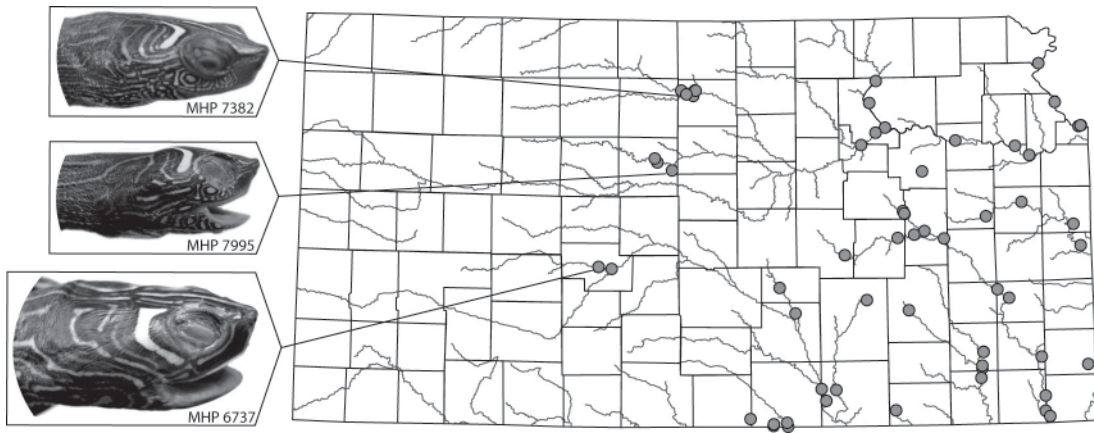


***JOURNAL OF* KANSAS HERPETOLOGY**

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Front Cover: A map of the state of Kansas, showing the exact localities (dark circles) for members of the turtle complex *Graptemys pseudogeographica*. Head patterns of individuals from the three westernmost drainages in which they occur are shown at left of the map. Prepared by Travis W. Taggart, Sternberg Museum of Natural History, Fort Hays State University, Hays, Kansas 67601.

Journal of Kansas Herpetology

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KHS BUSINESS

Kansas Herpetological Society *31st Annual Meeting*

6–7 November 2004

Ackert Hall
Kansas State University
Manhattan, Kansas

If you wish to present a paper, email the title, abstract, and your address or institutional affiliation to KHS President Eva Horne at ehorne@ksu.edu (or send same via US mail to her address; see inside front cover of the *Journal of Kansas Herpetology*). In addition, please email your title and institutional affiliation to Joe Collins (jcollins@ku.edu) for inclusion on the web site. The deadline is 1 October 2004. Generally, talks are restricted to twenty minutes or less. Detailed programs will be available at the registration table.

All scientific paper sessions for the KHS 31st Annual Meeting will be held in Ackert Hall (see the KSU campus map on page 4) on the Kansas State University campus, Manhattan, Kansas, on 6–7 November 2004. Those planning to attend should check the KHS web site at

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

to obtain up-to-date information about the program and motel availability.

Registration is at the door with the KHS Treasurer on Saturday and Sunday: Students (9th through 12th Grade) \$5.00 per person; adults \$10.00 per person. K through 8th Grade are admitted free.

The annual KHS auction will be held on Saturday night (6 November) at the Konza Prairie (maps will be provided at the meeting). All proceeds from the auction go to the KHS. Refreshments will be free.

Live Exhibit. A live exhibit of native Kansas herpetofauna will be assembled, and will be available for viewing and photographing on Saturday and Sunday.

Program

Saturday, 6 November 2004

8:00 am Registration for both days: Mary Kate Baldwin (KHS Secretary) and Eric Kessler (KHS Treasurer) in the main foyer of Ackert Hall (see the KSU Campus Map), Kansas State University, Manhattan, Kansas. Free coffee and donuts will be available.

8:45 am Welcome by Eva Horne (KHS President)

Scientific Paper Session 1 in Room 120, Ackert Hall, Kansas State University

9:00 am KEYNOTE SPEAKER: *Alicia Mathis, Southwest Missouri State University, Springfield*. Topic: *Sex, Safety, and Survival: Social Behavior and Conservation Biology of Salamanders*.

9:45 am Paper presentations until 10:30 am

Scientific Paper Session 2 in Room 120, Ackert Hall, Kansas State University

10:40 am Paper presentations until 11:40 am

11:40 am to noon KHS Group Photograph taken by Larry L. Miller (Kansas Heritage Photography, Wakarusa)

LUNCH: noon to 1:20 pm at the restaurant of your choice

Scientific Paper Session 3 in Room 120, Ackert Hall, Kansas State University

1:20 pm Paper presentations until 4:00 pm

4:00 pm KHS General Business Meeting

KHS President Eva Horne presiding in Room 120, Ackert Hall, Kansas State University

Introduction of current KHS officers by Eva Horne

KHS Treasurer's Report for 2004 by Eric Kessler

KHS Secretary's Report for 2004 by Mary Kate Baldwin

KHS Editor's Report for 2004 by Travis W. Taggart

The 32nd Annual KHS Meeting at Pittsburg State University in 2005 by President-Elect David Oldham.

Election of KHS Officers for 2005. The KHS Nominating Committee offers the following slate of candidates:

For President

David Oldham, Labette Community College, Parsons, Kansas; serving as president-elect during 2004, he automatically assumes the KHS presidency on 1 January 2005

For President-Elect

Keith Coleman, Johnson County Community College, Overland Park, Kansas

Curtis J. Schmidt, Sternberg Museum of Natural History, Fort Hays State University, Hays, Kansas

For Treasurer (unopposed)

Eric Kessler, Blue Valley North High School, Overland Park

For Secretary (unopposed)

Mary Kate Baldwin, Topeka Collegiate School

Announcement of the results of the KHS election by the Elector, Mary Kate Baldwin

Presentation of the Howard Kay Gloyd-Edward Harrison Taylor Scholarship for 2004 by Daniel D. Fogell (KHS Awards Committee Chairperson)

Presentation of the Alan H. Kamb Grant for Research on Kansas Snakes for 2004 by Daniel D. Fogell (KHS Awards Committee Chairperson)

DINNER: 5:00 pm to 6:30 pm at the restaurant of your choice

6:30 pm KHS Auction and Social at the Konza Prairie (maps will be available). At approximately 6:45 pm, the presentation of *The Suzanne L. & Joseph T. Collins Award for Excellence in Kansas Herpetology* for 2004 by Robert Powell (Avila University, Kansas City, Missouri) will take place. The recipient of *The Collins Award* receives a commemorative memento and a check for \$1000.00.

At approximately 7:00 pm, the KHS Auction will be conducted at the Konza Prairie by Joseph T. Collins, ably assisted by KHS Secretary Mary Kate Baldwin, KHS Treasurer Eric Kessler, and Suzanne L. Collins and featuring many excellent books and other items (of questionable value). The KHS takes cash, credit cards, and checks. Be sure and get a bidding number before the auction commences. Bid vigorously, and support the KHS.

Sunday, 7 November 2004

8:30 am Registration for participants that did not register on Saturday: Mary Kate Baldwin (KHS Secretary) and Eric Kessler (KHS Treasurer) in the main foyer of Ackert Hall, Kansas State University, Manhattan,

Kansas. Free coffee and donuts will be available.

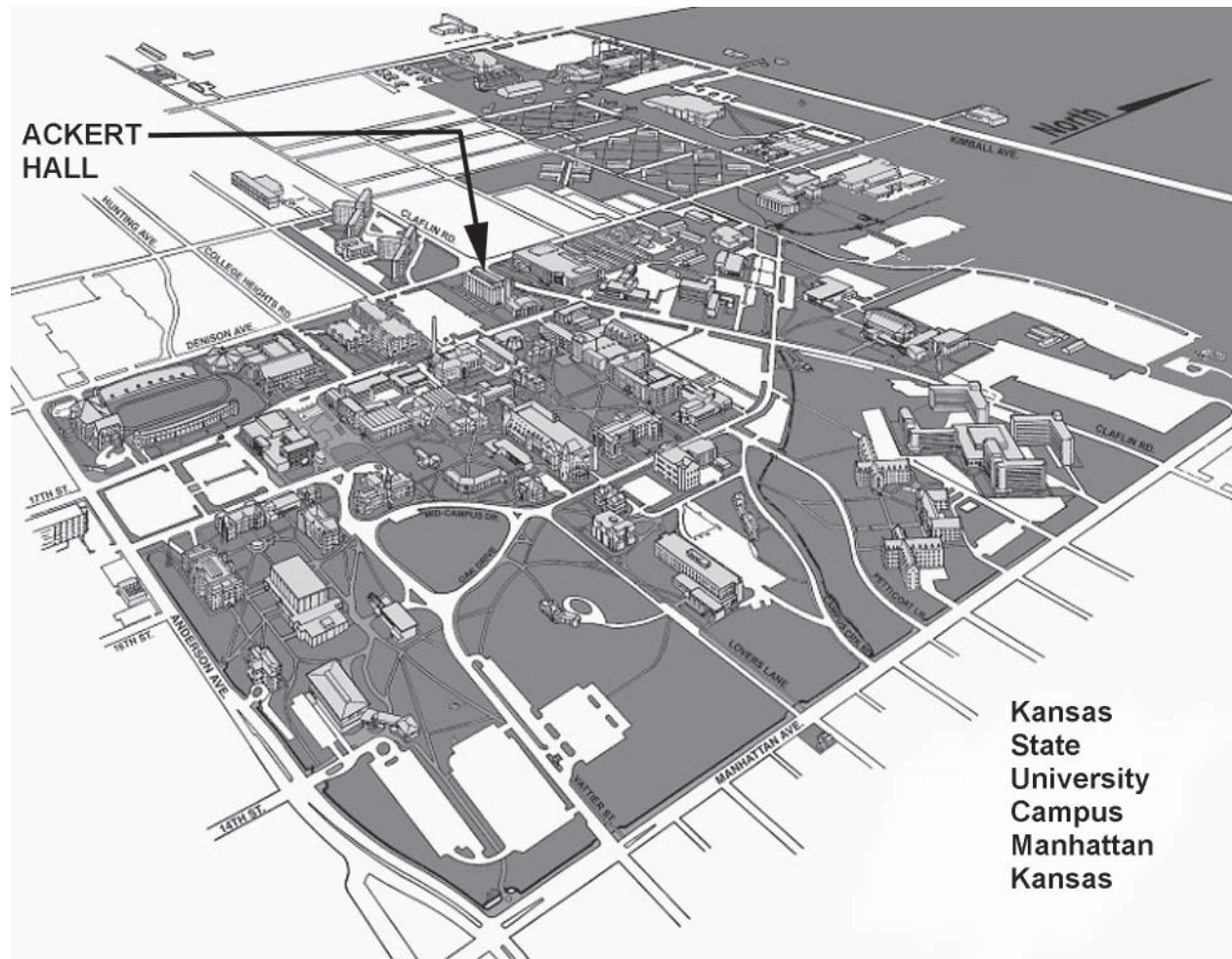
Scientific Paper Session 4 in Room 120, Ackert Hall, Kansas State University

9:00 am Paper presentations until noon (or earlier)

Have a safe trip home. See you in November 2005 in Pittsburg, Kansas, for the 32nd Annual KHS Meeting.

31st Annual Meeting Committee
Eva Horne, Chairperson

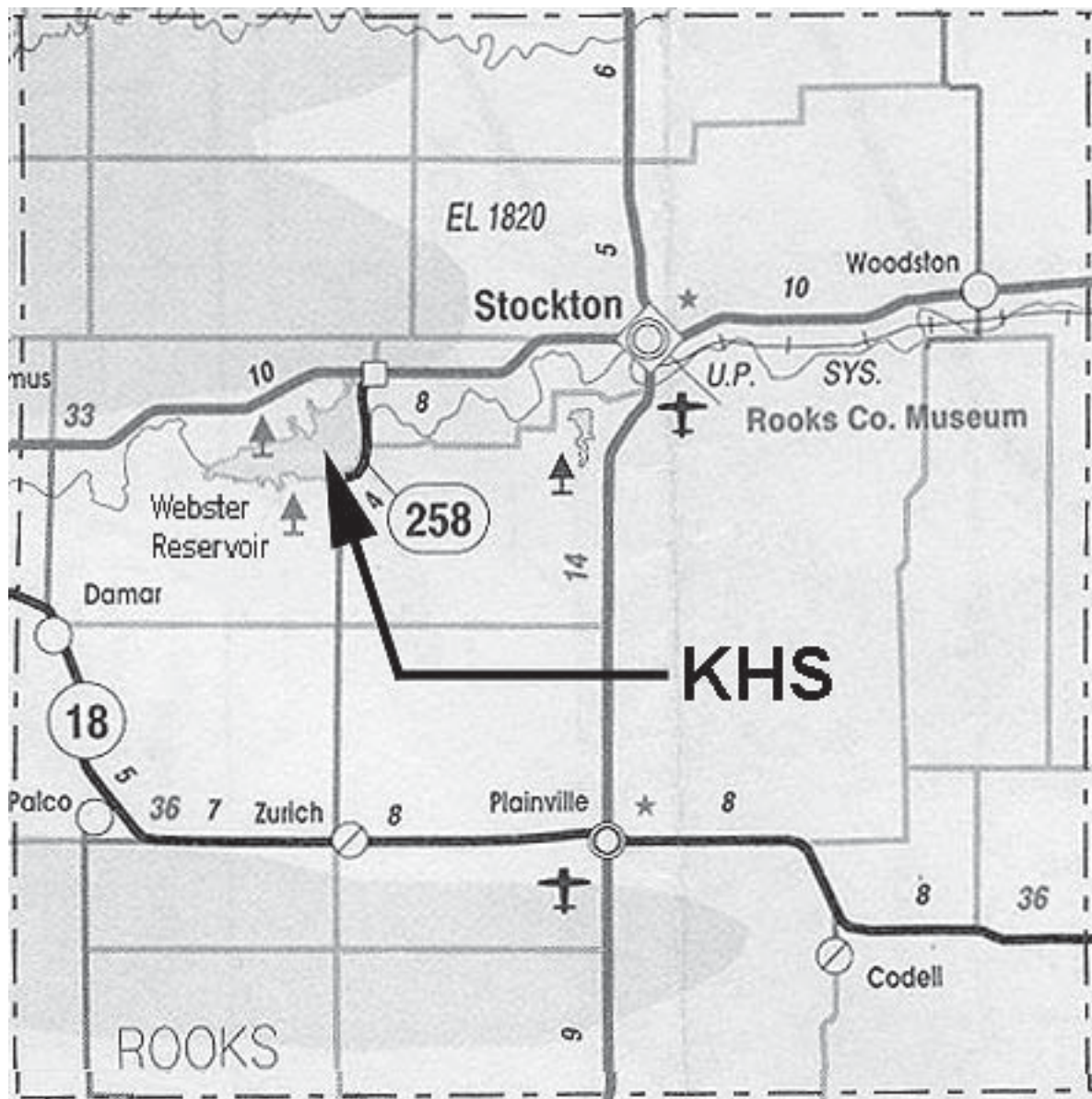
Note: *The Suzanne L. & Joseph T. Collins Award for Excellence in Kansas Herpetology* will be given at this KHS 31st Annual Meeting in Manhattan, Kansas, to the KHS member judged to have published the best scientific paper or made the best presentation at a KHS meeting on a species native to the Kansas herpetofauna. The KHS Awards Committee selected the recipient from papers published or presentations made during 2002 and 2003. During odd-numbered years (photography competition), only KHS members are eligible. During even-numbered years (scientific presentations or publications), candidates are strongly encouraged to join the KHS, because preference will be given to KHS members.



FALL 2004 KHS FIELD TRIP SCHEDULED FOR ROOKS COUNTY

The fall 2004 KHS field trip will be held at Webster Reservoir in Rooks County in northcentral Kansas. The dates of the field trip will be 2–3 October 2004. Although many participants will arrive the afternoon and evening of Friday, 1 October (look for the big KHS sign on the north side of the reservoir), the first organized count will begin at 9:00 am on Saturday, 2 October. The second organized count will begin at 2:00 pm on Saturday, 2 October. The final organized survey will take place at 9:00 am on Sunday, 3 October. The meeting place for the field trips will be Webster Reservoir, which is located approximately eight miles west and slightly south of Stockton. Please contact Jay Kirk, KHS Field Trip Chairperson (see inside front cover) for information about the availability of motels and restaurants in Stockton; both parking and camping permits are required at Webster Reservoir. More information will be posted on the KHS web site as it becomes available.

As with all KHS field trips, FRS channel 4 will be monitored. The Rooks County field trip will be the only official fall KHS field trip for 2004. Start making plans now to attend this exciting Society event.



A map of Rooks County, Kansas, showing the site of the KHS 2004 Fall Field Trip on 2-3 October.

KHS SCHOLARSHIP & GRANT DEADLINES

Individuals are reminded that the deadline is 15 September 2004 for submission of applications for the *Howard K. Gloyd-Edward H. Taylor Scholarship* and the *Alan H. Kamb Grant for Research on Kansas Snakes*. Self-nominations for the *Gloyd-Taylor Scholarship* are encouraged. Submissions for both the scholarship and grant should be sent to the Chairperson of the KHS Awards Committee (see inside front cover of this issue). For more details on the *Kamb Grant* and *Gloyd-Taylor Scholarship*, consult the inside back cover of this issue.

NEW MEMBERS WANTED

If you know of someone interested in herpetology, urge that they join the KHS by sending their calendar 2004 membership dues (\$15.00 regular, \$20.00 contributing) to:

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

Membership in the KHS has many benefits, and supports the KHS and its many fine programs. Also, members are eligible for KHS grants and scholarships. If you have received this issue, you have already paid your dues for 2004; please encourage a friend or colleague to join. The KHS is the strongest state herpetological society in the nation; keep us that way by promoting membership growth.

KHS AUCTION

Individuals planning to donate items for the KHS auction should bring them to the Konza Prairie on Saturday evening and place them on the tables set up for display. Artwork (photography, drawings, and sculpture), books, field gear, aquaria are most acceptable; please bring only items of a herpetological nature. This should *not* be an opportunity to clear out your cupboard (or library) of non-herpetological things. Also, no minimum bids will be set for any items. Be prepared to have your cherished contribution sold for anywhere from \$1.00 to \$100.00.

One of the items already donated: *Amphibians and Reptiles of Arkansas* by Stanley A. Trauth, Henry W. Robison & Michael V. Plummer (2004).

See you there. KHS takes cash, checks, and credit cards. Refreshments are free.

KHS OFFICER NOMINATIONS FOR 2005

The KHS Nominating Committee, composed of Eva Horne, Stanley D. Roth, and Joseph T. Collins, announces the following slate of candidates for 2005 KHS office:

FOR PRESIDENT-ELECT:

Keith Coleman
*Johnson County Community College
Overland Park*

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

FOR SECRETARY:

Mary Kate Baldwin
Topeka, Kansas

FOR TREASURER:

Eric Kessler
Kansas City, Missouri

David Oldham served as KHS President-elect during 2004 and automatically becomes KHS President for 2005.

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 August 2004.

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

Suzanne L. & Joseph T. Collins
Lisa K. & Kelly J. Irwin

*both in Memory of
Nona Tollefson*

KHS AWARDS COMMITTEE

President Eva Horne has appointed the *KHS Awards Committee* for 2004–2005 as follows: Daniel D. Fogell (chair, University of Nebraska, Omaha), Robert Powell (Avila University, Kansas City, Missouri), and Travis W. Taggart (Sternberg Museum of Natural History, Fort Hays State University). The Society thanks William Busby (Kansas Biological Survey) for serving during 2002–2003.

OF INTEREST

SALAMANDERS OF ARKANSAS POSTER

The Arkansas Game & Fish Commission has published a new wildlife poster illustrating in color the salamanders of their state. The poster is the product and design of Arkansas state herpetologist and KHS member Kelly J. Irwin with artwork by Bruce Cook, and is an attractive and handy reference to Arkansas salamanders. It supplements the information appearing in the recently (2004) published *Amphibians and Reptiles of Arkansas* by Stanley E. Trauth, Henry W. Robison, and Michael V. Plummer. The poster covers the following taxa (common names as they appear on the poster): Eastern Newt, Spotted Salamander, Marbled Salamander, Ouachita Dusky Salamander, Ringed Salamander, Longtail Salamander, Cave Salamander, Southern Redback Salamander, Grotto Salamander, Western Slimy Salamander, Caddo Mountain Salamander, Ozark Zigzag Salamander, Rich Mountain Salamander, Fourche Mountain Salamander, Dwarf Salamander, Ozark Hellbender, Red River Mudpuppy, Four-toed Salamander, Lesser Siren, and Three-toed Amphiuma. The excellent photography is by KHS member Suzanne L. Collins (Lawrence, Kansas) and Stanley E. Trauth (State University, Arkansas). For greater comprehension and ease of use (both among herpetologists and the general public), this poster adopts the standard common names of Collins & Taggart (2002). To request a free copy of the poster, call 1-800-364-4263.

COLORADO HERPETOFAUNAL ATLAS

Sponsored and managed by the Colorado Division of Wildlife and developed by Camp, Dresser & McKee, with the advice and assistance of Geoffrey A. Hammerson (author of *Amphibians and Reptiles in Colorado*) & KHS member Joseph T. Collins (director of The Center for North American Herpetology), the new Colorado Herpetofaunal Atlas is now online.

Many salamander, frog, turtle, lizard, and snake populations are declining rapidly throughout the western United States. In Colorado, some species have become scarce or no longer occur within their historical range. For example, Northern Leopard Frogs formerly were common and widespread in the mountains of the Front Range, but now they are very scarce. Similarly, subalpine wetlands throughout the Southern Rockies formerly hosted many robust popu-

lations of toads, but today they are few and highly localized. Northern Cricket Frogs have not been found in Colorado since 1979. What's going on? Insufficient information.

The factors responsible for these declines include habitat loss and degradation, competition with non-native species, pollution, excessive harvest or mortality on roads, and disease, but often the causes are unknown. Often we have insufficient information to determine whether a decline is cause for alarm or simply part of a natural fluctuation pattern. A major problem is that for most species we do not have enough information to know whether they are declining, increasing, or maintaining stable populations. This information gap makes it impossible to undertake appropriate and timely protection and management actions.

The Colorado Herpetofaunal Atlas was initiated as a means of assembling and displaying information that will facilitate assessments of the distribution, abundance, and conservation status of reptile and amphibian populations throughout Colorado. Access it at

<http://ndisdev.nrel.colostate.edu/herpatlas/coherpatlas/>

NEW ARKANSAS HERP BOOK

The Amphibians and Reptiles of Arkansas by Stanley E. Trauth, Henry W. Robison, and Michael V. Plummer is off the press and now available. The product of fifteen years of work by three well-known herpetologists, this book is a comprehensive examination of the amphibians, turtles, reptiles, and crocodilians of Arkansas, featuring over 136 species and subspecies. With over five hundred four-color photos, line drawings, and over one hundred maps, this user-friendly book will become the definitive text on the subject.

"This is a stunning and wonderful contribution to the natural history of Arkansas, crammed with information and spectacular photography. The authors bring together their extensive knowledge of different groups and meld them in a way that ensures that *The Amphibians and Reptiles of Arkansas* will be a lasting and frequently used compendium," said KHS member Joseph T. Collins, the *Wildlife Author Laureate of Kansas*, co-author of the *Peterson Field Guide to*

Reptiles and Amphibians of Eastern and Central North America, and author of *Amphibians and Reptiles in Kansas*.”

“This book is obviously a labor of love. . . . The authors have done an excellent job. The text is well written, and the photographs and illustrations are superb. *The Amphibians and Reptiles of Arkansas* is an essential addition to the library of any herpetologist, and will be accepted eagerly by the scientific community,” said James Dixon, professor emeritus at Texas A & M University and author of *Texas Snakes and Amphibians and Reptiles of Texas*.

“This is a major work. The authors have done a superb job of compiling the most definitive work on the herpetofauna of Arkansas to date. The photography and illustrations are well done and the text is replete with pertinent information. The extensive and well-written keys to larval amphibians are absent from most state herpetological works, and for this reason alone herpetologists and biologists will use this work as an important reference. The authors are to be commended for producing this exhaustive and much-needed work by synthesizing their collective expertise and experience into a single volume,” said KHS member Kelly Irwin, state herpetologist for the Arkansas Game and Fish Commission.

For greater comprehension and ease of use (both among herpetologists and the general public), this booklet adopts the standard common names of Collins & Taggart (2002).

Published: 2004 by The University of Arkansas Press. Cost: \$45.00 (clothbound). ISBN 1-55728-737-6. To order, call 1-800-626-0090.

NORTH AMERICAN HERP NAMES TRANSLATED

The latest version of the “Names of the Reptiles and Amphibians of North America” has been posted on

<http://ebeltz.net/herps/etyhome.html>

New scientific names have been added and biographies updated. In addition, the coding has been tightened up to html 4.01 standard and validated on all pages. This new format makes the list easier to use.

For those who are taxonomists, this list is not an effort to codify currently accepted scientific taxonomy or nomenclature. It merely translates the scientific names which have been put forward for the reptiles, turtles, crocodylians, and amphibians of North America.

Names that have been sunk are retained (some of them may come back to life later).

New scientific names and the original descriptions thereof are always being sought by the author. If you see anything on these lists to which you would care to contribute, your suggestions are welcome and you will be listed in the acknowledgements as a contributor. Contact Ellin Beltz at

ebeltz@ebeltz.net

SOUTH DAKOTA HERP SURVEY COMPLETED

Under a State Wildlife Improvement Grant from the South Dakota Department of Game, Fish, and Parks to KHS member Joseph T. Collins, a survey of amphibians, turtles, and reptiles found in Custer State Park in the Black Hills of southwestern South Dakota was conducted from 21 May 2004 to 23 June 2004.

During 34 days of searching, sixteen species were found and nearly 1,200 herpetofaunal observations were made. Tissues for mtDNA research were taken for all species (except the Common Snapping Turtle) and were deposited at the Sternberg Museum of Natural History, Fort Hays State University, Hays, Kansas.

Amphibians observed were the Barred Tiger Salamander, Plains Spadefoot, Woodhouse’s Toad, Boreal Chorus Frog, and Northern Leopard Frog. Turtles observed were the Common Snapping Turtle and Northern Painted Turtle. Reptiles observed were the Eastern Racer, Milk Snake, Smooth Green Snake, Bullsnake, Redbelly Snake, Western Terrestrial Garter Snake, Plains Garter Snake, Common Garter Snake, and Prairie Rattlesnake.

Participants on the survey were Joseph T. Collins, Suzanne L. Collins, John Stoklosa, and Ginny Weatherman (Lawrence, Kansas), Jerry D. Collins (Cincinnati, Ohio), Mark R. Ellis (Topeka, Kansas), Travis W. Taggart, Curtis J. Schmidt, Richard Hayes (Hays, Kansas), Errol D. Hooper, Jr. (Greentop, Missouri), Jay D. Kirk (Wichita, Kansas), Ross McNearney (Leawood, Kansas), Andrew Sindorf (Eudora, Kansas), Madeline Schickel (Lakewood, Ohio), and Meagan Hall and Andrew Kopp (Rapid City, South Dakota).

Images by Suzanne L. Collins of creatures found during the survey can be accessed at

<http://www.cnah.org/detail.asp?id=177>

<http://www.cnah.org/detail.asp?id=1192>

<http://www.cnah.org/detail.asp?id=368>

<http://www.cnah.org/detail.asp?id=282>

GREEN FROG DATA NEEDED

KHS member Walter Meshaka, state herpetologist of Pennsylvania, is currently studying geographic variation in life history characteristics of a widespread anuran, the Green Frog (*Rana clamitans*). If you live within the geographic range of this frog or come into contact with this species, would you consider the following request:

Please email him (wmeshaka@state.pa.us) or write him (State Museum of Pennsylvania, Zoology/Botany, 300 North Street, Harrisburg, Pennsylvania 17120-0024) with what you know to be the calling season of this frog in your area. It could be for a particular year and site (such as May-October, 2000, Gainesville, Alachua County, Florida), or in general for some region of your state (such as usually June-July in southwestern Ontario), or even something in between (such as during June-August 2002 in Cumberland, Dauphin, and Perry counties of Pennsylvania). If, for specific areas, you can tell him if males have a yellow throat, so much the better.

Please also note if you are willing for him to reference your information as a personal communication (i.e., pers. comm. followed by your name). This is necessary for him in order to use the information in publication.

NORTHERN CRICKET FROGS NEEDED

Kaela B. Beauclerc is a PhD student at Trent University in Peterborough, Ontario. She is working on the molecular systematics of Cricket Frogs as part of the recovery program for the Blanchard's Cricket Frog in Canada. She is trying to recruit people to collect tissue samples for her from throughout the U.S. She is hoping to get about 20 individuals from throughout each state where they occur, from a few different sites (maybe 4-5 per site, depending on how abundant they are). She is mainly interested in just toe clips for genetic analysis, but she knows many people prefer to collect entire voucher specimens. (it is up to the individual as to whether they want to just collect toe clips, or collect a voucher specimen and deposit it at their institution and send her a toe clip or the entire specimen). She can send you all the equipment you need if that will help, and also reimburse you for shipping or send you an account number for FedEx or Purolator Courier.

If you are able to help her out, please let her know from which areas you can collect samples and approximately how many you think you could get. That way, she can balance how many she may need

collected, depending on whether or not she can find anyone else to collect samples. She is not in a rush to get the samples, so whenever anyone has the chance to collect some is fine. If you know of anyone else that might be able to collect samples, she would greatly appreciate it if you could put her in touch with them.

Contact Kaela at

kaela.beauclerc@nrdfpc.ca

NEW ARKANSAS SNAKE GUIDE

A product of the skillful pen of state herpetologist and KHS member Kelly J. Irwin, this publication is a quick and handy reference to Arkansas snakes, and supplements the information appearing in the recently (2004) published *Amphibians and Reptiles of Arkansas* by Stanley E. Trauth, Henry W. Robison, and Michael V. Plummer. Co-sponsored by *The Center for North American Herpetology*, this 50-page booklet features the exquisite color photography of Suzanne L. Collins (CNAH, Lawrence, Kansas), and includes text and images for all 36 kinds of serpents known to inhabit Arkansas.

Species included (by common name as they appear in the booklet): Copperhead, Cottonmouth, Western Diamondback Rattlesnake, Timber Rattlesnake, Western Pigmy Rattlesnake, Texas Coral Snake, Scarlet Snake, Milk Snake, Mississippi Green Water Snake, Plainbelly Water Snake, Broad-banded Water Snake, Diamondback Water Snake, Northern Water Snake, Racer, Great Plains Rat Snake, Black Rat Snake, Eastern Hognose Snake, Prairie Kingsnake, Speckled Kingsnake, Coachwhip, Rough Green Snake, Western Ribbon Snake, Common Garter Snake, Mud Snake, Graham's Crayfish Snake, Glossy Crayfish Snake, Queen Snake, Eastern Worm Snake, Western Worm Snake, Ringneck Snake, Ground Snake, Brown Snake, Redbelly Snake, Flathead Snake, Rough Earth Snake, and Smooth Earth Snake.

An essential addition to the library of any North American herpetologist.

For greater comprehension and ease of use (both among herpetologists and the general public), this booklet adopts the standard common names of Collins & Taggart (2002).

Published 2004 by the Arkansas Game & Fish Commission, Little Rock. Cost: Gratis. To request a copy, call 1-800-482-8845.

HERPETOFAUNAL COUNTS

The Kansas Herpetological Society encourages both its members and non-members to sally forth across our state each year during April and May to conduct herpetofaunal counts. The results of these forays are reported in the September issue of the *Journal of Kansas Herpetology*. Compiled below are the counts for 2004.

CHEROKEE COUNTY HERP COUNT

On 17 April 2004, I conducted a Cherokee County herpetofaunal count at the Spring River Wildlife Area near the jct. of the Spring River & Rt. 96. The following species were observed:

Northern Cricket Frog	±100
Southern Leopard Frog	6
Eastern Box Turtle	1
Five-lined Skink	2
Coal Skink	1
Western Worm Snake	1
Ringneck Snake	7
Nothern Water Snake	2

Totals

8 species ±120 specimens

JAMES KENT DANIEL, Department of Biology,
Pittsburg State University, Pittsburg, Kansas 66762.

COWLEY COUNTY HERP COUNT

The 16th annual Cowley County herpetofaunal count was held on 25 April 2004 between 1:00 pm and 5:00 pm at a location in the Flint Hills east of Winfield. The survey primarily consisted of rock turning. The mid survey temperature was 20°C. The stream water temperature was 15°C. The day was sunny with winds calm to 5 mph from the southwest. The entire area had been burned on 31 March 2004. For two days prior to the survey, heavy rains fell and all of the intermittent streams in the survey area were flowing. The pond was full and had been running over the spillway. Participants were: Jack Greider, Ruth Greider, Joyce Lent, Jenny Previterra, Al Volkmann, Glynda Volkmann and Stan Wiechman. The following species were observed:

Woodhouse's Toad	2
Northern Cricket Frog	59
Plains Leopard Frog	8
Great Plains Narrowmouth Toad	3
Slider	1
Painted Turtle	1
Ornate Box Turtle	1

Totals

Eastern Collard Lizard	6
Great Plains Skink	21
Ground Skink	2
Six-lined Racerunner	2
Ringneck Snake	17
Flathead Snake	28
Eastern Racer	6
Coachwhip	2
Milk Snake	3
Common Kingsnake	2
Lined Snake	1
Common Garter Snake	1
Western Ribbon Snake	1
Northern Water Snake	2
Copperhead	1

22 species 170 specimens

AL VOLKMANN, 1650 Melrose Lane, Wichita,
Kansas 67212.

ELLSWORTH COUNTY HERP COUNT

On 1 May 2004, Michael Washburne, Jeremy Washburne and Austin Triboulet conducted a herpetofaunal count in northern Ellsworth County, Kansas. They searched from ca. 4:30 pm to 7:00 pm at a site north of I-70 and east of Ks. Rt. 14, and observed the following:

Great Plains Skink	18
Ringneck Snake	±400
Prairie Kingsnake	1
Common Kingsnake	1
Milk Snake	4
Bullsnake	1

Totals

6 species ±425 specimens

MICHAEL WASHBURNE, P. O. Box 58, Elk Falls,
Kansas 67345.

MARAIS DES CYGNES HERP COUNT

On 15 April 2004, Suzanne L. Collins, Curtis Schmidt, Travis Taggart and Joseph T. Collins conducted herpetological field work in Linn County, Kansas. They searched for reptiles, turtles, and amphibians from 9:30 am to 2:00 pm at various sites throughout the county; highlight of the count was the discovery of nine Western Rat Snakes and four Eastern Racers under a single sheet of metal roofing. The following species were observed:

Smallmouth Salamander	1
Slider	3
Eastern Collared Lizard	4
Five-lined Skink	4
Great Plains Skink	4
Western Worm Snake	2
Ringneck Snake	±100
Eastern Racer	9
Milk Snake	3
Western Rat Snake	16

Totals

10 species ±146 specimens

JOSEPH T. COLLINS, Kansas Biological Survey, University of Kansas, Lawrence, Kansas 66047 & Sternberg Museum of Natural History, Fort Hays State University, Hays, Kansas 67601.



(L-R) Joe Collins, Travis Taggart and Curtis Schmidt hold up the thirteen adult snakes they found under a single sheet of metal during their Linn County, Kansas, herp count on 15 April 2004. Curtis is standing on the piece of sheet metal. Field work was sponsored in part by a State Wildlife Improvement Grant from the Kansas Department of Wildlife & Parks and the U.S. Fish & Wildlife Service. Photograph by Suzanne L. Collins.

OSAGE COUNTY HERP COUNT

On 18 May 2003, Keith Coleman and James Gubanyi conducted an Osage County herpetofaunal count near Rt. 31 and Jordan Road from 11:00 pm to 11:15 pm. Temperature was 71°F and it was partly cloudy. They observed the following:

American Toad	1
Northern Cricket Frog	±100
Cope's Gray Treefrog	±30
Boreal Chorus Frog	2

Totals

4 species ±133 specimens

JAMES GUBANYI, 2501 SW Burnett Road, Topeka, Kansas 66614.

SUMNER COUNTY HERP COUNT

The 28th annual Sumner County herpetofaunal count was held from 22–24 April 2004. Fourteen Northern Hills Junior High School biology students from USD 345 in Topeka, Kansas and four adults from the school traveled to Sumner County to search for amphibians, reptiles, and turtles. They were assisted by more than thirty Caldwell, Kansas, area elementary students and adults for the survey. The area surveyed in 2004 included several locations bordered by the Kansas Turnpike on the east, the Harper County line on the west, the Oklahoma border on the south, and about three miles north into Sumner County from the Oklahoma line. Methods of collecting and observation included turning rocks, searching along stream banks, road cruising, and listening for the calls of frogs and toads. Those participating in the survey included Phil Esau, Larry L. Miller, Christi Heston, Kori Drane (all staff members from Northern Hills Junior High School); Brandon Appelhanz, Rose Armstrong, Debra Bush, Jessica Crowder, Michelle Dessens, Heather Hendrix, Jennifer Knudson, Michelle Kozubek, Kayla Price, Vicki Rea, Liz Smith, Matt Thiessen, Jeffrey Whorton, Gavin Williams (all freshman biology students from Northern Hills Junior High School); Kati Lebeda, Amanda Schulz, Brittnee York, Quinci Ward, Kelsi Ward, Nina Ward, Willan Freel, Dakota Davis, Joshua Delain, Holly Delain, Daniel Delain, Brooke Banister, Josh Petrik, Jay Cole, Gage Cole, Nick Nispel, Dowana Whaley, Dalton Whaley, Cole Dierking, Brooke Kuehny, Ross Kuehney (all from the Caldwell, Kansas area).

The following species were observed:

Great Plains Toad	1
Northern Cricket Frog	26
Spotted Chorus Frog	14
Plains Leopard Frog	5
Bullfrog	1
Great Plains Narrowmouth Toad	6
Yellow Mud Turtle	1
Painted Turtle	1
Ornate Box Turtle	4
Slider	3
Lesser Earless Lizard	3
Prairie Lizard	8
Southern Prairie Skink	7
Six-lined Racerunner	32
Ringneck Snake	103
Plains Blackhead Snake	3
Eastern Racer	3
Ground Snake	48
Diamondback Water Snake	1
Brown Snake	1
Common Garter Snake	2
Lined Snake	1

Totals

22 species 274 specimens

LARRY L. MILLER, Biology Department, Northern Hills Junior High School, 5620 NW Topeka Boulevard, Topeka, Kansas 66617



KHS member Larry L. Miller instructs students on field techniques during the 28th annual Sumner County herpetofaunal survey held on 22–24 April 2004. The Sumner County survey is the longest running annual count held each year in Kansas. Photograph by Liz Smith, a student at Northern Hills Junior High School, Topeka.

WAKARUSA HERP COUNT

During April 2004, Mark Ellis and Kathy Ellis conducted a herpetofaunal count within the Wakarusa city limits in Shawnee County, Kansas. Much of the count centered around an old well in Wakarusa. They observed the following:

Ringneck Snake	36
Brown Snake	3
Eastern Racer (in well)	28
Western Rat Snake (in well)	6
Common Garter Snake (in well)	45

Totals

5 species 128 specimens

MARK ELLIS and **KATHY ELLIS**, 10025 SW Jordan Road, Wakarusa, Kansas 66546.

WILSON COUNTY HERP COUNT

On 1 May 2004 under partly cloudy to clear skies, Keith Coleman and James Gubanyi conducted a Wilson County herpetofaunal count at a location 2 miles southeast of Buffalo, Kansas (or 1 mile south of Wilson State Fishing Lake) from 1:00 am (72°F) to 3:30 am (73°F). The following were observed:

American Toad	2
Northern Cricket Frog	±75
Cope's Gray Treefrog	±10
Boreal Chorus Frog	±5
Plains Leopard Frog	1
Southern Leopard Frog	± 6
Common Snapping Turtle	1
Northern Water Snake	3

Totals

8 species ±103 specimens

JAMES GUBANYI, 2501 SW Burnett Road, Topeka, Kansas 66614.

GEOGRAPHIC DISTRIBUTION

HYLA CHRYSOSCELIS/HYLA VERSICOLOR (Gray Treefrog complex). KANSAS: WASHINGTON CO: 39.84246°N, 97.29412°W. 17 June 2004. Curtis J. Schmidt and Brian C. Bartels. MHP 8890. Verified by Travis W. Taggart. New county record (Collins and Collins 1993. *Amphibians and Reptiles in Kansas. Third Edition*. Univ. Press Kansas, Lawrence. xx + 397 pp.)

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

BUFO COGNATUS (Great Plains Toad). Kansas: GRANT CO: 37.4315°N, 101.12343°W. 1 July 2004. Curtis J. Schmidt & Brian C. Bartels. MHP 9000. Verified by Travis W. Taggart. Although mapped by Collins and Collins (1993 *Amphibians and Reptiles in Kansas. Third Edition*. Univ. Press Kansas, Lawrence. xx + 397 pp.), their data were based on three Grant County specimens (KU 21879–881) collected on 7 July 1940 but lacking any other locality data; this specimen is the first record for the county with specific locality data, and corroborates the 1940 records.

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

APALONE SPINIFERA (Spiny Softshell). KANSAS: JEFFERSON CO: 39.87951°N, 95.19492°W. 14 July 2004. Curtis J. Schmidt and Richard S. Hayes. MHP 9088. Verified by Travis W. Taggart. New county record (Collins and Collins 1993. *Amphibians and Reptiles in Kansas. Third Edition*. Univ. Press Kansas, Lawrence. xx + 397 pp.)

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

EUMECES FASCIATUS (Five-lined Skink). WISCONSIN: CRAWFORD CO: Hwy F, 4 km SE Lynxville, Sec. 36 R6W, T9N. September 5, 2002. Brenda and Richard Rozelle. Photograph HDW-NIU 2002.10. Verified by Julie Ray. Extends state distribution southwest 60 km from eastern Iowa and Sauk County records, and 105 km from Juneau County to northeast; new county record. All three of these counties are within the unglaciated driftless area of Wisconsin of Casper (1996, Geographic Distributions of the Amphibians

and the Amphibians and Reptiles of Wisconsin, Milwaukee Public Mus. Interim Report of the Wisconsin Herpetological Atlas Project, 87 pp.)

When photographed, the lizard was scurrying from its woodpile basking site. In conversing with Bill Peterson, a naturalist within the Lynxville area, I was informed that occasional specimens have been observed on the bluffs overlooking the Mississippi River at Lynxville; several other individuals have also mentioned having seen this reptile within the area.

Submitted by **HARLAN D. WALLEY**, Department of Biology, Northern Illinois University, DeKalb, Illinois 60115 (email: hdw@niu.edu) and **BRENDA L. ROZELLE**, N835 Hwy North, Whitwater, Wisconsin 53190.

SCINCELLA LATERALIS (Ground Skink). KANSAS: KIOWA CO: 37.50471°N, 99.18341°W. 11 May 2004. Travis W. Taggart. MHP 8524. Verified by Curtis J. Schmidt. New county record (Collins and Collins 1993. *Amphibians and Reptiles in Kansas. Third Edition*. Univ. Press Kansas, Lawrence. xx + 397 pp.)

Submitted by **TRAVIS W. TAGGART**, Sternberg Museum of Natural History, Fort Hays State University, Hays, Kansas 67601.

OPHISAURUS ATTENUATUS (Western Slender Glass Lizard). KANSAS: KIOWA CO: 37.50471°N, 99.18341°W. 19 May 2004. Curtis J. Schmidt and Brian C. Bartels. MHP 8612. Verified by Travis W. Taggart. New county record (Collins and Collins 1993. *Amphibians and Reptiles in Kansas. Third Edition*. Univ. Press Kansas, Lawrence. xx + 397 pp.)

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

OPHISAURUS ATTENUATUS (Western Slender Glass Lizard). KANSAS: HARPER CO: 37.00211°N, 97.63654°W. 11 May 2004. Travis W. Taggart. MHP 8539. Verified by Curtis J. Schmidt. New county record (Collins and Collins 1993. *Amphibians and Reptiles in Kansas. Third Edition*. Univ. Press Kansas, Lawrence. xx + 397 pp.)

Submitted by **TRAVIS W. TAGGART**, Sternberg Museum of Natural History, Fort Hays State University, Hays, Kansas 67601.

ELAPHE VULPINA (Western Fox Snake). WISCONSIN: CRAWFORD Co: Lynxville, Sec. 23, T9N, R6W. May 25, 2003. Alan Hagensick and Jeff Hughes. HDW-NIU 1937 (DOR). Verified by Julie Ray. New county record (Casper 1996, Geographic Distributions of the Amphibians and Reptiles of Wisconsin. Interim Report Wisconsin Herpetological Project, Milwaukee Public Museum. 87 pp.). Previously taken in adjacent Grant, Richland and Vernon counties.

Submitted by **HARLAN D. WALLEY**, Department of Biology, Northern Illinois, Dekalb, Illinois 60115 (email: hdw@niu.edu) and **JORDAN R. WALLEY**, Department of Biology, Northern Illinois University, Dekalb, Illinois 60115, and 640 East McKinley Street, Hinckley, Illinois 60520.

PANTHEROPHIS EMORYI (Great Plains Rat Snake). KANSAS: STANTON Co: 37.52106°N, 102.01349°W. 28 April 2004. Travis W. Taggart. MHP 8434–35. Verified by Curtis J. Schmidt. New county record (Collins and Collins 1993. *Amphibians and Reptiles in Kansas. Third Edition*. Univ. Press Kansas, Lawrence. xx + 397 pp.)

Submitted by **TRAVIS W. TAGGART**, Sternberg Museum of Natural History, Fort Hays State University, Hays, Kansas 67601.

PITUOPHIS CATENIFER (Gopher Snake). KANSAS: LINN Co: 3 mi S Parker. 38.28434°N, 94.98875°W. 6 May 2004. Curtis J. Schmidt and Brian C. Bartels. MHP 8508. Verified by Travis W. Taggart. New county record (Collins and Collins 1993. *Amphibians and Reptiles in Kansas. Third Edition*. Univ. Press Kansas, Lawrence. xx + 397 pp.)

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

PITUOPHIS CATENIFER (Gopher Snake). KANSAS: THOMAS Co: Sec. 10, T10S, R32W, 39.19711°N, 100.87819°W. 2 August 2004. Joseph T. Collins & Suzanne L. Collins. MHP 9201. Verified by Travis W. Taggart. New county record (Collins and Collins 1993. *Amphibians and Reptiles in Kansas. Third Edition*. Univ. Press Kansas, Lawrence. xx + 397 pp.)

Submitted by **SUZANNE L. COLLINS**, The Center for North American Herpetology, 1502 Medinah Circle, Lawrence, Kansas 66047.

STORERIA DEKAYI (Brown Snake). KANSAS: KIOWA Co: 37.50471°N, 99.18341°W. 18 May 2004. Curtis J. Schmidt and Brian C. Bartels. MHP 8584. Verified by Travis W. Taggart. New county record (Collins and Collins 1993. *Amphibians and Reptiles in Kansas. Third Edition*. Univ. Press Kansas, Lawrence. xx + 397 pp.)

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

THAMNOPHIS PROXIMUS (Western Ribbon Snake). USA: KANSAS: WYANDOTTE Co: Sec. 24, T10S, R24E. 6 June 2004. Dan Murrow. MHP 9109. Verified by Joseph T. Collins. New county record (Collins and Collins 1993, *Amphibians and Reptiles in Kansas. Third Edition*. Univ. Press Kansas, Lawrence. xx + 397 pp.)

Submitted by **DANIEL G. MURROW**, 8419 Mastin Street, Apartment D, Overland Park, Kansas 66212.

THAMNOPHIS RADIX (Plains Garter Snake). WISCONSIN: CRAWFORD Co: Sec. 23, T9N, R6W. 26 April 2003. Alan Hagensick and Jeff Hughes. HDW-NIU 1936. Verified by Richard King. New county record; extends range westward from Iowa County (Casper 1996, Geographic Distributions of the Amphibians and Reptiles of Wisconsin. Interim Report Wisconsin Herpetological Atlas Project, Milwaukee Public Museum. 87 pp.)

Submitted by **HARLAN D. WALLEY** and Department of Biology, Northern Illinois University, Dekalb, Illinois 60115 (email: hdw@niu.edu) and **JORDAN R. WALLEY**, Department of Biology, Northern Illinois University, Dekalb, Illinois 60115, and 640 East McKinley Street, Hinckley, Illinois 60520.

THAMNOPHIS SIRTALIS (Common Garter Snake). KANSAS: SEWARD Co: 37.1505°N, 100.74812°W. 30 June 2004. Curtis J. Schmidt and Brian C. Bartels. MHP 9089. Verified by Travis W. Taggart. New county record (Collins and Collins 1993. *Amphibians and Reptiles in Kansas. Third Edition*. Univ. Press Kansas, Lawrence. xx + 397 pp.). Pattern and coloration typical of the Texas Garter Snake (*Thamnophis sirtalis annectens*).

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

LIFE HISTORY NOTES

THAMNOPHIS SIRTALIS (Common Garter Snake). **DIET.** On 18 May 2002, we captured a Common Garter Snake crossing a gravel road on Quivira National Wildlife Refuge (Kansas: Stafford Co: 38°07'30"N, 98°30'00"W). The snake (ca. 30 cm SVL) had a small (ca. 3 cm total length) desiccated earthworm oriented sideways in its mouth, and it was actively chewing on the worm. The worm was completely dehydrated and not pliable. The snake was released soon after capture.

Although this species is known to consume carrion (Gray 2002, *Herpetological Review* 33: 142–143; Sajdak and Sajdak 1999, *Herpetological Review* 30: 229; Conant and Collins 1998, *Peterson Field Guide to Reptiles and Amphibians of Eastern and Central North America. Third Edition Expanded*. Houghton Mifflin Co., Boston. xviii + 616 pp.), only vertebrate carrion has been mentioned in the literature. Thus, we believe that our observation expands the notion of what is a suitable food item for these snakes. In many habitats, dehydrated invertebrates could serve as an abundant food source for animals willing to consume them.

Submitted by **RYAN L. REHMEIER**, Division of Biology, Kansas State University, Manhattan, Kansas 66506, and **RAYMOND S. MATLACK**, Department of Life, Earth and Environmental Sciences, West Texas A & M University, Canyon, Texas 79016.

CHELYDRA SERPENTINA (Common Snapping Turtle) **MATING BEHAVIOR.** At 11:30 am (CDST) on the morning of 25 May 2004 at the Nelson Environmental Study Area eight miles N of Lawrence (Douglas County, Kansas), Galen Pittman and I observed two Common Snapping Turtles (*Chelydra serpentina*) in the SE corner of Pond 436, one of 28 ponds measuring 10 meters square within a fenced enclosure. Sky was overcast; air 73°F (Cooper Instrument Company SH66A digital thermometer); water 26.6°C (same instrument).

The observation was brief. The turtles seemed to be mating, but were doing so plastron to plastron. One (the male) had a carapace ca. 8 inches long, the other (which appeared to be a female) had a carapace ca. 12 inches long. The male's legs were outspread so as to facilitate his grasping the axial/inguinal areas of the larger turtle with his claws.

Ernst, Lovich, and Barbour (1994 *Turtles of the United States and Canada*) and most other references state that the males mount from above. This means the tail can be curled under the female's tail and the penis, though short in turtles, usually spade shaped, can reach under the female's tail. However, it must be noted that all of the published references I and others have noted to date have involved matings on land where the male mounting dorsally would, from a biomechanical standpoint, be the most practical behavior. In a water environment, a dorsal mount would present problems for successful mating should the female move off, whereas the behavior noted here would result in a far more hydrodynamic "package" of the two animals. This would especially be of advantage where the male is of noticeably smaller body size than the female.

I am not familiar with turtle behavior, but see no reason why they, in water, would not mate thus. But I have never seen any mention of this behavior. I would welcome comments from individuals with similar observations, and am grateful to Marty Capron (pers. comm.) for sharing a similar observation noted in a filmed sequence of sea turtle (no genus recalled) mating. I also am grateful to Dale Belcher, Reptile Curator, Rio Grande Zoo (Albuquerque, New Mexico) for relating an anecdotal reference to similar behavior (one mating observation out of over a hundred recalled). Thanks also are expressed to Harold Dundee (Tulane University Museum of Zoology) for pointing out the Ernst et al. reference.

Submitted by **GEORGE R. PISANI**, University of Kansas Field Station and Ecological Reserves, 350 Wild Horse Road, Lawrence, Kansas 66044.

GASTROPHRYNE OLIVACEA (Great Plains Narrowmouth Toad). **NEW STATE MAXIMUM LENGTH. KANSAS: LINCOLN CO: 39.07944°N, 98.15089°W. 13 July 2004.** Curtis J. Schmidt and Richard Hayes. MHP 9099. Verified by Travis W. Taggart. Female. SVL = 43 mm (1 11/16 inches). Exceeds previous record length of 41 mm as reported by Collins and Collins (1993. *Amphibians and Reptiles in Kansas. Third Edition*. Univ. Press Kansas, Lawrence. xx + 397 pp.).

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

VIEWPOINTS

HETERODON KENNERLYI REVISITED

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Smith, Chiszar, Eckerman and Walley (2003) recently reviewed data on geographic variation in the azygous and loreal scales of *Heterodon nasicus* and *Heterodon kennerlyi*, and concluded that these two taxa should be recognized as distinct species, rather than as subspecies of *Heterodon nasicus*. Their conclusion was based primarily on the paucity of morphological intermediates that one would expect from intergradation of two subspecies.

I recognized this problem while I was preparing my dissertation for submission to the Graduate School of Northwestern University (Edgren, 1952a) and while writing my brief synopsis of the genus (Edgren, 1952b). At the time, I attributed the lack of intermediates to the absence of significant numbers of specimens from critical geographic areas and felt that, with time and the availability of further specimens, the problem could be resolved. It seemed most parsimonious then to continue the trinomial designation that was current in the 1950s. Substantial additional material has now become available and formed the basis of Eckerman's Master's Thesis (1996).

Smith, et al. (2003) focused on variability in azygous scales, with 97% of *kennerlyi* bearing eight or fewer scales and 93% with two or fewer total loreals. The analysis of the data shows a sharp geographic discontinuity in azygous counts, while the loreal counts reflect a smooth north-south cline. The two traits are highly correlated ($r = 0.691$, $df = 148$, $p < 0.01$). I am a bit troubled by lack of a discontinuity in the loreal count data to correspond with that shown by the azygous scales; however, the actual data are in close overall agreement with my own (Edgren 1952a).

Smith, et al. (2003) did not consider other variables that might affect the interpretation of their data. My earlier work (Edgren 1952a) and Eckerman's (1996) initially analyzed the bulk of the data on *H. nasicus* without reference to subspecies. Thus, the analyses were independent of any taxonomic bias (clearly a psychological impossibility, but this was my intent,

and I believe Eckerman's). Three characteristics, dorsal blotches, ventral plates and subcaudal scales, appeared relevant and warrant reexamination herein.

Eckerman and I approached counting of dorsal blotches differently. I considered only body blotches (i.e., I counted only those from the one above vent anterior to the head); Eckerman counted all blotches, adding body blotches to those on the tail. Therefore, although the absolute numbers differed, I believe the patterns of variation were essentially similar. I interpreted what I considered a discontinuity in distributional pattern as reflecting a subspecific variation, and erected *Heterodon nasicus gloydi* on the basis of this trait. With larger numbers of specimens available, Eckerman was able to show that the geographic pattern of total blotches were that of a centrifugal cline. Blotch counts are high in the west-central portion of the range of *nasicus*, and decrease in all directions toward the periphery of the range. The lowest counts tended to be in the south, within the range of *kennerlyi*. Actually, blotch counts for *kennerlyi* are essentially identical to those for *gloydi*. In many respects, *gloydi* is *Heterodon nasicus kennerlyi* with a high azygous count.

The ventral and subcaudal counts for *Heterodon nasicus* were pooled into a single figure by Eckerman (1996) for his most critical analyses, whereas I (Edgren 1952a) treated the two scales independently. I believe that pooling the counts into what is essentially a "somite" figure obscures meaningful variation.

Like the body blotches, the ventral plates for *Heterodon nasicus* appear to show a centrifugal cline. Again the highest values are seen in material from the south central portion of the range and from Kansas, and decrease toward the periphery. Ventral counts to the west in Colorado also suggest a decrease. These very low counts also appear to correspond to *kennerlyi*. The cline continues to manifest itself irrespective of the *nasicus-kennerlyi* discontinuity.

Subcaudal scales for *Heterodon nasicus* form simple, more or less linear north-south clines. This is most clear in females while the males show little difference in individuals from northern and north central portions of the range, and both sexes show rather sharp decreases in subcaudal counts in the extreme south.

In summary, viewed as a single species population, *Heterodon nasicus* displays a marked discontinuity in azygous counts with few intermediates in the area where traits abut. In addition, the species shows clinal variation in four traits that are independent of the azygous counts. Current herpetological usage suggests that *Heterodon nasicus* and *Heterodon kennerlyi* be regarded as separate species. In contrast, it is my opinion that the trinomial designation more closely approximates the true biological relationship of these two taxa.

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An adult Western Hognose Snake (*Heterodon nasicus*) from Cimarron National Grasslands, Morton County, Kansas, exhibiting a defense display typical of the species. Photograph by Suzanne L. Collins.

ARTICLES

A FIELD STUDY OF THE TIMBER RATTLESNAKE IN LEAVENWORTH COUNTY, KANSAS

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Introduction

The Timber Rattlesnake (*Crotalus horridus*) is native to the eastern one-third of Kansas, occurring west into the Flint Hills and east to the Atlantic Coast throughout the Deciduous Forest Biome (Braun 1950). Since it occurs in the most heavily populated parts of the United States, it has steadily lost ground from habitat loss and killing by humans. The shrinkage in range and numbers of Kansas Timber Rattlesnakes convinced us of the need for a field study while it was still possible. It is hoped that our findings may be applicable to conservation efforts for the species.

Materials and Methods

Morphological (Pisani et al. 1973) and molecular (Clark et al. 2003) studies indicate that New York snakes are the same species as ours in Kansas. The binomial is thought to be appropriate for all populations, including the canebrake rattlesnake which was formerly recognized as the southern subspecies "*atricaudatus*."

Our study was made in 2003, at or very near the Frank B. Cross Reservoir in Leavenworth County, adjoining the University's Nelson Experimental Tract on the east (Figure 1). Casual observations made in the general area from 1948 to 2003 supplement the main findings. A spring 2003 search of about 100 m of rock outcrop along the north side of the Reservoir yielded 26 rattlesnakes. Six were equipped for radio-telemetry, and all others were scale-clipped for indi-

vidual recognition and equipped with passive integrated transponder (PIT) tags. Radio transmitters were surgically implanted intra-abdominally by the University's Animal Care veterinarian, James Bresnahan. On 26 April 2003, the radio-equipped snakes were released and were trailed almost daily throughout the summer.

The habitat consisted of a mixture of woodland (mainly in narrow bands around hilltop and upper slopes) and grassland. The open areas were mostly dominated by the introduced pasture grass, *Bromus inermis*. Occasionally there were relict clumps of native tallgrasses, big bluestem (*Andropogon gerardi*), and Indian grass (*Sorghastrum nutans*). Goldenrod (*Solidago* sp.) was often dominant. Other common forbs were dogbane (*Apocynum cannabinum*), common ragweed (*Ambrosia artemisiifolia*), aster (*Aster* sp.), tall thistle (*Cirsium altissimum*), oxeye daisy (*Chrysanthemum leucanthemum*), tall eupatorium (*Eupatorium altissimum*), snow-on-the-mountain (*Euphorbia maculata*), ironweed (*Vernonia interior*), and wooly verbena (*Verbena stricta*). There were clumps or isolated bushes of smooth sumac (*Rhus glabra*) and roughleaf dogwood (*Cornus drummondii*). Poison ivy (*Toxicodendron radicans*) was common. Tall weeds growing through dead brush were pokeweed (*Phytolacca americana*) and hemp (*Cannabis sativa*).

Along the rock outcrops were bands of trees 17 to 35 m wide, with trunks up to 30 cm or more in diameter consisting of osage orange (*Maclura pomifera*), honey locust (*Gleditsia triacanthos*), American elm (*Ulmus*

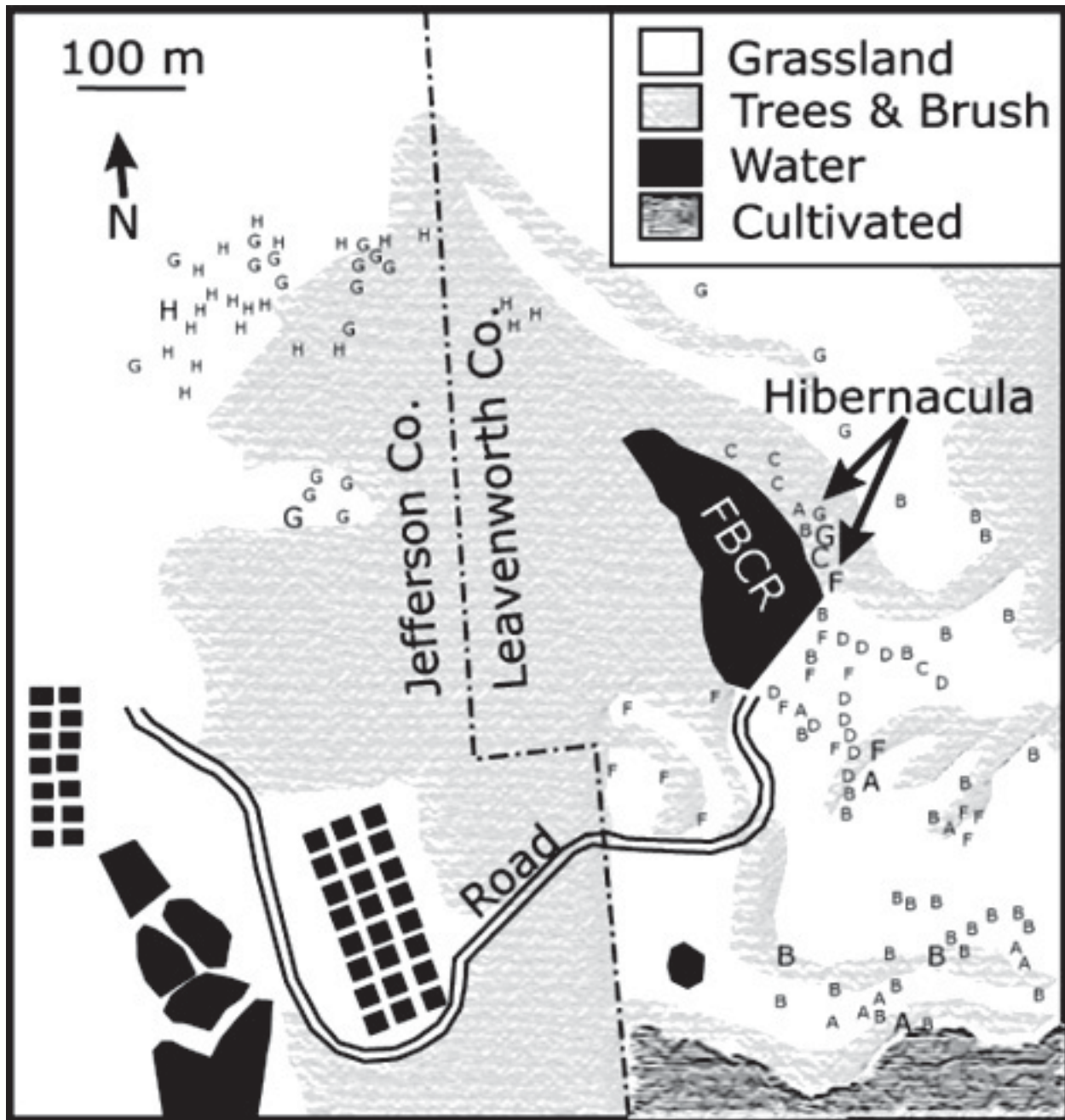


Figure 1. Map of Frank B. Cross Reservoir (FBCR) area, showing locations for all seven Timber Rattlesnakes telemetered and trailed in 2003; A = adult male; B, C and F = gravid adult females; D = nongravid adult female, G and H = immature females. Snakes often spent several or many consecutive days at a given site. Large letters indicate sites that snakes abandoned and later revisited.

Americana), walnut (*Juglans nigra*), common hackberry (*Celtis occidentalis*), cherry (*Prunus serotina*) and various other seral species.

In the grassland, the prairie vole (*Microtus ochrogaster*) is the principal prey species, whereas the Florida woodrat (*Neotoma floridana*), white-footed mouse (*Peromyscus leucopus*) and Elliot's short-

tailed shrew (*Blarina hylophaga*) are associated with trees. The woodrat is important not only for food but also for shelter. Its dome shaped stick houses are favorite hiding places. The rats themselves are subject to periodic die-offs, but their homes last for years, and provide shelter not only for the snakes but also for some of their prey species.

Results

For each of our telemetered snakes there follows a summary of activity during the 2003 season with mention of movements, social interactions, habitat and feeding. These day-to-day records suggest differences between the sexes, between adults and immatures, and between pregnant and nonpregnant females.

The only male of our telemetered snakes was an adult (No. 99, SVL 1120 mm, weight 1426 grams). After release on 26 April, he made several short daily movements eastward along the rock outcrop, then on May 3 moved southeast down a grassy slope to the drainage channel of the reservoir, swam across (about 2 m) and went to a gully that was choked with weeds and dead brush on the southeast side of the reservoir. He stayed there from May 4 to 17, then moved south up the grassy slope to the lower (316 m) rock outcrop, traveled along it for 133 m west, then back east along the rocks. On May 18 he had met our gravid female, No. 96 (neither snake seen, but they were under a rock together). From May 19 to June 10, he was back in the same gully where he had stayed in early May. On June 11 he had moved back out of the gully and south up the grassy slope to the hilltop and east along the rock outcrop for 100 m. He was captured and found to have eaten a prey item of wood rat size. After release on June 30 he was found to have moved back west along the rock outcrop. On July 2 his signal could not be detected, and he was missing for the next 47 days, but then was rediscovered on August 12 within 10 m of his last known refuge. On August 13 he moved 95 m west along the outcrop; on August 14 and 15 did not move; on August 17, moved 21 m west along the outcrop; on August 22 did not move; on August 23, moved 5 m east along the outcrop, on August 24, moved 210 m, where he remained August 26 to 29. There was no search August 30 and 31. On September 1, he had moved 210 m east along the outcrop; on September 2, had moved 7 m southwest, stayed there September 3. For the next nine days, he was in a deep crevice and nearby rolls of discarded fence wire blocked his signal except at very close range. He stayed in the same shelter until September 26, then emerged and moved about 50 m down across the grass to the lower outcrop. On September 27, there was no search. On the 28th and 29th he remained at the same place; September 30, no search; on October 1 he had moved an estimated 400 m, back to the denning area, and was under a limestone slab with No. 93A female.

Our telemetered female No. 96 was gravid, probably with her first litter of young (SVL 880 mm, 460 grams, six rattle segments plus the button, seven ova palpated). From April 26 to May 6, she stayed at the

release point; on May 7, moved 200 m east along the outcrop, on May 8, moved 20 m back, on May 9, she moved 17 m to the edge of the reservoir, on May 12 and 13, she moved south about 100 m up the grassy slope to the lower (371 m) outcrop, and there she met our telemetered male No. 99 in a thicket, was with him on May 18 and remained there after he left until May 31. She was almost stationary until June 20, and then she moved 17 m up to the hilltop outcrop, 123 m. She made only slight movements staying essentially in the same place until July 25, and then she moved 29 m east along the lower outcrop. On July 15 she moved 2 m. On July 25, she moved 20 m east along the lower outcrop. On August 2, she moved east along the hilltop rocks, and on August 3, she moved 130 m down to the lower outcrop and moved 146 m west along it. On August 6, she moved 25 m. On August 5, she was back at the gully near its south end, and within a few meters of where she had crossed in May. She stayed at this same spot for three days, then on August 9 made her longest movement of 270 m, up the slope to the hilltop, and east along the rock outcrop to the same woodrat nest where she had stayed a month earlier. The next 14 days were spent at this rat house. On August 26, she moved out, and on August 29, returned to the same rat house where she had been on July 29. On August 30 and 31 there was no search. On September 1, she was in the same rat house, on September 2, moved 2 m east; same September 3 to 15. On September 16, she moved 15 m WSW. She stayed there until October 2, then moved downhill to the gully, crossed it and was beside a large tree near the south end of the dike. On October 6, she had moved across the dike to the hibernation outcrop and seemed to have begun hibernation in a deep crevice.

Our telemetered female No. 93 was the only casualty. She was gravid, probably for the first time (SVL 880 mm, weight 496 grams, six rattles and a button). On May 1, she had moved 66 m east along the rock outcrop from the release point. On May 5 she had turned back 56 m to the south on the downhill side of the dike, out in the grass near the outlet rocks. On May 9, she had moved back 66 m west along the outcrop and was near the water's edge. On May 13, 14 and 15 she was there with a recently scale-clipped adult male. On May 17, 18 and 19 she moved 33 m back east along the outcrop. On May 23, she made a 66 m movement west and was at the water's edge. On May 26, she had made a 46 m movement back east and was in an abandoned beaver lodge at the edge of the water. She remained there until May 31, then moved north up the slope 53 m to the upper end of the band of trees and was in an abandoned woodrat house June 6 to 8. On June 10 she was back in the beaver

den and remained there until June 20. On June 23, her transmitter was found on the ground about 17 m from the beaver den, and it was obvious that she had been caught and eaten by a predator. More than three inches of rain during the night had obscured the evidence.

Our female No. 93A was a replacement for the original No. 93 and used the same transmitter (93A was gravid, SVL 855 mm, weight 660 grams, six rattles and a button). She was captured June 19 at a rock outcrop beside the road, about 100 m south of the boat dock on the south side of the reservoir. She was released July 2. On July 3, she had moved 50 m north along the outcrop on the north side of the road. On July 5, she had moved 47 m northwest across woodland and grass. On July 7, she was at the shore of the reservoir just west of the dock in thick grass and weeds. On July 9, she had moved 64 m west, uphill to the band of trees and stayed in about the same place until a 42 m trip back to the docking area on July 23. She remained in that vicinity until July 29, then moved 148 m across the dike to its northeast end. From July 21 to August 13, she was near the northeast end of the dike, with several movements of up to 13 m between two dilapidated rat houses and a massive limestone slab, always out of sight beneath one of these shelters. On August 14, she had moved 13 m southeast, and on the 15th to 19th was in a rat house. On August 28, she moved 3 m south; on August 29, moved one meter west to a rat house. August 30 and 31 passed with no trailing. On September 1, she had moved 4.5 m north to another rat house and was there Sept. 2 to 5. On September 6, she moved 17 m west to a large boulder and was there September 2 to 22. On September 23 she moved 2 m uphill to another massive slab and was there on September 24 and 25, when she was caught and examined and found to be parturient. On September 25, she moved west along the outcrop; from September 26 to October 10, she was in a den hole with No. 99 male, 83 female and 52 female.

Our telemetered female No. 83 (SVL 1042, weight 490 grams, six rattle segments with the button missing) was the only one that was nongravid. After several days at the release site, she made a series of several short movements to the east. On May 1, moved 20 m east; on May 7, moved 5 m north, then on May 10 had moved 58 m down the grassy slope to the outlet pipe of the reservoir where she remained until May 15. On May 17, she moved 31 m up over the dike to the edge of the water in the reservoir. On May 18, she was back in the pipe, and for the remainder of May she made only short movements, ranging from 1 to 33 m on the downhill (east) side of the dike. On June 2, she had moved 106 m southeast through the grass, crossed the drainage, and was in a brush-filled gully

with No. 99 male. On June 4, 5, 6 and 7, the two were together but were not seen. Mating may have occurred. On June 30, she had moved south about 27 m up the gully and was in a bush at its upper end where she stayed until July 27. Then she moved about 10 m down the gully and stayed there until September 10, when she was caught and weighed. She was released on September 11, and was in the same place on September 12; no search on September 13; on September 14, she had moved down the gully; on September 16, she was at the mouth of the gully where it emptied into the creek, on September 17, she had crossed the creek and moved toward the lake and for the next week was in rocks beside a large elm on the downhill side of the dike. On September 22, she had moved across the dike to the denning area on the north side and was in the same hole with female No. 93A.

Our female No. 81 was an immature in her second year (SVL 646 mm, weight 189 grams, rattle string two segments plus button). Released on April 26, she remained in the same place until May 5, then moved 27 m north out into the grass, then made daily short shifts of 20 m, 7 m, 3 m, 7 m, 3 m, 2 m, 3 m, 0.7 m, same place, 1 m, 0.7 m, 0.7 m, 1.5 m, same place, 0.3 m, same place; May 28 to 30: 1.5 m, same place, same place; June 3, 1 m; June 4, 17 m west along edge of woods; June 5, 3 m; June 6, no movement; June 7, 66 m west; June 8, 17 m west; June 9, same place; June 10, 17 m northwest; June 13 to 20, same place; June 21, 20 m north to upper edge of the trees; on June 26, had moved 360 m west; June 27, 10 m southeast; June 28, same place; June 29, 2 m; June 30 to July 2: same place; July 3, 17 m northwest; July 4, 47 m west; July 5, 3 m west northwest; July 6, 13 m south and 3 m west; July 7 same place at little cedar tree; July 8, coiled on branch of little cedar 0.3 m above ground; July 9 to 14, at same little cedar; July 16, moved 18 m north to fence between open grassy fields; July 20 moved 66 m south of fence in field; July 21 had moved back to fence and climbed locust tree 5 m above ground; July 22, at least 20 feet high in locust and poison ivy vine; July 24, moved 40 m back along fence; July 25 and 26, same place (in locust tree); July 27, moved 18 m west along fence; July 28, moved 2 m south; July 29, moved 1.5 m northeast; July 30, back to fence and 3 m along it, 10 feet high in locust. August 1 and 2, same place. August 3, in locust; August 4, same tree, 12 feet high; August 5, moved 20 m west (inside an abandoned and half buried tire at the fence). August 6 to 9, same place. August 10, moved 3 m east, August 11 to 13, same place. August 14, 2 m east; August 15, inside tire; August 17, moved 65 m east along fence; August 18,

same place. August 19 moved 17 m west along fence; August 20, base of locust tree at fence; August 21 in tree. August 23 had moved 3 m east, August 24 and 25, same place. August 26 moved 17 m east, August 27 moved 21 m west. August 28 moved 21 m east, August 29 was in field 33 m north of fence. August 30 and 31, no search. September 1, 7 m southeast. September 2, same place, 20 m north of fence. September 3 moved 7 m northwest; September 4, 33 m north of fence. September 5 moved 2 m west. September 6, moved 3 m northwest to small osage orange tree. September 7 and 8, same place; September 9, had moved 40 m east. September 10, same; had eaten a short-tailed shrew (*Blarina hylophaga*). September 11 to 14, same place. September 15, in tree at least 20 feet high. September 16 had moved 10 m north. September 17 had moved 100 m east in woods. September 18 no signal on this date. On Oct. 20 her signal was located evidently deep in the rocks about 250 m of the original release point on 26 April.

Our female No. 52 was thought to be a third year young (retarded and still not mature. SVL 665 mm, weight 181 grams, string of six rattle segments and a button). Released on April 26, she remained at the same place until May 4, then moved 20 m northwest, out of the band of trees along the outcrop, into the grass of the north facing slope. May 19, 7 m northeast; May 11, 30 m northwest; May 12, 20 m west; May 13, 12 m west; May 14, into grass on the north facing slope and made short movements there until May 18, when she turned south through the band of trees to the shore of the reservoir. May 21, 0.6 m east; May 22, 0.3 m north; May 25: 0.2 m west. On May 26 she made a 120 m move onto the open grassy slope, on May 29 moved 8 m north; for the next six days, made only short movements in the grass, but then, on June 3, moved 125 m northwest. She made movements of only a few feet on June 4 and 5. On June 6, 3 m west; on June 8 moved 8 m south; on June 11, moved 66 m west to the edge of a grassy field. Through the remainder of June, she stayed in the corner of this field making short daily movements up to 10 m. On July 5, she moved 32 m east southeast and made only short daily movements until July 25, then moved south out of the field and then made only short daily movements until July 27. Could not be found on July 28 nor until August 13, when she was found about 266 m south of where she was last recorded. On August 16, she moved south across a field to a small cedar, and on August 17 to a large dogwood clump. On August 18 she had moved 50 m north. On August 19 she was 83 m south of the fence in the grassy field near its highest point and stayed there for three days. On August 23 she was in a little dogwood clump 15 m

south of the fence and stayed there August 24 and 25. On August 26 she was in the same burrow where she had been on August 17 and stayed there August 27, but on August 28 she had moved 43 m southeast and was coiled in the grass. On August 29 she had moved 8 m northwest and was coiled in the grass. August 30 and 31, there was no trailing. On September 1, she was in the southern part of the field, 32 m north northeast of a small cedar tree and remained there on September 2, then moved 19 m southeast on September 3. On September 4, she had moved 43 m northwest; on September 5, 33 m south; approximately the same place on September 6 and 7; on September 8 had moved 3 m west and had eaten a short-tailed shrew (*Blarina* sp.); on September 9 had moved an estimated 66 m south to a cedar tree within 13 m of the north edge of the woods. She was there until September 17, then made a long movement east across the field to near its eastern edge. On September 18 she made another long movement east to where she had been in May. On September 20 she moved 33 m southeast across grass to the edge of the woods, stayed at the same spot on September 21. On September 22 she moved back into the woods and into the same rock crevice where she had been caught emerging in mid-April.

To summarize the records of movements, three of the five telemetered adults moved to the southeast to private land, and all were consistent in keeping to the bands of trees along outcrops, where there were dead trees, tall weeds and loose rock, except that on rare occasions they crossed open, grassy areas between these shelters. They tended to be sedentary and spent periods of days beneath a woodrat house or a massive boulder without emerging, but sometimes they made a series of short movements (less than 3 m per day) in different directions. They often returned to shelters that they had used earlier.

The two immature snakes differed from the adults in keeping to open terrain. They were usually found coiled in the grass. Often they were beneath a bush or shrub sized sapling. Our immature female No. 81 was the only one of our snakes that was found climbing in trees or bushes, but she was found climbing on several occasions, and once stayed in the same locust tree for six consecutive days.

Evidently the snakes that we studied were a discrete colony. Perhaps there were many more such colonies to the north, northeast and northwest, in hill country where the Cuesta Formation continues, with rocky slopes and not much cultivation. The 26 *Crotalus horridus* captured within a short time as they were emerging from hibernation represents a minimum figure, and doubtless some were missed. There were

thirteen males and thirteen females. Attempt was made to estimate the age of each snake on the basis of its size and the number of its rattle segments. There were eight adult males (940 to 1070 mm SVL), four that may have been three-year-olds (with intact strings of nine segments) and a single second-year snake (three segments plus button). The females included two adults (820 to 883 mm SVL), seven possible three-year-olds (mostly with six segments and a button, 740 to 880 mm SVL), two second-year snakes (with two or three segments plus button) and two first year individuals, each with only a button. Not included in this group was a neonate captured on 22 September.

An adult male captured on 27 April had been caught and marked on 4 September, 1995 on the Biotic Succession Area of the University's Nelson Environmental Study Area. In the interval of 55 months he had gained from 891 to 1007 mm SVL and from 745 to 1125 grams. The two capture points were just 1000 m apart. At first capture he was believed to have recently completed his fourth year, and thus was in his ninth year at the time of recapture.

Discussion

Many ecological studies (e.g., Brown 1993; Martin 1992, 2002; Galligan and Dunson 1979; Gibbons 1972) have been made on this fairly common and widely distributed snake species, revealing a remarkable diversity in life history in different regions. It is still unclear whether such differences result from locally adapted populations, or if instead, individuals have a broad range of flexibility, enabling them to adapt to a spectrum of conditions.

The time required to attain sexual maturity is a good example of such geographic variation. In Brown's (1993) New York population, females reach maturity and produce litters at nine or ten years of age. In contrast, our records indicate that in northeast Kansas, rattlesnakes usually mature in the third year and produce litters when they are three years old, but some may delay maturity until the fourth year. In the time required for one generation of *Crotalus horridus*

in New York, a Kansas pair might mature, multiply and become great-great-grandparents, with hundreds of descendants. Of course the growing season is longer in Kansas than in New York, but in South Carolina, with a growing season even longer than in Kansas, Gibbons (1972) found that it takes six years for females to mature (with a somewhat larger size at maturity than our Kansas snakes).

In New York, hibernacula are in the mountains on talus slopes. The heavily wooded slopes with dense shade may limit availability of suitable hibernacula. The snakes make long migrations, concentrating at hibernacula in the fall and dispersing in the spring. On our study site in Kansas, no such extensive migration occurred. The snakes emerged singly or in twos or threes from many different hibernacula along the hillside. Scent trailing in this species is well-known (Weldon et al. 1992; Brown and MacLean 1983; Seigel et al. 1987), and it may play a role in guiding several snakes to a common shelter. Also, these snakes may use airborne pheromones, as suggested by the sudden, long, up-wind movement of the telemetered adult male in May to join female No. 96.

The movements of individuals do not correspond well with the concept of "home range." The use of "minimum convex polygon" models gives a highly distorted view of their actual behavior which tended to be restricted to narrow bands of habitat. These factors have conservation implications for the species in areas of human development which may create significant barriers to dispersal and/or return to dens. Although our study included only one telemetered adult male, we found no discernible difference between the extent of his movements and those of the adult females (Table 1). In a four-year telemetry study in North Carolina that included six female and four male Timber Rattlesnakes, Sealy (2002) found that males had larger home ranges and on average moved both greater distances and more frequently than the females. Both of our immatures ranged mainly on the edges of open brome fields or into a terraced old-field tract, and they had ranges separate from those of the adults during the entire 2003 season.

Table 1. Comparison of average daily movements in male, female, and immature Timber Rattlesnakes. Numbers for distances moved are given as percentages for each category.

Age/Sex	Sample Size		Distance moved per day				
	Snakes	Records	0 m	1-10m	11-20m	21-30m	30+m
Adult Male	1	62	85.5	1.6	—	5.6	8.1
Adult Female (nongravid)	1	80	91.0	3.7	1.3	—	3.7
Adult female (gravid)	3	154	69.0	6.5	1.2	7.8	15.6
Immature	2	160	41.2	30.0	7.5	8.8	12.5

Since Audubon's time it has been well known that Timber Rattlesnakes occasionally climb trees, and various reasons (thermoregulation, hunting, escaping flood waters) have been postulated. In Nebraska, Fogell (2002) observed four instances of arboreality, including one of a gravid female. Of our seven snakes, four adults and two immatures, only the supposed two-year old was observed to climb, but she was in trees on many occasions. It is still unclear whether arboreality is correlated with either age of the snake, or with geographic distribution.

A surprising aspect of behavior was the rarity of feeding in our telemetered snakes. During the unusually long and hot dry spell of the summer, we recorded no food records, but in that time, the snakes tended to stay out of sight under shelter. The two gravid females were not known to take food for the entire season. Some feeding incidents may have been missed, but apparently each of the snakes went for periods of weeks without a meal. The adult male did not feed until July, and then apparently ate a woodrat. He was missing from July 4 to August 12, and might have fed during that interval, and he might have eaten again in late August/early September. The immatures, Nos. 52 and 81, each took a meal in September.

When individual counts are not feasible the "Petersen Index," involving their ratio of recaptures after a preliminary period of capture and marking is usually utilized. In this case the telemetered snakes complicated computations. They cannot be counted for recaptures. From 18 to 26 April 18 rattlesnakes were captured, marked and released, and seven of these were equipped for radiotelemetry, leaving a group of eleven that could serve for the census. In a follow-up census period 27 April through 11 June, ten snakes were caught, of which three were recaptures from the 15 to 26 April group. The recaptured marked snakes were thus 30 per cent of the sample, and the number actually present should be shown by multiplying $3.33 \times 11 = 36.7$ (plus the seven telemetered snakes = 43.7).

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All interested persons are invited to become members in the Society. Membership dues per calendar year are \$15.00 (U.S., Regular), \$20.00 (*outside* North America, Regular), and \$20.00 (Contributing) payable to the KHS. Send all dues to: KHS Treasurer (see inside front cover). All members are entitled to participate in Society functions, have voting privileges, and are eligible for Society grants and scholarships. They receive copies of the *Journal of Kansas Herpetology*, as well as other publications co-sponsored by the Society, either gratis or at a discount.

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).

The Howard K. Gloyd-Edward H. Taylor Scholarship

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.

The Alan H. Kamb Grant for Research on Kansas Snakes

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.

The Suzanne L. & Joseph T. Collins Award for Excellence in Kansas Herpetology

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.

KHS Advertisement Policy: As decreed by the KHS Executive Council, the *Journal of Kansas Herpetology* will accept advertisements at the rate of \$25.00 per quarter page per issue, up to a one-page maximum per issue. No advertisements for live animals or parts thereof will be accepted.

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