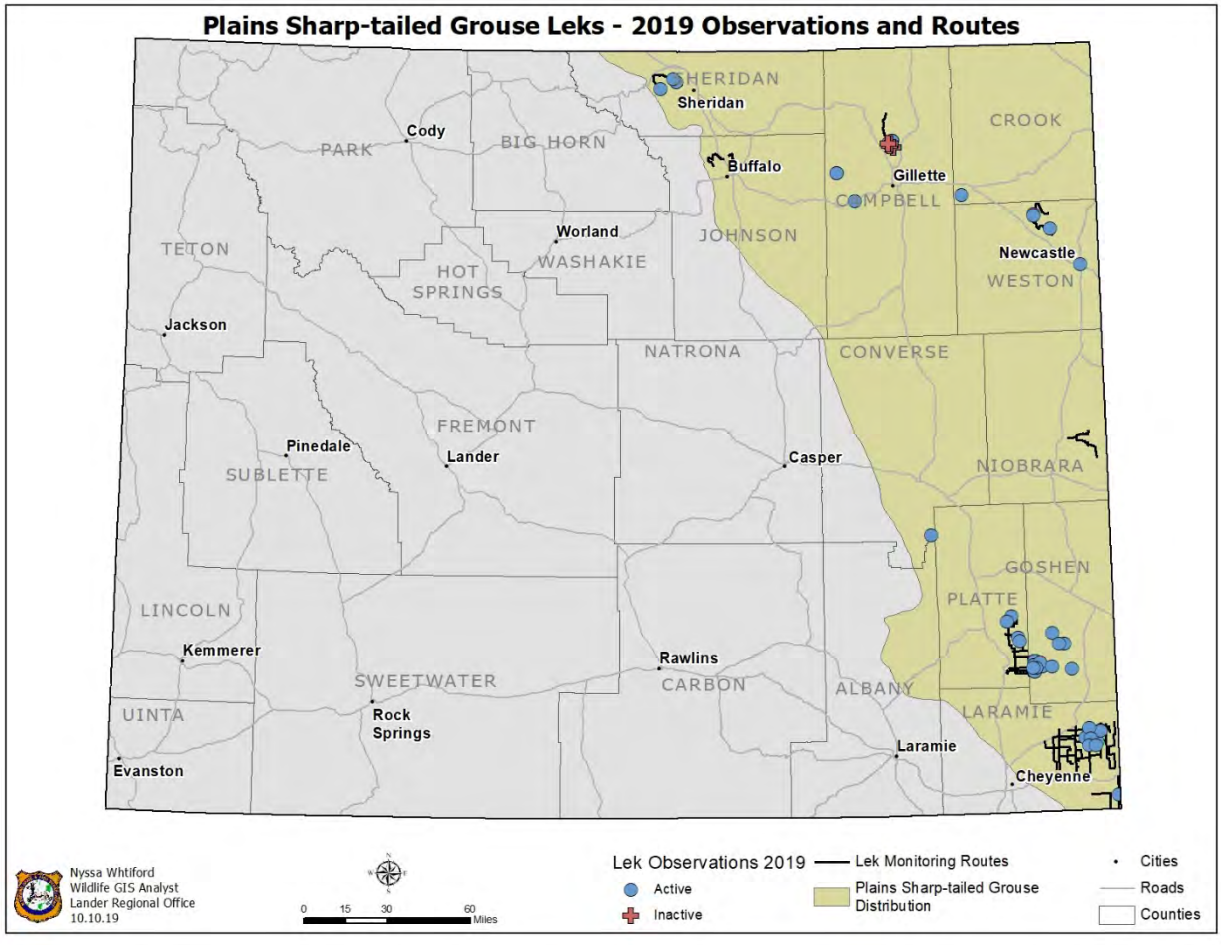
Washington – Mike Schroeder

Declining populations and distribution of Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*) in Washington have resulted in serious concerns for their long-term conservation status and their uplisting to State Endangered in 2018. The overall population was estimated to be 864 associated with 40 active leks in 8 isolated populations in 2019. This was an increase in the population of 6.9% since 2018. The overall population declined 34% between 2015 and 2016, declined 2% between 2016 and 2017, and increased 26% between 2017 and 2018. Wildfire appeared to play a large role in the declines and recovery from wildfire may explain the recent increases. Translocations of sharp-tailed grouse from 'healthy' populations outside the state were conducted to improve the genetic and demographic health of populations within Washington. The Washington Department of Fish and Wildlife, in cooperation with the Colville Confederated Tribes and the Bureau of Land Management, translocated 526 Columbian sharp-tailed grouse from central British Columbia, southeastern Idaho, north-central Utah, and the Nespelem area of Washington to different populations in Washington State in spring 1998–2019. The release sites in Washington included Scotch Creek (NW of Omak in Okanogan County), Dyer Hill (S of Brewster in Douglas County), Swanson Lakes (S of Creston in Lincoln County), Greenaway Springs (SE of Okanogan), Nespelem (E of Nespelem in Okanogan County), and Tunk Valley (NE of Omak in Okanogan County). Three of the release sites included state and federally-owned public land, one was private land, and the other sites are Colville Tribal land; all but the one on private land are being managed for the benefit of wildlife, and in particular sharp-tailed grouse. In all release sites, sharp-tailed grouse declined prior to translocation, despite the acquisition and protection of habitat and ongoing habitat restoration

efforts on and near the release sites. Translocations appeared to reverse the declines, at least in the short term.

Wyoming - Leslie Schreiber

Plains sharp-tailed grouse occupy most suitable habitats in eastern Wyoming. Their distribution extends from the eastern slopes of the Bighorn Mountains and Laramie Range to South Dakota and Nebraska. Wyoming Game and Fish personnel and other biologists surveyed sharp-tailed grouse leks in the spring of 2019. Biologists completed 22 routes, with most routes surveyed repeatedly. Eleven of the routes were occupied, denoted by an observation of at least 1 lekking sharp-tailed grouse. On these 11 occupied routes, biologists observed 90 active leks and counted 538 sharp-tailed grouse of both sexes. Wyoming started using a digital app to collect sharp-tailed grouse lek data, while concurrently updating and automating sharp-tailed observations in a central geodatabase. This process will assist Wyoming in investigating historic observations of sharp-tailed grouse.



Wyoming offers sharp-tailed grouse hunting east of the Continental Divide, which covers the state's entire known range of plains sharp-tailed grouse. The hunting season is open September 1

through December 31 for any sharp-tailed grouse with a daily bag limit of 3 and a possession limit of 9. Our 2018 annual hunter survey reports 1,027 hunters harvested 1,411 sharp-tailed grouse (not species specific) over 3,892 hunter-days.

As part of a larger study on Columbian sharp-tailed grouse near the Colorado/Wyoming border, an investigation of the range boundary between Columbian and plains sharp-tailed grouse in Wyoming based on genetic samples is nearing completion. University of Wyoming students and WGFD personnel collected blood samples from 75 plains sharp-tailed grouse in Laramie and Goshen counties and 13 feather samples in Weston County in spring 2019. These genetic samples will be compared to Columbian sharp-tailed grouse populations in Idaho and the Colorado/Wyoming border to better understand the species' range overlap in Wyoming.

THE HAMERSTROM AWARD

The Hamerstrom Award was established in honor of Fred and Fran Hamerstrom, pioneers of prairie grouse research and management. It will be awarded at the meeting of the Prairie Grouse Technical Council. The award will consist of a plaque with the engraved name of the recipient.

Award Criteria: 1. To recognize individual(s) and organization(s) who have made significant contributions in prairie grouse research, management or other support programs which have enhanced the welfare of one or more species of prairie grouse in a particular state or region. 2. The contribution should be evidenced by a sustained effort over at least 10 years. 3. The contribution may be related to research, management activity, promotion of an integrated program, or some combination thereof. The relative importance given to these three categories of contributions is the prerogative of the Awards Committee but it should be based on how it has helped the overall welfare and survival of prairie grouse.

Selection Procedure: 1. The selection of award recipients will be made by the three-member Executive Board and two additional members appointed by the Chairman. 2. Nominations will be accepted at large as well as from members of the Awards Committee. 3. Nominations will be submitted to the designated Awards Committee Chairman at least one month before the biennial meeting of the Prairie Grouse Technical Council. 4. Nominations should include the following information: A. Name, address, and phone number of nominee. B. Biographic sketch of individual of brief history of an organization. C. Overview of contributions indicating the nature of the contributions, duration, how it has contributed to the welfare of one or more species of prairie grouse, and the geographic area influenced by the contributions. 5. A maximum of two individual awards and two organization awards may be presented at a biennial meeting. No awards will be given if the Awards Committee feels that no deserving individuals or organization are available at the time.

The first recipient was Fran Hamerstrom, in 1991, and it has been since awarded at the biennial meetings of the Prairie Grouse Technical Council.

When the awards program was in the concept stage, Fran wanted to ensure that the Hamerstrom name not be associated with any interpretation of the word "conservation" that would include

any relationship to the anti-hunting mentality. To make that clear, the awards presentation is to include the following recommendation from Fran's Wild Foods Cookbook on yet another way to enjoy prairie grouse.

Prairie Grouse

Adapted from: Hamerstrom, Frances. 1989. Wild Foods Cookbook. Iowa State University Press, Ames, Iowa.

Prairie grouse are outstanding table birds. Unlike most gallinaceous birds such as pheasant and ruffed grouse, they retain their juices well and do not tend to dry out while cooking. Very young birds, still in juvenal plumage, have light breast meat and delicate texture, but the flavor is still undeveloped. By October, almost all the birds are in prime condition, with breast meat dark, almost like the legs, and very delicious. Chickens and sharptails should be served rare or at most well-done.

Roast: Pluck dry, dress and clean. Do not stuff. Roast in a hot oven (450 degrees) 25 minutes for medium-rare sharptails or chickens.

Fried Prairie Grouse: Pluck, dress, and clean. Cut in pieces for frying. The breasts of these birds are so plump that it is often simpler to cut them away from the bone: then cut or divide each side of the breast into two pieces. If this is not done, the legs and back will be overdone while the breast still requires more cooking. Flour each piece lightly before placing it in the hot fat. Salt just before serving.

If you want to take the wild taste out of your grouse, pay no attention to anything I've written.

PAST RECIPIENTS OF THE HAMERSTROM AWARD

1991 Fran Hamerstrom
1993 Ron Westemeier
1995 Dan Svedarsky and Jerry Kobriger
1998 Bob Robel
1999 Bill Berg
2001 Len McDaniel
2003 John Toepfer
2005 Nova Silvy and The Society of Tympanuchus Cupido Pinnatus, Ltd.
2007 Rick Baydack and Kerry Reese
2009 Randy Rodgers and Bill Vodehnal
2011 Mike Morrow, Jack Connelly, and The Minnesota Prairie Chicken Society
2013 Terry Wolfe, Mike Schroeder, and the Sutton Avian Research Center
2015 Patricia McDaniel and David Haukos
2017 K. C. Jensen, Don Wolfe, and The Minnesota Sharp-tailed Grouse Society

PAST PGTC CONFERENCES

1st	Grand Island, Nebraska	September 1957
2nd	Emporia, Kansas	March 1959
3rd	Stevens Point, Wisconsin	September 1960
4th	Pierre, South Dakota	September 1961
5th	Nevada, Missouri	September 1963
6th	Warroad, Minnesota	September 1965
7th	Effingham, Illinois	September 1967
8th	Woodward, Oklahoma	September 1969
9th	Dickinson, North Dakota	September 1971
10th	Lamar, Colorado	September 1973
11th	Victoria, Texas	September 1975
12th	Pierre, South Dakota	September 1977
13th	Wisconsin Rapids, Wisconsin	September 1979
14th	Halsey, Nebraska	September 1981
15th	Emporia, Kansas	September 1983
16th	Sedalia, Missouri	September 1985
17th	Crookston, Minnesota	September 1987
18th	Escanaba, Michigan	September 1989
19th	Billings, Montana	September 1991
20th	Ft. Collins, Colorado	July 1993
21st	Medora, North Dakota	August 1995
22nd	College Station, Texas	February 1998
23rd	Gimli, Manitoba	September 1999
24th	Woodward, Oklahoma	November 2001
25th	Siren, Wisconsin	September 2003
26th	Valentine, Nebraska	September 2005
27th	Chamberlain, South Dakota	October 2007
28th	Portales, New Mexico	October 2009
29th	Hayes, Kansas	October 2011
30th	Crookston, Minnesota	September 2013
31st	Nevada, Missouri	September 2015
32nd	Dickinson, North Dakota	October 2017

33rd Prairie Grouse Technical Council Sponsors

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