Proceedings of the 25th Prairie Grouse Technical Council

September 29 – October 3, 2003
Siren, Wisconsin

Sponsor

Host

From Barrens and Bogs to the Central Grasslands:
Wisconsin's Unique Prairie Grouse Range

SPONSORS AND DONORS:

The planning committee extends our sincere gratitude to all those who's contributions made the 25th PGTC so successful.

Sponsor of the 25th PGTC:
Society for Tympanuchus Cupido Pinnatus, Elm Grove, WI

Host of the 25th PGTC:
Wisconsin Sharp-tailed Grouse Society, Grantsburg, WI

Supporters

The Prairie Grouse Technical Council

National Prairie Chicken Sporting Dog Championship Association, Mokena, IL

James F. Shurts, Madison, WI

Doug and Judy Reisner, Black River Falls, WI

Minnesota Sharp-tailed Grouse Society, Bovey, MN

Northwest Field Trial Club, Princeton, MN

Wal-Mart, Hayward, WI

US Bank, Grantsburg, Grantsburg, WI

ACKNOWLEDGEMENTS

We gratefully acknowledge the 25th Prairie Grouse Technical Council Planning Committee and all those who assisted in making this event possible! Particular recognition is due to Jim Evrard who chaired the local arrangements committee and is in large part responsible for everything that made this conference enjoyable for the attendees – from food to field trips. Thank you Jim!

Special recognition goes to the **PGTC 2003 Planning Committee**…

Jim Evrard	Local arrangements and committee chair
Mary Griesbach	Banquet committee chair
Jim Keir	Paper sessions committee chair
Paul Kooiker	Paper sessions committee chair
Dave Evenson	Business meeting chair
Keith Warnke	Planning committee chair
Bill Berg	
Pete Engman	
Dennis Gengler	
Ken Jonas	
Neal Neimuth	
Andrea Robidoux	
Mark Schmidt	
Greg Septon	
James Shurts	

Gus Smith
Fred Strand
Tim Weiss

… and to the **Hammerstrom Award Committee**

Rick Baydack, Chair	University of Manitoba
Greg Septon	Society *Tympanuchus Cupido Pinnatus*
Keith Warnke	Wisconsin Department of Natural Resources
Russ Horton	Oklahoma Department of Wildlife
Dave Wiedenfeld	Sutton Avian Research Center

EVENT PROGRAM

September 29

7:00 Reception at the Lodge

September 30

8:30 Announcements

8:40 **Welcome to Northwest Wisconsin.** Bruce Moss, Regional Land Leader

8:50 Keynote address **The Ghosts of Prairie Grouse Past.** B. Berg, retired grouse biologist and PGTC member

9:20 **Northwest Sands Landscape Level Management Plan.** K.W. Jonas, Wildlife Biologist, WI Dept. of Natural Resources, Hayward, WI

9:40 **50+ Years of Sharp-tailed Grouse Management on the Glacial Lake Grantsburg Work Unit.**
P.Q. Engman, Wildlife Biologist, WI Dept. of Natural Resources, Grantsburg, WI

10:00 BREAK

10:20 **Survival of Sharp-tailed Grouse Chicks and Hens During the Breeding Season.**
D.L. Manzer, Dept. of Biological Sciences, Univ. of Alberta, Edmonton, Alberta, Canada

10:40 **Clearcuts: the Key to the Future of Sharp-tailed Grouse in Wisconsin?**
T.T. Connolly* and N.D. Niemuth, College of Natural Resources, Univ. of WI-Stevens Point, Stevens Point, WI

11:00 **Loss of Genetic Variation in Greater Prairie Chickens Over a 50 Year Period in Wisconsin.**
J.A. Johnson and P.O. Dunn*, Dept. of Biological Sciences, Univ. of Wisconsin-Milwaukee, Milwaukee, WI

11:20 **Prairie Chickens in Wisconsin: A Comprehensive Education Program for Teachers.**
M.S. Brown* and C.L. Thomas, Becoming an Outdoors Woman Program, Univ. of WI-Stevens Point, Stevens Point, WI

11:40 **Land Use, Life History, and Loss of the Lesser Prairie Chicken.** M. Patten , Sutton Avian Research Center, Bartlesville, OK

12:00 LUNCH

1:00 **Factors Affecting Post-Release Survival of Pen-Reared Attwater's Prairie Chickens.** M.F. Hess*, N.J. Silvy, and R.R. Lopez, Dept. of Wildlife and Fisheries, and D.S. Davis, Dept. of Veterinary Pathobiology, Texas A&M Univ., College Station TX

1:20 **Prairie Chickens and Grasslands: 2000 and Beyond-Introduction.** J.E. Toepfer, Society of Tympanuchus Cupido Pinnatus, Ltd. (STCP), Plover, WI

1:40 **Status of the "Other" Greater Prairie Chicken Populations in Central Wisconsin – 2003.** T.I. Meier*, Wildlife Biologist, WI Dept. of Natural Resources, Milladore, WI, J.E. Toepfer, STCP, Plover, WI, K.W. Jonas, Wildlife Biologist, WI Dept. of Natural Resources, Hayward, WI, M.A. Windsor, Wildlife Biologist, WI Dept. of Natural Resources, Black River Falls, WI

2:00 **Natal Dispersal of Greater Prairie Chickens in Wisconsin, 1996-2001.** D.A. Halfmann*, STCP, Custer, WI and John E. Toepfer, STCP, Plover, WI

2:40 **Serological Survey of the Greater Prairie Chicken in Wisconsin and Minnesota.** J. Paul-Murphy*, School of Veterinary Medicine, Univ. of WI, Madison, WI and J.E. Toepfer, STCP, Plover, WI

3:00 **Increasing Prairie Chicken Nest Success with Predator Deterrent.** M.E. Morrow* and T.A. Rossignol, US Fish & Wildlife Service, Attwater Prairie Chicken National Wildlife

3:20 **A Preliminary Look at Invertebrates and Prairie Chicken Broods.** A. Pratt* and J.E. Toepfer, STCP, Plover, WI; S. Grubbs and M.E. Morrow, US Fish & Wildlife Service, Attwater Prairie Chicken National Wildlife Refuge, Eagle Lake, TX

3:40 **Attwater's Prairie Chicken Population Supplementation – An Update.** M.E. Morrow* and T. Rossignol, US Fish & Wildlife Service, Attwater Prairie Chicken National Wildlife Refuge, Eagle Lake, TX, C. B. Crawford, The Nature Conservancy of Texas, Texas City, TX, J.E. Toepfer, STCP, Plover, WI, O. Dorris and B. Williams, Fossil Rim Wildlife Center, Glen Rose, TX

4:00 **A Preliminary Look at Greater Prairie Chicken Nesting Habitat in Central Wisconsin and Northwestern Minnesota.** J.E. Toepfer, STCP, Plover, WI

4:20 **Restoring the Greater Prairie Chicken to West Central Minnesota – A Progress Report.** J.E. Toepfer*, STCP, Plover, WI, D.R. Trauba, Minnesota Dept. of Natural Resources, Watson, MN, S.C. Vacek, US Fish & Wildlife Service, Morris, MN

4:40 **Prairie Chickens and Grasslands: 2000 and Beyond 1996-2003, Summary and Recommendations**. J.E. Toepfer, STCP, Plover, WI

October 1

8:15 Announcements

8:30 **Columbian Sharp-Tailed Grouse Management on the Colville Indian Reservation**. M.T. Berger*, R. Whitney and D. Antoine, Colville Confederated Tribes, Fish & Wildlife Dept., Nespelem, WA

8:50 **Relating Grouse Nest Success and Corvid Density to Habitat: A Multi-Scale Approach.** D.L. Manzer* and S.J. Hannon, Dept. of Biological Sciences, Univ. of Alberta, Edmonton, Alberta, Canada

9:10 **Breeding Season Survival of Greater Prairie-Chickens in the Flint Hills.** F.L. Loncarich*, Dept. of Biological Sciences, Kansas State Univ., Manhatten, KS and D.G. Krementz, Arkansas Cooperative Fish and Wildlife Research Unit, Dept. of Biological Sciences, Univ. of Arkansas, Fayetteville, AR

9:30 **Changes in Landscape Composition and Greater Prairie Chicken Populations in Wisconsin's Northern Range, 1990-2002.** J.R. Keir*, Wildlife Biologist, Wisconsin Dept. of Natural Resources, Friendship WI and N.D. Niemuth, US Fish & Wildlife Service, Bismarck, ND

9:50 **Canada's Agriculture Framework – Boon for Prairie Grouse but not a CRP – Yet!** D.A. Sexton * Box 1160 , Stonewall , MB. R2Y 0V8 Canada, and R.K. Baydack, Faculty of Environment, University of Manitoba, 204 Isbister Building, Winnipeg, Manitoba, Canada, R3T 2N2

10:10 **A Test of the Testosterone Hypothesis for Female Choice in the Greater Prairie Chicken**. J.K. Nooker* and B.K. Sandercock, Division of Biology, Kansas State Univ., Manhatten, KS

10:30 **Brood Survivorship in Relation to Microclimate/Habitat Use of Lesser Prairie Chickens**. L.A. Bell* and S.D. Fuhlendorf, Oklahoma State Univ., Plant & Soils Science, Stillwater, OK and M.A. Patten and S.K. Sherrod and D.H. Wolfe, George Miksch Sutton Avian Research Center, Bartlesville, OK

10:50 **Breeding Season Habitat Use of Conservation Reserve Program (CRP) Grassland by Lesser Prairie Chickens in Kansas.** T.L. Fields, G.C. White, W.C. Gilgert and R.D. Rodgers*, Kansas Dept. of Wildlife and Parks, Hayes, KS

11:10 **The Prairie Grouse of Manitoulin Island.** H.G. Lumsden, Biologist (retired), Ministry of Natural Resources, Ontario, Canada

12:45 **A Rangewide Genetic Evaluation of Lesser Prairie-Chicken Populations.** C.A. Hagen*, Div. Of Biology, Kansas State Univ., Manhatten, KS, S.J. Oyler-Mccance, US Geological Survey, Denver, CO, R.J. Robel, Div. Of Biology, Kansas State Univ., Manhatten, KS

1:05 **Six Years of Data from a Study of Lesser Prairie-Chickens in Southwestern Kansas – An Overview.** R.J. Robel*, C.A. Hagen, B.E. Jamison, J.C. Pittman and T.J. Walker, Jr., Div. Of Biology, Kansas State Univ., Manhatten, KS and R.D. Applegate, Dept. of Wildlife and Parks, Emporia, KS

1:25 Panel Discussion:
Re-establishing Isolated Populations of Greater Prairie-chickens and Sharp-tailed Grouse in their former ranges: A Good Idea, or a Recipe for Disaster?

Moderators:
Dave Sample, Wisconsin Department of Natural Resources
Melvin Moe, Iowa Department of Natural Resources
Chip O'Leary, Indiana Chapter of the Nature Conservancy
Al Stewart, Michigan Department of Natural Resources

2:30 Business Meeting

POSTER PRESENTATIONS

Cause and Patterns of Mortality in Lesser Prairie-Chickens
D.H. Wolfe*, M.A. Patten and S.K. Sherrod, G.M. Sutton, Avian Research Center, Bartlesville, OK.

Colville Confederated Tribes Sharp-tailed Grouse Project
M. Berger, Colville Confederated Tribes, Fish & Wildlife Department, Nespelem, WA

October 2

Field trip to **NW Wisconsin Sharp-tailed grouse habitat**.

Paper Session Abstracts:

NORTHWEST SANDS LANDSCAPE LEVEL MANAGEMENT PLAN.

K. JONAS, Wisconsin Dept. of Natural Resources, 10220 N. State Highway 27, Hayward, WI 54843.

The Northwest Sands Ecological Landscape of Wisconsin is a large pitted outwash plain of glacial origin that is characterized by deep sandy soils, pine and oak forests, large open wetlands, numerous lakes and rivers as well as traditional barrens habitat. Historically, fires were the primary disturbance factor that maintained the jackpine and open barrens habitat of the region along with their associated floral and faunal communities. In recent times, fire suppression, changing land-use patterns and increased human habitation have led to a reduction of early successional habitat and increased environmental impacts to the land and waters of the region, resulting in a change in native species composition and abundance.

To address the growing concern for ecosystem health and the human dimension that is integral to it, the Wis. Dept. of Natural Resources initiated an effort to undertake a large scale landscape management plan for the Northwest Sands Region. A multi-disciplinary planning team was assembled, composed of state, federal and county agencies as well as representatives from private organizations and industry. The committee was given the charge of accomplishing two primary goals: 1) Produce a comprehensive database that could be used by individual jurisdictions in their own planning efforts to see how they fit within a larger landscape context, 2) Produce goals, strategies and activities that individual jurisdictions could use in their area of responsibility or focus.

The planning effort relied extensively on GIS (Geographic Information Systems) mapping to visualize current landscape conditions and changes over time. A unique analytical system was utilized that examined and classified regional issues according to their inherent strengths, weaknesses, opportunities and threats. Issues were placed into the three broad categories of social, economic and natural resource/environmental concerns. Utilizing results of the analysis, the plan identified six primary goals, with twenty- one strategies and ninety-two activities related to specific goal accomplishment. Implementation of the Northwest Sands Management Plan's goals, strategies and activities is on a completely voluntary basis. However the recommendations and information generated by the plan are designed to be integrated with current and future planning and management efforts undertaken by the various agencies, organizations and individuals active as smaller units within the larger overall landscape. Recommendations identified in the plan that will enhance conditions for open landscape species such as sharp-tailed grouse include: modifying timber harvests regimes to increase the acreage and arrangement of open land habitat on public and private lands, identifying opportunities to expand barrens habitat through increased management efforts and acquisition, increasing public education efforts to enhance awareness of local ecological systems, and expanding funding for Northwest Sands landscape scale research and management activities.

50+ YEARS OF SHARP-TAILED GROUSE MANAGEMENT ON THE GLACIAL LAKE GRANTSBURG WORK UNIT.

P. ENGMAN, 110 East Crex Avenue, P.O. Box 367. Grantsburg, WI 54840

Crex Meadows Wildlife Area is the largest of the four wildlife properties that make up the Glacial Lake Grantsburg Work Unit (GLG). Management on Crex Meadows began in 1947 with the restoration of drained wetlands and the use of prescribed fire as habitat management tool. During the last 50 years more than 10,000 acres of pine barrens/brush prairie have been restored on GLG. Surveys for Sharp-tailed Grouse began in 1948 and occurred intermittently until 1972. Since 1972 systematic spring sharptail surveys have occurred annually on GLG.

SURVIVAL OF SHARP-TAILED GROUSE CHICKS AND HENS DURING THE BREEDING SEASON.

D.L. MANZER*, Department of Biological Sciences, University of Alberta, Edmonton, Alberta, Canada T6G 2E9, and S. J. HANNON, Department of Biological Sciences, University of Alberta, Edmonton, Alberta, Canada, T6G 2E9

We studied survival and causes of mortality for sharp-tailed grouse (*Tympanuchus phasianellus*) chicks up to 30 days old, and for hens during the breeding season in Alberta from 1999 through 2001. We used the Kaplan-Meier function for estimating survival for more than 1 radio-marked chick in the same brood by modifying a bootstrapping technique to calculate SE while accounting for censored data. Chick survival was 41% over 3-years (95% *CI* 25 to 57%, n=70) with 73% of mortalities occurring over the first 15 days. Predation accounted for 68% of chick mortalities with mammals taking the largest portion. Hen survival from 1 May to 13 Aug was 53% (95% *CI* 44 to 63%, n=111) over 3-years. Most hen mortalities were from predation (96%), with mammals accounting for the largest portion followed by birds of prey. Hen survival was moderately higher in landscapes (1600-m extent) with lower proportions of crop, and in grasslands with less bare ground than in areas with more crop and sparsely covered grasslands.

CLEARCUTS: THE KEY TO THE FUTURE OF SHARP-TAILED GROUSE IN WISCONSIN?

T. T. CONNOLLY*, N. D. NIEMUTH, College of Natural Resources, University of Wisconsin-Stevens Point, Stevens Point, WI 54481 USA, R. S. LUTZ, Department of Wildlife Ecology, University of Wisconsin-Madison, Madison, WI 53706 USA.

Sharp-tailed grouse populations in Wisconsin have declined dramatically over the past 50 years. By the late 1980s only a few isolated populations of sharp-tailed grouse remained in Wisconsin, most on savanna reserves managed by prescribed burning. In the early 1990s, thousands of hectares of forestland in northwestern Wisconsin were harvested

by clearcutting in a salvage logging operation as a result of a jack pine budworm outbreak. Sharp-tailed grouse colonized these sites, and by the late 1990s these populations reached high numbers and densities. Using radio-telemetry, we studied nesting success, hen survival, chick survival and production, and nest site selection on 6 study sites in northwestern Wisconsin. Study sites were classified as managed or unmanaged dependent on whether the majority of the landscape was managed specifically for sharp-tailed grouse. Nesting success (P = 0.015) and hen survival during the reproductive period (P = 0.035) and entire study period (P = 0.045) were greater on unmanaged landscapes than managed landscapes. Chick survival (P = 0.11) and production (P = 0.47) were not different between landscape types. On managed landscapes, hens preferred to nest on adjacent clearcut areas over managed savanna reserves (P = 0.001). Use of large aggregated clearcutting as a timber harvest tool provides early successional wildlife habitat and economic benefits for forest industry. Smaller clearcuts located near managed savanna reserves provides important nesting habitat for sharp-tailed grouse. Landscape-scale management using clearcutting to create early successional habitat can be an important management tool to maintain populations of sharp-tailed grouse into Wisconsin's future.

LOSS OF GENETIC VARIATION IN GREATER PRAIRIE CHICKENS OVER A FIFTY YEAR PERIOD IN WISCONSIN.

J. A. JOHNSON and P. O. DUNN* Department of Biological Sciences, University of Wisconsin-Milwaukee, PO Box 413, Milwaukee, WI 53201, USA and J. E. TOEPFER, STCP, 3755 Jackson Ave., Plover, WI 54467 USA.

Contemporary populations of greater prairie chicken (*Tympanuchus cupido*) in Wisconsin have reduced microsatellite and mtDNA control region diversity compared to contemporary populations in Kansas, Nebraska, Minnesota, and Missouri. In this study, we examined long-term changes in genetic variation within Wisconsin. We compared estimates of genetic variation from samples collected in 1951-1954 with samples collected in 1997-2000 from the same locations. Analysis of microsatellite DNA revealed a reduction of gene flow between management areas in Wisconsin, despite the close proximity of these areas (20-40 km). This loss of gene flow has reduced the effective population size and allowed genetic drift to reduce levels of genetic variation. The ability of birds to disperse may be an important factor in the extirpation of small populations of prairie chickens over the last century.

PRAIRIE CHICKENS IN CENTRAL WISCONSIN: A COMPREHENSIVE EDUCATION PROGRAM FOR TEACHERS.

M. S. BROWN * and C. L. THOMAS, Becoming an Outdoors-Woman program, University of Wisconsin-Stevens Point, Stevens Point, WI 54467 USA

One objective of the draft Greater Prairie Chicken Management Plan is to increase the awareness of the need for grassland conservation. The Becoming an Outdoors-Woman (BOW) program developed a hands-on, field-oriented workshop that specifically addressed this objective. The goal of the workshop was to increase teacher knowledge on prairie ecology, greater prairie chicken conservation and the tools of environmental education. Seventeen high school teachers attended a Beyond BOW workshop that was held April 25-27, 2003 in Rosholt, WI. Attending teachers participated in six sessions on prairie chicken ecology, prairie habitat, historical perspectives, environmental education, curriculum development, and viewing prairie chickens at the Buena Vista Marsh, WI. Pre- and Post-workshop surveys were used to evaluate the participants' knowledge of prairie chickens and intent to infuse the new information, as well as to evaluate the effectiveness of the BOW format for teacher specific workshop tracks. Teacher knowledge about prairie chicken ecology, habitat, historical and current populations, and management increased from 48% correct before the workshop to 83% correct after the workshop. Following the workshop, 94% of teacher participants indicated intent to infuse the information gained during this workshop into their curriculum. All participants agreed that the BOW workshop format is effective, that they consider themselves more knowledgeable about prairie chicken ecology/conservation concepts, and that this workshop would influence their future teaching.

This study shows that teachers, given adequate training and resources are willing to bring prairie chicken and grassland conservation education into the classroom.

LAND USE, LIFE HISTORY, AND LOSS OF THE LESSER PRAIRIE-CHICKEN.

M .A. PATTEN*, Sutton Avian Research Center, Univ. Oklahoma, P.O. Box 2007, Bartlesville, OK 74005 USA and Dept. Zoology, Univ. Oklahoma, Norman, OK 73019, D. H. WOLFE, E. SHOCHAT, and S. K. SHERROD, Sutton Avian Research Center, Univ. Oklahoma, P.O. Box 2007, Bartlesville, OK 74005 USA.

Historical differences in the partitioning and use of land in western North America has resulted in vast differences in parcel sizes. Smaller parcels at the eastern edge of the shortgrass prairie (western Oklahoma) are bounded by more fence and traversed by more roads than are larger parcels at the western edge (eastern New Mexico). Increased fencing, power lines, and roads are associated with higher mortality of female Lesser Prairie-Chickens (*Tympanuchus pallidicinctus*), a rare species endemic to the south-central United States. Differences in mortality rates have selected for differences in life history strategies: lifetime reproductive output is the same between sites, but, relative to females in New Mexico, female prairie-chickens in Oklahoma lay larger clutches and tend to nest fewer years but make more attempts within a year. Results of this trade off have left Oklahoma birds more susceptible to year-to-year environmental perturbations, potentially explaining that populations' rapid decline relative to the more stable populations in New Mexico.

FACTORS AFFECTING POST-RELEASE SURVIVAL OF PEN-REARED ATTWATER'S PRAIRIE CHICKENS.

M. F. HESS*, N. J. SILVY, R. R. LOPEZ, Dept. of Wildlife and Fisheries, Texas A&M University, College Station, TX, 77843 USA, D. S. DAVIS, Department of Veterinary Pathobiology Texas A&M University, College Station TX 77843 USA,

Introduction of pen-reared Attwater's prairie-chickens (APC, *Tympanuchus cupido attwateri*) into the wild to supplement existing populations has met with marginal success. Flight characteristics, predator avoidance behavior, and rearing methods are possible factors contributing to high post-release mortality of pen-reared birds. To evaluate flight characteristics and predator avoidance behavior of pen-reared APC that had been released into the wild on Attwater Prairie Chicken National Wildlife Refuge, we compared their characteristics and behavior to wild greater prairie-chickens (GPC, *T. c. pinnatus*) in Minnesota and Kansas. Wild GPC flew significantly ($P = 0.04$) faster than pen-reared APC, ($\bar{x}$ = 46.5 and 41.3 kph for GPC and APC, respectively). GPC also flew significantly ($P = 0.000$) further ($\bar{x}$ = 318 m) than APC ($\bar{x}$ = 83 m). A trained dog was able to approach closer to APC ($\bar{x}$ = 5 m) than GPC ($\bar{x}$ = 17.3) before birds flushed. To evaluate current rearing methods (lots of human contact, pelleted food and water in bowls) for APC, we used a greenhouse to simulate a natural environment. Limited human contact and no food or water dishes were provided to reinforce natural foraging behavior. Planted vegetation and supplied commercial insects provided a food sources and cover for chicks. The greenhouse was equipped with an underground heat source for chick warmth, water misters to simulate early morning dew, and a sprinkler system to simulate rain. The greenhouse provided APC chicks protection from predators and adverse weather conditions (before they could thermo regulate) while exposing the chicks to natural sunlight, day length, and temperature fluctuations. We found that APC chicks could successfully be reared in a greenhouse with little human contact and without pelleted food and water in bowls.

PRAIRIE CHICKENS & GRASSLANDS: 2000 AND BEYOND 1996-2003: INTRODUCTION.

J. E. TOEPFER, Society of Tympanuchus Cupido Pinnatus, Ltd. (STCP), 3755 Jackson Ave., Plover, WI 54467 USA.

This paper will present an overview of results of the field research project: Prairie Chickens & Grasslands: 2000 and

Beyond (PCG2B), sponsored by the Society of Tympanuchus Cupido Pinnatus, Ltd. The objective was to increase our knowledge and understanding of prairie chicken ecology and grassland management. The project spanned seven years 1996-2003 and consisted of several interrelated projects in North Dakota, Minnesota and Wisconsin that utilized radio telemetry to monitor survival, general habitat use, dispersal of young, and nesting success. We also tried to fill in gaps in our knowledge and establish base line data for Wisconsin first; then Minnesota and North Dakota on population trends and status, predation, disease, parasites, translocation methodology and genetics. Papers on some of these factors will be presented following this overview. This paper will cover study areas, general methods and other general aspects of PCG2B.

STATUS OF THE "OTHER" GREATER PRAIRIE CHICKEN POPULATIONS IN CENTRAL WISCONSIN – 2003.

T. I. MEIER*, Wisconsin Department of Natural Resources (DNR), Miladore, WI 54454, J. E. TOEPFER, Society of Tympanuchus Cupido Pinnatus, Ltd., 3755 Jackson Ave., Plover, WI 54467, K. JONAS, Wisconsin DNR, Spooner, WI and M. WINDSOR, Wisconsin DNR, Black River Falls, WI 54615

This paper outlines the history and status of the other greater prairie chicken populations in central Wisconsin. These other populations are associated with the George W. Mead Wildlife Area near Junction City and the booming grounds in the Outlying Area near Neilsville, Marshfield, Colby and Merrill Wisconsin. In 1991 these two subpopulations made up 37.4% of the Wisconsin prairie chicken population; today they comprise only 15%. Both of these subpopulations have been contracting in size and are in long-term decline. The Outlying Area declined from 134 cocks in 1991 to only 37 in 2003, a 72.4% decline. The Mead population declined from an average of 142 cocks during the 1970's to 68 cocks in 1990's, a decline of 52.2%. Causes for these declines and management recommendations for possible recovery will be discussed.

NATAL DISPERSAL OF GREATER PRAIRIE-CHICKENS IN WISCONSIN, 1996-2001.

D. A. HALFMANN*, Society of Tympanuchus Cupido Pinnatus, Ltd. (STCP), 7590 County Rd. Z, Custer, WI 54423 USA, and J. E. TOEPFER, STCP, 3755 Jackson Ave., Plover, WI 54467 USA.

Landscape changes, primarily to the quantity, contiguity, and composition of grassland habitat over the past 100+ years in Wisconsin have caused a greater prairie chicken (*Tympanuchus cupido pinnatus*) population decline and metapopulation conditions. Currently, 4 core subpopulations and more than 90% of the censused population primarily inhabit 4, spatially discrete, state wildlife management areas. Natal dispersal, the characteristic linkage in metapopulations, was studied. Juveniles captured July-October, 1996-2001 were monitored using radio telemetry until establishing at their first breeding location. Frequency, distance, direction, and timing attributes of dispersal were documented for over 260 juveniles. Cocks natal site fidelity was stronger than hens, which dispersed greater distances overall and more frequently. Less than 15% of juveniles dispersed outside natal subpopulations. Hens dominated emigration movements (+16 hens, 3 cocks, 4 unknown sex). Mean dispersal distance was greater for hens (~6.9 km) than cocks (~2.3 km). Uniform directional distributions occurred among all areas and sex except within 2 subpopulations. Inter-subpopulation movement direction was uniform but remained oriented toward adjacent subpopulations. Final dispersal occurred during February-March for cocks and March-early April for hens. Juvenile movement between central subpopulations was nearly absent alluding to 2 management needs; maintenance/enhancement of existing subpopulation relationships and habitat restoration in key places.

SEROLOGICAL SURVEY OF THE GREATER PRAIRIE-CHICKEN IN WISCONSIN AND MINNESOTA.

J. PAUL-MURPHY*, University of Wisconsin School of Veterinary Medicine, 2015 Linden Drive, Madison, Wisconsin, 58301 USA, J. E. TOEPFER, Society of Tympanuchus Cupido Pinnatus, Ltd. (STCP), 3755 Jackson Ave., Plover, WI 54467 USA, D. HALFMANN, STCP, 7590 County Rd. Z, Custer, WI 54423 USA, M. BLONDIN,

STCP and M. HICKS, STCP.

This report provides the preliminary results of a five-year serological survey of greater prairie chickens (*Tympanuchus cupido pinnatus*) in Wisconsin and Minnesota. Adults, juveniles and chicks were captured as part of a long-term field research project, Prairie Chickens & Grasslands: 2000 and Beyond (PCG2B), supported by Society of Tympanuchus Cupido Pinnatus, Ltd. (STCP). A 2-5 ml blood sample was taken via venipuncture from each prairie chicken. Blood samples were drawn into heparinized syringes or placed in lithium heparin tubes. Starting in August 2000, samples were divided into serum tubes and heparinized tubes.

400 plasma samples collected from January1998 - August 2001 were tested for antibodies to Pasturella multocida, Salmonella typhimurium, S. pullorum and no antibody titers were identified. Plasma samples were screened for antibodies to Mycoplasma gallisepticum and M. synoviae using a plate test and positive samples were re-tested using a more sensitive test, hemaglutination inhibition (HI) using turkey red blood cells. Of the 415 samples from 1998-2001, the plate test yielded over 183 positive samples but when re- evaluated using the HI assay, only 2 samples had very low titers for Mycoplasma gallisepticum.

625 plasma samples collected from August 2001 - January 2003 were tested for New Castles Disease (NCDV) and Avian Influenza (AI). All samples were negative for these viruses.138 serum samples collected in 2002 from Wisconsin and Minnesota have been tested for antibodies to West Nile Virus (WNV). Three samples from Minnesota have low titers, and all other samples are negative for WNV.

INCREASING PRAIRIE CHICKEN NEST SUCCESS WITH PREDATOR DETERRENT.

M. E. MORROW and T. A. ROSSIGNOL, U.S. Fish and Wildlife Service, Attwater Prairie Chicken National Wildlife Refuge, Eagle Lake, TX 77434 USA and J. E. TOEPFER, Society of Tympanuchus Pinnatus, Ltd., Plover WI 54467 USA

Research has documented the importance of breeding success in driving grouse population changes. Several studies have evaluated fences as a means for improving waterfowl nest success. We first investigated the efficacy of using predator deterrent fences for increasing greater prairie chicken (*Tympanuchus cupido pinnatus*) nest success. Then, this technique was used on the critically endangered Attwater's prairie chicken (*T. c. attwateri*). Fences used to protect greater prairie chicken nests were constructed of 1.3-cm (0.5-inch) mesh hardware cloth, 90-107 cm (36-42 inches) high. Fences were roughly square in shape with a 30.5-61 m (100-200 ft) perimeter and centered on nests. Initially, some greater prairie chicken hens experienced difficulty returning to the nest. This was rectified by placing the fence at a 30-45 degree angle for 36-48 hours. Fences used to protect Attwater's nests were similar, but were constructed of 0.32 cm (0.125 in) and 0.64 cm (0.25 in) hardware cloth with a 61 m (200 ft) perimeter. Both circular and square configurations were used for Attwater's nests. Greater prairie chicken nest success for 18 protected nests in 1998-99 was 78% compared to 57% for non-fenced nests. In 2000, 6 Attwater's nests (chosen at random) were fenced at the Attwater Prairie Chicken National Wildlife Refuge (APCNWR), and 4 were not. All the unfenced nests were predated, and all the fenced nests hatched. From 2000-2002, 18/22 (82%) fenced nests on APCNWR have hatched compared to 1/7 (14%) of unfenced nests. This technique requires that the fence be lifted or removed just before or when nests hatch so that chicks can exit the fenced area. More data are needed to evaluate the impacts of disturbance on egg hatchability.

A PRELIMINARY LOOK AT INVERTEBRATES AND PRAIRIE CHICKEN BROODS.

A. PRATT* and J. E. TOEPFER, Society of Tympanuchus Cupido Pinnatus, Ltd., Plover, WI 54467; S. GRUBBS and M. E. MORROW. U.S. Fish and Wildlife Service, Attwater Prairie Chicken National Wildlife Refuge, Eagle Lake, TX;

Invertebrates are critical to the survival of young galliformes. During the summer of 2003, we conducted a pilot study to examine the relationship of prairie chicken hens with broods to the presence of invertebrates. We used sweep nets to collect invertebrates in vegetation surrounding the flush site of hens and broods, birds without broods and non-bird areas. Samples were also collected in Texas on Attwater's prairie chickens (*Tympanuchus cupido attwateri*), but most were collected on greater prairie chickens (*T. c. pinnatus*) in northwestern Minnesota. Each site was video taped and information on plant species composition and VOR's were collected. Biomass and total number of invertebrates tallied were used to make comparisons between variables such as age of chicks and habitat types used by broods (CRP, Native Prairie, Cropland and Pasture). A total of 141 samples were collected, 83 from brood sites in northwestern Minnesota. Invertebrate biomass was highest at brood sites, followed by birds without broods and then at sites where birds were not present. We plan to use the information and experience gained from this study to develop a more comprehensive study.

ATTWATERS PRAIRIE-CHICKEN POPULATION SUPPLEMENTATION - AN UPDATE.

M. E. MORROW AND T. A. ROSSIGNOL, U.S. Fish and Wildlife Service, Attwater Prairie Chicken National Wildlife Refuge, Eagle Lake, TX 77434 USA, C. B. CRAWFORD, The Nature Conservancy of Texas, Texas City Prairie Preserve, Texas City, TX 77590, USA, J. E. TOEPFER, Society of Tympanuchus Pinnatus, Ltd., Plover WI 54467 USA, O. DORRIS and B. WILLIAMS, Fossil Rim Wildlife Center, Glen Rose, TX 76043 USA.

Attwater's prairie chicken (*Tympanuchus cupido attwateri*) populations dropped precipitously from 1993-96. By 1996, fewer than 50 individuals remained in wild populations. Population supplementation was initiated in 1995 as a last-ditch effort to prevent species extinction. From 1995-2002, 568 captively-reared birds have been released at the Attwater Prairie Chicken National Wildlife Refuge (APCNWR) and the Texas City Prairie Preserve. Birds acclimated at the release site for only 3 days prior to release experienced 5.3 times greater mortality during the first 30 days post-release as compared to birds acclimated 14 days ($P < 0.005$). Timing of release relative to migration of raptors was also important to post-release survival. Birds released outside the average fall arrival and spring departure times for northern harriers (*Circus cyaneus*), the most conspicuous wintering raptor in our area, experienced 1.7 times greater survival during the first 30 days post-release compared with those released while harriers were present ($P < 0.005$). No difference in survival was observed for sex or age at release. Nesting success was initially poor, but predator management and construction of predator deterrent fences around nests has resulted in improved nesting success. Brood survival remains poor, and is currently the factor most limiting progress toward recovery. Data on factors affecting brood survival are being collected concurrently for the Attwater's at APCNWR and Fossil Rim Wildlife Center (FRWC), and in western Minnesota and FRWC for greater prairie chickens (*T. c. pinnatus*). Greater prairie chicken data will be used as benchmarks for evaluation of Attwater's data.

A PRELIMINARY LOOK AT GREATER PRAIRIE-CHICKEN NESTING HABITAT IN CENTRAL WISCONSIN AND NORTHWESTERN MINNESOTA.

J. E. TOEPFER, Society of Tympanuchus Cupido Pinnatus, Ltd. (STCP), 3755 Jackson Ave., Plover, WI 54467 USA

A summary of nesting success for eight studies in Wisconsin, 1929-2001 totaling 620 nests indicated that nesting success averaged 50.8% and ranged from 40% to 70%. However, the averages from each study vary from 45.5-55.3%. Contemporary nesting success in central Wisconsin 1996-2003 averaged 52.2%. Nesting success has remained at or near 50% for the past 75 years. Nesting success is important but may not be the dominant factor in limiting greater prairie chickens in central Wisconsin. A preliminary analysis of nesting success by area (1996-2003) shows that it varies between management areas and is higher at Paul Olson/Mead (57.8%) than Buena Vista/Leola (49.0%) and is higher on private land than state land (56.2% versus 51.1%) but varies between the areas. Preliminary results from nests in western Minnesota indicate that success varied from 27.1-72.7% and averaged 44.2%. The success rate was higher in non-CRP grasslands than CRP grasslands 54.8% versus 45.8% but success has improved in CRP over the past 5 years. Much of the CRP has been undisturbed since 1986**.**

RESTORING THE GREATER PRAIRIE-CHICKEN TO WEST CENTRAL MINNESOTA – PROGRESS REPORT.

J. E. TOEPFER, Society of Tympanuchus Cupido Pinnnatus, Plover, WI 54467 USA, D. R. TRAUBA, Minnesota Dept. of Natural Resources, Watson, MN 56295 USA and S. C. VACEK, United States Fish and Wildlife Service, Morris, MN 56267 USA.

Continued habitat loss and subsequent fragmentation are serious threats to prairie grouse populations throughout North America. As wildlife managers work toward re-connecting isolated greater prairie chicken (*Tympanuchus cupido pinnatus*) populations, a better understanding of the techniques to re-establish populations are needed. From 1999-2003, 306 wild greater prairie chickens were trapped and released at 9 different sites in vacant grassland habitats throughout the 1,512-km^2 project area in west central Minnesota. Overall, 9 booming grounds were established at 7 out of 9 release sites. Summer releases established 6 booming grounds and a supplemental spring release in 2003 established 2 additional booming grounds. The final booming ground was discovered when a cock released in April 2003 moved 28 km outside the project area to an isolated grassland complex already occupied by non-radioed prairie chickens. Movement data from surviving spring-released prairie chickens found that 95% of the hens and 86.8% of the cocks established within a mile or less of one of the established booming grounds. This high localization rate indicates translocated prairie chickens are attracted to resident birds. Managers wanting to re-establish prairie chickens must first concentrate on establishing a network of booming grounds 3-5 miles apart through summer releases before supplementing with fall or spring releases. Dispersal away from release sites is the main reason most prairie chicken translocation projects have failed.

PRAIRIE CHICKENS & GRASSLANDS: 2000 AND BEYOND 1996-2003 SUMMARY AND RECOMMENDATIONS.

J. E. TOEPFER, Society of Tympanuchus Cupido Pinnatus, Ltd. (STCP), 3755 Jackson Ave., Plover, WI 54467 USA

This paper will summarize the results of Prairie Chickens & Grasslands 2000 and Beyond and discuss ramifications of the results, make recommendations, discuss what remains to be done and where we need to go from here.

COLUMBIAN SHARP-TAILED GROUSE MANAGEMENT ON THE COLVILLE INDIAN RESERVATION.

M. T. BERGER*, R. WHITNEY and D. ANTOINE, Colville Confederated Tribes, Fish and Wildlife Dept., Nespelem, WA USA 99155.

Columbian Sharp-tailed grouse (*Tympanuchus phasianellus columbianus*) were once one of the most numerous birds in the Columbia Basin and the Northwest. In addition, they are culturally significant to Indigenous peoples of the region. The design and focus of this three-year Bonneville Power Administration funded project is the protection, restoration, and enhancement of Columbian Sharp-tailed grouse (CSTG) and surrounding habitat on the Colville and Spokane Indian Reservations and lands purchased/managed by the WDFW. This project reviewed past studies, data and expert opinion to formulate a detailed method for restoration and conservation of this species and associated habitats. A team of experts familiar with sharp-tailed grouse biology and habitat requirements coordinate and oversee population and habitat models, etc. for use in future management of this species. Grouse Team members make recommendations for restoration and conservation efforts within the region and assist various agencies and Tribes as

requested. Walk-in traps were used to capture, take DNA samples, and attach radio collars to CSTG on different leks. Marked birds were followed and GPS points used to monitor seasonal habitat distribution and use. Currently in year two of the study, data collection and analysis to determine limiting factors restricting population growth and habitat utilization is still underway. Collected information will be used to develop an HSI model for CSTG and management plan for the Colville Reservation.

RELATING GROUSE NEST SUCCESS AND CORVID DENSITY TO HABITAT: A MULTI-SCALE APPROACH.

D. L. MANZER* and S. J. HANNON, Department of Biological Sciences, University of Alberta, Edmonton, Alberta, CA, T6G 2E9.

Predators are the proximate cause of death for most ground dwelling birds, although changes in habitat at small and broad spatial scales is likely the ultimate factor. We examined the dynamics between habitat and the interaction between predator and prey to clarify how human related habitat change affects nest success for sharp-tailed grouse. First, we evaluated nest habitat selection by grouse at 2-extents. Second, we determined the habitat important for explaining corvid density at landscape extents. Third, we evaluated sharp-tail nest success in relation to habitat at 3-extents including the extent most relevant for explaining corvid density. Nests were >2 times more likely to succeed in landscapes with < 35% crop and sparsely covered grasslands (1600-m extent). Corvid density was higher in these habitats at the same scale, and nests were 35 times more likely to succeed in landscapes with the lowest corvid density compared to landscapes with the highest corvid density. The likelihood of nest success increased 1.2 times for each 1-cm increase in concealment cover height measured over a 50-m extent. Nest sites had more treed cover than available at random at small scales. However, nests within 75 m of perch sites were 1.9 times more likely to fail, possibly since trees provided perches for corvids. Managers can likely improve nest success in prairie systems by maintaining >13cm of concealment cover height measured over a 50-m extent, reducing tree encroachment, and focusing efforts in landscapes (8.04 km^2) with <35% crop and bare grassland.

BREEDING SEASON SURVIVAL OF GREATER PRAIRIE-CHICKENS IN THE FLINT HILLS.

F. L. LONCARICH,* Department of Biological Sciences, Kansas State University Manhattan, KS 66506, USA, and D. G. KREMENTZ, USGS, Arkansas Cooperative Fish and Wildlife Research Unit, Department of Biological Sciences, University of Arkansas, Fayetteville, AR 72756, USA.

Recent data collected in the Flint Hills of Kansas suggest that populations of greater prairie-chickens (*Tympanuchus cupido*) may be declining there. Annual spring burning and changes in grazing practices have recently been implicated as factors contributing to apparent population declines. We examined the impact of burning and other factors on breeding season survival of radio-marked male greater prairie-chickens on 2 cattle ranches in the Flint Hills. We considered a set of *a priori* candidate models and used the information-theoretic approach to determine what factor(s) was(were) most affecting male greater prairie-chicken survival. Under a constant survival model, the probability of survival for males during the breeding season was 0.73 (95% CI = 0.52 - 0.87). Model selection identified 3 models with strong support. These models were constant survival, survival varied by burn group, and survival varied by hawk migration. We also found raptors to be the most important predator of radio-marked male prairie chickens during our study. Model selection results suggested little evidence that spring burning influenced male breeding season survival during 2002. However, because unburned areas provide important escape cover, managers should consider leaving some areas near leks unburned to provide close escape cover for displaying males and take precautions to reduce depredation by raptors.

CHANGES IN LANDSCAPE COMPOSITION AND GREATER PRAIRIE-CHICKEN POPULATIONS IN WISCONSIN'S NORTHERN RANGE, 1990-2002.

J. R. KEIR*, Wisconsin Department of Natural Resources, Friendship, WI 53943 USA, and
N. D. NIEMUTH[1], University of Wisconsin-Stevens Point, Stevens Point, WI 54481 USA

Most greater prairie chickens in Wisconsin are associated with managed grassland reserves such as the Buena Vista and Leola wildlife management areas. However, small numbers of greater prairie chickens are also found to the northwest of managed areas, associated with wetlands and marginal agriculture. In 1991, we mapped land use around 30 greater prairie chicken leks in the northern range that were active at least once from 1988-1991. Leks have been monitored annually since then, and land use at the same 30 points was again surveyed in 2002. Number of known active leks in the study area declined from a high of 25 in 1991 to 9 in 2002; number of males attending these leks declined from 134 in 1991 to 34 during the same time period. Land use in the northern range in 1991 was poor relative to core properties such as the Buena Vista Marsh, with less nesting cover, more timber, and no publicly owned or managed land. Land use in the northern range changed considerably from 1991 to 2002 with substantial increases in amount of row crop, woodland, large conifer, and miscellaneous cover types and substantial decreases in amount of small grains, grass hay, pasture, upland grass, and sedge meadow cover types. Logistic regression models indicate that idle cover, shrub-carr, and proximity to potential source populations were positively associated with continued lek presence and roads and housing were negatively associated with continued lek presence. Greater prairie chickens in the northern range are negatively impacted by intensification of agriculture, loss of habitat, hybridization with sharp-tailed grouse, and reduced connectivity among subpopulations. Numbers of leks and males in the northern range continue to decline; significant habitat management will be needed to maintain this subpopulation of Wisconsin's greater prairie chickens.

CANADA'S AGRICULTURE FRAMEWORK- BOON FOR PRAIRIE GROUSE BUT NOT A CRP- YET!

D. A. SEXTON * Box 1160 , Stonewall , MB. R2Y 0V8 Canada, and R.K. BAYDACK, Faculty of Environment, University of Manitoba, 204 Isbister Building, Winnipeg, Manitoba, Canada, R3T 2N2

Agriculture and Agri-Food Canada, the counterpart to the USDA, have proposed a 5 year Agriculture Policy Framework aimed at Canada becoming a leader in environmentally responsible food production. Major components of the proposal include protecting and enhancing Air, Water, Soil, and Biodiversity. One of the requirements is for farmers to complete Environmental Farm Plans dealing with these components, and another is a ' kick start ' program – Green Cover – to convert marginal cropland into long term perennial plant cover. These programs hold some promise for expanding prairie grouse habitat across Prairie Canada. The presentation will compare and contrast the proposed programs with the US CRP Program, and identify opportunities for wildlife and environmental groups in Canada to lobby for expanding or modifying these programs to provide greater environmental benefits, particularly for ground nesting birds, in Prairie Canada.

A TEST OF THE TESTOSTERONE HYPOTHESIS FOR FEMALE CHOICE IN THE GREATER PRAIRIE-CHICKEN.

J. K. NOOKER and B. K. SANDERCOCK, Div. of Biology, Kansas State Univ., Manhattan, KS.

Lek mating systems provide an excellent opportunity to study mate choice, because female choice is unrestricted, and females receive few direct benefits from males other than gametes. In birds, females often choose testosterone-dependent traits to assess male quality. In grouse, testosterone levels may affect behavior, territory position, and morphological traits. Our objective was to investigate which traits females use to select mates in the Greater Prairie Chicken (*Tympanuchus cupido*). Thirty-five males were observed at three leks near Manhattan in northeast Kansas. Males were captured and given unique leg band and tail color combinations. During focal observations, time spent displaying and fighting was calculated, and tallies taken of the number of fights and males engaged, boom vocalizations, and flutter jumps. Copulations and position of males at leks were recorded opportunistically. Males engaging in more fights gained more copulations, regardless of their display rate. Higher

copulation rates were also correlated with larger combs and longer tails. Females did not select males based on territory size or distance from lek center. However, aggression and display rate were correlated with distance from lek center. This observational study provides mixed support for the hypothesis that females choose testosterone-mediated traits. As predicted, two testosterone-mediated traits, aggression and comb height, were correlated with mating success. However, display rate, territory size and position were not related to mating success.

BROOD SURVIVORSHIP IN RELATION TO MICROCLIMATE/HABITAT USE OF LESSER PRAIRIE-CHICKENS.

L. A. BELL*, Oklahoma State University, Plant and Soil Sciences, 368 Agricultural Hall, Stillwater, OK 74078, USA., S. D. FUHLENDORF, Oklahoma State University, Plant and Soil Sciences, 368 Agricultural Hall, Stillwater, OK 74078, USA, M. A. PATTEN, University of Oklahoma, Adjunct Professor for Department of Zoology, George Miksch Sutton Avian Research Center, P.O. Box 2007, Bartlesville, OK 74005, USA, S. S. SHERROD and D. H. WOLFE, University of Oklahoma, George Miksch Sutton Avian Research Center, P.O. Box 2007, Bartlesville, OK 74005, USA.

Chicks have a high surface-area-to-volume ratio, so maintaining their internal body temperature can be difficult. Thus, apart from predation, relative humidity, ambient temperature, and exposure to wind are factors that influence survival of chicks. We studied the relationship between survivorship and microhabitat use for lesser prairie chicken (*Tympanuchus pallidicinctus*) broods from hatch to reproductive stages. Results will indicate the effect heat stress and other variables have on brood movements, microhabitat selection, and survivorship.

BREEDING SEASON HABITAT USE OF CONSERVATION RESERVE PROGRAM (CRP) GRASSLAND BY LESSER PRARIE-CHICKENS IN KANSAS.

T.L. FIELDS, G.C. WHITE, W.C. GILGERT, and R.D. RODGERS, Kansas Dept. of Wildlife and Parks, Hayes, KS.

Lesser prairie chicken (*Tympanuchus pallidicinctus*) populations have drastically declined throughout most of their range since the 1800's. Loss of suitable habitats has been suggested as the primary cause of this decline. A recent expansion of populations in west-central Kansas has been attributed to an increase in CRP (Conservation Reserve Program) lands. This study was designed to assess the importance of CRP to lesser prairie chicken habitat use and breeding success. We radio-collared 40 female lesser and 28 greater prairie chickens (*Tympanuchus cupido*) in Kansas and observed their habitat use during the breeding seasons of 2002 and 2003. CRP types were classified based on the presence or absence of forbs and how the forbs were seeded. This resulted in three CRP types which included CRP originally seeded to native warm-season grasses with no forbs, CRP originally seeded with warm-season grasses and native forbs, and grass-only CRP subsequently interseeded with forbs (primarily alfalfa). A $?^2$ was performed to test for goodness of fit of utilized nesting habitat to available habitat. Program MARK was used to model nest survival as a function of 11 individual covariates. Models were ranked using Akaike's Information Criteria (AIC_c). Results indicate that nesting hens used CRP interseeded with forbs and CRP composed only of grasses more than expected. In contrast, nesting hens used rangelands and croplands less than expected. Daily nest survival of prairie chicken nests was a function of nest age and a quadratic time trend. Probability of daily survival decreased throughout the season and decreased with nest age. These results suggest that nesting hens are using CRP more than expected, but we did not find evidence of direct habitat effects on nest survival.

THE PRAIRIE GROUSE OF MANITOULIN ISLAND.

H. G. LUMSDEN

Prairie Chickens must have started their range expansion from Wisconsin about 1900. They were well into the northern peninsula of Michigan by 1910. They had reached St. Joseph's Island and Sault Ste. Marie, Ontario by 1925. They spread steadily east and completed colonization of Manitoulin Island by 1945.
In the fall of 1933, an unusual irruption of Northern Sharptailed Grouse from the Hudson Bay Lowlands occurred. Residents of Manitoulin distinguished the two species and reported the presence of "square-tails" and "sharp-tails" in the winter of 1932-33. Records and specimens confirm that they had spread over at least 100,000 km^2 in Ontario south of their normal range. Within this acquired range there are seven records of breeding in 1933 but these muskeg birds rapidly disappeared. There is no specimen evidence or verbal reports that these Northern Sharptailed Grouse reached Michigan during this irruption that I know about.

Prairie Sharptailed Grouse started to expand their range perhaps 30 years after the Prairie Chickens. By 1930, they were in the northern peninsula of Michigan. In 1941, Michigan DNR made a planting of 37 Prairie Sharptails on Drummond Island. Thence they spread east and the first Prairie Sharptail collected on Manitoulin Island was in 1948 at Gore Bay. In 1952, the first lek was found at the west end of the island near Meldrum Bay. By 1960, these birds had virtually colonized the whole island.

In the winter of 1948 and many succeeding springs, I worked on Manitoulin Island trying to trap "Prairie Chickens" for a transplant in eastern Ontario. It quickly became apparent that many of the birds were not Prairie Chickens but were also not Sharptails. Development of a hybrid index from the morphology of study skins and skeletons indictated that 58-60% were hybrids.

In Michigan, Amman's data indicated that less than 2% of the birds necropsied or checked in hunters' bags were hybrid. Why the difference between Michigan and Manitoulin Island?

Mayr (1942) suggested that there were four kinds of isolating mechanisms which maintained the integrity of a species. There are ecological, ethological, mechanical and genetic isolating mechanisms. It seems likely that ethological mechanisms are the main operative system here. The booming display of the Prairie Chicken and the tail rattling display of the Sharptailed Grouse can be broken down into their component parts. They appear to be derived from five discrete displays of the Spruce Grouse grouped in different patterns in the two lek species.

There was little hybridization in Michigan between Prairie Sharptailed Grouse and Prairie Chickens which had lived sympatrically for thousands of years. Perception of the display differences on the part of hens would have been sharpened to the point of reducing hybridization to a minimum. Northern Sharptailed Grouse had probably never lived sympatrically with Prairie Chickens and the evolution of the perception of species distinctions had not evolved to the point where hybridization was a rare event. The sex ratio of the immigrant Sharptailed Grouse which entered museums was 48 female to 17 male. Most of the males I have examined were birds of the year which would have had little or no chance of breaking into the hierarchy of dominance of the existing lek groups of males on Manitoulin. I think it likely that the female Sharptails which bred mated with alpha Prairie Chickens on the leks on Manitoulin. Their progeny back-crossed to Prairie Chickens and occupied the rest of the island.

A RANGEWIDE GENETIC EVALUATION LESSER PRAIRIE-CHICKEN POPULATIONS.

C. A. HAGEN*, Division of Biology, Kansas State University, Manhattan, KS 66506 USA, S. J. OYLER-MCCANCE, U.S. Geological Survey, Denver, CO 80208 USA, and R. J. ROBEL, Division of Biology, Kansas State University, Manhattan, KS 66506 USA.

The lesser prairie-chicken (*Tympanuchus pallidicinctus*) has sustained marked reductions in suitable habitat over the last century. What remains is a highly fragmented distribution throughout the species range. The cumulative loss of habitat and declining population trends led to listing the lesser prairie-chicken as a warranted but precluded threatened species. It has been hypothesized that intrinsic factors may be contributing to the observed population trends. Such

was the case of greater prairie-chicken (*T. cupido*) populations in Illinois and Wisconsin that sustained population bottlenecks. Could similar processes be at work with the lesser prairie-chicken? We examined the genetic variation of 8 lesser prairie-chicken populations (n = 278 individuals) from 4 states Kansas (4, n = 112), Colorado (1, n = 15), New Mexico = (1, n = 63) and Oklahoma (2, n = 88) using sequencing data of 478 base pairs of a rapidly evolving portion of the control region of mitochondrial genome. Analysis of molecular variance indicated that 95% of the population structuring was explained by within-population variation, indicating reasonable levels of genetic diversity, but New Mexico had the lowest genetic diversity overall. Pairwise F_{ST} tests ($P < 0.002$) indicated substantial population structuring among the 8 populations, and was consistent with geographic subdivision of populations: Kansas (Finney, Kearny; [s. of Arkansas River]), Colorado, Kansas (Gove [n. of Arkansas River]), Oklahoma (Beaver, Harper) Kansas (Comanche[n. of Oklahoma border]), and New Mexico. Further work needs to examine genetic structuring and diversity of isolated populations.

SIX YEARS OF DATA FROM A STUDY OF LESSER PRAIRIE-CHICKENS IN SOUTHWESTERN KANSAS: AN OVERVIEW.

R. J. ROBEL*, C. A. HAGEN, B. E. JAMISON, J. C. PITMAN, and T. J. WALKER, JR., Division of Biology,. Kansas State Univ., Manhattan, KS 66506 USA, and R. D. APPLEGATE, Research and Survey Office, Dept. Wildlife and Parks, Emporia, KS 66801 USA.

The lesser prairie-chicken *(Tympanuchus pallidicinctus)* (LPCH) has sustained marked reductions in numbers over the past 100 years and now is considered for listing as a threatened species under the Endangered Species Act. Even though the decline in the LPCH population has been documented, few in-depth studies have been conducted to determine factors impacting LPCH populations. We initiated a 6-year study in the sand sagebrush *(Artemisia filifolia)* prairie of southwestern Kansas to more fully understand the dynamics of the LPCH population in that habitat. A total of 755 LPCH was captured and banded; 363 of which were fitted with radio transmitters. Recaptures and 39,969 daily locations of these birds allowed the determination of survival, nest success, dispersal, and impacts of human disturbance. Apparent LPCH nest success was 0.26 and chick survival to next breeding season was 0.11. Adult survival was similar for males (0.69) and females (0.67). Mammalian predation was the major mortality factor, followed by avian predation, accidents, and hunting. LPCH reacted negatively (nest locations and habitat use) to the presence of power lines, buildings, oil/gas wellheads, irrigation pumps, and improved roads. Females dispersed farther from their hatch site than males (? = 10 and 3 km, respectively). Demographic models projected a LPCH population decline due primarily to low nest success and poor chick survival, both of which were associated with vegetation structure. Alteration of vegetation structure of the sand sagebrush prairie has the potential to reverse the LPCH population decline by improving nest success and increasing brood survival.

BUSINESS MEETING

Keith Warnke called the business meeting to order at 3:10, Oct 1, 2003.

Roger Applegate, Christian Hagen, and Keith would be compiling the proceedings of this conference.

Items:

Approval of previous conference minutes.
Rick Baydack moved and Nova Silvy seconded that we approve the minutes of the 24th conference as published. Motion carried.

Treasurer's Report.

According to registration data, there were 132 persons in attendance at the conference. Registrants came from 16 states and 3 Canadian Provinces (Alberta, Manitoba, and Ontario). Wisconsin led the states with 47% of the registrants, followed by Kansas with 9%, Texas with 8%, and in decreasing order, Minnesota, Washington, Oklahoma, Iowa, South Dakota, Missouri, Illinois, Nebraska, New Mexico, Michigan, Colorado, North Dakota, and Indiana.

Of the 132 registrants, 125 were paid registrants. Of the 7 that didn't pay a fee, 2 were our guests (Bill Berg and Harry Lumsden), 2 were from the press, 2 had "name tags only", and 1 apparently did not pay their fee.

INCOME:

Registrations	$11,800.00
Donations	$3,750.00
Funds forwarded from 2001 PGTC Meeting	$1,500.00
Auction	$1,130.00
Raffle	$433.00

Total Income: $18,613.00

EXPENSES:

Adventures Restaurant (dinner, 2 lunches)	$3,927.17
Forts Folle Avoine (dinner, program)	$1,440.00
Kelli's Catering Kitchen (2 dinners)	$1,310.75
Prevost's Restaurant (lunch)	$520.00
Moquah Barrens refreshments	$120.00
Namekagon Barrens refreshments	$35.49
Meeting refreshments	$214.94
Ole and Lena entertainment	$500.00
The Lodge (meeting room, beer, breaks)	$1,362.98
Travel/lodging for invited guests	$615.00
Drawing for travel subsidy for 5 registrants	$250.00
Chippewa Trails bus rental (Thursday)	$1,140.00
Siren Bus Co. bus rentals (Tuesday)	$420.00
Embroidered shirts for registrants	$1,719.50
Wild rice for registrants	$216.00
Miscellaneous supplies	$17.95

Total expenses: $13,809.78

Forwarded to Nebraska (Scott Taylor) for PGTC 2005: $2000.00

Balance returned to donors on a prorated basis.

Draft policy re disposition of conference net gains.

Rick Baydack and Stephanie Harmon worked on the policy. They did not have it at this meeting, but it should be available for discussion in Nebraska.

Committee Reports.

John Toepfer continues to work on the PG Bibliography.

Next Host.

Mike Schroeder of Washington stated that they would be hosting the Western States Sage Grouse Working Group on June 29-July 1, 2004. He invited us to attend that meeting, which will be involving sharptail areas around Wenatchee.

Scott Taylor of Nebraska welcomed us to attend the 26th PGTC in or near Valentine, which was met with exuberant applause. Roger Applegate moved and Nova Silvy seconded that we accept the offer of Nebraska, and the motion carried.

New Business.

Roger Applegate commended Wisconsin for the excellent job they had done on this meeting, followed by a round of applause.

Jerry Kobriger is developing a 1 page guide to help hunters age birds, and would be happy to hear if anyone can help improve on it. He also uses it for educational purposes.

Christian Hagen is the contact for the listserver, and he also mentioned that the Spring Wildlife Society Bulletin will have a special section on Prairie Grouse, from the Bismarck meeting last year.

Bill Berg feels this organization should have a web page. Questions were raised about who and how. Christian Hagen will look into costs. Bill suggested that Dan Svedarski might be a good contact, and possible host.

North American Grouse Plan.

Rob Manes of WMI gave a presentation on why we need a North American Grouse Management Plan. This has been approved by NAFWC. Dan Dessecker of RGS will be writing the ruffed grouse chapter, and Terry Riley and Rob from WMI are both working on the plan. To accomplish the prairie grouse chapters will take some work. Steve Sherrod is looking for the right person and funding, and has some leads in that direction.

Roger Applegate moved and Nova Silvy seconded that PGTC endorse the process of developing this plan, and further stated that we should send a letter from PGTC to the International Association of Fish and Wildlife Agencies regarding our support. Motion carried.

Al Stewart moved we adjourn. Motion carried.

HAMERSTROM AWARD

The Hamerstrom Award was established in honor of Fred and Fran Hamerstrom, pioneers of prairie grouse research and management.

- The award is 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.
- The contribution should be evidenced by a sustained effort over at least 10 years.
- The contribution may be related to research, management activity, promotion of an integrated program, or some combination thereof.

Its 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 Recipe

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 of 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.

2003 Hamerstrom Award Recipient

Presented at the 25th Meeting of the Prairie Grouse Technical Council,
Siren, Wisconsin, September 29-October 3, 2003

This year's recipient is a native of Wisconsin, who received his B.S. and later his M.S. from the University of Wisconsin, Stevens Point. He also received a Ph.D. from Montana State University. He has been actively involved with prairie grouse management-oriented research for about 30 years in a number of states. His involvement might be described as a passion as few individuals would have been able to keep up the pace that he has kept for this period of time. He is a master at finding financial resources and improvising equipment to keep an ambitious multi-state research program going. Often, he has supported his research with personal finances.

The nomination of Dr. John E. Toepfer for this award lies in his total commitment and dedication to wildlife in general and prairie grouse in particular. He completed both his MS and PhD degrees working with prairie chickens. Although his main thrust was identifying problems in reintroducing chickens, he carried this search far beyond survival of birds from varied sources. Much of his investigations dealt with biology and behavior of birds from both penned and wild stock and how these data fit into success or lack of success in establishing a population. He pioneered and perfected the summer transplant method and compared results with the more common, and easier, spring transplants.

Following completion of his Doctorate, John took a job at Little Hoop Community College. During his time at the college, he continued his earlier work with reintroductions of prairie chickens, primarily on weekends and vacation time and mostly on his own expense (travel and equipment). His connection at Little Hoop Community College paved the way for a long-term study of sharp-tailed grouse nesting, brooding, and movement study on the Fort Berthold Reservation in western North Dakota. When he left this college position, he became chief consultant for the *Society Tympanuchus Cupido Pinnatus*, Ltd., and assumed leadership of the project entitled "Prairie Chickens and Grasslands: 2000 and Beyond" which continues today. He has continued to perfect techniques for reestablishing prairie chickens, and is without doubt the leading authority on summer trapping and transplanting of prairie grouse. Although the main thrust of his work has been in restoring prairie grouse populations in suitable habitat, he has obtained a wealth of data on biology of the chicken, which could only be collected by someone with the persistence and determination shown by Dr. Toepfer. This persistence includes many 24 hour sessions of relocating radioed birds, re-trapping individuals for battery replacement, and thus providing data on habitat use, movements and survival over several years for individual birds. We are unaware of any other data set gathered with this intensity. In so doing, he has re-defined the use of radio tagging and trapping techniques and his methods and procedures are now being used throughout the prairie grouse range. Much of these data have been gathered in the vicinity of Conservation Reserve Program acreages providing some of the first quantitative data on prairie grouse use of this habitat type. Dr. Toepfer has served as an expert consultant for nearly every state or province that has populations of prairie grouse, or University that has studied prairie grouse. This even includes a consulting trip to Martha's Vineyard, home of the last heath hen, where the Nature Conservancy is trying to restore that prairie.

In addition to his own work with prairie grouse, John has made himself available to help students on projects with other grouse species, as sage grouse, sharp-tailed grouse and ruffed grouse. Again, his expertise with these species, and with radio telemetry and trapping, and his willingness to help has proved invaluable to many graduate students and state and federal agencies.

More recently, John has taken the lead in researching the American bittern, identifying key wintering areas by radio-tracking breeding birds trapped on nesting areas in prairie habitat in the upper Midwest. The intensity and breadth that accompanies John's field efforts (from the upper Midwest to Florida and Texas) has provided a wealth of information on this little known prairie-breeding bird.

In the broadest sense, John is a prairie grouse ecologist, not too unlike the husband and wife for whom this award is named. He has a clear vision of research needs for prairie grouse. He is innovative and frequently challenges current or traditional thinking. John is so totally immersed in his work with prairie species that, even in this profession where commitment is the rule, John has few, if any, peers. Without reservation, we wholeheartedly recommend John for this award.

(Respectfully submitted by Robert L. Eng, William E. Moritz, Leonard L. McDaniel, and Jerry D. Kobriger)

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

Past 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	Fort 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

Mark your calendars for the 26th PGTC Conference in Valentine, NE - 2005

PROCEEDING EDITORS:
Keith Warnke, Roger Applegate, and Christian Hagen