# The Natural Enquirer

FORT HAYS STATE UNIVERSITY DEPARTMENT OF BIOLOGICAL SCIENCES

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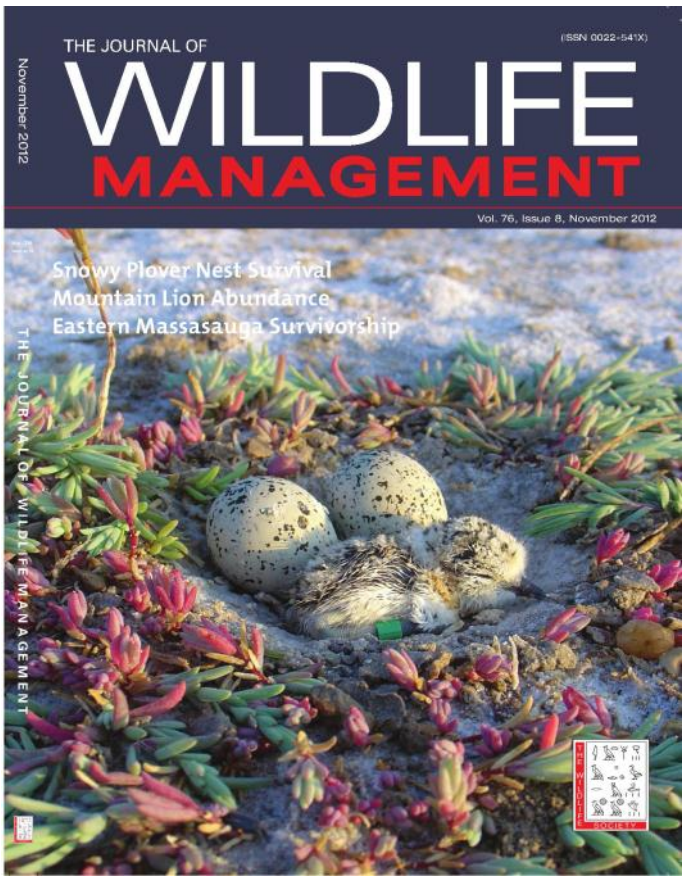



FHSU Biology alumnus **Matt Sexson**'s (MS, 2006) photograph of a snowy plover nest was featured on the cover of the Journal of Wildlife Management.

The following article was published in this issue: Sexson, M. G. and G. H. Farley. 2012. Western snowy plover nest survival in Kansas and effective management to counter negative effects of precipitation. Journal of Wildlife Management 76:1587-1596.

At the Kansas State Science Fair in Wichita, KS (March 29-30), Kansas Academy of Math and Science (KAMS) students Hayley Disney and Quentin Aker won second prize overall in Division I (grades 9-12), qualifying them for the International Science and Engineering Fair in Phoenix, AZ. They also won the following: 1st place in the Botany category, U.S. Stockholm Junior Water regional winner, U.S. Army certificate, and Kansas BioScience award winner.

Quentin Aker (l), and Hayley Disney (r)

**Inside this issue:**

## The Kansas Academy of Science annual meeting (April 5-6, 2013, Overland Park, KS)

*Oral Presentations:*

Caudle, K.L. and B.R. Maricle. Ecophysiological responses of salt marsh plant communities to spilled oil in experimental meso-cosms. (**3rd place oral presentation by an undergraduate student**).

Cheeseman, A. E. and E. J. Finck. Spatial and temporal diet analysis of two Mephitidae as determined by $\delta^{13}C$ and $\delta^{15}N$ stable isotope analysis. (**3rd place oral presentation by a graduate student**).

Maricle, B.R., K.L. Caudle, K.J. Lindsey, S.G. Baer, and L.C. Johnson. Effects of extreme drought on photosynthesis and water potential of *Andropogon gerardii* (big bluestem) ecotypes in common gardens across Kansas.

*Poster Presentations:*

Betzen, B.M., C.M. Smart, K.L. Caudle, and B.R. Maricle. Effects of salinity on photosynthesis and water potential in native and non-native salt marsh species. (**3rd place poster by an undergraduate student**).

Biggs, T.N., S.J. White, A. Meraz, N.G. Maforo, and B.R. Maricle. Effect of ethanol toxicity on enzyme activity in anaerobic respiration in plants.

Caudle, K.L., L.C. Johnson, S.G. Baer, and B.R. Maricle. Influence of precipitation on trichome densities in big bluestem (*Andropogon gerardii*) ecotypes grown in reciprocal gardens. (**2nd place poster by an undergraduate student**).

Caudle, K.L., L.C. Johnson, S.G. Baer, and B.R. Maricle. Non-destructive vs. destructive methods of measuring leaf chlorophyll content in *Andropogon gerardii* ecotypes.

Disney, H.L., Q.C. Aker, and B.R. Maricle. Effects of drought on Kansas turf grasses.

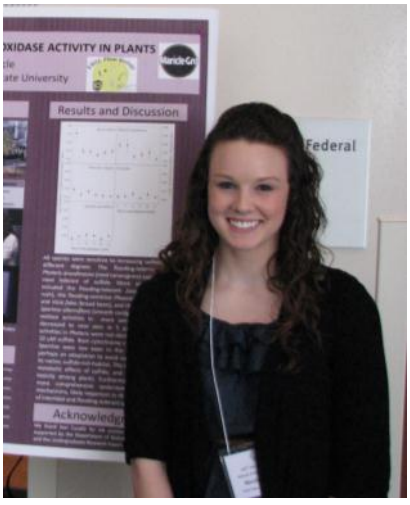
Elledge, S. and J. J. LaFantasie. Germinable populations under native and yellow bluestem grass stands in southern mixed grass prairie.

Honig, A., R. Bond, and Y. Kobayashi. Identification of brain-specific aromatase (CYP 198) gene and common gonadotropin alpha subunit gene in orangethroat darter (*Etheostoma spectabile*).

Maricle, B.R., M.M. Gray, J. Bryant, A. Jensen, A. de la Cruz, K.L. Caudle, J.T. Olsen, S.G. Baer, M. Knapp, and L.C. Johnson. A possible mechanism for increased performance of a xeric adapted big bluestem (*Andropogon gerardii*) ecotype: Nitrogen and chlorophyll content of leaves in reciprocal gardens across the Great Plains.

Martin, N.M. and B.R. Maricle. Effect of sulfide toxicity on root cytochrome *c* oxidase activity in plants.

Samantha Elledge




Nicole Martin

Amber Honig

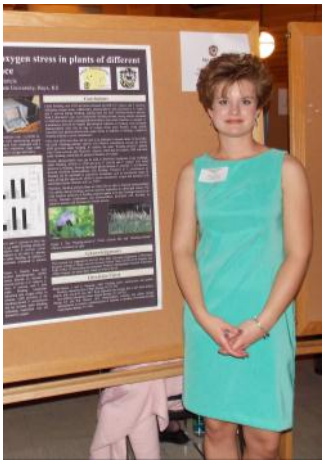
The Rangeland Conservation Planning (BIOL 634) class took an amazing trip to **Yellowstone National Park** for a seminar on Stewardship of Public Lands. The class learned about the economic and social aspects of public land and wildlife conservation, speaking with ranchers, members of the Wolf project, members of the Yellowstone association and other stakeholders. They also had some incredible wildlife watching experiences with numerous wolf, bison, elk, pronghorn, American dipper, and other bird sightings.

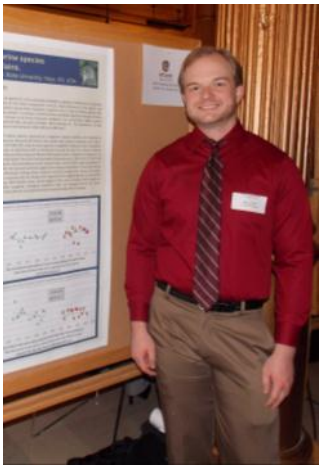
**Front row**: Nina Luna, Kasandra Brown, Jordge LaFantasie, Jessica Casey, and Andree Brisson.

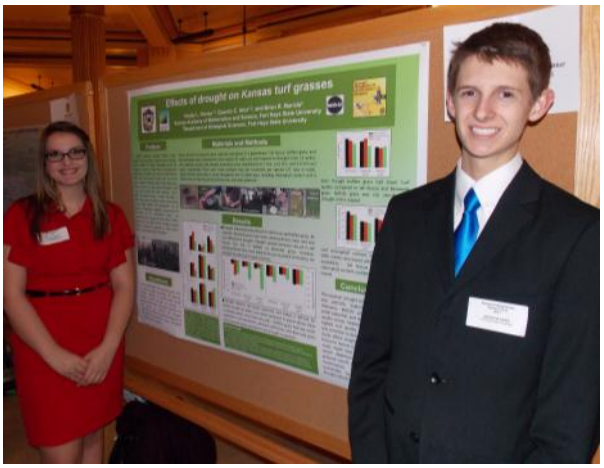
**Back row**: Anthony Luna, Clint Helms, Christina Khim, Sarah Bailey, and Kyle Broadfoot.

Mammoth Springs, Yellowstone National Park

**Undergraduate Research Day** at the Capitol Building in Topeka, KS, April 3. Keri Caudle, Jeff Carter, Hayley Disney (KAMS), and Quentin Aker (KAMS) presented results of their work.








Kansas Academy of Math and Science (KAMS) students working in the Department of Biological Sciences presented the following at the **Kansas State Science Fair** in Wichita, KS, March 29-30:

Betzen, B.M., C.M. Smart, K.L. Caudle, and B.R. Maricle. Effects of salinity on photosynthesis and plant water potential in native and non-native salt marsh species.

Disney, H.L., Q.C. Aker, and B.R. Maricle. Effects of drought on Kansas turf grasses.

Bliss Betzen (l), Cera Smart (r)

Shorebirds at Bioblitz, April 20th, Quivira NWR, Stafford County, KS. Photograph by Ian Cost

## Society for Range Management annual meeting (Feb. 2-8, 2013, Oklahoma City, OK)

*Oral presentations:*

Schmidt, S. W. and E. J. Finck. Habitat associations of grassland birds along a gradient of eastern redcedar encroachment in Central Kansas.

Tanis, B. P. and E. J. Finck. Influence of wind turbines on mammalian occupancy patterns.

*Poster presentations:*

Casey, J. L., J. J. LaFantasie and K. R. Harmoney. Timing and intensity of cattle use on Old world bluestem (B*othriochloa ischaemum*) and blue grama (*Bouteloua gracilis*) in southern mixed-grass prairie.

Helms, C. J., J. J. LaFantasie, G. H. Farley and R. Penner. Effects of grazing treatments on nest success of wet meadow breeding birds at Cheyenne Bottoms Preserve, Barton County, KS.

Rusk, A., A. Pettibone, J. J. LaFantasie, S. Casey, R. Nicholson and K. Harmoney. A continued analysis of the population expansion of yellow bluestem in Kansas southern mixed grass prairie.

The Undergraduate Range Management Exam (URME) team of **Chandra Devine, Helena Harmison,** and **Adam Rusk** placed 5th out of 24 collegiate teams at the Society for Range Management Annual meeting in Oklahoma City, OK, and **Adam Rusk** finished second out of 219 students in the individual competition.


(l-r): Dr. Jordge LaFantasie, Adam Rusk, Chandra Devine (Dept. of Agriculture), and Helena Harmison.

In order to do well on the URME, students needed to be able to interpret scientific tables and figures and calculate a variety of applied problems. They also needed to be able to answer questions ranging from plant physiology and ecology to grazing management, rangeland economics, ecosystem manipulation methods, soil chemistry, and sampling techniques.

The exam is difficult (the top score was an 86%), and their performance can be attributed to their education here at FHSU as well as several hours of practice on a weekly basis. This is the first time FHSU has ever placed in the top five of the URME. Congratulations Chandra, Helena, and Adam!!

Dr. Richard Packauskas, Bradley Bott, and Ryan Shofner attended the 89th Annual meeting of the **Kansas Entomological Society** at Pittsburg State University, Pittsburg, KS, on April 13th. Brad Bott took third place among all student presenters for his presentation on the "Investigation of the gut flora of a western Kansas dung beetle, *Canthon pilularius*".

## Robert Noyce Scholarship winners

Two FHSU students majoring in Biology and Secondary Education were selected for the National Science Foundation's Robert Noyce Scholarship. **Karli Henning** and **Julie Weber** will each receive $12,000 during their senior year in 2013–2014.

The Noyce Scholarship Program was established to increase the number of quality teachers at the secondary education level (grades 6–12) in the subjects of biology, chemistry, earth sciences, math, and physics who teach in high-needs areas, such as rural and inner-city schools. The scholarship is available to juniors and seniors. In addition to the financial support, the awardees will receive special instruction in topics related to teaching in high-needs schools, such as using distance-learning technology and financial issues facing small, rural schools.

Additional support is provided for undergraduate research experiences, travel to professional meetings, and other activities during the first 3 years of teaching. The awardees also will work with a mentor to help them through the transition to teacher-leaders. In return for the scholarship, the awardees must complete their major in science or math secondary education and teach for 2 years in a high-needs school for every year they were awarded the scholarship.

Julie and Karli were among 6 scholarship recipients at FHSU for the 2013–2014 academic year, along with 2 students in math and 1 each in physics and chemistry. A committee of representatives from the FHSU Science and Mathematics Education Institute and the departments of Biological Sciences, Chemistry, Geosciences, Math, Physics, and Teacher Education selected the awardees based on their GPAs (overall and in their science or math major), written personal statements, letters of recommendation, and interviews. Congratulations to Julie and Karli!

## *Graduate School Honors Reception, May 15*

Congratulations to **Jen Klaus** (outstanding GTA award), and **Joanna Fay** and **Amanda Cheeseman** (outstanding thesis awards).

L-R: Jen Klaus, Dr. Greg Farley, Jessica Casey, Dr. Eric Gillock, Dr. Jordge LaFantasie, Brian Tanis, Ryan Schofner, Joanna Fay, Clint Helms, Dr. Elmer Finck, and Dr. Rob Channell.

Outstanding GTA Jen Klaus with advisor Dr. Rob Channell (photobomb courtesy of Dr. Eric Gillock).

## Graduate Student News:

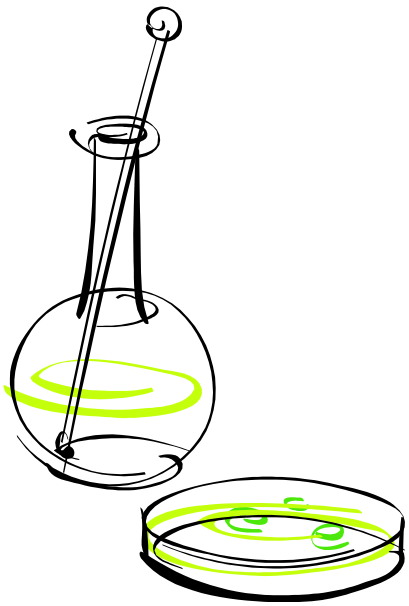
Graduate students completing their oral examinations this semester:

Lisa Prowant  Jessica Casey  Clinton Helms

Chris Baroody  Brian Zink

Congratulations to students completing their Master's degrees in Spring 2013!!

**Joanna Fay** was born and raised in Dighton, KS. She received her B.S. in Biology in 2011 from FHSU. While working on her master's degree in the department of Biological Sciences, she was a GTA for one year, receiving two GTA awards, and a recipient of the Balthazor fellowship for one year. Joanna's research interests include pathogenesis, intercellular communication, and microbial ecology, and she hopes to eventually teach at the university level. *Thesis title: Antimicrobial-Producing Bacteria Isolated from Petroleum-Laced Hypersaline Soil.*



### Justin Kerby II

*Thesis title: Effects of long-term exposure to kanamycin and/or ampicillin on resistance genes on an E. coli plasmid.*

### Jeffrey Sekavec

*Area of research: Chlorhexidine resistance exhibited in a Gram-negative bacterium.*

Congratulations to students completing their Master's degrees in Spring 2013!!

**Amanda Cheeseman** graduated from Michigan State University in 2009. She will be working at the Cary Institute in Millbrook, NY, this summer, and will begin Ph.D. studies under Dr. Jonathan Cohen at the State University of New York college of Environmental Science and Forestry in Syracuse this fall. Her Ph.D. work will be focusing on habitat associations and demography of New England cottontails and eastern cottontails in the Hudson Valley area, NY. *Thesis title: Stable isotope analysis of two Mephitidae species reflects population trends and landscape structure.*

Amanda's Fleharty presentation this semester was entitled: "Long-term changes in diet composition of Kansas Mephitidae as determined by stable isotope mixed model analyses".

**Brian Tanis** will be starting a Ph.D. program in Zoology at Oregon State University this fall. *Thesis title: Influence of wind turbines on mammalian occupancy patterns.*

**Sarah Rages** will be moving to Stillwater, OK to pursue alternative licensure in secondary science education. Her report title was: *Morphological Systematics of Pimephales*. She observed differences in bone morphology between the four different species of the Cyprinid (Teleostei) genus *Pimephales*: *P. notatus*, *P. vigilax*, *P. tenellus*, and *P. promelas*. Her goal was to hypothesize phylogenetic relationships between the species, since an in-depth osteological study had not been conducted to date and molecular studies were inconclusive.

Ducks at Bioblitz, Quivira NWR, Stafford County, KS April 20th.

Photograph by Ian Cost

## Kansas Natural Resources Conference (January 24-25, 2013, Wichita, KS)

*Oral presentations:*

Casey, J.L., J.J. LaFantasie, and K.R. Harmoney. Timing and intensity of cattle use on Old World bluestem (B*othriochloa ischaemum*) and blue grama (*Bouteloua gracilis*) in southern mixed-grass prairie.

Cikanek, V. and G. Farley. Habitat characteristics surrounding prairie chicken leks of different sizes in northwestern Kansas.

Helms, C.J., J.J. LaFantasie, G.H. Farley, and R. Penner. Effects of grazing treatments on nest success of wet meadow breeding birds at Cheyenne Bottoms Preserve, Barton County, KS.

Hofmeier, J., W. Stark, Y. Kobayashi, and E. Gillock. Antimicrobial resistance of channel catfish intestinal microflora in the Arkansas and Ninnescah Rivers in Kansas.

Oyster, J., E. J. Finck, and M. Peek. Evaluation of distance sampling as a technique to monitor pronghorn in Kansas.

Rusk, A., A. Pettibone, J. J. LaFantasie, S. Casey, R. Nicholson, and K. Harmoney. A continued analysis of the population expansion of yellow bluestem in Kansas southern mixed grass prairie.

Tanis, B. and E. J. Finck. (2013) Influence of wind turbines on mammalian mesocarnivore occupancy patterns.

Zinke, B. and E. J. Finck. Small mammal community structure at a dried wetland site.

**Armadillo** sighted at Bioblitz!

Quivira NWR, Stafford County, KS
April 20th

Photograph by Ian Cost

**Kansas Wetlands Education Center news:**

Activities at the Kansas Wetland Education Center on Saturday, April 27 began with the first annual Wild Goose Chase 5k/1mile Fun Run at Cheyenne Bottoms at 9:00 am, followed by a Kansas Raptor Show, featuring live birds of prey, presented by staff from the Milford Nature Center at 11:00 am. At 6:30 pm that evening, author, and radio show producer Laura Erickson presented "101 ways to help birds", at the Barton Community College Auditorium. More information can be found on the KWEC website: http://wetlandscenter.fhsu.edu

## Southwestern Association of Naturalists (SWAN) 60th annual meeting (April 4-6, 2013, McNeese State University, Lake Charles, LA):

*Oral presentations:*

Broadfoot, K., R. Channell, and W. Stark. Spatial association of the Texas horned lizard and harvester ants (*Pogonomyrmex* spp.) in south-central Kansas.

Brown, K., R. Channell, and W. Stark. Sexual dimorphism among populations of the Texas horned lizard (*Phrynosoma cornutum*) in south-central Kansas.

Prowant, L., R. Channell, and W. Stark. Inferring species distributions of herpetofauna in south-central Kansas for conservation planning.

Rusk, A., R. Channel, and W. Stark. An analysis of habitat use among four lizard species in south-central Kansas.

*Poster presentation:*

Pfannenstiel Klaus, J. and R. Channell. Dispersal of antibiotic-resistant bacteria near central plains feedlots.

**Mark Eberle** delivered "**SWANsong 2013 in 4D: A New Pair of Glasses**" as closing banquet remarks for SWAN's 60th annual meeting. The meetings are held at various sites, typically universities, in the region south of 40 degrees north latitude (the northern border of Kansas) and west of the Mississippi River in the USA and Mexico. Mr. Eberle also completed the second of two years as Immediate Past-President following two years each as President-Elect and President. Past-Presidents become life members of the SWAN Board of Governors.

Bioblitz, April 20th, Quivira NWR, Stafford County, KS.

Photograph by Ian Cost

Kansas IDeA Network of Biomedical Research Excellence (**K-INBRE**) meeting
(January 19-20, 2013, Manhattan, KS):

*Poster presentations:*

Biggs, T.N., S.J. White, A. Meraz, N.G. Maforo, and B.R. Maricle. Effect of ethanol toxicity on enzyme activity in anaerobic respiration in plants.

Fay, J., and E.T. Gillock. Antimicrobial producing bacteria isolated from petroleum-laced hypersaline soil.

Hofmeier, J., W. Stark, Y. Kobayashi, and E.T. Gillock. Antimicrobial resistance in channel catfish intestinal microflora in the Arkansas and Ninnescah Rivers.

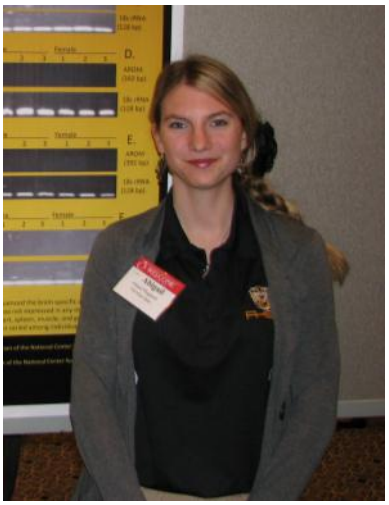
Honig, A., R. Bond, and Y. Kobayashi. Identification of brain-specific aromatase (CYP 198) gene and common gonadotropin alpha subunit gene in orangethroat darter (*Etheostoma spectabile*).

Kerby II, J.W.R. and E.T. Gillock. Effect of long-term exposure to kanamycin and/or ampicillin on resistance genes in an *E. coli* plasmid.

Pflughoeft, A. and Y. Kobayashi. Identification of brain-specific aromatase (CYP 198) gene and examination of its mRNA expression in various tissues of northern plains killifish (*Fundulus kansae*).

Sekavec, J.G. and E.T. Gillock. A healthcare issue: Chlorhexidine resistance exhibited in a Gram-negative bacterium.

Jordan Hofmeier



Abigail Pflughoeft

Taylor Biggs

**Abigail Pflughoeft** was accepted into the University of Kansas medical school,

and **Madison Edwards** was accepted into the Medical Technology program at Wichita State University


Bioblitz, April 20th, Quivira NWR, Stafford County, KS. Photograph by Ian Cost

## Alumni News:

University of North Carolina School of Medicine researchers including **FHSU biology alumnus Dr. Lance Thurlow** (BS 2002, MS 2005) have been conducting research on a strain of MRSA (methicillin-resistant *Staphylococcus aureus*) called USA300. Their findings identify specific genes that enable the bacteria to be resistant to otherwise toxic skin compounds called polyamines. This discovery provides a promising target in the treatment of the dangerous USA300 strain.

*Thurlow, L. R., G. S. Joshi, J. R. Clark, J. S. Spontak, C. J. Neely, R. Maile, and A. R. Richardson. 2013. Functional modularity of the arginine catabolic mobile element contributes to the success of USA300 methicillin-resistant Staphylococcus aureus. Cell Host & Microbe 13:100-107.*

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