



## Biennial Report 2018-2019

### Kansas Cooperative Fish and Wildlife Research Unit

We are pleased to provide this report highlighting activities and accomplishments of the Kansas Cooperative Fish and

Wildlife Research Unit for 2018-2019. This year marks the 29th year of the Kansas Unit at Kansas State University. On behalf of the greater than 30 Unit scientists, staff, graduate students, technicians, and associated undergraduate students, we would like to thank the myriad of people, governmental agencies, and nongovernmental organizations for their support of the Kansas Unit.

During the 2018-2019 reporting period, the Kansas Unit had 15 active research grants totaling \$7,923,813 in funding; graduated 2 graduate students; published 27 book chapters and journal articles; mentored 1 undergraduate student research project; and presented 82 presentations at professional meetings. Please see our updated website (<https://www.k-state.edu/kscfwru/>) for additional details and specifics relative to our reported activities.



Undergraduate student members of the BAE/DAS/GENAG 582 Natural Resources/ Environmental Sciences Project capstone course for the Natural Resources and Environmental Sciences secondary major led by David Haukos. Team members, from L-R, were Megan Rohrs, Emily Nottingham, Hallie Lucas, and Colbe Austin during Spring 2019.

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#### Kansas Cooperative Fish and Wildlife Research Unit

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## Current Unit Staff

Unit Leader—David Haukos  
Assistant Unit Leader—Martha Mather  
Office Manager—Tara Dreher  
Post-Doctoral Research Associates  
Dan Sullins (2017-2019)  
Bram Verheijen (2017-2020)

## Completed Graduate Students 2018-2019

**Adela Annis** (M.S., 2019; advisor Haukos). Ring-necked pheasant survival, nest habitat use, and predator occupancy in Kansas spring cover crops.

**Richard Lehrter** (M.S., 2018; advisor Mather). Links between food web structure, biodiversity, and resilience: effects of anthropogenic disturbance on aquatic communities in the Smoky Hill River, KS.

## Current Kansas State University Graduate Students (Graduation Date)

**Alixandra Godar** (Ph.D, GRA, Haukos). Ring-necked pheasant population and space use response to landscapes including spring cover crops. Biology (5/20)

**Talesha Karish** (Ph.D, GRA, Haukos). Resource selection and activity patterns of female mule deer and white-tailed deer in western Kansas. Biology (11/21)

**John Malanchuk** (Ph.D, GRA, Haukos). Assessment of temperate-breeding Canada goose management in Kansas. Biology (12/20)

**Carly Aulicky** (Ph.D, GTA, Haukos). Landscape patterns contributing to lek establishment and morphometrics of attending lesser prairie-chickens. Biology (5/20)

**Liam Berigan** (M.S., GRA, Haukos). Dispersal, reproductive success, and habitat use by translocated lesser prairie-chickens. Biology (12/19)

**Chris Gulick** (M.S., GTA, Haukos). Spatial ecology and resource selection by female lesser prairie-chickens within their home ranges and during dispersal. Biology (8/19)

**Maureen Kinlan** (M.S., GRA, Haukos). Survival and mortality factors for sympatric male white-tailed deer and mule deer among Kansas landscapes. Biology (12/20)

**Mitchell Kern** (M.S., GRA, Ricketts/Haukos). Fawn survival and bed-site selection of mule deer and white-tailed deer in western Kansas. Horticulture and Natural Resources (12/19)

**Jackie Gehrt** (M.S., GRA, Haukos). Greater prairie-chicken response to military activity on Fort Riley. Biology (2/21)

**Elisabeth Teige** (M.S., GRA, Haukos). Translocation of the lesser prairie-chicken to the Sand Sagebrush Prairie Ecoregion. Biology (5/21)

**Nick Parker** (M.S., GRA, Sullins/Haukos). Lesser prairie-chicken and grassland response to intensive wildfire in the mixed-grass prairie. M.S. Candidate, Kansas State University. Horticulture and Natural Resources (5/21)

## Completed and Active Research Projects 2018-2019

### *Completed*

Plum Island Ecosystems LTER

Coupled Climate, Cultivation, and Culture in the Great Plains: Understanding Water Supply and Water Quality in a Fragile Landscape

Dams and Fish Communities: Developing and Testing a Spatially-Explicit, Science-Based, Decision-Support Tool for Making Riverscape-Scale Management Decisions for Native Stream Fish Communities in the Neosho and Smoky Hill Rivers, KS

Use of Moist-Soil Management for Waterfowl on the Texas Coast

Climatic and Anthropogenic Forcing of Wetland Landscape Connectivity in the Great Plains

### *In Progress*

Ring-necked Pheasant Use of Cover Crops in Western Kansas

Use of Grazing Management and Prescribed Fire for Conservation of Lesser Prairie-Chickens

Lesser Prairie-Chicken Response to USDA Conservation Practices in Kansas and Colorado

Survival Rates, Habitat Selection, and Movement of Sympatric Mule Deer and White-tailed Deer in Kansas

Assessment of Resident Canada Goose Management in Kansas

Assessment of Lesser Prairie-Chicken Response to Translocation

Lesser Prairie-Chicken and Grassland Response to Intensive Wildfire in the Mixed-Grass Prairie

Response of Greater Prairie-Chickens to Natural and Anthropogenic Disturbance on Fort Riley

Historical Trends of the Landscape Structure of Plant Communities of Sand Shinnery Oak Prairie in the Southern High Plains: establishing a foundation for the restoration of lesser prairie-chicken populations (with C. Portillo-Quinero, B. Grisham, and C. Boal of Texas Tech University; project based at Texas Tech University)

Structure and connectivity of mid-continental snowy plovers (Conway, W.C., D.P. Collins, C.W. Boal, D.A. Haukos, W.P. Johnson, P. Schmidt, and B.A. Grisham; Texas Tech University)



Information booth at the Lenora Summer Festival highlighting the mule deer and white-tailed deer project.

## Publications 2018-2019

### *Book Chapters*

- Albanese, G., and D. Haukos. 2019. Toward a theory of connectivity among depressional wetlands of the Great Plains: resiliency to natural and anthropogenic disturbance within a wetland network. In Press in E. Beever, S. Prange, and J. Franklin (editors). *Disturbance Ecology and Biological Diversity: Context, Nature, and Scale*. CRC Press/Taylor and Francis Group.
- Caldas, M., M. Mather, J. Bergtold, M. Daniels, G. Granco, J. Aistrup, D. Haukos, A.Y. Sheshukov, M. Sander-son, and J.L. Heier Stamm. 2019. Lessons learned in operationalizing interdisciplinary collaboration. Pages 265-294 in Dr. Stephen Perz, editor. *Social-Ecological Systems Science*, University of Florida, Gainesville.

### *Journal Articles*

- Andersson, K., C.A. Davis, G. Harris, and D.A. Haukos. 2018. Nonbreeding duck use and management contribution trends for Central Flyway refuges. *Journal of Fish and Wildlife Management* 9:45-64.
- Ashbaugh, H.M., W.C. Conway, D.A. Haukos, D.P. Collins, C.E. Comer, and A.D. French. 2018. Evidence for exposure to selenium by breeding interior snowy plovers (*Charadrius nivosus*) in saline systems of the Southern Great Plains. *Ecotoxicology* 27:703-718.
- Becker, T.A., A.A. Ahlers, S. Hesting, and D.A. Haukos. 2018. Spatiotemporal distribution of waterfowl disease outbreaks in Kansas, USA. *Prairie Naturalist* 50:4-14.
- Fritts, S. R., B. A. Grisham, R. D. Cox, C. W. Boal, D. A. Haukos, P. McDaniel, C. A. Hagen, and D. U. Greene. 2018. Interactive effects of severe drought and grazing on the life history cycle of a bioindicator species. *Ecology and Evolution* 8:9550–9562.
- Gerber, K. M., M. E. Mather, and J. M. Smith. 2019. Multiple metrics provide context for the distribution of a highly mobile fish predator, the blue catfish. *Ecology of Freshwater Fish* 128:141-155.
- Gerber, K. M., M. E. Mather, J. M. Smith, and Z. Peterson. 2019. Evaluation of a field protocol for internally-tagging fish predators using difficult-to-tag ictalurid catfish as examples. *Fisheries Research*: 209:58-66.
- Haukos, D.A., C.W. Boal, S. Carleton, and B. Grisham. 2018. Roles of Cooperative Research Units in contemporary conservation of natural resources. *Transactions of the North American Wildlife and Natural Resources Conference* 80:124-132.
- Hellgren, E.C, D.J. Austen, D.A. Haukos, J.R. Mawdsley, J.F. Organ, and B.K. Williams. 2018. Barriers and bridges in reconnecting natural resources science and management: summary of a workshop. *Transactions of the North American Wildlife and Natural Resources Conference* 81:215-221.
- Hitchman, S. M., M. E. Mather, J. M. Smith, and J. S. Fencel. 2018. Habitat mosaics and path analysis can improve biological conservation of aquatic biodiversity in ecosystems with low-head dams. *Science of the Total Environment* 619–620:221–231.
- Hitchman, S.M, M. E. Mather, J. Smith, and J. Fencel. 2018. Identifying keystone habitats with a mosaic approach can improve biodiversity conservation in disturbed ecosystems. *Global Change Biology* 24:308-321.

## Publications 2018-2019

- Lautenbach, J.M., D.A. Haukos, D.S. Sullins, C.A. Hagen, J.D. Lautenbach, J.C. Pitman, R.T. Plumb, S.G. Robinson, and J.D. Kraft. 2019. Factors influencing nesting ecology of lesser prairie-chickens. *Journal of Wildlife Management* 83:205-215. 180:66-86.
- Meyers A.R., S.A. Carleton, W.R. Gould, C. Nichols, D.A. Haukos, and C.A. Hagen. 2018. Temporal variation in breeding season survival and cause-specific mortality of lesser prairie-chickens. *Journal of Fish and Wildlife Management* 9:496-507.
- Ogden, S., D.A. Haukos, K.C. Olson, J. Lemmon, J. Alexander, G.A. Gatson, and W.H. Fick. 2019. Grassland bird and butterfly response to sericea lespedeza control via late-season grazing pressure. *American Midland Naturalist* 181:127-169.
- Plumb, R.T., J.M. Lautenbach, S.G. Robinson, D.A. Haukos, V.L. Winder, C.A. Hagen, D.S. Sullins, J.C. Pitman, and D.K. Dahlgren. 2019. Lesser prairie-chicken space use in relation to anthropogenic structures. *Journal of Wildlife Management* 83:216-230.
- Riecke, T.V., W.C. Conway, D.A. Haukos, J.A. Moon, and C.E. Comer. 2019. Nest survival of black-necked stilts, *Himantopus mexicanus*, on the upper Texas Coast. *Waterbirds In Press*.
- Robinson, S.G., D.A. Haukos, R.T. Plumb, J.D. Kraft, D.S. Sullins, J.M. Lautenbach, J.D. Lautenbach, B.K. Sandercock, C.A. Hagen, A. Bartuszevige, and M. A. Rice. 2018. Effects of landscape characteristics on annual survival of lesser prairie-chickens. *American Midland Naturalist* 180:66-86.
- Robinson, S.G., D.A. Haukos, R.T. Plumb, J.M. Lautenbach, D.S. Sullins, J.D. Kraft, J.D. Lautenbach. C.A. Hagen, and J.C. Pitman. 2018. Nonbreeding home range size and survival of lesser prairie-chickens. *Journal of Wildlife Management* 82:374–382.
- Ross, B.E., D.A. Haukos, and P.T. Walther. 2018. Quantifying changes and drivers of mottled duck density in Texas. *Journal of Wildlife Management* 82:374–382.
- Ross, B.E., D.A. Haukos, C. Hagen, and J. Pitman. 2018. Combining multiple sources of data to inform conservation of Lesser Prairie-Chicken populations. *Auk* 135:228-239.
- Ross, B.E., D.S. Sullins, and D.A. Haukos. 2019. Using an individual-based model to assess common biases in lek-based count data to estimate population trajectories of lesser prairie-chickens. *PLoS ONE* 14(5): e0217172.
- Sullins, D.S., D. A. Haukos, J. Craine, J. M. Lautenbach, S. G. Robinson, J. D. Lautenbach, J. D. Kraft, R. T. Plumb, B. K. Sandercock, and N. Fierer. 2018. Identifying diet of a declining prairie grouse using DNA metabarcoding. *Auk* 135:583–608.
- Sullins, D.S., J.D. Kraft, D.A. Haukos, S.G. Robinson, J. Reitz, R.T. Plumb, J.M. Lautenbach, J.D. Lautenbach, B.K. Sandercock, and C.A. Hagen. 2018. Selection and demographic consequences of Conservation Reserve Program grasslands for lesser prairie-chickens. *Journal of Wildlife Management* 82:1617-1632.
- Sullins, D.S., W.C. Conway, D.A. Haukos, and C.E. Comer. 2019. Using pointing dogs and hierarchical models to evaluate American woodcock winter habitat. *Proceedings of 11th American Woodcock Symposium In Press*.
- Verheijen, B.H.F., D.M. Varner, and D.A. Haukos. 2018. Effects of large-scale wetland loss on network connectivity of the Rainwater Basin, Nebraska. *Landscape Ecology* 33:1939–1951.
- Verheijen, B.H.F., H.L. Clipp, A.J. Bartolo, W.E. Jensen, and B.K. Sandercock. 2019. Effects of patch-burn grazing on density and territory size of dickcissels. *Avian Conservation and Ecology* 14:7.

## Awards and Recognition

### David Haukos

The Wildlife Society – Wildlife Publications Award – Edited Book 2018. D. Haukos and C. Boal, editors. Ecology and Conservation of Lesser Prairie-Chickens.

Texas Chapter of The Wildlife Society Scientific Publication of the Year Award: Book 2018 for D. Haukos and C. Boal, editors. Ecology and Conservation of Lesser Prairie-Chickens.

The Wildlife Society – Caesar Kleberg Award for Excellence in Applied Wildlife Research. 2019.

### Martha Mather

Promoted to Adjunct Professor, Division of Biology, Kansas State University

### KDWPT

The Wildlife Society— 2019 Federal Aid in Wildlife Restoration Award—Wildlife Research and Surveys Category, “Lesser Prairie-Chicken Habitat Use, Survival, and Recruitment”

### Ed Koger—Research Cooperating Landowner

Central Mountains and Plains Section of The Wildlife Society—2018 Citizen’s Conservation Achievement Award

### Hallie Lucas—Undergraduate Research Assistant

Haymaker Award—Outstanding Senior, Division of Biology

### Graduate Student Travel Grants

7 Students, 22 Grants, \$8,600

## Professional Presentations

Total—82; 8—Invited

29—The Wildlife Society

20—Kansas Natural Resource Conference

8—International Grouse Symposium

5—Midwest Fish and Wildlife Conference

3—American Fisheries Society

2—Society of Range Management

3—oSTEM

3—American Ornithological Society



Talesha Karish, Maureen Kinlan, and Mitchell Kern presented results from their mule deer and white-tailed deer research at the annual meeting of the Kansas Bowhunters Association.

## Teaching

*Graduate Student Teaching Assistants—Total 19 sections*

Principles of Biology (10 sections), Organismic Biology (1 section), Mammalogy (4 sections), Wildlife Management and Techniques (3 sections), Advanced Habitat Management (1 section)

*David Haukos*

Introduction to Fisheries, Wildlife, and Conservation Biology (BIOL 433; Spring 2018, 2019)

Habitat Ecology and Management (BIOL 890; Fall 2019)

Population Biology (BIOL 640; Fall 2018)

Natural Resources/Environmental Science (NRES) Capstone Course (Spring 2019)

*Dan Sullins and David Haukos*

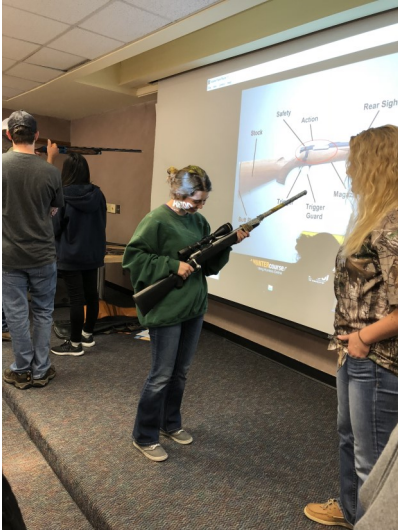
Modeling Distribution and Resource Selection of Organisms (BIOL 890; Fall 2018)

*Bram Verheijen and David Haukos*

Design and Analyses of Wildlife Population Studies (BIOL 890; Fall 2019)

## Undergraduate Research

Hallie Lucas. Project: Comparison of avian diversity in playa wetlands along a latitudinal gradient.



In conjunction with KSU Research and Extension and the Kansas Department of Wildlife, Parks, and Tourism, the KSU Student Chapter of The Wildlife Society organized and hosted a Hunter Safety Certification course during fall 2019.



Current and previous members of the Kansas Cooperative Fish and Wildlife Research Unit gathered at the 2018 annual meeting of The Wildlife Society in Cleveland, Ohio.

## Service

### **CRU Research Work Orders Administered**

Where do we look and what should we do: examining the hard questions of chronic wasting disease management and surveillance – Trevor Hefley, Statistics Department

Multi-scale factors influencing occurrences of Topeka Shiner (*Notropis topeka*) in the Flint Hills, Kansas – Keith Gido, Division of Biology

### **David Haukos**

4 M.S. and 2 Ph.D Graduate Committees Member; 3 defended in 2018-2019; Clemson University, University of Missouri, Texas Tech University, Kansas State University

Editor-in-Chief, Wildlife Society Bulletin

Associate Editor, Journal of Fish and Wildlife Management

Adjunct Professor, Texas Tech University

Member, KSU Institutional Animal Care and Use Committee

Faculty Advisor, KSU Student Chapter of The Wildlife Society

Technical Representative, Great Plains Cooperative

Ecosystems Study Unit

KSU Representative for North Central Climate Science Center

Member, Great Plains LCC Science Team

Member, Playa Lakes Joint Venture Science Advisory Team

Board Member At Large – Kansas Chapter of TWS (2017-2018)

Member of the KDWPWT Threatened and Endangered Task Committee

Science Team, STG and GPC Interstate Working Group

Member, USFWS Lesser Prairie-Chicken Species Status

Assessment Science Team

Kansas Alliance of Wetlands and Streams – Board Member 2018-Current

Abstract Reviewer, The Wildlife Society 2018 and 2019 Annual Meetings

External Reviewer, P/T Application, University of Wyoming, 2018

Reviewed draft report for BLM SGP Rapid Environmental Assessment Vol II (Species and Assemblages)

External Reviewer, P/T Application, Montana State University, 2019

Reviewed and scored 2 proposals for Wind Wildlife Research Fund, 2019

Served on a USGS RGE Panel, 2019

### **Martha Mather**

Membership Committee, Kansas Chapter American Fisheries Society 2012-2018, Member and Co-Chair

Professional Liaison Committee, Kansas Chapter American Fisheries Society, 2018, Member and Chair

Judge, Best Student Poster, National AFS meeting, 2018

Subject Editor, Wetlands Ecology and Management

Member, Most Promising Undergraduate Student Committee, Kansas State University, 2017, 2018, 2019

Judge, Kansas State University Graduate School Research Forum, 2017, 2018

Presenter, Faculty Data Blitz, Student Recruitment, 2018

Faculty Host, David Crook, Oz to Oz Seminar Speaker, October, 2018



## KSCFWRU COORDINATING COMMITTEE

