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Grassland Gazette

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An Expanding Institute

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Worldwide, grasslands/savannas are the most important ecosystem type supporting human livelihoods, providing the base for agricultural and grazing economies while maintaining extensive and integrated ecosystem goods and services. The Institute of Grassland Studies was developed in 2008 in response to and follows naturally from a history of strong research programs in grassland studies at Kansas State University. Without doubt, KSU researchers have made major contributions to new knowledge about grassland structure and function, managing grasslands as renewable resources that support critically important grazing economies, and developing appropriate rationale and methods for its conservation and stewardship.

The Institute of Grassland Studies at KSU was established to meet a critical need – to expand the current high level research capacity of grassland study at KSU to an international level. IGS seeks to elevate the stature of KSU’s reputation in grassland science internationally, foster new and additional collaborations and extramural funding with scientists working on grasslands throughout the globe to facilitate more global competency of faculty and students to manage and conserve the world’s grasslands and their ecosystem goods and services.

Visiting Scholars (continued on p. 6)

Bison grazing at the KPBS
(photo by Judd Patterson)



The IGS expresses our appreciation to the scholars and scientists who contributed greatly to the caliber of research and international collaboration experienced at K-State. Their work has been an exciting addition and a valued platform for future interaction. The following researchers partnered with us for a short time, leaving their mark through field work, seminars, workshops, and synthesis. We are continuing to seek to host international scientists who would like to experience the professional interaction that K-State has to offer on a long-term basis, while conducting research on the unique ecology of this region.

(Continued on p. 2)

Visiting Scholars Program (continued)

The IGS seeks to host international scientists who would like to partner with us by completing a long term visit to the flint hills and our research facilities !

Dr. Niaping He (Inner Mongolian Grassland Research Station) visited Konza Prairie for 2 months (April-May, 2010) to establish collaborative research projects in carbon sequestration between the US and the Chinese Academy of Sciences with John Blair.

Dr. Shiguang Hao (Institute of Zoology, Chinese Academy of Sciences) visited for 1 week to develop research ties on grassland food web dynamics with Anthony Joern.

Dr. Gareth Phoenix, Department of Animal and Plant Sciences, University of Sheffield, UK visited for two weeks in September, 2010, hosted by Dr. Jesse Nippert to develop research collaborations in the impacts of environmental change on vegetation and ecosystem processes (particularly nutrient cycling and fluxes) and on how these ecosystem processes are affected by plant community structure (<http://www.sheffield.ac.uk/aps/staff/acadstaff/phoenix.html>).

Dr. Xin Xiaopin, Director of Hulunber Grassland Observation and Research Station, part of the Ecosystem Network of China was hosted by John Briggs in June 2010. Research collaborations in grassland structure and productivity using remote sensing and modeling tools were explored.

Dr. Yingzhi Gao, Professor at Northeast Normal University, Changchun, China visited in April 2010 to develop research possibilities with grassland ecologists at KSU. He attended an annual meeting of the Konza LTER to extend his ability to network.

IGS Fellow Research in the News

RESEARCHERS INVESTIGATE CAUSES OF POPULATION DECLINES OF PRAIRIE CHICKENS IN KANSAS

MANHATTAN -- In an avian equivalent of a rowdy campus bar, male Greater Prairie Chickens gather at booming grounds every spring to display for females. But long-term monitoring programs in Kansas have indicated major declines in this once common bird of the tallgrass prairie, according to two Kansas State University ecologists.

Investigating the population biology of prairie chickens has been the research focus of Brett Sandercock and Samantha Wisely, both associate professors in K-State's Division of Biology.

"Understanding ecological causes of declining numbers is an important first step in conservation," Sandercock said. "Our goal is to use a combination of genetic and demographic methods to understand the impacts of land use and land-cover change on prairie chicken population dynamics."

Field work at three sites in the Flint Hills and Smoky Hills has been directed by three K-State graduate students in biology: Lance McNew, **Council Grove**; Lyla Hunt, **Manhattan**; and Andy Gregory, **Wamego**. The project started in 2006, and the research team has now captured and collected genetic samples from more than 1,300 prairie chickens; put radio collars on 320 females; located 380 nests; and collected 16,500 locations to describe movements and habitat requirements.

(Press release continued on p.5)

An Anniversary Symposium...



REGISTER NOW!

www.dce.k-state.edu/conf/grassland

GRASSLANDS IN A GLOBAL CONTEXT

An Anniversary Symposium Celebrating 30 years of research at the Konza Prairie Biological Station and the LTER Program

SEPTEMBER 12-14, 2011

KANSAS STATE UNIVERSITY

Keynote Speaker:

Oswaldo Sala

An International leader in ecology and global environmental policy at Arizona State University.

Konza Researchers presenting along with International Grasslands Experts:

Robert Scholes (South Africa)

Richard Hobbs (Australia)

Sally Archibald (South Africa)

Shiquiang Wan (China)

Tim O'Connor (South Africa)

William Bond (South Africa)

On September 12-14, 2011, Kansas State University will sponsor the international symposium, entitled "Grasslands in a Global Context." The symposium is planned to celebrate important milestones reached at Konza Prairie Biological Station (KPBS) and the associated Konza Prairie Long-Term Ecological Research (LTER) program.

The conference strives to develop a current, comparative synthesis of grassland/savanna ecosystems within a global framework. With the development of Konza Prairie as a global research platform in grassland studies coinciding with the benchmark 30th and 40th year anniversaries of our research station and LTER program, the stage is set for a synthesis of past, ongoing and new research results in the context of global understanding of grassland systems. This synthesis is aimed at identifying generalities about the structure and function of grassland and savanna ecosystems around the globe, recognizing continental level differences of critical importance, while identifying significant research gaps that can drive future studies. In short, we hope that this conference will develop a critical synthesis.

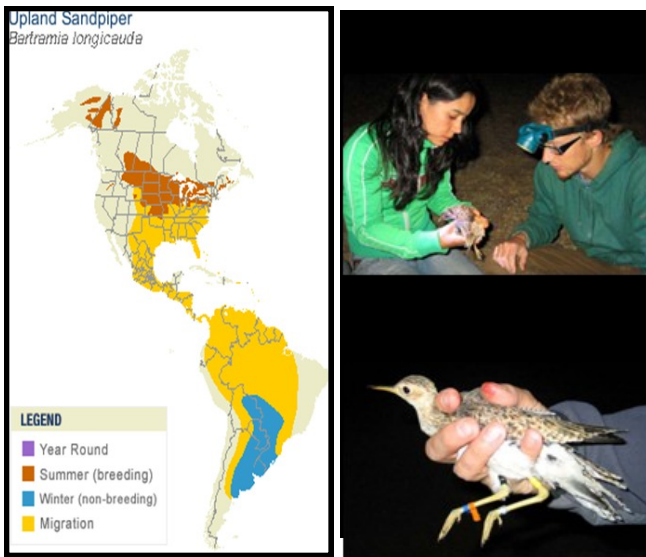
The KPBS was established in 1971, and the Konza LTER program formally

began in 1981 with support from the National Science Foundation and has grown into a world-class grassland ecological research facility and program. Research at Konza has also shifted over these 30 years from a more regional long term perspective to one of global use and scientific implications. With the emergence of Konza as a global research platform coinciding with the 30th anniversary of the LTER research program, the stage is set for a synthesis of past, ongoing, and new Konza research results with studies from other grassland systems from around the world. Such a synthesis will be invaluable for broadening

(Continued on p. 4)

Linking the Ecology of Migratory Birds Between Native Grasslands in North and South America

As part of a collaborative research project of Dr. Brett Sandercock of K-State and Dr. Matilde Alfaro-Barios of Uruguay, the IGS is supporting a comparative study linking the ecology of the Upland Sandpiper on Konza Prairie with that of the Greater Rheas of Tacuambo.



It is unusual to gain detailed ecological information for bird populations in both the breeding and wintering areas, despite the importance for developing appropriate conservation policy. We now know that despite low fecundity in Kansas rangelands, adult survival is ~70% per year. Seasonal survival is high during both breeding (KS) and nonbreeding (Uruguay) seasons, so most losses must occur during migration.

This is the first range-wide study of a grassland bird of conservation concern across continents. Such collaborative efforts sponsored by IGS is developing collaborative research infrastructure and great international training opportunities for students from institutions in U.S. and Uruguay.

- **Dr. Kiona Ogle** (University of Wyoming “Bayesian synthesis of plant and ecosystem carbon and water dynamics across four desert biomes”)

Symposium (Cont.)

...the level of inference of Konza results, identifying generalities in the functioning of grassland and grass dominated ecosystems around the globe and identifying critical research gaps that can drive future studies. Interactions among participants during the symposium and the accompanying syntheses that emerge will form the foundation of a collaborative book, advancing the synthesis of complimentary research at an international level. In short, we seek to place 40-years of site-based research from Konza Prairie into a global context with this symposium to improve our understanding of grasslands and savannas in both North America and around the world.

Learn more
about keynote
speakers
and
Conference
Registration:
www.dce.k-state.edu/conf/grassland

IGS Supported Seminars...

IGS has provided partial support during this year for visits by international and US scientists working in grassland systems to visit KSU, present seminars, and to work with KSU faculty to develop new funding opportunities.

- **Dr. Michael Kaspari** (University of Oklahoma),
- **Dr. Weixin Cheng** (UC-Santa Cruz)
- **Dr. Debra Peters** (USDA/ARS Jornada Research Station, NM).

Press Release: Wednesday, Oct. 27, 2010



"Our students have had great working relationships with private landowners," Sandercock said. "The project couldn't have been completed without support of ranchers and local communities."

Prairie chickens in Kansas have high genetic diversity and do not show any evidence of the inbreeding effects reported for more isolated populations, Wisely said. Reproductive potential is also good because females lay an average of about 13 eggs per nest and regularly re-nest if their first nest is destroyed.

"Population declines are clearly being driven by dismal rates of survival for nests, broods and incubating females," Sandercock said. "Most losses are due to predation, and our results are remarkably consistent among sites and years."

Predators have been investigated by videotaping prairie chicken nests and by deploying scent stations. Skunks, badgers and even gopher snakes have been recorded destroying eggs and young. Reproductive success is so low that in some years at least seven nesting females are needed to produce a single juvenile prairie chicken, Sandercock said.

"High levels of predation appear to be related to rangeland management," he said. "Intensive grazing and annual burning removes vegetative cover that prairie chickens need for concealment during nesting, and the spread of woody plants in areas of fire suppression has aided recovery of predator populations."

"Regional managers are very interested in our research results," Wisely said. "We look forward to providing the field data needed to develop improved mitigation strategies."

The collaborative research effort was initiated by the National Wind Coordinating Collaborative Wildlife Workgroup Grassland and Shrub Steppe Species Subgroup to establish whether there are effects from wind structures to prairie chickens in the Midwest. The research team is focusing current research efforts around the Meridian Way Wind Farm, a 201-megawatt wind facility recently built in north central Kansas. The effects of rangeland management on productivity of prairie chickens were discovered before turbines were erected. New data from ongoing monitoring since completion of construction could be used to improve siting guidelines for wind power facilities in Kansas, according to Sandercock and Wisely.

Oversight for the research project was provided by the National Wind Coordinating Collaborative, with funding from the U.S. Department of Energy, National Renewable Energy Laboratory, Kansas Department of Wildlife and Parks, National Fish and Wildlife Foundation, The Nature Conservancy, BP Wind Energy, Competitive Power Ventures, Horizon Wind Energy, Iberdrola Renewables and Next Era Energy Resources.

The National Wind Coordinating Collaborative provides a neutral forum so a wide range of stakeholders can pursue the shared objective of developing environmentally, economically, and politically sustainable commercial markets for wind power in the United States. The Grassland and Shrub Steppe Species subgroup of the collaborative's Wildlife Workgroup brings together representatives from state and federal agencies, private industry, academic institutions and nongovernmental organizations in a collaborative effort to identify critical research questions; secure and administer cooperative funding to conduct research; encourage peer-reviewed collaborative research; and identify both potential impacts and mitigation strategies to address any impacts. More information on the National Wind Coordinating Collaborative is available at <http://www.nationalwind.org>.



"Our goal is to use a combination of genetic and demographic methods to understand the impacts of land use and land-cover change on prairie chicken population dynamics."

Institute for Grassland Studies

*An Expanding
Institute (Cont.)*



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We're on the Web!

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*Enhancing Excellence in Grassland
Research in Kansas and Worldwide*

We continue to work actively to establish our international scholars program by encouraging KSU faculty to invite visiting international scientists to KSU. As a keystone component of IGS, designed to foster new fundable interactions with international scholars, the IGS program has blossomed with the presence and expertise of dynamic grassland/savanna ecologists that have contributed to a growing synthesis of research.

In addition, we recruited Dr. Angela Laws as a post-doctoral research associate to study grassland food-web dynamics. Dr. Laws received her PhD at the University of Notre Dame and has experience in trophic interactions in several North American grasslands.

British Grassland Research: Dr. Gareth Phoenix

From September 9-17th, IGS sponsored the visit of Dr. Gareth Phoenix, Lecturer from the Department of Animal and Plant Science, University of Sheffield, England. Dr. Phoenix is an ecosystem ecologist with research focused on the impacts of atmospheric nitrogen deposition on ecosystem structure and function. Dr. Phoenix delivered a dynamic departmental seminar to the Division of Biology focusing on a long-running N deposition experiment in an acidic and calcareous grassland in England. These experiments showed the capacity for N deposition to alter community structure with both grasslands showing an increase in grass abundance at the expense of forb species. He also related the threat of Nitrogen-deposition in a global context, with recent work showing that many of the world's Biodiversity Hotspots are predicted to experience considerable increases in N deposition over the coming century. This is driven largely by the occurrence of much of the world's floristic diversity

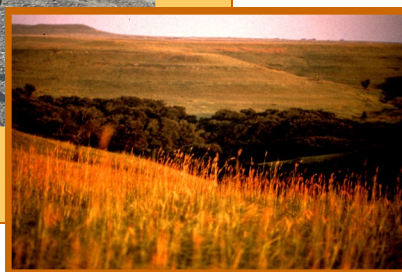
in developing nations undergoing industrialization, and suggests the threat of N deposition to global floristic diversity may be even greater than initially thought.

During his visit, Dr. Phoenix met with many faculty and graduate students in Biology and Geography at K-State. He also spent considerable time exploring the Konza

Prairie and discussing opportunities for new grassland research with KSU scientists.

Dr. Jesse Nippert and Dr. Phoenix are now developing new research possibilities on the impacts of dry-N deposition on grassland ecophysiology and link differences in foliar-N to grass canopy leaf density across a gradient of sites with low to high canopy density. During his stay, the group visited a variety of grasslands throughout Kansas, including the Tallgrass Prairie Preserve near Council Grove, and the Albertson Prairie, near Fort Hays State University, Hays, Kansas.

Dr Gareth Phoenix hiking at the Tallgrass
Prairie Preserve



- Jesse Nippert