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Front Cover: Max Stieben (left) and Charlie Stieben examine a Western Slender Glass Lizard (*Ophisaurus attenuatus*) from Ellis County, Kansas. Discoveries such as these at a young age often make a lasting impression and may contribute to an increasing environmental awareness as children grow to adulthood. Photograph by Travis W. Taggart, Hays, Kansas.

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KHS BUSINESS

REPORT ON THE KANSAS HERPETOLOGICAL SOCIETY 32nd ANNUAL MEETING

The *Kansas Herpetological Society* held its 32nd Annual Meeting at Yates Hall, Pittsburg State University, in Pittsburg, Kansas, on 4–6 November 2005. Approximately 125 participants (Figure 1) attended scientific paper sessions to listen to over 30 talks on amphibians, turtles, and reptiles by scientists and students from across the nation.

During its business meeting, the KHS elected a new slate of officers (Figures 2 & 5). Ginny Weatherman (University of Kansas, Lawrence) was voted president-elect for 2006, Eric Kessler (Blue Valley North High School) as treasurer, and Mary Kate Baldwin (Topeka Collegiate School) as secretary. Curtis Schmidt (Sternberg Museum of Natural History, Fort Hays State University) currently is president-elect and takes office as president on 1 January 2006. David Oldham (Pittsburg State University) served as president during 2005, and hosted the meeting this year.

During the Society business meeting, Daniel D. Fogell (KHS Awards Committee) announced that Lynett Bontrager of Emporia State University was this year's recipient of the *Howard K. Gloyd-Ed-*

ward H. Taylor Scholarship (Figure 3). The scholarship of \$100.00 honors the memory of two great herpetologists (and KHS Distinguished Life Members) with strong ties to Kansas. Gloyd was born in Ottawa, Kansas, and attended both Kansas State University and the University of Kansas, and Taylor graduated from Garnett (Kansas) High School and was a faculty member for decades at the University of Kansas. Next, Fogell awarded the *Alan H. Kamb Grant for Research on Kansas Snakes* to George R. Pisani, Kansas Biological Survey in Lawrence (Figure 4). The \$100.00 grant honors the memory of longtime KHS member Al Kamb of Lawrence. Also, during the KHS Business Meeting, the assembled members approved the amendment to the KHS By-laws that removes the cap on annual dues (see *Journal of Kansas Herpetology* 14 for the complete text of the amendment).

At the start of the Saturday night KHS auction, Larry L. Miller, Northern Hills Junior High School, Topeka, Kansas (Figure 6), was chosen as the eighth recipient of *The Suzanne L. and Joseph T. Collins Award for Excellence in Kansas Herpetology*. Larry was selected



Figure 1. Some of the 125 participants attending the 32nd annual meeting of the Kansas Herpetological Society at Pittsburg State University, Pittsburg, Kansas, on 4–6 November 2005. Photograph by Larry L. Miller.

for this honor by the KHS Awards Committee, which judged his image of a Common Snapping Turtle to be the best of a Kansas amphibian, turtle, or reptile displayed during the KHS photography competition. For his excellent photograph, Larry was given a commemorative certificate and a check for \$1,000.00 by KHS president David Oldham. *The Collins Award* is the largest biological award given annually in the state of Kansas, and the largest annual presentation made nationally for research (even-numbered years) or photography (odd-numbered years) of amphibians, turtles, and reptiles. Judges for *The Collins Award* during 2005 were Daniel D. Fogell (University of Nebraska, Omaha) and Travis W. Taggart (Sternberg Museum of Natural History, Fort Hays State University, Hays).

After a welcome by Dr. James Triplett, chairperson of the PSU Biology Department, KHS President David Oldham introduced the Society's featured speaker at the two-day event, Dr. Stanley E. Trauth (*Arkansas State University, State University, Arkansas*). Stan spoke about the Arkansas herpetofauna and his talk was very well received and generated much interest about these creatures, some of which are found in Kansas.

Other speakers for the scientific paper sessions on Saturday included (in order of presentation): Walter E. Meshaka (*State Museum of Pennsylvania, Harrisburg*) on Big Grasslands: Land of the Big Snakes;

Kelly J. Irwin (*Arkansas Game & Fish Commission, Benton*) on Western Diamondback Rattlesnakes in Arkansas; Rod Wittenberg (*University of Arkansas, Fayetteville*) on Timber Rattlesnakes in a fragmented landscape; Eva Horne (*Kansas State University, Manhattan*) on ectoparasites and female choice in the Eastern Collared Lizard; Henry S. Fitch (*University of Kansas, Lawrence*) on dramatic geographical changes in squamate species on the Fitch Natural History Reservation; Travis W. Taggart (*Fort Hays State University, Hays, Kansas*) on the Kansas Herpetofaunal Survey: A Summary; Rafe Brown (*University of Kansas, Lawrence*) on acoustic adaptation to the environment by Asian frogs; Joseph R. Milanovich & Stanley E. Trauth (*Arkansas State University, Jonesboro*) & David A. Saugey (*U.S. Forest Service, Jessieville, Arkansas*) on the reproductive ecology of the Western Slimy Salamander in an abandoned mine shaft; David McLeod (*University of Kansas, Lawrence*) on herpetofaunal diversity and ecology in Thailand; Lisa K. Irwin (*U.S. Fish & Wildlife Service, Conway, Arkansas*) & Susan Walls (*U.S. Geological Survey, Lafayette, Louisiana*) on amphibian disease monitoring in the lower Mississippi River valley; Kiyoshi Sasaki (*Oklahoma State University, Stillwater*) on influences of an indigenous belief system on snakes; and Bruce Young & Virginia Barnes (*Washburn University, Topeka*) on the question: Do snakes have gaits?

Speakers for the scientific paper sessions on Sunday included: Charles Linkem & Rafe Brown (*University of Kansas, Lawrence*), Arvin Diesmos (*National Museum of the Philippines*), Djoko Iskander (*Bandung*



Figure 2. Current and newly-elected officers of the Kansas Herpetological Society. Front row (L–R): Mark R. Ellis (field trip co-chairperson), Travis W. Taggart (editor), Eric Kessler (treasurer) & David Oldham (president). Back row (L–R): Eva Horne (past president), Curtis J. Schmidt (president-elect), Ginny Weatherman (newly-elected president-elect), Derek Schmidt (field trip co-chairperson), Mary Kate Baldwin (secretary) & Larry L. Miller (out-going field trip co-chairperson). Photograph by Suzanne L. Collins.



Figure 3. Lynett Bontrager was the 2005 recipient of the KHS Gloyd-Taylor Scholarship. Here she receives a commemorative certificate and a check for \$100.00 from KHS Awards Committee Chairperson Daniel D. Fogell. Photograph by Suzanne L. Collins.



Figure 4. At the Society Business Meeting on Saturday, 5 November, George R. Pisani received the 2005 *Alan H. Kamb Grant for Research on Kansas Snakes* for his research at the Kansas Biological Survey, Lawrence. Accepting the award for George, who could not be present, is Joe Collins, also from the KBS. Photograph by Suzanne L. Collins.

Institute of Technology, Indonesia), Chris Austin (*Louisiana State University, Baton Rouge*) & Jim McGuire (*University of California, Berkeley*) on the phylogeny of southeastern Asian Emerald Green Tree Skinks, genus *Lamprolepis*; Craig Hassapakis (*Amphibian & Reptile Conservation, Modesto, California*) & Joseph T. Collins (*CNAH*) on the future of scientific publishing in herpetology; Cameron Siler (*University of Kansas, Lawrence*), Angel Alcalá (*Silliman University*) & Rafe Brown (*University of Kansas, Lawrence*) on the phylogeny of the frog genus *Kaloula*; Dustin Wilgers & Eva A. Horne (*Kansas State University, Manhattan*) on variation in predation on snakes on a fire-disturbed tallgrass prairie; Juan Manuel Guayasamin (*University of Kansas, Lawrence*) on relationships of Glass Frogs (*Centrolenidae*) based on morphology and DNA; Bryan Maher (*Emporia State University, Kansas*) on snake community structure on a native prairie; Kyle Hesed (*University of Kansas, Lawrence*) on the ecology of a Thai pit viper; Robert Powell (*Avila University, Kansas City, Missouri*) on the herpetology of the Dutch Windward Islands; Dustin Wilgers, Eva A. Horne, Brett K. Sandercock & Allan W. Volkmann (*Kansas State*

University, Manhattan) on effects of land management practices on a tallgrass prairie herpetofauna; Bruce Eichhorst & Christie Coleman (*University of Nebraska, Kearney*) on herpetofaunal composition and abundance between riparian woodland and clear-cut areas in Dawson County, Nebraska; Dwight R. Platt (*Bethel College, North Newton*) on a study of Ornate Box Turtles on a sand prairie in southcentral Kansas; Curtis J. Schmidt & Travis W. Taggart (*Fort Hays State University, Hays, Kansas*) on the status of Fowler's Toad in Kansas; Tracy Patten, Daniel D. Fogell & James D. Fawcett (*University of Nebraska, Omaha*) on habitat use and seasonal activity of *Masasaugas* in Nebraska; Daniel D. Fogell (*University of Nebraska, Omaha*) on a herpetofaunal inventory of the Missouri National Recreational River; Jeremy S. Lane & Richard T. Kazmaier (*West Texas A&M University, Canyon*) on daily movements of Texas Horned Lizards; Joseph T. Collins (*Kansas Biological Survey, Lawrence*) & Suzanne L. Collins (*CNAH*) on the herpetofauna of Custer State Park, South Dakota; Michael Rochford (*Fort Hays State University, Hays, Kansas*) on herpetofaunal observations in southern California; Sarah R. McCoy (*Pittsburg State University, Kansas*) on the herpetofauna of the Marais des Cygnes National Wildlife Refuge.

Abstracts for many of these talks appear elsewhere in this issue of the *Journal of Kansas Herpetology*.

The Saturday evening KHS auction (Figures 8–10) garnered \$1,580.00 for the Society treasury, spurred once again in part by the extraordinary offering of original artwork by Eva Horne and Ted Leonard, excellent donations of herpetological books by Suzanne L.



Figure 5. Kathy Ellis (left, Wakarusa) and Ginny Weathersman (Lawrence) were both nominated for the position of KHS president-elect. Ginny won, but Kathy has the big smile—she doesn't have to conduct the annual meeting in 2007. Joe Collins gets the hugs. Photograph by Larry L. Miller.



Figure 6. Larry L. Miller (R), former KHS president, was the eighth recipient of *The Suzanne L. & Joseph T. Collins Award for Excellence in Kansas Herpetology* for his image for a Common Snapping Turtle, judged the best entry displayed in the KHS photography competition at the 32nd annual meeting of the Kansas Herpetological Society at Pittsburg State University, Pittsburg, Kansas, on 5 November 2005. Here, Larry (Topeka) and runners-up Andy Durbin (Lawrence) and Aubry Heupel (Iowa) display their stellar images. Photograph by Suzanne L. Collins.

Collins (CNAH) and herpetological color photographs by Larry L. Miller (Kansas Heritage Photography), and also by the hard work of auction assistants Ginny Weatherman, Anna Tarnowski, Laura Acuff, and Grace Ann Johnson, who so ably assisted KHS auctioneer Joe Collins.

Meeting Chairperson and KHS President David Oldham (Figure 7) deserves the generous thanks and appreciation of the KHS membership for putting together a memorable meeting. David was aided in his task by a local committee consisting of himself, Sarah McCoy, and James Triplett. To them all we owe our enthusiastic cheers. And, of course, we must recognize the stalwart and sterling efforts of Mary Kate Baldwin (KHS Secretary) and Eric Kessler (KHS Treasurer); both kept us financially frugal and fulfilled through their fiscal work (Figure 11). Finally, our thanks to Eric Thiss of Zoo Book Sales for his contributions to the KHS auction.

In 2006, the Society will meet in Hays (talks and coffee, free beer and auction) under the auspices of Curtis J. Schmidt, who will serve as KHS President during that year. For more precise information on the

33rd Annual Meeting of the KHS in November 2006, bookmark and regularly check the KHS meeting web site (updated constantly as new information becomes available) at

<http://www.ku.edu/~khs/AnnualMeetingInfo.html>



Figure 7. President David Oldham is interviewed about the KHS meeting by the local TV station. Photograph by Larry L. Miller.



Figure 8. L-R: Ginny Weatherman, Anna Tarnowski, Joe Collins, Laura Acuff & Grace Ann Johnson offered up the goodies at the KHS auction on 5 November 2005 at the Lincoln Center in Pittsburg, Kansas. Photograph by Suzanne L. Collins.



Figure 9. Ginny Weatherman, who will become president-elect of the KHS on 1 January 2006, indicates she evolved during the KHS auction on 5 November 2005 at the Lincoln Center in Pittsburg. The change was not immediately apparent. Photograph by Suzanne L. Collins.



Figure 10. Anna Tarnowski was ready to handle any scenario during the KHS auction at Lincoln Center in Pittsburg, Kansas. Photograph by Larry L. Miller.



Figure 11. Mary Kate Baldwin and Eric Kessler kept track of it all during the KHS meeting at Pittsburg State University. Photograph by Larry L. Miller.

Images of the 32nd Annual Meeting
Kansas Herpetological Society
Pittsburg, Kansas
4–6 November 2005



KHS president David Oldham prepares to dispense words of wisdom to a very needy crowd at the 32nd annual meeting of the KHS at Pittsburg State University. Photograph by Suzanne L. Collins.



Dennis Ferraro, Ted Leonard & Tracy Patten play computer herp games at the KHS Social on Friday night in Pittsburg, Kansas. Photograph by Suzanne L. Collins.



Kathy Ellis, Curtis Schmidt & Robin Oldham tell funny stories at the KHS Social on Friday night in Pittsburg, Kansas. Photograph by Suzanne L. Collins.



KHS Distinguished Life Members Dwight R. Platt and Henry S. Fitch re-live fondly remembered field moments at the 32nd annual meeting of the KHS at Pittsburg State University. Photograph by Larry L. Miller.



Craig Hassapakis & Kiyoshi Sasaki exchange ideas and viewpoints at the KHS Social on Friday night in Pittsburg, Kansas. Photograph by Suzanne L. Collins.



John Lokke & Ken Brunson provided some twang at the KHS auction on Saturday night at the Lincoln Center in Pittsburg, Kansas. These guys like to get together on warm nights and imitate Green Frogs; sometimes they do. Photograph by Suzanne L. Collins.



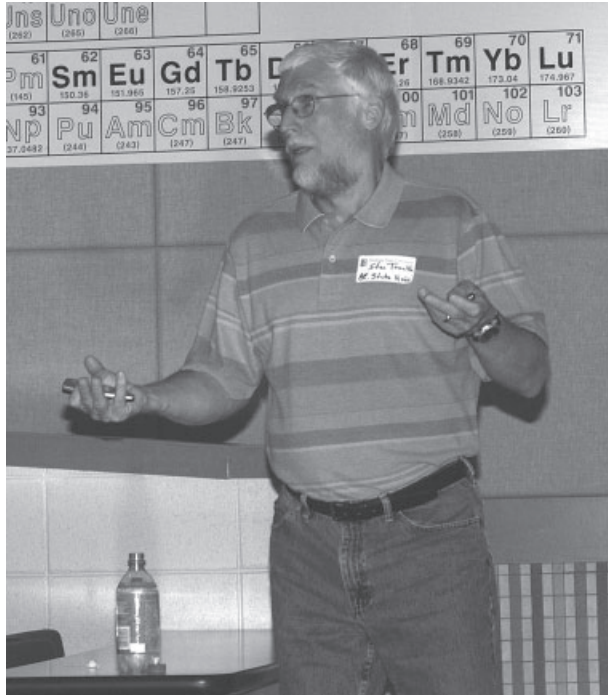
Erin Dugan may have a little touch of the Irish in her, but the historical lack of snakes on the Emerald Isle didn't stick in her genes and doesn't prevent her from touching serpents. Here, she checks out a Gopher Snake from the KHS live exhibit. Photograph by Larry L. Miller.



Former KHS president and current KHS historian Suzanne L. Collins kept things in historical perspective at the KHS business meeting on Saturday at Pittsburg State University. Photograph by Larry L. Miller.



Former KHS president Mark Ellis celebrated his 50th Birthday on Saturday at the KHS meeting at Pittsburg State University. He will have his cake and eat it, too. Photograph by Suzanne L. Collins.



Stanley Trauth, Arkansas State University at Jonesboro, was the Society's keynote speaker and his lecture on Arkansas herpetology opened the scientific paper sessions on Saturday for the KHS meeting at Pittsburg State University. The audience listened attentively as Stan revealed the great diversity of amphibians, turtles, reptiles, & crocodilians that inhabit his state. Photograph by Suzanne L. Collins.



L–R: Suzanne Miller, Mark Ellis & Kathy Ellis checked out the photographic competition for *The Collins Award* at the KHS business meeting on Saturday at Pittsburg State University. Photograph by Larry L. Miller.



Ginny Weatherman (L) & Anna Tarnowski nearly got out of control at the KHS auction on Saturday evening at the Lincoln Center in Pittsburg, Kansas. Photograph by Larry L. Miller.



Travis W. Taggart explains the Kansas Herpetofaunal Atlas during the scientific paper sessions on Saturday at the KHS meeting at Pittsburg State University. Photograph by Suzanne L. Collins.



L-R: Lisa Irwin, former KHS president Kelly Irwin, and former KHS president Jeff Burkhart, get re-acquainted at the KHS auction on Saturday night. Photograph by Larry L. Miller.



L-R: Raul Diaz, Rafe Brown, Cameron Siler & Juan Manuel Guayasamin of the University of Kansas gave excellent presentations at the scientific paper sessions; their topics broadened the horizons of KHS members. Photograph by Suzanne L. Collins.



L-R: Travis Taggart & Bill Stark (Fort Hays State University) & Nate Davis (Kansas Department of Wildlife & Parks) discuss herp topics during the 32nd annual meeting of the KHS at Pittsburg State University. Photograph by Suzanne L. Collins.



Suzanne Miller gets a step up on the photographic competition for *The Collins Award* in 2007. Although Gopher Tortoises are not native to Kansas, the tools of PhotoShop can make miracles happen. Photograph by Larry L. Miller.



Mary Kate Baldwin studies an item at the KHS auction on Saturday night; Laura Acuff wonders how she plans to bid for it. Photograph by Larry L. Miller.



L-R: Jill Lokke, John Lokke (former KHS president), & Kirk Mullen gather outside Yates Hall on the PSU campus to talk herps. Photograph by Suzanne L. Collins.



L–R: Michael Rochford, Chad Whitney, Anna Tarnowski, Dan Murrow & Ginny Weatherman (the short one in the foreground) gaze at creatures in the live exhibit. Chad was checking to see if there were any Milk Snakes worthy of viewing. Photograph by Larry L. Miller.



Soon-to-be KHS president Curtis Schmidt contemplates the crowd at the KHS auction on Saturday evening at the Lincoln Center in Pittsburg, Kansas. After considerable thought and analysis, he went back to the keg. Photograph by Suzanne L. Collins.



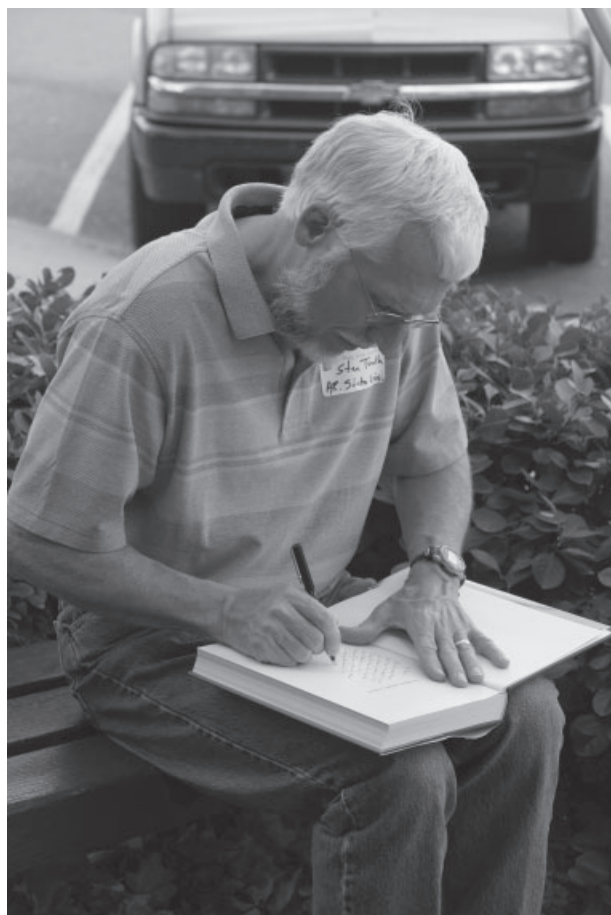
KHS Distinguished Life Member Henry S. Fitch presents a paper in Yates Hall on Saturday during the scientific paper sessions of the 32nd annual meeting of the Kansas Herpetological Society at Pittsburg State University. Photograph by Larry L. Miller.



Long time KHS member Walter Meshaka autographs yet another copy of his best-selling book on the Florida herpetofauna. Photograph by Suzanne L. Collins.



Kelly Irwin (L) explains to Joe Collins the fascinating aspects of being the state herpetologist of Arkansas. Photograph by Suzanne L. Collins.



Stan Trauth autographs a copy of his great volume on the herpetofauna of Arkansas at the KHS meeting in Pittsburg, Kansas. Photograph by Larry L. Miller.

KHS 2006 SPRING FIELD TRIP

The KHS 2006 spring field trip will be to Kiowa County. For information as it is posted, be sure to check the KHS web site regularly at:

<http://www.ku.edu/~khs/FieldTripSpringInfo.html>

For immediate information, contact:

Mark Ellis & Derek Schmidt
KHS Field Trip Co-Chairpersons

(see inside front cover of this issue)

PAY YOUR 2006 DUES

If you have not already done so, send your calendar 2006 dues (\$15.00 regular, \$20.00 contributing) to:

Mary Kate Baldwin
KHS Secretary
5438 SW 12th Terrace Apt. 4
Topeka, Kansas 66604

Your attention to this matter will ensure that delivery of the *Journal of Kansas Herpetology* will be uninterrupted.

Donors

Few tributes are so lasting or honor individuals so well as donations. The *Kansas Herpetological Society* is privileged to carry on the aims and goals of the Society through its awards, grants, and scholarships. This list recognizes donations received through 1 November 2005.

*The Alan H. Kamb Grant
for Research on Kansas Snakes*

Suzanne L. & Joseph T. Collins
In Memory of
Byron Carl Sneegas
(1923-2005)

&

Suzanne L. & Joseph T. Collins
In Memory of
Mildred Mary McWethy
(1904-2005)

ABSTRACTS OF PAPERS PRESENTED AT THE 32ND ANNUAL MEETING OF THE
KANSAS HERPETOLOGICAL SOCIETY, 4–6 NOVEMBER 2005,
YATES HALL, PITTSBURG STATE UNIVERSITY

The Amphibians, Turtles, and Reptiles of
Custer State Park, South Dakota

Joseph T. Collins

*Sternberg Museum of Natural History, Fort Hays
State University, Hays, Kansas*

Suzanne L. Collins

*The Center for North American Herpetology,
Lawrence, Kansas*

During 2004, a one-month survey for amphibians, turtles and reptiles was conducted at Custer State Park, Custer County, South Dakota. The objective of the survey was to verify the presence of all species previously documented from the park, determine their distribution within the park, and record their observable abundance. All species previously documented from Custer State Park were discovered in the course of the survey. Almost 1,200 observations were made. Specimens were collected and deposited (along with tissues for DNA from each) at the Sternberg Museum of Natural History.

Herpetofaunal Species Composition and Relative
Abundance between Riparian Woodland and
Clear-cut Areas at Jeffrey Island Habitat Area,
Dawson County, Nebraska

Bruce Eichhorst & Christie Coleman

University of Nebraska, Kearney, Nebraska

Last year we reported on the first year's results of this study (*Journal of Kansas Herpetology* 12: 9). From 16 May to 20 July 2005, we used a drift fence system with pitfall buckets and funnel traps at each of the two wooded sites and two clear-cut sites that were trapped in 2004. A total of 2,520 trap-nights of effort resulted in 41 amphibian and 170 reptile captures at the wooded sites, and 80 amphibian and 130 reptile captures at the cleared sites. Amphibians included *Bufo woodhousii*, *Rana blairi*, and *Ambystoma mavortium*. Reptiles included four species that were also captured in 2004 (*Cnemidophorus sexlineatus*, *Thamnophis sirtalis*, *Pituophis catenifer*, and *Coluber constrictor*) and three new species (*Eumeces septentrionalis*, *Sceloporus undulatus*, and *Tropidoclonion lineatum*). *Cnemidophorus sexlineatus* accounted for 94.1% of the reptile captures at the wooded sites and 53.8% at the cleared sites. As observed in 2004, funnel traps were more effective at capturing Six-lined Racerunners (average of 27.36

captures/100 trap-nights [22.2 in 2004]) than the pitfall buckets (3.44 captures/100 trap-nights [2.37 in 2004]).

A Herpetofaunal Inventory of the Missouri
National Recreational River

Dan Fogell & George Cunningham

University of Nebraska, Omaha, Nebraska

During 2003 and 2004, surveys for amphibians, reptiles, and turtles were conducted within the National Park Service's Missouri National Recreational River (MNRR) in Nebraska and South Dakota. The objective of the survey was to account for 90% of all species expected to occur within the park. Of the 29 species expected to occur, 25 (86.2%) were encountered. Range extensions were discovered for at least six species, with the most notable being Cope's Gray Treefrog (*Hyla chrysoscelis*) with an extension of more than 242 km (150 mi). Although the Missouri River is not channelized within the boundaries of the park, human recreation and other anthropogenic activities appear to have both short- and long-term effects on herpetofaunal habitat.

The Future of Scientific Publishing
in Herpetology

Craig Hassapakis

Amphibian and Reptile Conservation, California

Joseph Collins

Kansas Biological Survey, University of Kansas

The future of scientific publishing (and subsequent access to this information), and more specifically herpetology, was discussed using a live public demonstration on the Internet and utilizing important web site sources and topics (Google Scholar, Google Earth, HerpNet, PubMedCentral [PMC], CrossRef, Digital Object Identifiers [DOI], AmphibiaWeb, The Public Library of Science [PLOS], Ingenta, and many others) on the World Wide Web. As a direct result of the Internet (and other computer advances) publishing models are and will continue to change driven by these technological advances. Scientific societies are often the slowest to make often drastic changes to the "way things normally get done" as it pertains to their business practices, operation, and publishing modes. As the Internet (and computers) get more sophisticated and advanced, access to and the pro-

duction of scientific literature (science papers) becomes easier and faster to produce and access to this information greatly enhanced. The future will bring, as a result of such techniques as data mining, almost instantaneous access to information while allowing external linking to other supporting information in every variety (i.e., audio, video, direct referenced article linking), allowing large (usually not published) data sets to be presented and other important information to be published. There are no practical limitations to publishing types of data on the Internet; thus, scientific papers as a result will be more informative and entertaining. The future holds greater promise in producing and accessing scientific information as a result of the advances in computer technology and the Internet.

Assessing Daily Movement in Texas Horned Lizards

Jeremy S. Lane & Richard T. Kizmaier
West Texas A&M University, Canyon, Texas

Determining the distances and pathways individuals move during the course of a day can help elucidate certain aspects of a species' biology, such as energy requirements, habitat selection, and dispersal distances. While radiotelemetry can be used to relocate animals at different points throughout a day, little is known about an individual's movement between those points. Traditional powder tracking techniques can be used to assess daily movement, but these techniques suffer from many problems, including increased susceptibility to predation because of loss of crypsis, an inability to differentiate "normal" activity from escape behavior, and difficulties in documenting lengthy trails because of an inability to insure that an adequate amount of powder adheres to the animal. We used a modification to traditional powder tracking techniques for lizards that we term the Powdered Fur Patch (PFP) method, which can be used to determine daily movement. By gluing rabbit fur, covered with UV-reactive powder, to the ventral side of Texas Horned Lizards (*Phrynosoma cornutum*), we were able to track daily lizard movement with the aid of a blacklight. By having the brightly-colored powder only on the ventral side of the lizard, we infringed less upon the animal's cryptic appearance that it relies on to avoid predation. Our technique allowed for documentation of complete 24-hr movement pathways for distances of over 200 m. Additionally, PFPs were successfully used to document movements of all sizes of lizards, including hatchlings. Analyses indicated that Texas Horned Lizard pathways were extremely nonlinear, reiterating that use of radiotelem-

etry underestimates actual movement distances. In general, juveniles (1-yr old) exhibited greater movement than either young-of-the-year or adults (2+ yr old). Use of the PFP method shows considerable promise for studying movement in other reptiles, especially those that are small or rely heavily on crypsis.

Amphibian Disease Monitoring in the Lower Mississippi Valley

Lisa Irwin
*USFWS Arkansas Ecological Services Field Office,
Conway*
Susan Walls
*USGS National Wetlands Research Center, Lafayette,
Louisiana*

As part of a national effort by USFWS to screen frogs on National Wildlife Refuges for malformations, incidental findings of infectious diseases were discovered on five southeastern refuges by the USGS National Wildlife Health Center. In an effort to confirm these findings and to expand health screening to additional sites, the USFWS and USGS National Wetlands Research Center have partnered sampling efforts within the LMV. Results from these collective health screening efforts indicate that at least three important and potentially serious infectious amphibian diseases (e.g., ranavirus, chytrid fungus, and perkinsus-like infections) are present in the LMV. Classic field signs associated with these disease agents and our current understanding of these pathogens will be discussed. Some of these results include the first reports of these infections in previously unreported anuran species as well as being the first reports of two of these infections in these states. The significance of these findings as well as recommendations for preventing the spread of these diseases will be discussed.

Snake Community Structure on Native Prairie Patches as a Function of Specific Regional Habitat Variables**

Bryan Maher
Emporia State University, Emporia, Kansas

Anthropogenic disturbance has fragmented native habitats, creating a landscape comprised of a mosaic of land-uses. The native grasslands of the Midwest are one of the most impacted ecosystems in the world. Native grasslands once covered millions of acres throughout the Midwest, but today are only mere remnants surrounded by an agriculturally dominated landscape. Many animal species have been

impacted by the loss of native habitat and as a result studies have been conducted to determine the effect human disturbance has had on plant and animal communities. The prairie herpetofauna, unlike mammals, has not received much attention until recently for conservation. It was my intent to study the community composition of snakes in native prairie patches as a function of local and regional habitat variables within the Flint Hills National Wildlife Refuge (Coffey County, Kansas). Four native prairie sites (~ 3.24 to 4.05 hectares) with similar vegetation and a different surrounding landscape matrix was examined. Drift fences in combination with funnel traps were used to determine relative abundance and habitat use by individual species. Local habitat variables were collected by employing Daubenmire's canopy-coverage method, and recording the height of visibility through the flora. Regional habitat variables were assessed by calculating land-values in several buffers around each native patch. Ordination analysis indicates that arrays within two of the four sites cluster to form distinct communities. Further analysis also indicated that there is no correlation ($r = 0.279$, $P = 0.35$) between land-use values and species abundance.

Distribution and Habitat Preference of the
Herpetofauna of the Marais des Cygnes
National Wildlife Refuge**

Sarah R. McCoy
Pittsburg State University, Pittsburg, Kansas

The U.S. Fish and Wildlife Service established the Marais des Cygnes National Wildlife Refuge, located in Linn County, Kansas, in 1992. Field data were collected on the habitat preference and distribution of the reptiles and amphibians located on the refuge. Survey methods used were mainly time-constrained searching, supplemented with pitfall trapping, funnel trapping or opportunistic observations. Thirty-one species of herpetofauna were found on the refuge. Using an existing delineation of habitat types made by staff at the refuge, a relationship was shown between each habitat and its associated herpetofaunal community, then those communities were compared to each other using cluster analysis and a community similarity coefficient. Based on these results, the six original habitat types were grouped into three overall communities: 1) Mature forest/Young Forest/Miscellaneous grassland, 2) native grassland/agricultural, and 3) aquatic. The habitat preference of each species was also shown using Ivlev's index of electivity, which produced groups of herpetofauna that preferred similar habitats. One of the main goals of the refuge is to conserve the bottom-land hardwood

forests associated with the Marais des Cygnes river. These mature forests showed the greatest diversity of herpetofauna, but the overall diversity of the refuge was high, indicating the need for conservation of all natural habitat types on the refuge.

Big Grasslands: Land of the Big Snakes
Walter E. Meshaka, Jr.
State Museum of Pennsylvania, Harrisburg

During May–October 2005, a snake assemblage was studied in a large grassland in the Ridge and Valley province of central Pennsylvania. Based upon marked and observed snakes captured or seen under coverboards and active in the field, six species were recorded at the site. The Timber Rattlesnake (*Crotalus horridus*) was not individually marked. A comparison of numbers of newly captured snakes of five species revealed a dominance of large individuals of two large-bodied snakes, the Black Rat Snake (*Elaphe obsoleta obsoleta*) and the Northern Black Racer (*Coluber constrictor constrictor*). The few Eastern Hognose Snakes (*Heterodon platirhinos*) were also large adults. The Northern Ringneck Snake (*Diadophis punctatus edwardsii*) and the Northern Water Snake (*Nerodia sipedon sipedon*) were rare at this site. This assemblage could be explained by the large patch size, which is in sharp contrast to the Eastern Garter Snake (*Thamnophis sirtalis sirtalis*)-dominated systems in small grasslands elsewhere in Pennsylvania.

Reproductive Ecology of the Western Slimy
Salamander (*Plethodon albagula*): Use of an
Abandoned Mine Shaft

Joseph R. Milanovich & Stanley E. Trauth
Arkansas State University, State University
David A. Saugey
U.S. Forest Service, Jessieville, Arkansas

The Western Slimy Salamander (*Plethodon albagula*) is a large woodland salamander which inhabits woody, rocky hillsides in north and western Arkansas and occasionally enters the twilight zones of mine shafts and caves. Spillway Mine, an abandoned mine shaft in the Ouachita National Forest (Garland County, Arkansas), offers a unique opportunity to study *P. albagula* use of one such mine shaft. The reproductive ecology and the influence of precipitation on fecundity were examined for the population of *P. albagula* which utilize the mine shaft to brood and defend egg clutches. Reproductive data was collected for 390 clutches between 1982 and 2004. Thirteen females were found to exhibit nest site fidelity and 10 females exhibited nest securing. The

amount of precipitation one year prior to oviposition was correlated with the average number of eggs per clutch, and an increase of precipitation during the spring prior to oviposition was found to increase egg diameters. Therefore, based on our data it appears precipitation influences fecundity in terrestrial *Plethodon*.

Seasonal Activity and Habitat Use of the Massasauga (*Sistrurus catenatus*) in Nebraska

Tracy J. Patten

University of Nebraska-Omaha, Omaha, Nebraska

Daniel D. Fogell

Southeast Community College, Lincoln, Nebraska

James D. Fawcett

University of Nebraska-Omaha, Omaha, Nebraska

The state-threatened Massasauga (*Sistrurus catenatus*) historically occupied most of Nebraska's tallgrass prairie region but is presently found in only four counties. Habitat conversion and fragmentation have resulted in the decline and isolation of massasauga populations in Nebraska. The objectives of this project were to study the life history characteristics and spatial ecology of massasauga populations located at two different state-managed wildlife areas (Burchard Lake, Pawnee Prairie). Both sites are managed using haying and prescribed fire rotations. Human recreation disturbances occur frequently at Burchard Lake and seldom at Pawnee Prairie. To study spatial movements and seasonal habitat use, we radio tracked 12 snakes during 2004 and 15 snakes during 2005. We used mark-recapture techniques to estimate population sizes, study growth rates, and determine population structures. Massasaugas hibernate exclusively in crayfish burrows located in hydric prairie and utilize mesic to xeric prairie for summer foraging and breeding activities. Vital life history activities such as breeding, feeding, and parturition have been observed and can now be linked to critical habitat. Encounters to date total 212 (156 alive, 56 dead). Causes of mortality were automobiles, haying, malicious killing, predation, and fire. Spatial data presented here are from the 2004 radio-telemetry season. There were no significant differences in home range size, linear distance moved, or total distance moved between males, females, or gravid females. Additionally, no significant differences were found in spatial movements between sites. A thorough investigation of this kind is necessary so that adaptive and sustainable management techniques can be successfully employed for the remaining massasauga populations.

Movements of Ornate Box Turtles (*Terrapene ornata*) on a Sand Prairie in South Central Kansas**

Dwight R. Platt

Bethel College, North Newton, Kansas

From 1966 to 1971, 305 Ornate Box Turtles were captured and marked when encountered during field work on Sand Prairie Natural History Reservation in Harvey County, Kansas. Half of these individuals were captured only once and half were recaptured from one to eleven times. Although individuals moved up to 775 meters between captures, the median distance moved between captures for the 267 recaptures was 54 m. Males moved significantly farther than females (70 m vs 41 m). Individuals more than 10 years old moved farther than individuals aged 10 years or less but the difference was not significant (62 m vs 52 m). The distance moved increased significantly with increase in the length of the period between captures (measured in days during the active season), especially after 500 active season days (<100 days = 48 m; 101–250 days = 50 m; 251–500 days = 52 m; >500 days = 78 m). When the two captures were within one active season, movement was significantly less than when one or more dormant periods intervened (48 m vs 56 m). Most of those individuals captured only once probably behaved similarly to the recaptured individuals since more than half (57%) of the recaptured individuals were not encountered in one or more seasons between captures.

Herpetology of the Dutch Windward Islands: Political Proximity and Biogeographic Discrepancies

Robert Powell

Avila University, Kansas City, Missouri

The Dutch Windward Islands (St. Eustatius, Saba, and St. Maarten) are part of the Netherlands Antilles, which also includes the South American continental islands of Bonaire and Curaçao (and formerly Aruba). Although geographically proximate (on a clear day one can see the others from any one of the three islands), each is associated with a different island bank: St. Eustatius is part of the St. Kitts Bank (with St. Kitts and Nevis), Saba is an isolated, emergent volcanic peak near the Saba Bank, and St. Maarten is part of the Anguilla Bank (with Anguilla, St. Barts, and their satellites). Furthermore, the Anguilla Bank is part of the older "outer arc" of Lesser Antillean islands known as the "limestone Caribbees," characterized by extinct

volcanic cores that have been repeatedly submerged since the last glacial period, whereas Saba and the St. Kitts Bank are part of the geologically more recent "inner arc" islands known as the "volcanic Caribbees," with active or dormant volcanoes that often function as "snag islands" (elevations high enough to "trap" clouds and generate considerably different precipitation patterns at different elevations). The collective herpetofauna of the three islands includes 20 terrestrial reptiles, four sea turtles (one known only as a vagrant in surrounding waters), and two amphibians. One species is endemic to Saba and another 11 are known only from the Anguilla or St. Kitts banks. At least three species of reptiles and both amphibians are introduced, although additional "strays" are known from St. Maarten. Species richness per unit area is inversely correlated to island size and binary indices of similarity are greatest between St. Eustatius and Saba (0.38) and lowest between Saba and St. Maarten (0.20 or 0.24, if introduced taxa are included).

Herpetofaunal Observations in Southern California

Mike Rochford
Fort Hays State University, Hays, Kansas

An account of several months of herpetological field work on the coast, in the mountains, and across the deserts of southern California in 2005, with photographs of the species encountered and comments on their biology.

Toads of the genus *Bufo* of Southeastern Kansas

Curtis J. Schmidt & Travis W. Taggart
*Sternberg Museum of Natural History
Fort Hays State University, Hays, Kansas*

For years scientists have attempted to distinguish among the many toads of the eastern United States. Particularly troublesome has been the group comprising *Bufo americanus*, *B. woodhousii*, *B. fowleri*, *B. terrestris* and some lesser known related forms. In Kansas, this problem is most apparent in the *Bufo* of the extreme southeastern part of the state, where as many as two to four species have been proposed to occur at different times, and by different authors. The recent acquisition and subsequent availability of specimens from southeastern Kansas has provided the opportunity to investigate this problem with more resolution than previously possible. We discuss our analyses in comparison with previously reported and novel external morphological characters. We offer a

hypothesis of distribution of those species that we believe occur in the state, and point out additional issues of confusion, contention, and a direction for future research.

The Kansas Herpetofaunal Atlas Project
Travis W. Taggart
*Sternberg Museum of Natural History
Fort Hays State University, Hays, Kansas*

The Kansas Herp Atlas began as a small personal endeavor in 1999. The current Atlas is a product of a State Wildlife Grant awarded to the Sternberg Museum of Natural History in 2003 through the United State Fish and Wildlife Service and the Kansas Department of Wildlife and Parks. Additional assistance was provided by The Center for North American Herpetology, Kansas Herpetological Society, and many other participants. The Kansas Herp Atlas is intended to serve both education and conservation. The information acquired through the grant and from interested participants serves as baseline data for further research, provides data to assist with conservation needs as they arise, and contributes to an increasing public awareness of the amphibians, reptiles, and turtles in the state. The Atlas contains information on all known occurrences of Kansas' amphibians, reptiles, and turtles. Unique to the site, are the most up-to-date distribution maps of each species known to occur (or potentially occur) in the state. Each species account has text descriptions summarizing the distribution, fossil history, maximum size, taxonomy, and an ever-growing list of references. The Atlas represents the work of thousands of individuals, who over countless hours, collected and recorded the nearly 70,000 specimens and observations presented herein. Our current high-level of understanding with respect to the Kansas herpetofauna is largely due to their efforts. There is still much to learn, and those people wishing to contribute to the Atlas, may do so by donating specimens or reporting observations.

Effects of Land Management Practices
on the Community Dynamics
of Tallgrass Prairie Herpetofauna**
Dustin J. Wilgers, Eva A. Horne & Brett K. Sandercock
Kansas State University, Manhattan, Kansas
Allan W. Volkmann
Wichita, Kansas

The Flint Hills of Kansas and Oklahoma is the largest remaining tract of tallgrass prairie in North

America. This area has undergone major changes in land management practice in the past 30 years. Traditional season-long cattle stocking with variable burn schedules has largely been replaced by early-intensive cattle stocking accompanied by annual burning. In order to understand how these different land management practices affect the herpetofauna of the tallgrass prairie, we used mark-recapture methods to analyze herpetofaunal community dynamics. We analyzed survey data collected over a 15-year time span (1989–2003) from a rangeland site in Cowley County, Kansas. An open population Cormack-Jolly Seber model, POPAN-5, was used to estimate four community parameters: species loss rate (ϕ'), probability of detection (p), probability of entry (P_{ent}), and species richness (N). The top models included burn status as a covariate for species loss rate, while cattle stocking received moderate support. Rates of species loss were higher during burn years ($\phi' = 0.04$, 95% CI: 0.02 to 0.08) than non-burn years ($\phi' = 0.00$, 95% CI: 0.00 to 0.01). *Post hoc* analysis through a 3 time block model indicated species loss rates were smaller throughout the early-intensive stocking time period compared to season-long stocking, thus species richness declines were less drastic throughout early-intensive stocking. Early-intensive stocking maximizes gains in cattle production and minimizes losses of grassland reptile and amphibian species. These results support early-intensive stocking as the best management practice to minimize herpetofaunal biodiversity declines in the Flint Hills region.

Spatial Variation in Predation Attempts
on Snakes in a Fire-disturbed Tallgrass Prairie**
Dustin J. Wilgers & Eva A. Horne
Kansas State University, Manhattan, Kansas

The tallgrass prairie historically burned every 2 to 3 years, removing the litter layer and leaving post-burn environments inhospitable to many terrestrial species. Selection pressures such as lack of food and shelter, and increased predation are multiplied for some species over limited time periods. In order to quantify predation pressures on large snakes, model snakes were placed in recently burned and long-term unburned areas of a grassland system in northeastern Kansas. Any disturbance to the original placement of the model snake was considered a predation attempt. Known fate models were used to estimate daily survival rates of individual model snakes within both habitat types. A group effect (burned vs. unburned) was selected as the single top model, garnering > 93% of the data's support. Survival estimates from this top model indicated model snakes in

newly burned areas had significantly lower daily survival than models placed within unburned sites ($\phi_b = 0.986$, 95% CI = 0.975 to 0.993; $\phi_u = 0.999$, 95% CI = 0.990 to 1.0; $\chi^2 = 8.47$, $df = 1$, $P = 0.003$). Due to the nature of this study, lower survival rates for individuals placed in newly burned sites can be directly attributed to an increase in predation pressure. Indirect evidence from destroyed model snakes indicates raptors are a major predator on large snakes. Overall herpetofaunal activity in burned areas was low during the first 20 days post-burn, with increasing activity throughout the rest of the season. However, activity within unburned areas was constant throughout the spring. Burning tallgrass prairie likely increases predation pressure on large snakes in the area for 1 to 2 months following the burn, due to lack of cover from aerial predators.

Do snakes have gaits?
Bruce A. Young & Virginia Barnes
Washburn University, Topeka, Kansas

Terrestrial quadrupeds have a variety of distinctive gaits, the coordinated and repetitive footfall patterns used for locomotion. Among quadrupeds transitions from one gait to another are associated with changes in velocity, limb mechanics, and locomotor energetics. While the kinematics and mechanics of snake locomotion are not as well known; snakes are generally regarded as having multiple forms of locomotion but not distinct gaits. Snakes switch from one form of locomotion to another depending on their localized environment, not speed; sidewinding is used on loose sand, whereas concertina locomotion is used when the snake is in a burrow. We propose that snake locomotion may be more complex than previously appreciated, and that snakes may have true gaits, analogous to the situation found in other terrestrial vertebrates. The focus of our study is rectilinear locomotion and the transition from rectilinear locomotion to lateral undulation. Rectilinear (or inchworm) locomotion is only common in heavy-bodied boids and viperids. This form of locomotion is not, strictly speaking, substrate dependent; rather, it appears that snakes only use rectilinear locomotion for slow movements then switch to lateral undulation for faster movement. If rectilinear locomotion uses fundamentally different propulsive mechanics than lateral undulation, and if snakes regularly transit from one to the other depending on velocity, then these would represent true ophidian gaits.

**indicates the paper is eligible for *The Suzanne L. & Joseph T. Collins Award* in 2006.

RESULTS OF THE KHS 2005 FALL FIELD TRIP

In early October 2005, KHS members traveled to Crawford County, Kansas, to search for amphibians, turtles, and reptiles found in the southeastern portion of the state as part of the annual Society Fall Field Trip. Participants gathered at Crawford County State Lake on Friday night, and at 9:00 am on both Saturday and Sunday, over 70 individuals were registered for the herpetofaunal counts.

Led by Mark Ellis and Larry L. Miller, the group spent the morning chasing amphibians, turtles, and reptiles around the state lake; during the afternoon, the assembled participants spread out through much of the rest of the county. The group had a great weekend, collecting and observing numerous herpetological species throughout the county (Figures 1–8; pages 20–21). The complete count for 30 September–2 October 2005 is listed below.

Participants were: Ted Abel, Karen Abraham, Cathy Acuff, Laura Acuff, Rob Acuff, Sandi Appier, Catherine Brungardt, Gerard Brungardt, Petra Brungardt, Tom Brungardt, Morgan Butrick, Keith Coleman, Joe Collins, Suzanne Collins, Mike Dee, Mark Denney, Erin Dugan, Kent Dugan, Andy Durbin, Kathy Ellis, Mark Ellis, Jim Gubanyi, Julian Gubanyi, Marla Gubanyi, Laura Hagen, Molly Heil, Raymond Hillegan IV, Michel Hogan, Emily Hooser, Debbie Horne, Dan Johnson, Grace Anne Johnson, Jennifer Johnson, Reggie Kapka, Eric Kessler, Owen Kessler, Emmy Lieser, Brandon Low, Judy Low, Ross McNearny, Joshua Marshall, Stephen Marshall, Larry L. Miller, Dan Mosier, Chris Mossler, Daniel G. Murrow, David Oldham, Jackson Oldham, Robin Oldham, Tag Oldham, Michael Province, Mike Rochford, Brett Schmidt, Curtis Schmidt, Derek Schmidt, Sarah Sloan, Zack Simson, Gayan Stanley, Charlie Stieben, Travis Taggart, Anna Tarnowski, Doug Unruh, Mike Washburne, Ginny Weatherman, Eric Wenzl, Roy Wenzl, Chad Whitney, Garrett Wilkinson, Victor Wilkinson, & Tim Wray.

The Count Crawford County State Lake & Surrounding Areas 30 September to 2 October 2005

American Toad	7	Western Worm Snake	2
Woodhouse's Toad	1	Ringneck Snake	18
Northern Cricket Frog	±600	Flathead Snake	8
Gray Treefrog	16	Eastern Racer	1
Boreal Chorus Frog	1	Common Kingsnake	5
Plains Leopard Frog	1	Milk Snake	3
Bullfrog	±128	Rough Green Snake	4
Southern Leopard Frog	16	Great Plains Rat Snake	1
		Western Rat Snake	6
Common Snapping Turtle	2	Bullsnake	1
Common Musk Turtle	1	Plainbelly Water Snake	16
Northern Painted Turtle	13	Northern Water Snake	12
Eastern Box Turtle	13	Western Ribbon Snake	7
Ornate Box Turtle	10	Common Garter Snake	7
		Lined Snake	1
Eastern Collared Lizard	35	Timber Rattlesnake	3
Five-lined Skink	1		
Ground Skink	37		
Six-Lined Racerunner	17		
Western Slender Glass Lizard	1		

GRAND TOTAL

34 species ±995 specimens

All verified by Mark Ellis, Larry L. Miller & Derek Schmidt



Figure1. These hardy individuals stayed until the final minutes of the KHS Fall Field Trip to Crawford County State Lake on Sunday, 2 October 2005. They were not disappointed, because many excellent creatures were discovered in the waning hours of the event, among them a number of Rough Green Snakes. Photograph by Suzanne L. Collins.



Figure 2. Tom Brungardt takes full advantage of photographic opportunities during the Society's Fall Field Trip to Crawford County State Lake in southeastern Kansas. Here, he photographs a Western Rat Snake that is conveniently clinging to the bark of a tree in the state park. Photograph by Larry L. Miller.



Figure 3. Here, a younger KHS member makes a stealthy approach to capture an elusive Northern Cricket Frog during the Society's Fall Field Trip to Crawford County State Lake in southeastern Kansas. Northern Cricket Frogs are the smallest species of frog in Kansas. Photograph by Larry L. Miller.



Figure 4. David Oldham, KHS President, explains to the assembled participants the protocols for conducting a herpetofaunal count. Photograph by Larry L. Miller.

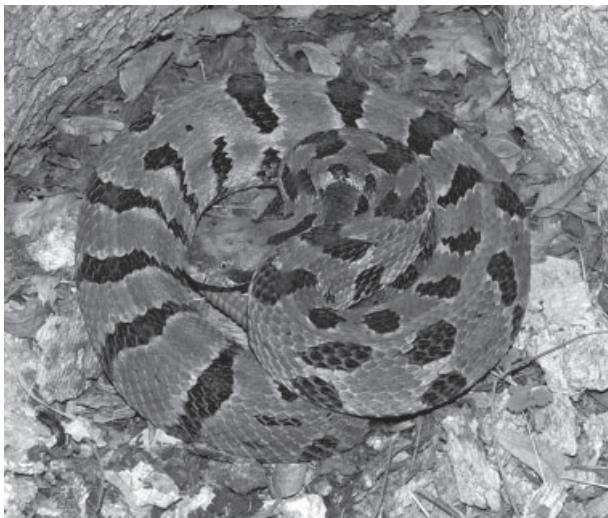


Figure 5. Finding a Timber Rattlesnake on a KHS Field Trip is always a special event. Photograph by Suzanne L. Collins.



Figure 6. KHS Historian Suzanne Collins prepares to photograph a small snake that Joe Collins is trying to position. Photograph by Larry L. Miller.

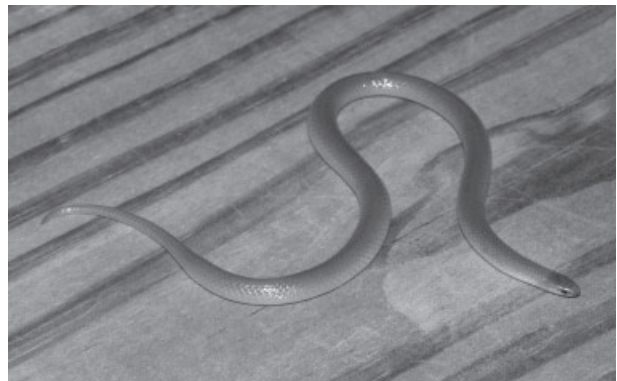


Figure 7. This Flathead Snake, one of the smallest species of serpents in Kansas, was well represented in the Society herpetofaunal count. Photograph by Suzanne L. Collins.



Figure 8. Kathy and Mark Ellis examine an Eastern Box Turtle found during the KHS herpetofaunal count in Crawford County. Photograph by Larry L. Miller.

GEOGRAPHIC DISTRIBUTION

CHELYDRA SERPENTINA (Common Snapping Turtle). KANSAS: FINNEY CO: 37.97535°N, 101.01130°W. 8 September 2005. Peggy Minter. MHP 12120. New county record (Collins and Collins 1993, Amphibians and Reptiles in Kansas, Third Edition, Univ. Press Kansas, Lawrence. xx + 397 pp.). Verified by Travis W. Taggart.

Submitted by **CURTIS J. SCHMIDT**, Sternberg Museum of Natural History, Fort Hays State University, Hays, Kansas 67601.

STERNOTHERUS ODORATUS (Common Musk Turtle). KANSAS: DOUGLAS CO: Lone Star Lake, N38.83176, W95.37876. 2 November 2005. Richard Sanders, Bruce Wolhuter & Joseph T. Collins. MHP 12145 (Figure 1). Verified by Travis W. Taggart. One of eleven specimens caught while trapping at four sites on the lake; water temperature was 57°F. About

15 Northern Painted Turtles were also trapped. Second known specimen of *S. odoratus* from the county and first in 56 years; the oldest record (KU 30056) was collected in northwestern Douglas County at Lakeview along the Kansas River in April 1949 by Edward H. Taylor (Collins and Collins 1993, Amphibians and Reptiles in Kansas, Third Edition, Univ. Press Kansas, Lawrence. xx + 397 pp.).

Submitted by **RICHARD SANDERS & BRUCE WOLHUTER**, Kansas Department of Wildlife & Parks, 798 North 1415 Road, Lawrence, Kansas 66049 & **JOSEPH T. COLLINS**, Kansas Biological Survey, University of Kansas, Lawrence, Kansas 66047.



Figure 1. An adult Common Musk Turtle (*Sternotherus odoratus*) from Douglas County, Kansas, discovered on 2 November 2005 at Lone Star Lake by Richard Sanders, Bruce Wolhuter, and Joseph T. Collins. Photograph by Suzanne L. Collins.

NOTES

A Summary of Fort Riley Herpetofaunal Counts from 2002–2005

Gibran Suleiman
Conservation Division
Fort Riley Directorate of Public Works
Fort Riley, Kansas 66442

The Fort Riley Directorate of Public Works (DPW) Conservation Division has sponsored a annual reptilian, chelonian, and amphibian count every spring since 2002 (Tables 1 & 2). Surveys were conducted around the first week of May. Participants met at the Conservation Division headquarters. Once briefed, they were split into eight groups and were assigned to a particular area on the Base. There was an average of 20.5 participants for the four annual surveys conducted. Each individual actively searched for approximately 5.5 hours. Searches included active viewing, rock flipping, and checking cover boards. Participants were asked to record the context in which individual animals were found and also to distinguish between adults and juveniles.

There are two species found on Fort Riley that are considered either a state listed *Species in Need of Conservation* or a Federally listed *Species of Concern*, and they are the Western Hognose Snake and the Texas Horned Lizard.

Species that were not documented during any of the four counts are the Ornate Box Turtle, Eastern Hognose Snake, Western Hognose Snake, Diamond-back Water Snake, Graham's Crayfish Snake, Plains Garter Snake, Redbelly Snake, Smooth Earth Snake, Prairie Kingsnake, Common Kingsnake, Timber Rattlesnake, Massasauga, American Toad, Great Plains Toad, and the Plains Spadefoot.

Fort Riley is a 101,000 acre Army installation located in Geary, Riley, and Clay counties of north-eastern Kansas. The Base is approximately 135 miles west of Kansas City and 130 miles north-northeast of Wichita. Fort Riley consists of three types of topographical-physiographic areas: 1) high upland prairies; 2) alluvial bottomland flood plains; and 3) broken and hilly transition zones. The high upland prairies consist of alternating layers of very gently dipping (less than one degree) Permian limestone and shale. The uplands often contain various shale units that cover the escarpment-forming limestones. The cutting action of streams on the thick shale units has sculpted much of the area into a rolling plateau. Two types of alluvial bottomlands exist at Fort Riley:

wide meandering floodplains of major rivers, with associated terraces; and areas created by smaller creeks and streams that cut the uplands. The transitional areas, extending from the uplands down to the valley floors are broken, sloping to steep country composed of alternating limestones and shales. Fort Riley drains into the Republican River and Milford Reservoir to the west, the Kansas River to the south and Wildcat Creek to the West.

The majority of Fort Riley is considered to be tallgrass prairie. Approximately forty percent of all the grassland on Fort Riley is considered to be native, while sixty percent is considered to be go-back from when the lands were farmed. Approximately fifteen percent of the installation is considered to be forested.

I would like to thank the following individuals for participating in one or more of the annual counts: Chris Mammolitti, Kirk Mammolitti, Eva Horne, Alan Hynek, Ed Miller, Max Good, Shawn Stratton, Doug Eifler, Melinda Emmert, Michele McNulty, Vernon Tabor, Greg Kramos, Mark Neely, Phil Gipson, Andy Forbes, Troy Livingston, Jeff Keating, Stan Roth, Bill Busby, Adam Martin, Nicole Gerlanc, Chris Hase, Ricky Trexler, Rick Upshaw, Jimmy Ward, Dustin Wilgers, Bryan Simmons, Paula Urban, Thomas Duckworth, Chris Newell, Dan Mulhern, Carla Hurlbet, John Fontenot, Steve Wahle, Ryan Jones, Rocky Fayhe, Mark Houck, Chris Otto, Sam Wisely, Nicholas Gomez, Brain Probost, Nate Davis, Micah Tice, Russell Japuntich, Ben Mulhern, Phil Brinkley, Matt Koch, Johnathan Conard, and Dave Jones.

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Table 1. Number of species, participants, and personhours tallied for herpetofaunal counts during the span 2002–2005 (inclusive) at Fort Riley, Kansas.

Year	Species	Participants	Personhours
2002	25	24	132.0
2003	27	15	82.0
2004	27	25	137.5
2005	24	18	99.0



Figure 1. The Slider was the most commonly observed turtle at Fort Riley during the surveys from 2002–2005. Photograph by Suzanne L. Collins.



Figure 2. The Plains Leopard Frog was one of the most commonly observed amphibians at Fort Riley during the surveys from 2002–2005. Photograph by Suzanne L. Collins.

Table 2. Species list and number of herpetofaunal observations made for the span 2002–2005 (inclusive) at Fort Riley, Kansas.

Species	Number Observed
Common Snapping Turtle	7
Northern Painted Turtle	28
False Map Turtle	16
Slider (Figure 1)	50
Softshell sp.	23
Eastern Collard Lizard	80
Texas Horned Lizard	3
Prairie Lizard	4
Great Plains Skink	128
Ground Skink	11
Northern Prairie Skink	3
Five-lined Skink	2
Six-lined Racerunner	71
Western Slender Glass Lizard	2
Ringneck Snake	735
Western Worm Snake	2
Flathead Snake	6
Plains Blackhead Snake	4
Eastern Racer	10
Great Plains Rat Snake	16
Eastern Rat Snake	5
Milk Snake	30
Gopher Snake	3
Plainbelly Water Snake	2
Northern Water Snake	20
Western Ribbon Snake	1
Common Garter Snake	9
Lined Snake	10
Brown Snake	1
Copperhead	17
Woodhouse's Toad	5
Northern Cricket Frog	++
Cope's Gray Treefrog	1
Boreal Chorus Frog	++
Bullfrog	102+
Plains Leopard Frog (Figure 2)	153+
Great Plains Narrowmouth Toad	73
Barred Tiger Salamander	1
Total Species =	38
Total Individuals =	±1634

++ Symbol indicates that too many individuals were found by a group to accurately count.

A New Kansas Locality for *Virginia valeriae*

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Lawrence, Kansas 66044

Virginia valeriae is a secretive snake with a very restricted distribution in Kansas (see Collins 1993). Though the species has been collected in small numbers from ca 20 miles north and west of the University of Kansas Natural History Reservation (Collins & Pisani, unpublished field notes), Henry Fitch has observed only three specimens in over 50 years of snake research on the Reservation and surrounding habitats (Fitch 1999).

On 6 September 2005, while assisting with a late controlled burning on newly acquired property of at the University of Kansas Field Station and Ecological Reserves (KBS/KSR), my attention was called to a small snake observed in one of the experimental (4 x 4 meter) plots that had just been burned. Smoldering thatch was extinguished with a water blast., which exposed the snake. The snake, barely damaged macroscopically but freshly dead, was a female *Virginia valeriae elegans*. Post mortem examination suggested that the cause of death was cardiac arrest and brief hyperthermia. Time was ca 1300 hrs (CDST), cloud cover ca 20%, air temperature ca 83°F, exposed soil surface dry, though conditions beneath thatch pre-burn are unknown. In general, morning dew has been substantial and the month of August was unseasonably wet.

Habitat where the specimen was found was of this area is reseeded Conservation Reserve Program (CRP) tall grass prairie, about 50 meters from a woodland edge. The woods lie on and along a shallow E–W oriented ravine that may serve as a hibernaculum for others of the species based upon my observations (Pisani, unpublished). Locality is the extreme NW corner of the 40 acres that comprise the most SE corner of Sec. 32, T11S, R20E, Jefferson County, Kansas. The location is close to the border of the Reservation.

Data for the specimen are: SVL 245 mm; tail 41 mm; mass 11.0 grams; scutellation/coloration typical of the species; not gravid and oviducts did not show indication of recent birth of a litter; gut with considerable well-digested food remains (unidentifiable).

The area will be surveyed for additional specimens in coming months. The specimen has been deposited in the Fort Hays State University/Sternberg Museum Collection (MHP 12128).

I am grateful to Dean Kettle and Bruce Johanning (both of KSR) for calling my attention to the snake, and to Galen Pittman, Manager KSR Field Station, for information on the property location.

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ARTICLES

WHAT SHOULD BE DONE ABOUT EROSION MESH NETTING AND ITS DESTRUCTION OF HERPETOFAUNA?

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Erosion netting consists of woven mats of seed-implanted straw or jute layered between two sheets of netting, or occasionally with a single layer of erosion netting over a layer of straw (Munshower 1994). This netting comes in various sizes, but the most commonly used size is 20 x 20 mm. Some netting comes in several varieties such as Bird-X Protective netting, which is used for protection of fruit trees and is manufactured by Dalten Products (Knoxville, Tennessee). Another type is mist nets, which are made of nylon and used by biologists doing avian field work. Still other types of erosion mesh netting are used as a ground service stabilizer for new plant growth and for stabilizing revegetated barren slopes, controlling runoff, and reducing erosion on construction sites throughout the United States.

In recent years, the specific use of erosion mesh netting (Figure 1) on construction sites has become a drastic threat for North America's herpetofauna, which is already undergoing major decline from the environmental impacts of development, farming, air pollution, and numerous other factors caused by human practices.

One such example, submitted by Nebraska's Audubon Society of Omaha via the internet, is snake

traps constructed from Ross Garden Netting. Ross Garden Netting is composed of 3/4-inch polypropylene netting, and the Audubon Society of Omaha has suggested several different methods of attaching the netting to bluebird poles. This suggestion provides an excellent example of lack of foresight as to the unintended consequences of using webbing in this manner; if snakes are a problem around bird boxes, we suspect that some would become entangled in such netting and die from overheating, desiccation, predation, or would suffer severe injuries, which would further add to the mortality factor. The frequency with which people would check nest boxes during mid-day sun, when mortality would be the major factor, is questionable.

Several authors including Fauth and Welter (1994), Liner and Hogenstad (1996), Stuart et al. (2001), Bonine et al. (2004), Hunsinger (2004), Low (2005) and Walley et al. (2005) reported incidences relating to mortality or endangerment when snakes became entangled in erosion mesh or plastic netting.

In recent months, Anderson (2004), Casper (2004), Hunsinger (2004), King (2004) and Salzberg (2004) expressed their concern through correspondence to us providing noteworthy information relating to mortality and entrapment in erosion mesh netting. The authors (2005) reported an instance in which three specimens of *Lampropeltis triangulum* and a single *Coluber constrictor* became entangled in 20 x 20 mm plastic erosion netting and perished from either heat exposure or starvation in LaSalle County, Illinois, bordering the Illinois-Michigan Canal (Figure 2). This site borders a toll path road, 2 miles west of Utica, adjacent and just east of Split Rock, a feature cited on quadrangle maps and in Cady (1919). It is noteworthy that this land is under State Department of Natural Resources surveillance, but without adequate supervision due to lack of state funding. A recent issue of *HerpDigest* (2004) notes a forthcoming article on erosion mesh netting mortality in press by us. This topic has been a source of concern among other colleagues or conservationists; therefore, we herein

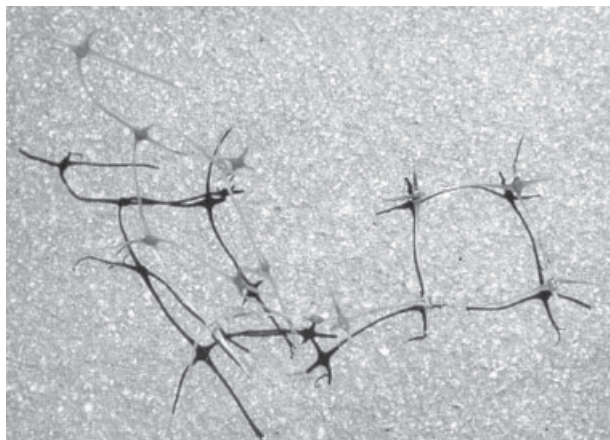


Figure 1. Close up view of erosion mesh netting.

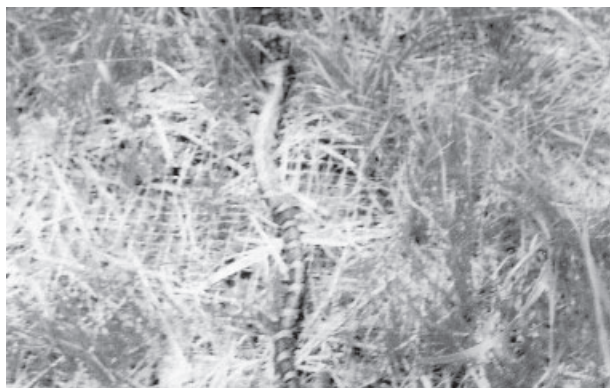


Figure 2. *Lampropeltis triangulum* entrapped in erosion mesh netting in LaSalle County, Illinois.

provide additional information, which we feel is noteworthy.

Gary Casper of the Milwaukee Public Museum provided several photographs (Figures 3–4) of *Thamnophis butleri* entangled in erosion mesh netting in Ozaukee County, Wisconsin, and involving injuries which would certainly cause death from constriction of vital organs and/or infection. This species is of major concern and is listed as threatened in Wisconsin (Levell, 1997).

Ron Black (pers. comm.) found two Eastern Massasaugas (*Sistrurus c. catenatus*) and three Northern Water Snakes (*Nerodia sipedon*) entangled in erosion mesh netting in Ontario, Canada. It is noteworthy that *S. c. catenatus* is considered a threatened species in Ontario and is protected throughout most of its range in the eastern United States.

Walley (1963) had previously reported *C.*



Figure 3. *Thamnophis butleri* from Ozaukee County, Wisconsin, showing injuries from erosion mesh netting. Photograph by Gary Casper.



Figure 4. *Thamnophis butleri* from Ozaukee County, Wisconsin, showing injuries from erosion mesh netting. Photograph by Gary Casper.

horridus from the same area in LaSalle County, Illinois, where the above noted *L. triangulum* mortalities occurred; the Timber Rattlesnake is cited as threatened in Illinois, as reported in the Illinois Endangered Species Protection Board Biennial Report for 2004 (Anonymous, 2004). Andrew King (pers. comm.) informed the authors that he freed an adult *Crotalus horridus* that had been severely entangled in polypropylene erosion-control netting from along the rocky slope of a natural gas pipeline right-of-way in south-central Pennsylvania (Figure 5), while Fauth and Welter (1994) recorded this same species having perished in the same type of netting in Giles County, Virginia.

Low (2005) provided a note and illustration of *Thamnophis sirtalis* that became entangled in erosion netting in Shawnee County, Kansas.

There have been other reports of this type of netting being discarded at a dump site in northwest Tucson, Arizona (Bronine, et. al. (2004), where those authors observed *Crotalus atrox*, *Masticophis flagellum*, *Pituophis catenifer*, *Lampropeltis getula*, *Phrynosoma solare*, *Dipsosaurus dorsalis* and *Sceloporus magister* entangled over a two year period, of which all were fatalities. Hunsinger (2004) cites two adult *Coluber constrictor* (NYSM 3543–4) found entangled in this type of webbing in Saratoga County, New York.

As previously mentioned by Stuart et al. (2001), it has become apparent that we are confronted with a lethal product being used not only by landscape and road construction agencies throughout the United States, but also by the Audubon Society in Omaha on a smaller scale for preventing bird predation by several species of snakes.



Figure 5. *Crotalus horridus* being released from erosion mesh netting. Photograph by Andrew King.

This supposedly photodegradable netting has often been found intact after having been exposed to sunlight and the elements for eight years, and it is unknown how long this netting has been at the dump site recorded by Stuart et al. (2001) and Bonine et al. (2004).

Using this type of erosion control imposes a threat to herpetofauna and small mammals for extended periods of time. We feel that prompt measures should be taken to produce and promote other means of erosion control, especially in areas where vulnerable, threatened, and endangered species are possibly found or known to exist. Jennifer Anderson (pers. comm) of the Iowa Department of Natural Resources is very much concerned over the use of such material, has made the NRCS biological staff aware of this issue, and informs me that many other organizations are interested in this problem as well.

Acknowledgements: We are highly indebted to Gary Casper and Andrew King for supplying photographs and Jeff Black, Todd Hunsinger, Andrew King, Jed Merrow, Jim Stuart and Theresa L. Wusterbarth for providing comments or correspondence relating to this subject.

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The Kansas Herpetological Society

The *Kansas Herpetological Society* is a non-profit organization established in 1974 and designed to encourage education and dissemination of scientific information through the facilities of the Society; to encourage conservation of wildlife in general and of amphibians, turtles and reptiles in Kansas in particular; and to achieve closer cooperation and understanding between herpetologists, so that they may work together in common cause.

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Editorial Policy

The *Journal of Kansas Herpetology*, issued quarterly, publishes peer-reviewed manuscripts and notes dealing with the biology of amphibians, turtles and reptiles. Manuscripts should be submitted to the Editor no later than the 10th of the month prior to the month of issuance. All manuscripts become the sole possession of the Society, and will not be returned unless arrangements are made with the Editor. Pen and ink illustrations and photographs are also welcomed. Illustrations and photographs will be returned to the author only upon request. The *Journal of Kansas Herpetology* uses the common names standardized nationwide by Collins & Taggart (2002).

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The Gloyd-Taylor Scholarship is presented annually by the Kansas Herpetological Society to an outstanding herpetology student. Nominations for this award are open to any KHS member enrolled in an accredited educational institution in Kansas or any KHS member enrolled in any accredited educational institution outside of Kansas. The scholarship is \$100.00 and is awarded on the basis of potential for contributing to the science of herpetology. Students from grade school through university are eligible.

Nominations should include typewritten details of the nominee's qualifications, plus name and address of the nominee and nominator. Self-nomination is encouraged. If self-nominated, a letter of reference from an academician is required.

Nominations should include, but are not limited to, academic record, herpetological activities, and future plans in herpetology. Academic record should address schools attended and an indication of academic performance in each (e.g., grade point average, teacher evaluations, courses completed). Herpetological activities should include a brief narrative that details experiences and activities that demonstrate a long-term interest in herpetology, and documents accomplishments in herpetological study. Future plans in herpetology should include a statement, not to exceed one-page, written by the student about his/her future interests and plans.

Applicants may include an optional appendix with photographs, awards, newspaper articles, reports written by the student, or other documents relevant to herpetological activities.

Nominations should be sent to the KHS Awards Committee Chair, and must be postmarked by 15 September. The scholarship winner will be announced at the annual meeting in November. New applications will be accepted after 1 January of the following year.

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KHS members only are eligible to apply for The Alan H. Kamb Grant for Research on Kansas Snakes. The recipient of the grant (minimally \$100.00) will be selected by the KHS Awards Committee. If no qualified proposals are submitted, no award will be made for that year.

The KHS Awards Committee will entertain proposals for research on Kansas snakes. The proposal must be limited to ten typed pages, and should include, but not be limited to the following: title, name of researcher, contact information, abstract, introduction and justification, objectives or hypotheses, materials and methods, significance of research and possible results, literature cited, timetable, and proposed budget. The research must be conducted on one or more native Kansas snake species. Additionally, a majority of the field work or observations must be proposed to occur in Kansas, or the data must be proposed to be collected, at least in part, on Kansas specimens.

Proposals should be sent to the KHS Awards Committee Chair, and must be postmarked by 15 September. The grant recipient will be announced at the annual meeting in November. New applications will be accepted after 1 January of the following year.

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Conditions and Stipulations: The Award shall be known, presented, and portrayed as the *Suzanne L. & Joseph T. Collins Award for Excellence in Kansas Herpetology* and may not be changed for any reason, nor added to or merged with any other award, prize, or gift. The Award is established in recognition of the scientific and photographic achievements of Suzanne L. Collins and Joseph T. Collins, whose life-long study and conservation of the native amphibians, turtles, and reptiles of Kansas is amply demonstrated in their extensive and excellent writings and photography, both academic and popular, about these animals.

The Collins Award shall be presented no more than once each year. The Award may not be divided, but must be presented in full to a single individual. The Award consists of a trust-in-perpetuity, owned and invested by the *The Center for North American Herpetology*, and part of the interest from the trust is annually forwarded to the *Kansas Herpetological Society*, should they choose to make an award in that year.

Recipients of *The Collins Award* are chosen by the *Kansas Herpetological Society Awards Committee*.

In even-numbered years, the Award is bestowed upon an individual who, in the *preceding* two calendar years, had published a paper of academic excellence on the systematics, ecology, or conservation of a native species of Kansas amphibian, turtle, and/or reptile in the *Journal of Kansas Herpetology*, *Transactions of the Kansas Academy of Science*, *Herpetological Review*, or the *Journal of Herpetology*, and/or presented a lecture of excellence on the systematics, ecology, or conservation of a native species of Kansas amphibian, turtle, and/or reptile at the KHS Annual Meeting. To qualify for the Award, a portion of the field work or observations must have occurred in Kansas, or the systematic data must have been based in part on Kansas specimens. *In odd-numbered years*, the Award is bestowed upon an individual who was chosen the best in a juried competition featuring the art of photography in portraying amphibians, turtles, and/or reptiles, said competition to take place under the auspices and on the occasion of the annual meeting of the *Kansas Herpetological Society*. To qualify for the Award, the art work must portray a species native to Kansas.

The Collins Award is minimally \$1000.00, and is neither a grant nor a scholarship. No nominations or applications can be made for it.

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