

KANSAS HERPETOLOGICAL SOCIETY



NEWSLETTER No. 115

MARCH 1999



ANNOUNCEMENTS

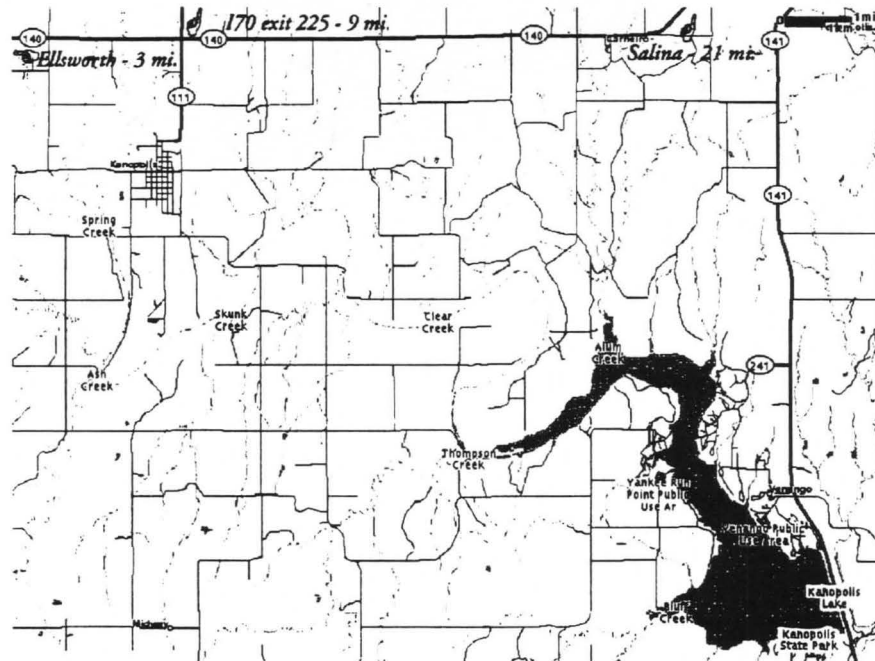
KANSAS HERPETOLOGICAL SOCIETY SPRING FIELD TRIP

The 1999 Spring KHS Field Trip will be held at Kanopolis State Park in Ellsworth County. KHS members will gather as early as Friday night (21 May) at a location in the park displaying the large KHS sign. Field herp counts will officially begin at 9:00 A.M. on Saturday (22 May), and continue until noon on Sunday (23 May). See map below and check the KHS website for other maps of the area.

Any questions about this KHS field trip should be directed to Larry Miller. Inquiries may be in the form of email, a telephone call, or U.S. mail.

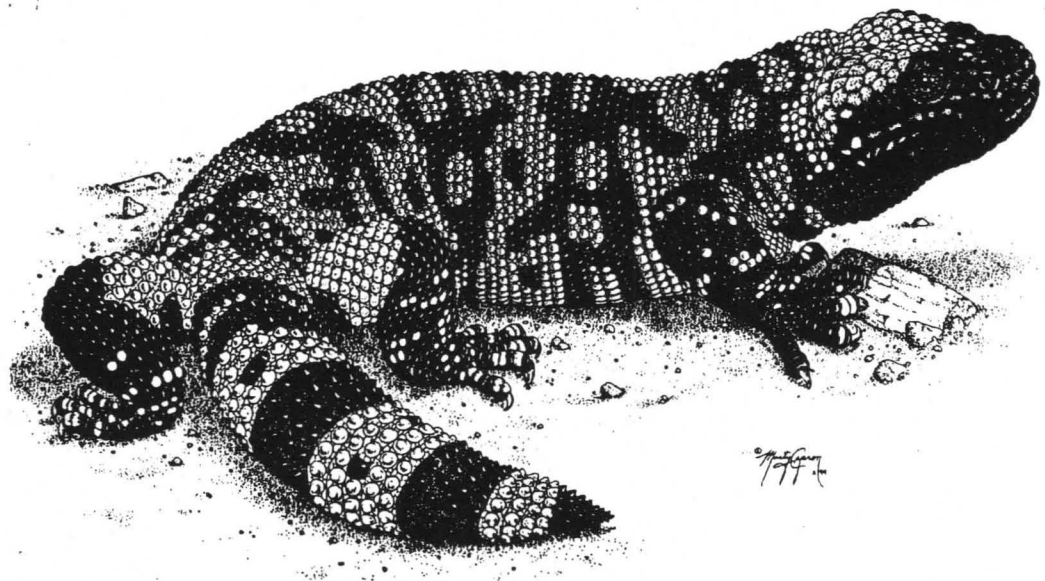
– Larry L. Miller
KHS Field Trip Chairperson
840 SW 97th Street
Wakarusa, Kansas 66546
Telephone 785-836-2119
email: wakarusa@cjnetworks.com

Location of Field Trip.



NEW PRINT AVAILABLE

KHS' own wildly popular artist, Martinez de Capronio (known to some as Marty Capron) announces the issuance of a new herp print that is sure to sell out quickly. The print is a pen and ink illustration of the Gila Monster (*Heloderma suspectum*). The image is life-sized at 11 X 17 inches and is printed on acid-free stock. Black-and-white, signed, and numbered prints are available for \$25. A limited-edition hand-colored print is available for \$75 (specify whether you prefer pink or orange Gilas). Shipping is \$7 for both editions. Send check or money order to: Marty Capron, 1832 East 20th North, Oxford, Kansas 67119.



KHS BUSINESS

SPRING HERP COUNTS COMING UP

It is time for the annual KHS spring Herp Counts. As usual, a checklist of Kansas herps has been enclosed for each member in this Newsletter. Please feel free to make as many copies as you wish and do as many herp counts as you can. As this is the 10th anniversary of this Society project, I encourage everyone to make a special effort this year and get out into the boonies and tally our herpetofaunal diversity. As always, the count period is 1 April-31 May. Please send your finished counts to Eric Rundquist at the address listed on the inside front cover of this Newsletter. Remember that counts received after 15 June will not be included in the final tally and will not be published.

On the subject of counts, I need to mention two other projects with which KHS has become involved. The first is the Kansas Amphibian Monitoring Project which will coordinate with the international North American Amphibian Monitoring Program. The coordinator of this project is Joseph T. Collins, under the sponsorship of the Kansas Department of Wildlife and Parks. Volunteers in far western Kansas are still needed to run pre-selected routes in the state, which are conducted minimally once a month from March through June of each year. Contact Joe Collins if you are interested. This program is particularly suitable for a continuing high school class project, especially now that Keith Coleman and Joe Collins have issued the new *Calls of Kansas Frogs and Toads* tape. Also, in light of this new program, the Kansas Amphibian Populations Program, coordinated by Eric Rundquist, will be herewith discontinued. I want to thank all those who have given me data sheets over the years and urge all of you to get in touch with Joe.

The second project is the Kansas Deformed Amphibian Project. This effort is being made in conjunction with the Kansas Department of Wildlife and Parks and the North American Reporting System on Amphibian Malformations. Eric Rundquist is the state coordinator for this project. Reports on deformed amphibians (extra or missing limbs, pattern abnormalities, organ abnormalities) should be made to Eric. A space has been allocated at the Division of Herpetology, Natural History Museum, University of Kansas to receive specimens of deformed amphibians and these are especially needed along with verbal and/or written reports. Contact Eric for further details on this project.

KDWP HERP STING JABS FIVE MORE ON KANSAS CHARGES

More information has been obtained on recent convictions and plea bargains for illegal trafficking in Kansas amphibians and reptiles, uncovered during Operation

Squamata, a "sting" operation conducted by the Kansas Department of Wildlife and Parks, in cooperation with the U. S. Fish and Wildlife Service, during 1995, 1996, and 1997. Officials with other appropriate governmental agencies and jurisdictions in Kansas also provided information on the convictions of various individuals, as follows:

Joseph T. Bain (Wichita area) was found guilty in September 1998 at the Sedgwick County Courthouse, Wichita, for a wildlife violation involving a Kansas reptile. Bain (Belle Plaine) was charged with illegal commercialization of Kansas wildlife (involving a juvenile Eastern Rat Snake), was fined \$300.00 plus \$125.00 court costs, and was placed on 90 days probation.

Russell Hicks (Topeka) pled guilty in September 1998 at the Shawnee County Courthouse to two counts of illegal possession of Oklahoma snakes and two counts of illegal commercialization of Oklahoma and Kansas snakes. He was fined \$200.00 plus \$102.50 court costs. The species involved were Western Hognose Snake, Racer, Eastern Rat Snake, Prairie Kingsnake, Common Kingsnake and Milk Snake.

Christopher Kirmse (Topeka) obtained a diversion agreement in September 1998 at the Shawnee County Courthouse. He had been charged with attempting to illegally purchase a Common Kingsnake.

Troy Nydegge, (Topeka) pled guilty in September 1998 at the Shawnee County Courthouse to one count of illegal possession (trading four Douglas County, Kansas, Milk Snakes for a California Kingsnake). He was not fined and paid \$45.00 court costs.

Richard Tinsley (Topeka) was charged in September 1998 at the Shawnee County Courthouse with one count of illegal commercialization of snakes. He did not appear at his hearing, and was issued an outstanding warrant for his arrest.

More cases developed through the KDWP "sting" operation are pending for state offenses, and will be reported to KHS members as they are settled. We will also report on the result of additional federal charges for violations that occurred in Kansas or involved Kansas reptiles and amphibians, as they are processed and become available. To date for the cases filed, the "sting" operation at the state and federal level has resulted in a 100% conviction rate and fines, court costs, and restitution in excess of \$18,000.00. Operation Squamata is one of the most successful undercover "stings" ever conducted by the Kansas Department of Wildlife and Parks, and their cooperation with the U. S. Fish & Wildlife Service allowed that agency to successfully prosecute additional violators far outside the boundaries of the Sunflower State.

ADDRESS CHANGES

Please note that there have been a couple of address and phone number changes for KHS Board members. Treasurer Karen Toepfer's address is now 327 West 24th St., Hays, Kansas 67601. Her phone number remains the same. Eric Rundquist's phone number is now 785-864-8848.

VOLUNTEERS NEEDED

As a result of its recent affiliation with the Kansas Grazing Lands Coalition, KHS has been invited to participate in an assessment of grazing lands owned by the Kansas Department of Wildlife and Parks at Cheney Lake in Sedgwick County. KHS personnel will conduct a survey of the herpetofauna on these lands. A time for the assessment project has not been set at this time. Those wishing to participate in or needing more information on this project, should contact Eric Rundquist, the KHS liaison to the KGLC, at 785-864-8848.

EDITOR TO RESIGN IN DECEMBER

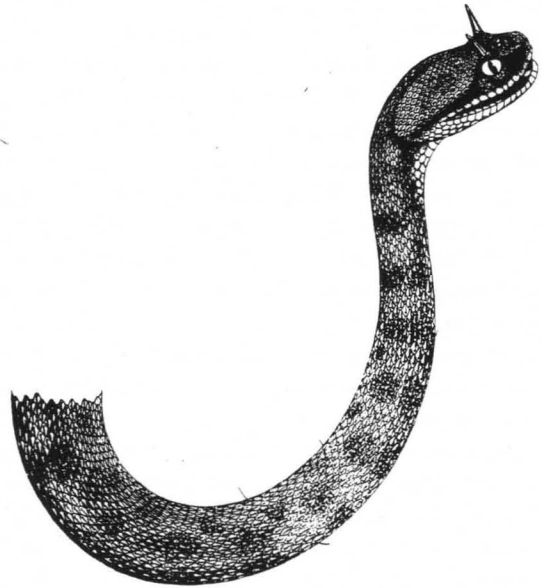
I will be retiring from my position as Editor of the Kansas Herpetological Society at the end of this year. My reasons for doing so are varied, but in no way reflect any dissatisfaction on my part with the Society or its members. In fact, I consider being allowed to be a member of the Executive Council and to serve the Society for these past many years one of my greatest honors and achievements.

I have served as your Editor for 11 years now and, over the course of time, have been a member of the Executive Council for 13 years in total, which reflects exactly half the age of KHS. Also, 1999 is the last year of this century (although some pedants would dispute that, I suppose) and it seems appropriate that the Society begin the new millenium with someone not quite as battle-scarred as me. Frankly, there are number of projects that I have begun that are requiring more of my time than I have been able to commit and others that have been hanging fire that I want to finish. Although I have enjoyed editing the Society's publications for all these years, it is a time-consuming task that I have become somewhat burned out on doing. I think it best to hand over the position to someone who is a little fresher and more eager for the task.

So, if you think you have the ability and desire to fill this post, please contact KHS President Chris Mammoliti. You will need to be proficient in Macintosh computers, Microsoft Word, and Adobe Pagemaker 6.5. Skill in graphics capture, placement, and editing will also be helpful. In addition, a good deal of patience, forbearing, time available, ability to meet deadlines and kick derrieres when necessary, and long-term commitment to the Society's publications and service on the Executive Council are also mandatory.

I will continue to manage the yearly KHS Spring Herp Counts, coordinate the Deformed Amphibian Monitoring Project for the Society, and serve as liaison to the Kansas Grazing Lands Coalition, so I won't completely disappear off the scene. In addition, I will be more than happy to consult with and advise those concerned with the Society's affairs, past, present, and future.

— EMR



KHS BRINGS YOU GREAT NEWS OF THE WORLD

SONGS OF LOVE

The Budweiser frogs are typical Madison Avenue TV trickery. Truer amphibian stars are the Kansas frogs and toads whose voices can be found on an audio tape currently in some local book and pet stores.

Their star turns—a varied collection of dries, croaks, screeches, and other mating pleas—can be heard on “The Calls of Kansas Frogs and Toads” by [KHS member] Keith Coleman with narration by Joseph T. Collins.

Coleman and Collins, both of Lawrence, produced the tape with sponsorship of Kansas Department of Wildlife and Parks as part of a plan to do an annual statewide frog and toad census.

The tape was produced so dozens of volunteers—who will drive 110 designated frog-detection routes in 81 counties tallying the calls they hear from ditches, ponds, swamps, and wetlands—will have an aural reference for identifying the beasts whose numbers they will attempt to count.

“What we’re trying to do is put together the baseline data on how many frogs and toads there are, what kinds there are and where they are. We don’t have data for what is normal population either nationally or in Kansas,” Collins said.

“It’s a long-range program, minimally five years, maybe 10.”

Collins said he still needs volunteers for routes in far western Kansas but already has people lined up for the rest of the state.

Coleman, a Kansas University doctoral candidate in philosophy, who teaches at Johnson County Community College, did the stereophonic field recordings, criss-crossing Kansas, as Collins explains, through “snowstorm and rainstorm, through blistering heat and bitter cold in search of chorusing amphibians.”

“It’s a slight exaggeration to say I was out in a snowstorm,” Coleman said in a recent interview, “although one time it turned bitter cold by the time I got home and snowed a little on the way back. Frogs don’t call in snowstorms,* so it really wouldn’t do any good to record in a snowstorm.”

“Like a traveling preacher of days gone past,” Collins intones on the tape, “he searched the back roads of Kansas for the temples and chapels where choirs of these amphibians would sing the lust and desire primal to their kind.”

Lust and desire. There is plenty of that on the tape; in fact, there is little else. Enough perhaps to even make crooner Barry White blush were he more toadish.

“I’m proud of pointing out to volunteers that this whole thing is sex-driven,” said Collins.

*Editors note: Indeed, frogs do call in snowstorms in Kansas. Collins has heard Western Chorus Frogs, Plains Leopard Frogs, and Spring Peepers calling during wet spring snowstorms.

Frogs and toads, like fraternity boys, are loudest when seeking mates. The Coleman/Collins recording is full of the animals’ full-throated mating songs.

The tape is a hit with herpetologists, happy to have an audio reference to the 22 species of Kansas frogs and toads.

“There have been many frog recordings done over the past 30 years,” said Eric Rundquist, editor for the Kansas Herpetological Society, “but I’ll tell you it’s the best sound quality I’ve heard for this kind of thing. It’s an impressive piece.”

“Keith went out and got these recordings of all these things, except for one species,” Rundquist said. “He went out and spent thousands of miles traveling and I don’t know how many hundreds of hours. He’s spent many years doing this.”

Sixteen to be precise.

“I began doing this probably in 1982,” said Coleman. “But I used primitive equipment at that time. I just went out using what they call a shoebox recorder ... and bought microphones at Radio Shack. I got the idea from listening to some recording that had been made of primarily eastern amphibians. I came across another LP album made by Charles Bogert, a well-known herpetologist in the 1950s.

“Even with the primitive equipment I had I found it sounded very nice,” Coleman said. “I talked with members of the Kansas Herpetological Society and they encouraged me to see if I could go get all the frog and toad species in Kansas, saying it would be nice to put them together in one recording.

“I decided if I was going to take it seriously I ought to upgrade my equipment. And I read everything I could about recording devices.”

The recordings are in stereo.

“I wanted stereo effect because frogs call in response to one another. With stereo you get this nice back and forth calling. I got two professional microphones and stands to mount them on.

“First, I walk around the pond or lake or wherever I’m recording and try to find the best location to record. Usually out in the field there’s (undesired) noise coming from one direction, either a city or cows in the pasture. My mikes are not omnidirectional. So, I point my mikes in one direction and avoid sound coming from behind.

He went out with 60-minute cassettes and filled them up. Then he brought them back for editing.

“I listen to the whole thing and try to get the best two minutes out. In spite of my precautions, there’s always interference, maybe cars or an airplane goes over.”

Human interference wasn’t a factor, he said, although some people would look at him funny when they found him out in the dark recording frogs.

"Most of the time I didn't have any problems," he said. "I had farmers tell me: Most people here this time of night are up to no good. But I never had anybody shoot me anyway."

The project took Coleman all over Kansas.

"I haven't been in every county," he said. "But I've been all over the state. There's one amphibian, the Green Toad (*Bufo debilis*) the only place you find it is way out in the southwest."

There is one call on the tape that wasn't made by a Kansas animal. The Pickerel Frog [*Rana palustris*] is so hard to find that the voices of Missouri Pickerels were used for the tape.

"If the Pickerel Frog is ever going to be found (in Kansas) it's going to be found in the southeast," Coleman said. "We've discovered Spring Peepers [*Pseudacris crucifer*] (another hard-to-find frog) now in Bourbon County near Fort Scott.

Coleman, a teacher by profession, has been fascinated by reptiles and amphibians since youth.

"As a kid, I always used to keep toads and frogs and lizards," he said. "I do still keep snakes as pets. I have a Gray Rat Snake, some Corn Snakes, and a Taiwan Beauty Snake."

His fascination with the animals is unabated despite hours outdoors listening to toads and frogs.

"Lots of times in late spring," he said, "there are tree frogs an Cricket Frogs and Woodhouse's Toads all in kind of a mixed chorus. It creates quite a noise. It's amazing they can find one another in all that racket they're making."

—Lawrence Journal World, 14 December 1998
(Submitted by Shelley Skie, Lawrence)

TOPEKA LIZARDS GET INTERNATIONAL RECOGNITION

Sixth-grade students at Topeka Collegiate sat on the edge of their seats Friday as an amateur herpetologist from Germany examined two species of European lizards that have made their homes near the elementary school.

The two species—the Podarcis and possibly the Lacerta—are endangered in Europe, but thrive in auto repair shops, churches and backyards near both sides of S. W. Gage from 23rd Street to 17th Street. Members of both species apparently escaped from a commercial animal dealer near SW 21st and Gage during the 1950s. Both species have established themselves in the area.

Dr. Guntram Deichsel is a biostatistician for a pharmaceutical company, but his hobby is reptiles and amphibians, which is the reason for his detour to Kansas from Connecticut, where he traveled on business earlier this week.

Deichsel had read in the Peterson reptile and amphibian

field guide that the Lacerta lizard, which is dark green and about 18 inches long, is found in Topeka.

The Lacerta was once thought to be a single species, but it was discovered three years ago that it is two species. The lizards look nearly identical as adults, although differences can be detected among the young.

The Lacerta was commonly called the European Green Lacerta, but the scientific discovery has resulted in the single species dividing into two separate species—the Western Green Lacerta and the Eastern Green Lacerta.

Deichsel, who is interested in determining which species the Topeka lizard belongs to and correcting the reptile and amphibian handbooks, contacted one of the Peterson authors and was referred to John Simmons, collection manager at the Museum of Natural History at the University of Kansas.

Simmons referred Deichsel to Joseph T. Collins, herpetologist emeritus at KU and founder and director of *The Center for North American Amphibians and Reptiles*, who referred Deichsel to Topeka Collegiate science teacher Larry Miller.

Miller's students have conducted annual amphibian and reptile counts and photographed species that were pictured in several versions of Collins' field guide.

As Deichsel flipped the lizard over in his hands Friday, he told the students there was an 80 percent likelihood the creature was a Western Green Lacerta. But he couldn't be sure until he could examine a young lizard, which the students hadn't managed to capture.

The cold and rainy drizzle on Friday meant the creatures were likely seeking cover, and Deichsel would need to pray for warm weather before his return trip to Germany on Sunday.

Miller conducted a summer class three years ago called "In Search of the Green Lacerta." He sent fliers to neighbors, asking them to collect the lizard, but none were caught during the week-long class.

The day after the class ended, a neighbor brought in a Lacerta, and there has been a steady stream since.

"Last year this time people were bringing in young lizards all the time," Miller said, "but we didn't know."

—Topeka Capital-Journal, October 1998
(Submitted by Heather Hollingsworth)

\$9.1 MILLION ASKED FOR PROBE OF FROG DECLINE, DISFIGUREMENT

Frogs are disappearing throughout the nation at unprecedented rates, spurring Interior Secretary Bruce Babbitt to ask Congress Wednesday for more than \$9 million to try to find out why.

"This is urgent," Babbitt said at the Interior Department before heading off to Capitol Hill to appeal to congressional budget committees to increase research funds from \$1 million to \$9.1 million a year.

There is evidence that up to a third of 230 species of native frogs, toads, and salamanders in the United States – species that have been around since dinosaur days – are declining, Babbitt said.

At the same time, freakish frogs with multiple or missing limbs and facial deformities have been reported in 42 states over the past few years, he said.

“All amphibian biologists are now convinced that something unusual and catastrophic is happening,” said Ron Heyer, research curator at the National Museum of Natural History.

Frog experts are especially troubled because they see amphibians as an early warning system for humans.

So far, there are more questions than answers about what might be causing the frogs’ problems. Among the possibilities: contamination of the frogs’ environment by pesticides and herbicides used by farmers and gardeners; an increase in ultraviolet radiation caused by chemicals destroying the planet’s protective ozone layer; disease and fungus infections; the introduction of non-native, frog-eating fish into the habitat; and the loss of wetlands because of development.

Many scientists say there might be more than one cause of the frogs’ problems and that those causes might vary from region to region.

—USA Today, 25 February 1999
(Submitted by James Gubanyi, Topeka)

WEST PALM BEACH MAN SENTENCED FOR POSSESSING MARINE TURTLE EGGS

A man charged six times in the past for stealing sea turtle eggs was sentenced Friday to five years in federal prison for possessing 383 marine eggs.

Alvin Keel, 55, of West Palm Beach, was arrested May 29, 1998, when Marine Patrol officials using night vision goggles seized the eggs from him just before dawn.

Keel had dropped a canvas bag full of eggs and fled into the ocean, but emerged minutes later, officers said after his arrest.

Keel also was convicted of molesting a marine turtle. That charge stemmed from his removal of turtles to get to the eggs in about seven nests, officers said.

In addition to the prison sentence, U.S. District Judge Daniel T. K. Hurley sentenced Keel to three years’ probation. The sentence was the maximum Keel could have received.

Keel had two prior federal convictions and four state convictions for offenses involving taking marine sea turtle eggs from their nests. State criminal records show Keel has been arrested 35 times since 1962.

The sea turtle eggs are considered aphrodisiacs by some and are sold outside area bars for about \$1.50 each, officials said.

—News-Journal Wire Services, 9 January 1999
Submitted by Larry Zuckerman, Pretty Prairie

SEA TURTLE EGGS SEIZED FROM POACHERS

Federal police have arrested five people and seized 26,000 turtle eggs in the southern state of Oaxaca, Mexico, in their latest crackdown on poachers.

The seizure took place near the Pacific coast in Santiago Astata, 320 miles southeast of Mexico City, the government’s Notimex news agency reported late Monday. The truck carrying the eggs was impounded.

Traffic in sea turtle eggs, long considered a delicacy, is banned in Mexico, which has tried to protect a number of beaches where the turtles emerge from the sea to lay their eggs.

Last week, police seized 89,000 turtle eggs in another operation.

—Lawrence Journal World, 9 September 1998
(Submitted by Carolyn Moriarty, Lawrence)

HUNDREDS OF REPTILES KILLED IN ZOO FIRE

Fire broke out at the reptile house of the Cape May (New Jersey) county zoo, killing more than 200 animals.

The fire broke out late Wednesday or early Thursday, burning the one-story, wood-frame structure to the ground, said Joseph Martino, operations supervisor at the Cape May County Park and Zoo.

Turtles, snakes and other reptiles and amphibians were killed. They will cost \$30,000 to \$50,000 to replace, Martino said.

“We’ll definitely rebuild,” he said. “It’s tragedy, but we’re going to rebuild.”

No park employees were injured, and no other buildings were damaged.

The cause of the fire was under investigation.

—Lawrence Journal World, 29 May 1998
(Submitted by Carolyn Moriarty, Lawrence)

MUGGERS TERRORIZE WOMEN WITH SNAKES

Muggers are using snakes to terrorize and rob women in downtown New Delhi (India), a newspaper reported Monday.

In the latest incident Saturday, three men thrust snakes at a woman in a taxi and demanded her money and jewelry, the Times of India reported. The woman, Roshni, turned the valuables over.

“Those bloodshot eyes and the snakes slithering all around keep coming back to me,” Roshni, who uses only one name, was quoted by the newspaper as saying.

The same men have attacked several other women, the newspaper said, citing police.

Street performers carrying snakes that sway as a flute is played are a common sight in India.

—Lawrence Journal World, 29 May 1998
(Submitted by Carolyn Moriarty, Lawrence)

FEATURE ARTICLES

KANSAS HERPETOLOGICAL SOCIETY HERP COUNTS: A 10-YEAR SUMMARY AND EVALUATION

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Animal Care Unit
Malott Hall
University of Kansas
Lawrence, Kansas 66045

Since 1989, the Kansas Herpetological Society has sponsored a series of controlled censuses of amphibian and reptile taxa and populations in Kansas (Collins 1989). The count period is typically from 1 April to 31 May of a given year, although two censuses were conducted in early June (Collins and Rundquist 1993). Anyone with an interest in Kansas herps has been encouraged to participate in these censuses and the Society has used the auspices of its annual spring field trip to train participants in identification and field methods. Although the model for these counts was originally the winter, Christmas, and breeding bird surveys of the Audubon Society of the United States (K. Brunson, pers. comm.), the KHS herp counts have been far less systematic in that only three counts have been held in the same place and manner for more than six consecutive years. However, given the relatively static nature of herp populations and the ability to actually count individuals in a given survey area, I believe that species and specimen numbers represented in these counts give an accurate reflection of species and population status over time in large areas of the state. Counts have been held in all major physiographic provinces of the state.

The following account summarizes the data gathered from herp counts from 1989 through 1998. In addition, I attempt to analyze and evaluate these data.

METHODS

A number of different count methods have been used, separately or in combination, to compile species and specimen data. These are as follows: visual search without capture, visual search with capture, uncovering ground cover (rocks, free-fall vegetation, manmade debris), trapping (shelters, pitfall, Fitch snake, turtle), and road-driving.

Count totals are generally based on counting actual specimens, although in the case of large amphibian choruses and/or larval congregations, estimates have occasionally been made. In larval congregations, estimates have been made via actual counts within a square area and using the total square area occupied by larvae as a multiplier. Calling amphibian surveys are based on male calls only, to the best of my knowledge.

Species identification is dependent upon confirmation by a knowledgeable observer at a count. However, it is not uncommon for a single participant to make observations. Acceptance of single observer identifications is subjective and contingent on the overall count enumerator's acceptance of said observations. On rare occasions, observers have been contacted to confirm or reject species identifications.

Individual count data is submitted to a single count enumerator during and after the official count period. Prior to 1997, these data were accepted for several months after the count period. Since 1997, only data submitted by 15 June of the count year have been accepted. Consequently, some counts have not been included in the total data set because they were not submitted by the established deadline. All data is compiled and a report submitted for publication in the Kansas Herpetological Society Newsletter during the count year.

RESULTS

Counts have been conducted in 60 counties (57%) (Fig. 1) of the state at 309 sites. Barber, Cowley, Douglas, and Sumner Counties are the most frequently represented counties in the 10-year period. Thirteen counties have been surveyed five or more times and 24 counties have been surveyed only once. See Table 1 for a complete listing of

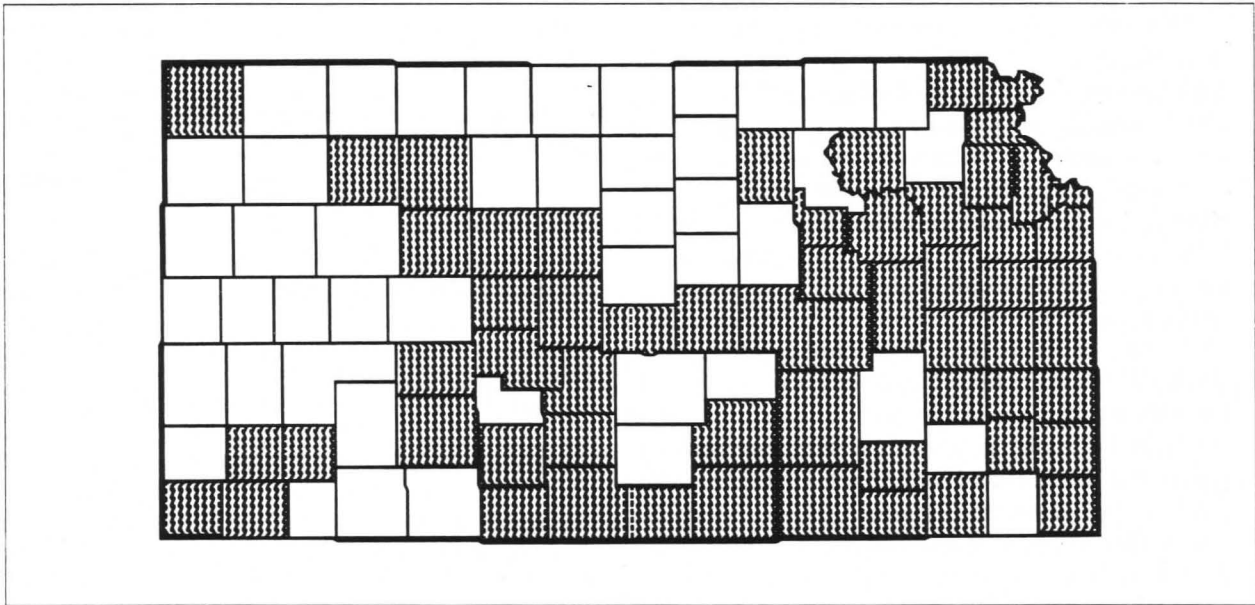


Figure 1. Counties (shaded) in which herp counts have been conducted in Kansas 1989–1998.

counties in which surveys have been held. Counties in the western High Plains have received the least attention. In addition, counties in the state’s northcentral region have also been neglected. Many of the count sites are visited repeatedly over time, reducing the actual number of unique, site-specific counts, although the exact number of repeatedly visited sites cannot be determined accurately from the data submitted.

Table 1. Counties in which Kansas herp counts have been conducted.

County	Counts held (Number of years)
Cowley	10
Sumner	10
Barber	8
Douglas	8
Pratt	7
Chase	6
Ellis	6
Johnson	6
Cherokee	5
Kiowa	5
Linn	5
Osage	5
Shawnee	5
Bourbon	4
Lyon	4
Russell	4
Anderson	3
Barton	3
Clark	3
Comanche	3
Crawford	3
Miami	3
Montgomery	3
Sedgwick	3
Wabaunsee	3
Butler	2
Chautauqua	2
Coffey	2
Graham	2
Jefferson	2
Leavenworth	2
McPherson	2
Morris	2
Neosho	2
Pottawatomie	2
Stafford	2
Allen	1
Atchison	1
Brown	1
Cheyenne	1
Clay	1
Doniphan	1
Elk	1
Ford	1
Franklin	1
Geary	1
Grant	1
Haskell	1
Harper	1
Hodgeman	1
Marion	1
Morton	1
Pawnee	1
Rice	1
Rush	1
Sheridan	1
Stevens	1
Trego	1
Wyandotte	1
Woodson	1

Of the 99 species of amphibians and reptiles known to occur in Kansas, 88 taxa (89%) have been observed during the KHS herp counts. For amphibians, the following species have the highest representation (eight or more calendar year observations): *Acris crepitans*, *Bufo americanus*, *B. cognatus*, *B. woodhousii*, *Gastrophryne olivacea*, *Hyla versicolor*, *Pseudacris triseriata*, *Rana catesbiana*, and *R. blairi*. Species reported the fewest times (three or fewer) are: *Ambystoma tigrinum*, *Bufo punctatus*, *Gastrophryne carolinensis*, *Notophthalmus viridescens*, *Pseudacris crucifer*, *Rana areolata* and *Typhlotriton spelaeus*. *Bufo debilis*, *Eurycea multiplicata*, *Necturus maculosus*, *N. louisianensis*, *Rana clamitans* and *R. palustris* have never been reported during the herp counts. The most commonly reported reptile taxa are: *Chelydra serpentina*, *Chrysemys picta*, *Terrapene ornata*, *Trachemys scripta*, *Crotaphytus collaris*, *Cnemidophorus sexlineatus*, *Eumeces obsoletus*, *E. obtusirostris*, *Ophisaurus attenuatus*, *Sceloporus garmani*, *Scincella laterale*, *Agkistrodon contortrix*, *Coluber constrictor*, *Diadophis punctatus*, *Elaphe emoryi*, *E. obsoleta*, *Lampropeltis calligaster*, *L. getula*, *L. triangulum*, *Masticophis flagellum*, *Nerodia erythrogaster*, *N. sipedon*, *Pituophis catenifer*, *Sonora semiannulata*, *Tantilla gracilis*, *Tantilla nigriceps*, *Thamnophis proximus*, *T. sirtalis*, and *Tropidoclonion lineatus*. The least observed reptile species are *Arizona elegans*, *Heterodon platirhinos*, *Leptotyphlops dulcis*, *Opheodrys aestivus*, *Rhinocheilus tessellatus*, and *Storeria occipitomaculata*. *Agkistrodon piscivorus*, *Macrochelys temminckii*, *Thamnophis marcianus*, and *Virginia striatula* have never been reported during these counts. Note that *Graptemys pseudogeographica*/*G. ouachitensis*, *Hyla versicolor*/*chrysocephala*, and *Pseudacris maculata*/*P. triseriata* have been treated as one taxon, due to their visual similarity (although there is no doubt that all these species have been accurately reported at one time or another), but *Sceloporus u. undulatus* and *S. u. garmani* are treated as separate species. See Table 2 for a complete listing of taxa reported during the 10-year period. No attempt is made herein to tabulate taxa by individual count, as I believe that calendar year reports give a more accurate reflection of species status over time in the state. For example, *Eumeces laticeps* was reported from three different counts in one year, but that is the only year in which this species was reported.

The lowest total species count was 36 in 1989 and a high of 72 taxa was reported in 1997. The mean taxa count is 54.5.

A total of 22,529 specimens have been reported over the 10-year period, with a low of 448 specimens in 1989 and a high of 5,196 in 1998. An additional 40,000 tadpoles of a *Bufo* sp. were reported in 1994 and have not been included in the count totals, as this is a one-time occurrence and such a large number obscures meaning for the other count numbers. Therefore, the mean total specimen count per

Table 2. Species found during KHS Herp Counts 1989–98. Middle column lists years observed as follows: 10 = 1998, 9 = 1997, etc. Last column indicates number of times observed.

Species	Years Observed	Times Observed
AMPHIBIANS		
<i>Acris crepitans</i>	all	(10)
<i>Gastrophryne olivacea</i>	all	(10)
<i>Rana catesbiana</i>	all	(10)
<i>Pseudacris triseriata</i>	10,9,8,7,6,5,4,3,2	(9)
<i>Rana blairi</i>	10,9,8,7,6,5,4,3,2	(9)
<i>Bufo americanus</i>	10,9,8,7,6,5,4,3	(8)
<i>Bufo cognatus</i>	10,9,8,7,6,5,4,3	(8)
<i>Bufo woodhousii</i>	10,9,8,7,6,5,4,3	(8)
<i>Hyla versicolor</i>	10,9,8,7,6,5,4,3	(8)
<i>Pseudacris clarkii</i>	9,8,7,6,5,2	(6)
<i>Spea bombifrons</i>	9,8,7,5,3,2	(6)
<i>Ambystoma mavortium</i>	10,8,6,4,2	(5)
<i>Ambystoma texanum</i>	8,7,6,1	(4)
<i>Eurycea longicauda</i>	10,8,6,5	(4)
<i>Eurycea lucifuga</i>	10,8,6,5	(4)
<i>Rana sphenoccephala</i>	10,8,7,6	(4)
<i>Typhlotriton spelaeus</i>	8,6,5	(3)
<i>Bufo punctatus</i>	9,2	(2)
<i>Pseudacris crucifer</i>	7,6	(2)
<i>Ambystoma tigrinum</i>	9	(1)
<i>Notophthalmus viridescens</i>	6	(1)
<i>Gastrophryne carolinensis</i>	6	(1)
<i>Rana areolata</i>	7	(1)
REPTILES		
<i>Chelydra serpentina</i>	all	(10)
<i>Chrysemys picta</i>	all	(10)
<i>Terrapene ornata</i>	all	(10)
<i>Trachemys scripta</i>	all	(10)
<i>Kinsternon flavescens</i>	10,9,8,7,5,3,2,1	(7)
<i>Terrapene carolina</i>	10,9,8,6,1	(5)
<i>Apalone spinifera</i>	10,9,8,3	(4)
<i>Sternotherus odoratus</i>	9,8,6	(3)
<i>Graptemys pseudogeographica</i>	10,8	(2)
<i>Apalone mutica</i>	2	(1)
<i>Graptemys geographica</i>	8	(1)
<i>Pseudemys concinna</i>	8	(1)
<i>Crotaphytus collaris</i>	all	(10)
<i>Eumeces obsoletus</i>	all	(10)
<i>Eumeces obtusirostris</i>	all	(10)
<i>Cnemidophorus sexlineatus</i>	all	(10)
<i>Sceloporus garmani</i>	all	(10)
<i>Ophisaurus attenuatus</i>	10,9,8,7,6,5,4,2,1	(9)
<i>Scincella laterale</i>	10,9,8,7,5,4,3,2	(8)
<i>Eumeces fasciatus</i>	10,8,7,6,5,4,3	(7)
<i>Phrynosoma cornutum</i>	10,9,6,3,2,1	(6)
<i>Holbrookia maculata</i>	10,9,8,6,2,1	(6)
<i>Eumeces septentrionalis</i>	8,7,6,5,4	(5)
<i>Eumeces anthracinus</i>	8,6	(2)
<i>Eumeces laticeps</i>	6	(1)
<i>Sceloporus undulatus</i>	6	(1)

<i>Coluber constrictor</i>	all	(10)
<i>Diadophis punctatus</i>	all	(10)
<i>Elaphe obsoleta</i>	all	(10)
<i>Lampropeltis triangulum</i>	all	(10)
<i>Nerodia sipedon</i>	all	(10)
<i>Lampropeltis getula</i>	all	(10)
<i>Thamnopsis sirtalis</i>	all	(10)
<i>Agkistrodon contortrix</i>	10,9,8,7,6,5,4,3,2	(9)
<i>Elaphe emoryi</i>	9,8,7,6,5,4,3,2,1	(9)
<i>Pituophis catenifer</i>	10,9,8,7,6,5,3,2,1	(9)
<i>Sonora semiannulata</i>	10,9,8,7,6,5,4,2,1	(9)
<i>Thamnopsis proximus</i>	10,9,8,7,6,3,2,1	(9)
<i>Tropidoclonion lineatus</i>	10,9,7,6,5,4,3,2,1	(9)
<i>Lampropeltis calligaster</i>	10,9,8,7,6,5,4,2	(8)
<i>Masticophis flagellum</i>	9,8,7,6,5,4,3,2	(8)
<i>Nerodia erythrogaster</i>	10,9,8,7,6,5,3,1	(8)
<i>Tantilla gracilis</i>	10,9,8,7,6,5,4,3	(8)
<i>Tantilla nigriceps</i>	10,9,7,6,5,4,3,2	(8)
<i>Carphophis vermis</i>	10,8,7,6,5,4,3	(7)
<i>Sistrurus catenatus</i>	10,9,8,7,6,2,1	(7)
<i>Crotalus viridis</i>	9,8,5,4,3,2	(6)
<i>Crotalus horridus</i>	10,8,6,5,4	(5)
<i>Nerodia rhombifer</i>	10,9,8,7,6	(5)
<i>Regina grahamii</i>	10,8,7,6,5	(5)
<i>Storeria dekayi</i>	10,9,8,6,2	(5)
<i>Thamnopsis radix</i>	10,8,7,6,3	(5)
<i>Virginia valeriae</i>	10,8,6,5,4	(5)
<i>Heterodon nasicus</i>	9,5,3,2	(4)
<i>Hypsiglena torquata</i>	9,8,6,5	(4)
<i>Ophedrys vernalis</i>	9,7,1	(3)
<i>Arizona elegans</i>	9,8	(2)
<i>Heterodon platirhinus</i>	9,8	(2)
<i>Leptotyphlops dulcis</i>	9,8	(2)
<i>Rhinocheilus tessellatus</i>	9	(1)
<i>Storeria occipitomaculata</i>	6	(1)

year is 2253. Mean specimens per count is 72.9. The low mean specimens per count was 56.0 in 1989 and the high mean was 148.5 in 1998. As few as 1 specimen per count has been recorded (several times) and a count in 1991 totaled 716 specimens. See Figure 3 for a yearly graph of specimens observed.

Counts have been conducted at 309 sites during the 10-year period, for a mean of 31 counts per year. The lowest number of sites visited was 8 in 1989 and the highest number was 72 in 1996.

There have been a total of 1566 participants in counts during the 10-year period, for a mean of 157 per count year. Relatively low numbers of participants are seen from 1989-1993. However, beginning in 1994, participants per count year more than doubled and reached a peak of 309 in 1996. The lowest number of participants was 69 in 1989. Over time, there has been a mean of 5.1 participants per count, with a low of 3.6 participants in 1991-93 and a high of 7.4 in 1995.

A total of 865.75 hours spent in search activities has

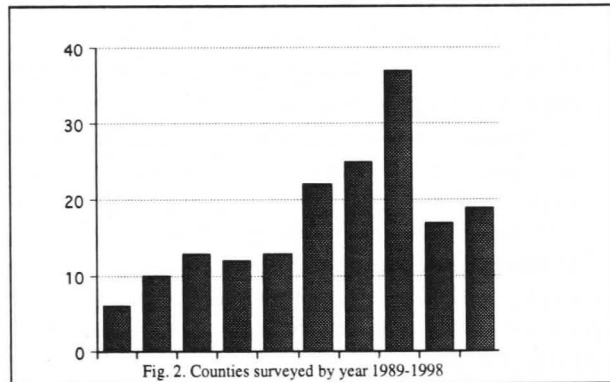


Fig. 2. Counties surveyed by year 1989-1998

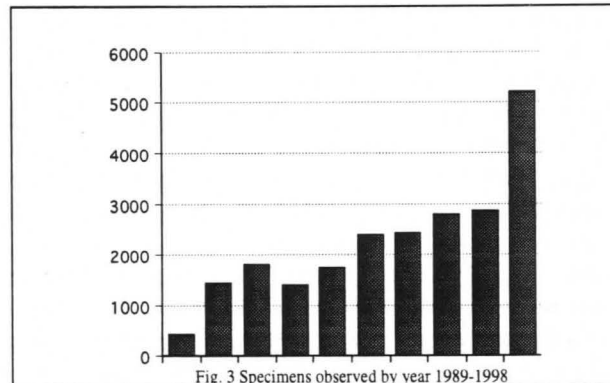


Fig. 3 Specimens observed by year 1989-1998

been reported for the 10-year period, for a mean of 86.6 hours per count year. The lowest number of hours spent searching was 28.75 in 1989 and the high was 220.0 hours in 1996. A total of 7731 man/hours have been spent in search activities, for a mean of 773.1 man/hours per count year. The fewest man/hours recorded was 301.0 in 1989 and a high of 1600.25 was reported in 1997. A mean of 2.8 hours was expended in search activities at each site, with a low mean of 2.0 hours per site in 1995 and a high mean of 3.7 hours per site in 1998. A count period may be as brief as .25 hr or may last as long as 13 hrs.

DISCUSSION

The lack of counts in the western High Plains can probably be accounted for by the fact that there are few towns in this area and that KHS has very few members here. In addition, the vast majority of counts are conducted by members from the Kansas City, Lawrence, Topeka, and Wichita areas, which are considerably removed from far western Kansas, and therefore persons are probably not inclined to travel long distances to conduct counts in this area. The lack of counts in the northcentral portion of the state cannot be as easily explained. There are significant numbers of active KHS members in the Topeka-Manhattan-Hays corridor but it appears that these persons are not inclined to conduct counts in the northcentral region. In fact, there has never been a count conducted in Riley County, of which Manhattan is the county seat. A possible

explanation is that the northcentral region of the state is perceived as herpetologically depauperate. If so, this is a false perception as there is significant good herpetological habitat throughout the area. Additionally, the Society has never held its annual spring field trip (a major herp count source) in either the westcentral High Plains or northcentral regions of the state.

The KHS herp counts have been remarkably effective in documenting the known herpetofauna of the state, accounting for 89% of the state's reported herp taxa. In fact, if one excludes taxa which observers could not reasonably be expected to find, that number rises to 96% of the state's herpetofauna. Excluded taxa and the rationale for excluding same are as follows: *Eurycea multiplicata* – not reported from the state since 1969 (Ireland 1970). A number of herp counts have been conducted at the original collection site without finding this species. In addition, specific searches by other workers for this species over the past 20 years have failed to find this salamander. It is likely extirpated from the state's fauna; *Necturus louisianensis* and *N. maculosus* – These salamanders are strictly aquatic and primarily riverine. Herp count methods have not included effective sampling techniques for these taxa and riverine habitats are not typically included in herp counts; *Rana palustris* – not reported from the state since its discovery in 1932 (Smith 1932). The original collection site is now a cultivated field. Again, herp counts have been held repeatedly in Cherokee County and many field workers have searched specifically for this species for decades here without revealing the presence of this frog. This species is almost certainly extirpated; *Bufo debilis* – Although this toad is now known to exist in a number of localities in western Kansas, no herp counts have been held in these areas. In addition, the prime activity period for this species is after the designated herp count period; *Agkistrodon piscivorus* – Only two authentic records exist for this snake in Kansas and it is likely that these two specimens were vagrant (Rundquist and Triplett 1993). It is unlikely that herp count participants would have found this snake, as count activities in Cherokee County have not been held at the reported localities for this species; *Macrochelys temminckii* – There is only one authentic record for this species in Kansas in the past fifty years. Given that this turtle is an age-related migratory vagrant (Pritchard 1982) and almost exclusively aquatic, it is highly unlikely that count participants would have encountered the species.

Of the species reported, frequency of occurrence tends to fit conventional wisdom. However, there are some significant discrepancies from expectations. Of amphibians, *Ambystoma tigrinum*, *Rana areolata*, and *Pseudacris crucifer* appear to differ from what one would expect to find. *A. tigrinum* seems to be exceptionally rare, even though count activities have been held throughout its expected range and activity period in Kansas. There are only two

reports for *Pseudacris crucifer*, but this frog is abundant in Cherokee County (pers. obs.) and reports from Bourbon County (L. Anderson, pers. comm.) indicate that it is common there. The one report for *Rana areolata* is probably a reflection of timing, as this frog has a very short breeding period (perhaps only two or three days) and is rather fossorial, making it very difficult to find unless a concerted effort is made to do so. The frog is now known to be more common and widespread than previously thought (Busby 1997).

Of reptiles, reports for *Apalone mutica*, *A. spinifera*, *Graptemys pseudogeographica/ouachitensis*, *Eumeces obtusirostris*, *E. septentrionalis*, *Sceloporus undulatus*, *Crotalus viridis*, *Virginia valeriae*, *V. striatula*, and *Opheodrys aestivus* all appear to differ from expectations. The reports for both species of softshell turtles are fewer than expected, as both species are common (even abundant) residents of riverine habitats. The report probably reflects the paucity of river habitat surveyed and the extreme shyness of these turtles. Also, both species are virtually impossible to distinguish at a distance. The same rationale applies for the *Graptemys* mentioned. Although not nearly as common as *Apalone*, nonetheless they are relatively common inhabitants of appropriate river systems.

The situation with the two *Eumeces* is intriguing, presenting a reversal of expectations. *E. obtusirostris* is usually considered to be a rare species and *E. septentrionalis* is usually thought to be a relatively common species here. *E. obtusirostris* is reported for all 10 years of the count period and *E. septentrionalis* is reported five times. I believe the reports for *obtusirostris* are an accurate reflection of the species' status in the state, even though it has a limited range here. The situation in regard to *septentrionalis* is harder to interpret. Many counts have been held in the species' prime range in Kansas, the Flint Hills, yet have failed to reveal this lizard. Perhaps it is more uncommon than previously thought. The status of this species in Kansas merits more in-depth investigation.

Sceloporus undulatus also presents an interesting situation, having been reported only once. *S. undulatus* is common to abundant throughout its main range. Again, counts have been held throughout the species' range in Kansas but have failed to reveal the lizard. *S. undulatus* is arboreal and cryptic and may not conform to an observer's sight picture in Kansas. However, my personal experience with this species in Kansas is that it is quite rare and I believe that these counts reflect this lizard's status in the state accurately.

The reports for *Virginia striatula* and *V. valeriae* also confound conventional belief. *V. valeriae* is listed as a threatened species in Kansas (Collins 1993) and I believe that this listing is valid. *V. striatula* only receives slight protection as a species in need of conservation in Kansas. Yet, *valeriae* has been reported five times and *striatula* has

never been reported. Counts have been held in *striatula*'s range without finding the species and it is not particularly difficult to find this snake where it occurs. Again, perhaps the status of this species needs to be re-evaluated and investigated.

Opheodrys aestivus has been reported three times for the count duration, indicating that it is a rare species in Kansas. However, like *Sceloporus undulatus*, this snake is arboreal and extremely cryptic (color, conformation, behavior) and occupies habitat (riparian) that is not frequently searched during herp counts. However, given *Opheodrys*' dependence upon arthropods which are subject to pesticide control, these counts may reflect the species' status properly. Further investigation into this snake's status in Kansas is warranted.

To judge from how often *Crotalus viridis* has been reported during these counts (six), it is not readily apparent that the herp counts may or may not accurately reveal the species' status in Kansas. However, this reporting status is only slightly higher than the state-protected *Crotalus horridus* (five), a species whose decline has been documented throughout its range and in Kansas and which receives state protection as a species in need of conservation. It is my experience that *C. viridis* has radically declined in at least one physiographic province in Kansas (Gypsum Hills) over the past 10 years and local informants and informants in other parts of this snake's range in Kansas indicate that the snake's numbers have indeed declined significantly. Historically, *C. viridis* has been a common and easily observed species in Kansas in areas where it occurs. One would expect that, given that herp counts have occurred often within this snake's range, if populations were stable these herp counts would have a representation equal to that of such species as *Pituophis* or *Masticophis*. In fact, only 16 specimens of *C. viridis* have been reported in 10 years of herp counts, which seems exceptionally low for an allegedly common snake. The population status of this snake in Kansas for now and in the future bears watching.

There has been a steady increase over time of number of specimens observed, except for 1998, which saw a nearly 80% increase over the previous record high in 1997. It is interesting to note that specimen numbers have increased regardless of environmental conditions and numbers of participants.

Numbers of participants remained relatively steady over the first five years of the counts and then increased over 100% in 1994. Although there was a sharp drop in 1995, it shows a dramatic increase in participant numbers compared to participants and species and specimens is somewhat problematic, but there are possible, even probable, explanations for both. For sites and specimens, I offer the following: amphibian and reptile populations vary from year to year and the ability to observe same is highly

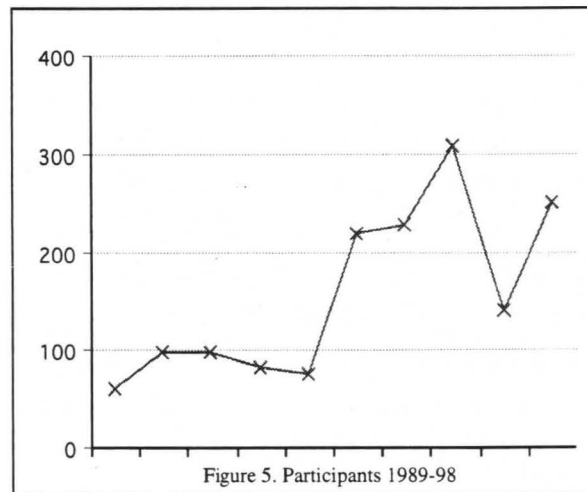


Figure 5. Participants 1989-98

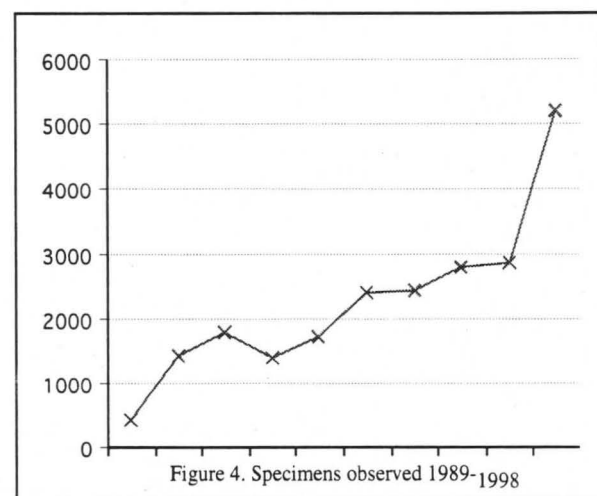
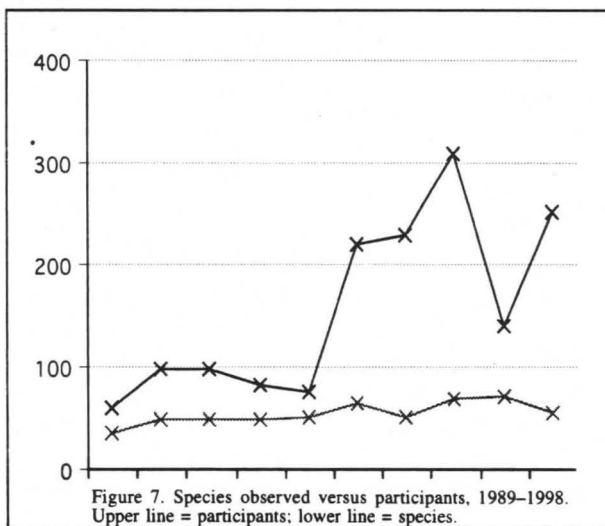
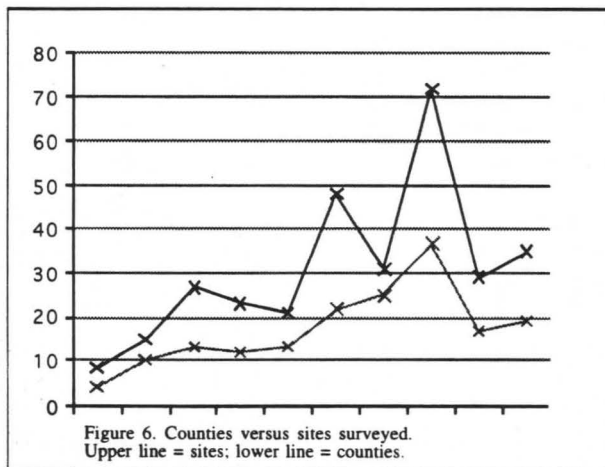


Figure 4. Specimens observed 1989-1998

dependent on two important environmental factors: temperature and moisture. Too much or too little of either and in combination (or lack of proper combination) can have dramatic effects on the availability of observable specimens. Thus, while abundant to common taxa may be observed every year, their numbers may fluctuate drastically under less than optimal conditions. In addition, for less common species, responding to the same variables, available specimens may become quite rare under these conditions. Finally, some species (e. g. *Rana areolata*) may only be easily found for a few days per year. If observers are not present when these species appear, they will not be observed. Another factor to consider is observer experience (and this applies to the next scenario as well). For example, the ability to accurately estimate large numbers of anurans at breeding sites is, in my experience, directly dependent on the experience of the estimator. Less-experienced estimators may misjudge anuran populations at these sites by orders of magnitude. Observer experience may also influence site selection and corresponding num-



bers of found amphibian and reptiles. Not every ridge of rocks, though similar in appearance, may hold the same numbers of specimens. Again, in my experience, seasoned observers note subtle changes in habitat type and quality and tend to concentrate on areas with the most promise. In addition, these observers tend to return to productive sites from year to year. Inexperienced observers may tend to spend time (and longer amounts of it) in unproductive sites.

For participants and species and specimens reported, I believe that observer experience is the most important factor. The experienced observer concentrates on productive sites, both for numbers of species and numbers of specimens, and probably surveys more sites per day than the inexperienced observer. For example, in 1996, the second-most species for the history of the Kansas herp counts was reported, along with one of the highest numbers of specimens for herp counts to that date. This was unexpected in that the spring of 1996 experienced the most severe drought of any herp count year (pers. obs.). Drought severely depresses observable herp populations. However,

during this year, some of the most experienced herpetologists in the state were conducting surveys and were conducting repeated surveys in the most herpetologically speciose areas of the state. One observer traveled over 6000 miles and conducted ten extensive surveys in areas which contain over 95% of the state's herpetofauna. His counts tabulated 34 (49%) of the 69 species reported that year. Large numbers of participants offer no guarantee of high species or specimen counts, particularly the latter. In fact, counts with more than 10 participants reveal approximately the same numbers of species and specimens than counts with three or fewer participants. The reasons for this may not be obvious, other than observer experience for species observed. Not every piece of available cover harbors herp specimens. Therefore, even though large groups may in fact uncover all or most available habitat, there only so many occupied spaces. The experienced observer(s) probably intuitively recognizes "prime" cover and maximizes his search effort. Although this person is not examining all or most of the available cover, he or she is revealing the same numbers of species and specimens as a result of personal knowledge.

The KHS Herp Counts offer valuable information on species status and distribution of the Kansas herpetofauna. As was shown previously, species status of a number of Kansas amphibian and reptile taxa may not be accurately reflected by conventional wisdom nor museum records. The counts also offer valuable indicators of taxon distribution, although the counts themselves do not constitute valid voucher records (Rundquist 1994).

On the other hand, KHS herp counts do not appear to give an accurate reflection of population status of the state's herpetofauna. Although the number of specimens reported has increased yearly, this probably only reflects the results of opportunity, as only two sites have been surveyed consistently for the 10-year period. The surveys of Larry Miller in Sumner County and Allan Volkmann in Cowley County undoubtedly would reveal much about the population status of herps in these areas but an in-depth analysis of these surveys is beyond the scope of this report. I would recommend that more persons attempt to conduct long-term surveys in a variety of areas around the state. In fact, I recommend that the Kansas Herpetological Society encourage, through its facilities, more such surveys.

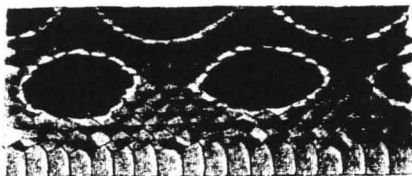
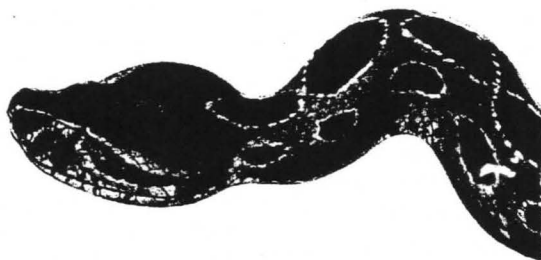
ACKNOWLEDGMENTS

I thank all the members of the Kansas Herpetological Society who have contributed their time and efforts to making the Kansas Herpetological Society herp count program the most extensive and unique of its type in the country. It is my hope that other herpetological societies will initiate such programs of their own and that KHS will continue to provide leadership for those involved in con-

ervation-oriented regional herpetological societies. In addition, Larry Miller deserves recognition for originally suggesting the herp count program, and Joseph T. Collins deserves recognition for initiating the program in Kansas in 1989 and administering it for the first five years of its existence.

LITERATURE CITED

- Busby, W. 1997. Chorusing phenology and habitat associations of the crawfish frog, *Rana areolata* (Anura: Ranidae) in Kansas. *Southwest. Nat.* 42(2): 210-217.
- Collins, J. T. 1989. First Kansas herp counts held in 1989. *Kansas Herpetol. Soc. Newsl.* 77: 11-14.
- Collins, J. T. 1993. *Amphibians and Reptiles in Kansas*. Third ed. Univ. Press of Kansas, Lawrence. xx + 397.
- Collins, J. T. and E. M. Rundquist. 1993. Results of the fifth Kansas herp counts held April-June 1993. *Kansas Herpetol. Soc. Newsl.* 94: 7-11.
- Ireland, P. H. 1970. Rediscovery of the grey-bellied salamander, *Eurycea multiplicata griseogaster* Moore and Hughes, in southeastern Kansas. *Southwest. Nat.* 14(3): 366.
- Pritchard, P. C. H. 1982. The biology and status of the alligator snapping turtle (*Macrochelys temminckii*) with research and management recommendations. Unpub. ms. 124 pp.
- Rundquist, E. M. 1994. Results of the sixth annual KHS herp counts held 1 April-31 May 1994. *Kansas Herpetol. Soc. Newsl.* 97: 5-14.
- Rundquist, E. M. and J. Triplett. 1993. Additional specimens of the western cottonmouth (*Agkistrodon piscivorus leucostoma*, Reptilia: Squamata) from Kansas. *Trans. Kansas Acad. Sci.* 96(1-2): 148-151.
- Smith, H. M. 1932. A report on amphibians hitherto unknown from Kansas. *Trans. Kansas Acad. Sci.* 35: 93-96.



THE SUBSPECIFIC STATUS AND WESTERN DISTRIBUTION OF THE EASTERN RAT SNAKE, *ELAPHE OBSOLETA*, IN OKLAHOMA

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The subspecific status and distribution of the Eastern Rat Snake, *Elaphe obsoleta*, in western Oklahoma have been problematic. While specimens in this area commonly exhibit many color and pattern characteristics of the Texas Rat Snake, *E. o. lindheimerii*, some are more typical of the Black Rat Snake, *E. o. obsoleta*. Additionally, these Rat Snakes have been discovered further west over the past 25 years than previous records indicated. Smith (1956) and Collins (1974, 1982) showed *E. o. obsoleta* occurring west into Harper Co., Kansas, and recognized only the nominate subspecies. Webb (1970) documents the distribution of *E. o. obsoleta* in western Oklahoma to the northwestern corner of Woodward Co. and central Roger Mills Co., without recognizing specimens of or intergrades with *E. o. lindheimerii*. Secor and Carpenter (1984) reported on a specimen of *E. obsoleta* from Beaver Co. in the Oklahoma Panhandle. Joseph T. Collins communicated with me, preparatory to revising the Peterson Field Guide (1991), about the status of *E. obsoleta* in Oklahoma. I sent him examples of *E. o. obsoleta* x *lindheimerii* (RLL 1950, 1950, 1956, 1687, and 1899; later deposited in the University of Kansas Natural History Museum collection). Miller (1986) reported on a specimen of *E. o. lindheimerii* from Sumner Co., Kansas. He considered the Rat Snake population in Sumner and Harper Counties to be intergrades between *E. o. obsoleta* and *E. o. lindheimerii*. He felt more research needed to be done on these snake in Kansas and Oklahoma. Mulvaney et al. (1987) reported on an *E. obsoleta* (KU Slide 7608) collected and released from 1.5 mi S Shattuck, Ellis Co., Oklahoma, 6.5 mi E of the Texas state line. Dixon (1987) showed an "isolated" record of *E. o. lindheimerii* west of the main area of distribution in Floyd Co., Texas. He did not indicate the occurrence of *E. o. obsoleta* in Texas. Conant and Collins (1991) first showed *E. obsoleta* as an intergrade population from southcentral Kansas, western Oklahoma to the Texas border, an outlier in Beaver Co., Oklahoma, the northeastern corner of Texas, and extreme northwestern Arkansas. Irwin et al. (1992) reported *E. o. lindheimerii* from Barber, Cowley, Harper, and Sumner Cos., Kansas and considered all these specimens to be intergrades. Collins (1993) stated

that Rat Snakes are intergrades of *E. o. obsoleta* and *E. o. lindheimerii* in Barber, Harper, Sumner, and Kingman Cos., Kansas. Tennant (1998) indicated that *E. o. lindheimerii* intergrades with *E. o. obsoleta* in northeastern Texas. Montgomery (1998) reported on a specimen of *E. o. lindheimerii* from Kiowa Co., Colorado.

Recently, Lardie et al. (in press) reported on *E. o. lindheimerii* from Dewey, Major, Kingfisher, and Garfield Cos., Oklahoma, to further verify the occurrence of intergrades in northwestern Oklahoma. Their report lists 18 specimens that showed many color and pattern characters of *E. o. lindheimerii*, including distinct dorsal blotches surrounded by reddish color, a series of smaller lateral blotches on each side, frequently connected by a stripe 3-3.5 scales rows wide, yellow-gray to yellow background color, and a gray to black head. They noted that a specimen from southeast Garfield Co. and most of those observed from Williams Scout Reservation from Cleo Springs in Major Co. were more typical of the nominate subspecies. All specimens in northwest Oklahoma are considered intergrades. The intergrade specimen's color and pattern apparently blend comparatively well with a prairie/forest edge ecotone.

The apparent increase in the Rat Snake's western distribution may be attributed in part to changing habitats that include mixed scrub and woodland along streams that flow easterly through the High Plains and prairies. Pictures of the plains and prairies 100 years ago, even in river valleys, were like a "ruler's edge," according to Dr. Paul Nighswonger of Northeastern Oklahoma State University in Alva. He further reports that Rat Snakes are now common around Alva (Major Co.) where they were once relatively rare.

Reduced, uncontrolled natural prairie fires have in part allowed an increase in wooded areas beyond the northern side of large streams such as the Arkansas, Salt Fork, Cimarron, North and South Canadian, and Red Rivers. Red cedar (*Juniperus virginiana*) often invades prairies, and the runaway introduced salt cedar (*Tamarax gallica*) has joined native black willow (*Salix nigra*) to dominate sandy flood plains of these same streams and their tributaries.

Locality records for *E. obsoleta* from the Gypsum Hills

and further west have invariably been near stream valleys in relatively mesic habitat. Additional specimens of *E. obsoleta* may be found, especially in flood plains and valleys of the larger rivers and their tributaries. Continued field studies are necessary to help resolve the definition of *E. obsoleta* subspecies and the extent of their western distribution.

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LITERATURE CITED

- Collins, J. T. 1974. *Amphibians and Reptiles in Kansas*. Mus. Nat. Hist. Univ. Kansas Pub. Ed. Series 1: 1-283 pp.
- Collins, J. T. 1982. *Amphibians and Reptiles in Kansas*. Second ed. Mus. Nat. Hist. Univ. Kansas Pub. Ed. Series 1: 1-356 pp.
- Collins, J. T. 1993. *Amphibians and Reptiles in Kansas*. Third ed. Univ. Press of Kansas, Lawrence. xx + 397 pp.
- Conant, R. and J. T. Collins. 1991. *Peterson Field Guide to Reptiles and Amphibians of Eastern and Central North America*. Third ed. Houghton Mifflin Co., Boston. 450 pp.
- Dixon, J. R. 1987. *Amphibians and Reptiles of Texas*. Texas A & M Univ. Press, College Station. 434 pp.
- Irwin, K. L. Miller, and T. W. Taggart. 1992. *Elaphe obsoleta lindheimerii*, Distribution. Herpetol. Rev. 23(1): 27.
- Lardie, R. L., D. L. Crosswhite, and M. K. Meier. *Elaphe obsoleta lindheimerii*, Distribution. Herpetol. Rev. in press.
- Miller, L. 1986. The status of black rat snakes in Sumner County, Kansas. Kansas Herpetol. Soc. Newsl. 643: 12.
- Montgomery, C., T. Childers, J. D. Manzer, E. Bergman, J. Sifert, B. Hill, and S. R. Mackessy. 1998. *Elaphe obsoleta lindheimerii*, Distribution. Herpetol. Rev. 29(2): 112.
- Mulvany, P. S., M. C. Mulvany, and K. A. Mulvany. 1987. New records for reptiles in Ellis and Woodward Counties, Oklahoma. Bull. Oklahoma Herpetol. Soc. 12(1-4): 21.
- Secor, S. M., and C. C. Carpenter. 1984. Distribution maps of Oklahoma reptiles. Oklahoma Herpetol. Soc. Spec. Publ. 3.
- Smith, H. M. 1956. *Handbook of Amphibians and Reptiles of Kansas*. Second ed. Mus. Nat. Hist. Univ. Kansas Misc. Publ. 9: 1-356.
- Tennant, A. 1998. *A Field Guide to Texas Snakes*. Second edition. Gulf Publ. Co., Houston. 291 pp.
- Webb, R. G. 1970. *Reptiles of Oklahoma*. Univ. Oklahoma Press, Norman. 370 pp.

OBSERVATIONS ON AMPHIBIANS, REPTILES, TURTLES AND CROCODILIANS IN THE APALACHICOLA REGION OF FLORIDA

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From 20 December 1998 to 16 January 1999, we had the opportunity to visit and conduct a count of amphibians, reptiles, turtles and crocodilians observed on the Gulf Coast of Florida in the vicinity of Apalachicola. Assisted for nine days by biologists Kelly J. Irwin and Lisa K. Irwin (Museum of Natural History, University of Georgia, Athens), we explored promising habitats on St. George Island (Franklin County), in areas north, east and west of East Point (Franklin County), and on the St. Vincent National Wildlife Refuge. Weather during the entire trip was partly cloudy to sunny, with two days of rainfall. We observed the following (C = Calhoun County; LE = Leon County; L = Liberty County; W = Wakulla County; F = mainland Franklin County; SG = St. George Island, Franklin County; SV = St. Vincent National Wildlife Refuge):

<i>Bufo terrestris</i> (Southern Toad) F, SG, SV	11
<i>Eleutherodactylus planirostris</i> (Greenhouse Frog) F	7
<i>Acris gryllus</i> (Southern Cricket Frog) LE	6
<i>Hyla femoralis</i> (Pine Woods Treefrog) F, SG	3
<i>Hyla squirella</i> (Squirrel Treefrog) F, SG	33
<i>Pseudacris nigrita</i> (Southern Chorus Frog) C, L	±25
<i>Pseudacris ornata</i> (Ornate Chorus Frog) C, F, L	±25
<i>Rana sphenoccephala</i> (Florida Leopard Frog) F, L, SG, SV	±25

<i>Anolis carolinensis</i> (Green Anole) F, SV	10
<i>Sceloporus undulatus</i> (Fence Lizard) F, W	3
<i>Scincella lateralis</i> (Ground Skink) F, SV	12
<i>Ophisaurus ventralis</i> (Eastern Glass Lizard) SG	1
<i>Coluber constrictor</i> (Eastern Racer) SG	1
<i>Elaphe guttata</i> (Corn Snake) SG	1
<i>Ophiodrys aestivus</i> (Rough Green Snake) F	1
<i>Virginia striatula</i> (Rough Earth Snake) SV	1
<i>Agkistrodon piscivorus</i> (Cottonmouth) F, SV	2
<i>Sistrurus miliarius</i> (Pigmy Rattlesnake) F, SV	4
<i>Gopherus polyphemus</i> (Gopher Tortoise) SV	1
<i>Kinosternon subrubrum</i> (Eastern Mud Turtle) F	1
<i>Terrapene carolina</i> (Eastern Box Turtle) F, SV	5
<i>Alligator mississippiensis</i> (American Alligator) SV	2
22 species	180 specimens

All common names are those standardized by Collins (1997).

LITERATURE CITED

Collins, Joseph T. 1997. Standard Common and Current Scientific Names for North American Amphibians and Reptiles. Fourth Edition. SSAR Herpetol. Circ. 25: 1-40.

