2015 Annual Meeting

The Wildlife Society

CENTRAL MOUNTAINS and PLAINS SECTION

Colorado · Kansas · Nebraska
North Dakota · South Dakota · Utah · Wyoming

Hosted by
The Kansas Chapter of The Wildlife Society and Kansas State University

at the
Bluemont Hotel
1212 Bluemont Ave.
Manhattan, Kansas

August 10-13, 2015

Meeting theme:

"Grassland Strongholds: Biodiversity and Management"

Table of Contents

Overview

The Kansas Chapter of The Wildlife Society and Kansas State University are proud to host the 2015 meeting of the Central Mountains and Plains Section (CMPS) of The Wildlife Society in Manhattan, Kansas. The academic host, Kansas State University, is one of the region's top institutions in wildlife biology. K-State faculty and post-docs will be leading informative workshops on software packages (FRAGSTATS, R) that have become staple research tools in wildlife biology.

The theme for the meeting, "Grassland Strongholds: Biodiversity and Management," pertains, in part, to the ecoregion in which the meeting will be held: the Flint Hills, the largest remaining expanse of tallgrass prairie in North America. This unique landscape and its wildlife will feature prominently in the meeting's scientific program, field trips, and social venues. Further west in Kansas are most of the planet's Lesser Prairie-Chickens (*Tympanuchus pallidicinctus*), a species now federally designated as a threatened. In addition to management considerations regarding grassland wildlife, issues pertaining to threatened and endangered species will also be featured in afternoon panel discussions. We look forward to interacting with professionals from across the CMPS region and hearing about your contributions to wildlife biology and management.

Local Committee

Scheduling / workshops / field trips:
Chair: Bill Jensen (wjensen1@emporia.edu)
Dave Haukos (dhaukos@ksu.edu)
Bob Culbertson
(bob.culbertson@ksoutdoors.com)

Hotel / socials / banquet
Chair: Megan Smith
(megan.smith@ksoutdoors.com)
Matt Smith (matt.smith@ksoutdoors.com)
Dustin Mengarelli
(dustin.mengarelli@ksoutdoors.com)
Emily Ferlemann (ferlemann@cityofmhk.com)
Bill Jensen (wjensen1@emporia.edu)

Financial oversight:
Chair: JR Glenn (jrayglenn@yahoo.com)
Jim Hays (jim_hays@tnc.org)
Tom Swan (btswan@cox.net)

Fundraising (sponsors/donors and raffle):
Chair: Brad Rueschhoff
(brad.rueschhoff@ksoutdoors.com)
Pamela Moore (pmcclain@g.emporia.edu)
Carl Bowden (bowden03@ksu.edu)
Cale Hedges (rhedges2@g.emporia.edu)
Alexandria McChesney (mcchesne@ksu.edu)
Andrew Page (andrew.page@ksoutdoors.com)
Lucas Kramer (lucas.kramer@ksoutdoors.com)
Dylan Crawford (dbcrawf95@ksu.edu)
Taylor Gibson (taylor.gibson2011@gmail.com)

Scientific program:
Chair: Justin Hamilton
(justin.hamilton@ksoutdoors.com)
Vickie Cikanek
(vickie.cikanek@ksoutdoors.com)
Richard Rogers (rrogers1221@yahoo.com)
Jackie Gehrt (jgehrt94@gmail.com)
Bill Jensen (wjensen1@emporia.edu)

Schedule at a Glance

Dates & times	**Event**	**Venue** (*Bluemont Hotel)
Monday, August 10		
0800-1200	Workshop: FRAGSTATS	Excel Room, Bluemont*
1200-1300	Lunch	Local Manhattan eateries
1300-1700	Workshop: R	Excel Room, Bluemont
1300-1800	Registration	Pre-function area, Bluemont
1700-1900	Supper	Local Manhattan eateries
1900-2200	Opening social	Flint Hills Discovery Center
Tuesday, August 11		
0600-0800	Early-bird Field Trip	Konza Prairie Biological Station
0700-0815	Registration	Pre-function area, Bluemont
0800-0815	Welcome and announcements	Hartford Room, Bluemont
0815-0915	Plenary I: Ecology of Tallgrass Prairie (Briggs)	Hartford Room, Bluemont
0915-0930	Break	Pre-function area, Bluemont
0930-1130	Paper session	Hartford Room, Bluemont
1130-1300	Lunch	Local Manhattan eateries
1300-1500	Paper session	Hartford Room, Bluemont
1500-1520	Break	Pre-function area, Bluemont
1520-1700	Panel discussion I: T/E Species issues	Hartford Room, Bluemont
1800-2200	Supper, poster session, and social	Konza Prairie Biological Station
Wednesday, August 12		
0600-0800	Early-bird Field Trip	Bolton Wildlife Area
0700-0810	Registration	Pre-function area, Bluemont
0800-0810	Announcements	Hartford Room, Bluemont
0810-0910	Plenary II: Grassland management (Hovick)	Hartford Room, Bluemont
0910-0950	Paper session	Hartford Room, Bluemont
0950-1020	Break	Pre-function area, Bluemont
1020-1200	CMPS business meeting	Hartford Room, Bluemont
1200-1320	Lunch	Local Manhattan eateries
1320-1500	Paper session	Hartford Room, Bluemont
1500-1520	Break	Pre-function area, Bluemont
1520-1700	Panel discussion II: Tools for Conservation of Private Lands	Hartford Room, Bluemont
1700-1800	Pre-banquet social, auction and raffle bids	Pre-function area, Bluemont
1800-2300	Banquet, Plenary III (Manes), and Raffle	Hartford Room, Bluemont
Thursday, August 13		
0800-1200	Field Trip	Tallgrass Prairie Nat'l Preserve

Oral Presentation Guidelines

Those giving oral presentations should bring their presentation files (PowerPoint only) on USB flash drives to the registration desk, *during the Monday afternoon or Tuesday or Wednesday morning registration periods*, where the presentations will be uploaded (see registration schedule above and your time slot, pp. 5-7). Please name the file of your presentation thusly:

Last name_Day_Time

(e.g., "Ross_Tues_930"). Plenary speakers and discussion panelists notwithstanding, each speaker will be allotted 20 minutes: a 15-minute presentation followed by 5 minutes for questions and answers.

Plenary Presentations and Speakers

"Ecology of the tallgrass prairie"
Tuesday, 08:15, Hartford Room, Bluemont Hotel

Dr. John M. Briggs, Kansas State University

John M. Briggs is Professor of Biology and Konza Prairie Biological Station (KPBS) Director at Kansas State University (KSU). He received his B.S. and M.S. in Biology from Pittsburg State University (Pittsburg, KS.) and his Ph.D. in Zoology from the University of Arkansas-Fayetteville, AR. He was the Information Manager for the KPBS Long Term Ecological Research program at KSU from 1984 to 1998 and co-director of the KPBS LTER from 1990-1998. He served as Program Director of Ecology in the Division of Environmental Biology at the National Science Foundation from 1998-1999. In 1999 he relocated to Arizona State University (ASU), Department of Plant Biology. During his time at ASU, he served as Department Chair of Plant Biology, co-director of the LTER Central Arizona Program and was founding director of ASU GIS Certificate Program. He moved back to KSU to become the first full time director of KPBS in 2008. He has chaired or co-chaired eleven graduate student committees and has served on 46 graduate student committees. He has authored or co-authored over 80 peer-reviewed publications, seven book chapters and one book. As either Principal or Co-Investigator, his research grants have exceeded $22,000,000.00.

"Restoring heterogeneity as an approach to managing tallgrass prairie"
Wednesday, 08:10, Hartford Room, Bluemont Hotel

Dr. Torre Hovick, North Dakota State University

Torre received his M.S. from Iowa State University where he studied the roles of fire and grazing on Grasshopper Sparrow nest survival and post-fledgling survival in southern Iowa grasslands. He did his doctorate work at Oklahoma State University where he examined grassland bird responses to interacting fire and grazing at The Nature Conservancy's Tallgrass Prairie Preserve. This work focused on breeding and non-breeding grassland passerines and Greater Prairie-Chickens. Torre is currently an Assistant Professor at North Dakota State University in the School of Natural Resource Sciences-Range Program. His interests are broad but mostly evolve around fire and grazing in grasslands. Currently, Torre has students investigating prairie dependent butterflies, pollinators, bats, and of course, birds.

"Lessons learned in the conservation of tallgrass prairie"
Wednesday, 19:00, Hartford Room, Bluemont Hotel

Robert Manes, The Nature Conservancy, Kansas Chapter

With broad experience in the policy, technical, and management arenas, Rob Manes is a 34-year veteran of natural resource conservation. His professional experience includes both public agency service and private sector work. His career foundation is broad-based, including large-scale ecological planning, landscape conservation implementation, conservation education, land management, state and federal policy formulation, and executive leadership.
Since 2011, Manes has served as Director for The Nature Conservancy of Kansas. His career also included five years as Midwest Regional Representative for the Wildlife Management Institute and

nearly 20 years with the Kansas Department of Wildlife and Parks, where, as Assistant Secretary, he led all field operations from 1995 to 2000.

Manes' professional accomplishments and publications include major contributions to four publications on prairie chicken conservation; establishment of the Flint Hills Legacy Conservation Area (a one-million-acre easement-based national wildlife refuge expansion); formulation of conservation policy in three iterations of the federal Farm Bill; development of a 1.3-million-acre public recreational access program on private lands; national forest and grassland management policy and planning; national guidelines for wind energy development; one of the earliest publications on wind energy and wildlife interactions; a foundational paper on ecological compatibility certification of wind energy facilities; and one of the nation's first agreements to implement large-scale habitat mitigation for commercial wind energy facility impacts. Manes has served on boards of directors for the North American Grouse Partnership, Prairie Pothole Joint Venture, Tallgrass Legacy Alliance, and other private and public entities.

Manes resides in rural Wabaunsee County, Kansas with wife Stephanie and the two youngest of his four children. He values family, hunting, fishing, physical fitness, carpentry, livestock, church, music composition and performance, and quiet solitude.

Schedule of Oral Presentations and Panel Discussions

Abstracts and author affiliations for all oral and poster presentations are posted online at http://drupal.wildlife.org/kansas/. Author names below are presented as submitted.

*Tuesday, August 11 – **Hartford Room**, Bluemont Hotel*

0800-0815 Welcome and announcements

0815-0915 **Plenary I: Ecology of the tallgrass prairie.** John M. Briggs

0915-0930 *Break (Pre-function area)*

0930-0950 **Extreme drought events and changes in land cover interact to reduce resilience of the lesser prairie-chicken.** Beth Ross, David Haukos, Christian Hagen, and James Pitman

0950-1010 **Regional demographic variability for lesser prairie-chickens in Kansas and Colorado.** Daniel S. Sullins, David A. Haukos, Brett K. Sandercock

1010-1030 **There is no space like home: space use of nonbreeding lesser prairie-chickens.** Samantha Robinson, Reid Plumb, David Haukos, Scott Carleton, Andrew Meyers, Jonathan Reitz

1030-1050 **Lesser prairie-chicken space use response to anthropogenic structures among landscapes.** Reid T. Plumb, J. M. Lautenbach, S. G. Robinson, J. D. Kraft, D. Sullins, D. A. Haukos, J. C. Pitman, C. A. Hagen, and D. Dahlgren

1050-1110 **Female lesser prairie-chicken response to grazing in western Kansas grasslands.** John D. Kraft, Joseph Lautenbach, David Haukos, Jim Pitman, Christian Hagen

1110-1130 **Estimating abundance of the greater prairie-chicken in Kansas and Oklahoma.** Lyman McDonald, Troy Rintz, Kristen Adachi, and Grant Gardner

1130-1300 *Lunch (local Manhattan eateries)*

***Tuesday, August 11 – Hartford Room**, Bluemont Hotel (continued)*

1300-1320	**Grasshopper sparrows on the move: what explains variation in within-season breeding dispersal in a declining grassland songbird?** Emily J. Williams, W. Alice Boyle
1320-1340	**Responses of a grassland spider community to habitat structural heterogeneity driven by fire and bison grazing disturbances interactions.** Jesús E. Gómez and Anthony Joern
1340-1400	**Patch-burn grazing promotes pollinator diversity in Flint Hills rangelands.** Shelly Wiggam[1*], Andrew Ricketts[2], Gregory Zolnerowich[1], and Brian P. McCornack[1]
1400-1420	**Small mammal responses to patch-burn grazing in tallgrass prairie.** Andrew M. Ricketts and Brett K. Sandercock
1420-1440	**Old World bluestem invasion and its effects on the small mammal communities of north-central Oklahoma, USA: an ecological threshold.** Mitchell J. Greer, Morgan A. Noland, Karen R. Hickman, Gail W. T. Wilson
1440-1500	**Habitat Use by Secretive Marsh Birds in Moist-Soil Managed Wetlands in Eastern Kansas.** Eric Wilson, William Jensen, Richard Schultheis
1500-1520	*Break (Pre-function area)*
1520-1700	**Panel discussion I: Threatened and Endangered Species Issues**

***Wednesday, August 12 – Hartford Room**, Bluemont Hotel*

0800-0810	Announcements
0810-0910	**Plenary II: Restoring heterogeneity as an approach to managing tallgrass prairie.** Torre Hovick
0910-0930	**Ecological restoration and conservation outreach in the Osage Hills of Oklahoma.** Robert G. Hamilton
0930-0950	**Birds, butterflies, honey bees, dung beetles, and jackrabbits: today's coal-mine canaries: inconceivable or not!** Kenneth Higgins and Lora B. Perkins
0950-1020	*Break (Pre-function area)*
1020-1200	**Business meeting – Central Mountains and Plains Section of The Wildlife Society**
1200-1320	*Lunch (local Manhattan eateries)*
1320-1340	**Hunting in a modern landscape: a large-scale assessment of use of publicly accessible hunting lands.** Lindsey N. Messinger and Joseph J. Fontaine
1340-1400	**Gradient habitat modeling of regal fritillary (*Speyeria idalia*) and larval host plant using a distribution modeling approach with notes on life history attributes.** Kelsey McCullough, Gene Albanese, and David A. Haukos
1400-1420	**The influence of refining resource selection models based on multiple analyses at different scales: how do we move forward with on the ground management?** Mindy B. Rice, Anthony D. Apa, Liza Rossi

1420-1440	**Using occupancy models to determine wildlife food plot preference in Kansas.** Alan Tajchman, Peg Shaw-McBee
1440-1500	**Occurrence and prediction of avian disease outbreaks in Kansas.** Thomas Becker, Peggy Shaw-McBee, David Haukos
1500-1520	*Break (Pre-function area)*
1520-1700	**Panel discussion II: Tools for Conservation of Private Lands**

List of Posters

Posters are to be presented during the evening social at Konza Prairie Biological Station, Tuesday, August 11, beginning at 18:00. Poster presenters should have their posters hung by 18:00 and be present at their posters by 19:00. Abstracts and author affiliations for all oral and poster presentations are posted online at http://drupal.wildlife.org/kansas/. Author names below are presented as submitted.

Small mammal communities in experimentally manipulated sites within the Flint Hills tallgrass prairie. Donald W. Kaufman, Glennis A. Kaufman, and Dawn M. Kaufman

Expansion of the semi-arboreal white-footed mouse in tallgrass prairie: three decades of fire, woody invasion, and land-cover changes. Dawn M. Kaufman, Glennis A. Kaufman, and Donald W. Kaufman

Body size and reproduction of deer mice in anthropogenic and native habitats.
Glennis A. Kaufman and Donald W. Kaufman

Monitoring grassland species of greatest conservation need in Wyoming.
Andrea C. Orabona

Response of grassland passerine communities to tallgrass prairie restoration using summer fire and sheep grazing. Sarah Ogden, David Haukos, KC Olson, and Jack Lemmon

Timing of incubation breaks and predation risk for nesting greater prairie-chickens.
Mark R. Herse, V.L. Winder, L.M. Hunt, A.J. Gregory, L.B. McNew, and B.K. Sandercock

Pheasant hunting in the landscape of fear: modeling interactions between predator and prey habitat decisions. Lyndsie S. Wszola and Joseph J. Fontaine

The influence of watershed condition on avian use and diversity of playa wetlands in western Kansas.
Willow Malone and David A. Haukos

Public vs. leased: comparing acreages of public vs. private hunting lands in Nebraska.
Heather M. Johnson, Mark P. Vrtiska, and Karie Decker

Individual and sex-related variation in the long-distance vocalizations of Bengal tigers (*Panthera tigris tigris*). Emily L. Ferlemann and Courtney E. Dunn

Panel Discussions

Two panel discussions will be featured at the meeting during the afternoons of August 11 and 12 (see schedule, p. 3). The panel for each discussion will include experts in the field who are dealing with issues and programs related to the discussion topics and who can answer your questions and provide insightful advice. Each panelist will make a 15-minute presentation and the remainder of the time will be open discussion. This will be an open forum format, so come prepared with questions for our panelists.

Threatened and Endangered Species
15:20-17:00, Tuesday, August 11

Panelists:
Christian Hagen (Oregon State University)
Dan Mulhern (U.S. Fish and Wildlife Service)
Jim Pitman (Western Association of Fish and Wildlife Agencies)
Mark VanScoyoc (Kansas Department of Wildlife, Parks and Tourism)

The Endangered Species Act of 1973 has been touted as one of the most powerful and comprehensive tools for protecting imperiled species. The law has also presented some of the more contentious issues in natural resources management. The greater Central Mountains and Plains region has been host to prominent endangered species, such as the gray wolf (*Canis lupus*) and black-footed ferret (*Mustela nigripes*), in addition to newly-listed species, such as the lesser prairie-chicken (*Tympanuchus pallidicinctus*) and northern long-eared bat (*Myotis septentrionalis*). Panelists will include representatives from federal and state agencies, universities, and affiliated working groups.

Tools for Conservation of Private Lands
15:20-17:00, Wednesday, August 12

Panelists:
Andy Bishop (U.S. Fish and Wildlife Service, Rainwater Basin Joint Venture)
Michael Disney (PFW Program, U.S. Fish and Wildlife Service)
Mike Estey (U.S. Fish and Wildlife Service)
Stephanie Manes (Rangeland Trust of Kansas)
Brian Obermeyer (The Nature Conservancy)

The vast majority of the Central Mountains and Plains region is privately owned. Effective conservation must obviously include contributions by private landowners, agricultural producers being prominent among them. Many Farm Bill programs have been integral in subsidizing landowner efforts. Additionally, easement programs through the U.S. Fish and Wildlife Service and non-governmental organizations have emerged, including programs targeting the Flint Hills tallgrass prairie ecoregion, joint ventures, and mitigation opportunities.

Social Events and Banquet

Opening social, 19:00-22:00, Monday, August 10

On Monday evening we will meet at the **Flint Hills Discovery Center**, a new facility in Manhattan that showcases the ecology of the Flint Hills tallgrass prairie. We will have the opportunity to view the exhibits while reconnecting and socializing with our colleagues in wildlife biology and management. You may choose to dine at a local establishment beforehand, but light snacks (cheese, veggies, etc.) and non-alcoholic beverages will be served, along with complimentary beer and a cash bar. **Location:** 315 S. 3rd Street in downtown Manhattan, Kansas. From the Bluemont Hotel, head east on Bluemont Ave. 8 blocks to 14th St.; turn right. Go approximately 8 blocks to Pierre St.; turn left and continue 1 block to 3rd St. Turn right and you'll see the center with its tall, cylindrical, glass entryway.

Poster session and social, 18:00-22:00, Tuesday, August 11

For the second evening we will be meeting at the headquarters area of the world-renowned **Konza Prairie Biological Station**, a National Science Foundation Long Term Ecological Research site managed by Kansas State University and owned by The Nature Conservancy. Elk burgers and sides will be served for supper along with complimentary beer and non-alcoholic beverages. **Location:** Take K-177 south/east from Manhattan, crossing the Kanas River. Immediately turn right onto McDowell Creek Rd. after crossing the bridge. Follow McDowell Creek Rd. 6.2 miles to Konza Prairie Ln.; turn left.

***Banquet,* 17:00-23:00, Wednesday, August 12**

The banquet will be held at the Bluemont Hotel. The agenda is as follows:

- 17:00-18:00, Pre-banquet social and raffle bids (Pre-function area)
- 18:00-19:00, Banquet dinner (Hartford Room, henceforth)
- 19:00-19:10, Announcements
- 19:10-20:00, Plenary III by Robert Manes: "Lessons learned in the conservation of tallgrass prairie"
- 20:00-23:00, Silent auction and raffle drawings

Silent Auction and Raffle

Items donated for silent auction and raffle will be displayed in the Pre-function area for bids. Successful bidders will be announced at the banquet (see above).

Dining options in Manhattan

Your registration packet includes a list of locally-owned restaurants in this fine, Midwestern college town. "Aggieville" is the entertainment district adjacent to campus and a block south of the Bluemont Hotel. There are other fine establishments downtown and in west Manhattan. Enjoy!

Workshops

Landscape Spatial Pattern Analysis for Categorical Map Data
08:00-12:00, Monday, August 10, Excel Room, Bluemont Hotel

Instructor:
Dr. Gene Albanese, Research Associate/Instructor, Kansas Cooperative Fish and Wildlife Research Unit, Division of Biology, Kansas State University

Ecologists most often apply the patch-mosaic conceptual model to measure spatial heterogeneity in categorical maps. In a categorical map, landscape heterogeneity is represented as a collection of discrete areas or patches with abrupt boundaries and patches are assigned to a category based on the system property of interest. This model facilitates experimental design and landscape pattern analysis using well described and accepted tools and has furthered our knowledge of pattern/process relationships across ecological systems. The goal of this workshop is to introduce the patch-mosaic model and the analysis of spatial pattern in landscapes represented as categorical maps with the software program FRAGSTATS. FRAGSTATS is widely used, open release software that quantifies numerous spatial pattern metrics at different observational scales in categorical maps. Specifically, the workshop will provide an introduction to Landscape Ecology concepts that are important to an informed analysis of categorical map patterns with relevant examples. This will be followed by a more in-depth description of categorical pattern metrics and in particular, a demonstration and tutorial of categorical data analysis using the latest release of FRAGSTATS (v4.2). The course assumes basic background knowledge in GIS and concepts of Landscape Ecology.

Program R
13:00-17:00, Monday, August 10, Excel Room, Bluemont Hotel

Instructor:
Dr. Brett Sandercock, Professor of Biology, Division of Biology, Kansas State University

Program R is an open source programming language for statistical analysis and mathematical modeling. The software is freely available as a download from the CRAN website and has been widely adopted in the research community. Program R is available as a base package, and over 6,000 additional packages have been created by contributors to implement new statistical techniques and methods. The introductory workshop will provide an overview of the basics of data manipulation, programming, statistical functions, and graphics. Topics will include navigating in R, basic commands, tools for help and documentation, and how to install and work with packages. We will explore example datasets and demonstrate how to input and output files. Example scripts will be used to demonstrate how to calculate descriptive statistics, and the basics of significance testing and regression. Program R has great tools for visualizing data and creating publication quality graphs and we will use tools of the base package to create basic graphs. Participants will need to bring their own laptop computer, but no prior experience with Program R is required.

Field Trips

Unless otherwise stated (Konza trip), participants are responsible for transportation to the sites. On-site transportation will be provided as necessary.

Konza Prairie Biological Station, *0600-0800, Tuesday, August 11*

Konza Prairie Biological Station is the benchmark tallgrass prairie field station within the National Science Foundation's Long Term Ecological Research Program, approximately 8 miles (13 km) from Manhattan, Kansas. Konza Prairie is a 8,613-acre (3,487-ha) area that includes 50, watershed-scale experimental units where fire is applied annually (in different seasons, but mostly in spring), or every 2, 4, or 20 years. Additionally, there are several units treated with patch-burn grazing, a practice that is becoming common in tallgrass prairie for managing for grassland habitat heterogeneity and that will be described elsewhere in the meeting. The site is renowned internationally for ecological studies and is managed by Kansas State University and owned by The Nature Conservancy. Field trip leaders will showcase the ecological treatments on the site and the patch-burn grazing treatments.
Travel / where to meet: Participants should meet outside the west entrance to the Bluemont Hotel on Manhattan Ave. A KSU van will take you to the site. **Directions** for personal vehicles, should attendance exceed van seating capacity: Take K-177 south/east from Manhattan, crossing the Kansas River. Immediately turn right onto McDowell Creek Rd. after crossing the bridge. Follow McDowell Creek Rd. 6.2 miles to Konza Prairie Ln.; turn left.

Bolton Wildlife Area, *0600-0800, Wednesday, August 12*

Bolton Wildlife Area is located in the northern Flint Hills approximately 25 miles (40 km) from Manhattan, Kansas. In 1995, the Bolton family donated 640 acres (259 ha) of primarily native tallgrass prairie to the Kansas Department of Wildlife, Parks & Tourism (KDWPT). The property had been utilized as pasture for many years. In 2011, KDWPT removed 1.5 miles (2.4 km) of interior fences and revised range management on the site from an intensive-early stocking system to a patch-burn grazing system. With this change in grazing management, increased use of the area by grassland dependent birds has been apparent. Also, overall plant diversity and structure has improved markedly. Bolton Wildlife Area is open to public access. Public hunting is the primary use. Popular game species include northern bobwhite, greater prairie-chicken, and mourning dove.
Directions: Take K-177 south/east from Manhattan to I-70 (~8.5 miles). Take I-70 east to Exit 333 (K-139) at Paxico. In Paxico, take Paxico Rd. 2.5 miles north to Mulberry Rd; turn left. You will reach Bolton Wildlife Area in approximately 1 mile.

Tallgrass Prairie National Preserve, *0800-1200, Thursday, August 13*

One of the largest protected areas in the Flint Hills ecoregion, the 10,861-acre (4,397-ha) Tallgrass Prairie National Preserve is the only site dedicated to tallgrass prairie preservation within the National Park System. The site is also unique in being owned and co-managed by The Nature Conservancy (TNC) and the National Park Service (NPS). The site is managed with fire and grazing, the latter accomplished by bison and domestic cattle (and nematodes and grasshoppers, etc.). Much of the site is managed with patch-burn grazing, a practice that is becoming common in tallgrass prairie for managing for grassland habitat heterogeneity and that will be described elsewhere in the meeting. We will receive an interpretive tour from TNC and NPS staff. The trip is the final event of the meeting, taking place from 08:00 to noon on August 13. The site is approximately 54 miles (87 km) south of Manhattan, Kansas.
Directions: Take K-177 south from Manhattan. The Preserve is 54 miles south on K-177. You will pass through the town of Council Grove; turn right onto K-177 / US-56 / W Main St. and continue for a couple blocks, then continue south on K-177. The Preserve is on the west side of K-177.

Thanks to our generous sponsors!!!