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Kansas Herpetological Society

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Front Cover: An adult male Eastern Collared Lizard (*Crotaphytus collaris*) from Harper County, Kansas.
Photograph by MacKenzie K. Wiley

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KHS Business

Presidential Address

A new year is now upon us, and as many of you know, I will be serving as your society president for 2006. First of all, I would like to congratulate David Oldham for doing an excellent job as president in 2005. As I look forward to serving you in 2006, I see another successful and eventful year for KHS. Our field trip coordinators are already preparing for an excellent trip to Kiowa County this spring (see the announcement on page 3). I am excited to bring the annual KHS meeting back to western Kansas and to Hays for the first time. I really look forward to hosting this meeting and promise to provide a good time for all.

For the next year, it is my duty to see that the KHS continues to rank as one of the most prestigious regional herp society in the country. In order to succeed in this endeavor, I encourage the participation of all KHS members and welcome all thoughts and suggestions. Please feel free to contact me at any time. I look forward to seeing you all soon.

Curtis J. Schmidt
KHS President

It's Herp Count Time Again

The KHS encourages individuals to conduct herpetofaunal counts throughout the year. All interested persons are invited to participate and the data they collect will be published in the *Journal of Kansas Herpetology* and added to the Kansas Herpetofaunal Atlas (webcat.fhsu.edu/ksfauna/herps).

Counts should include as specific a locality as is possible, date, names of participants, species observed and the number of each, and the complete name and address of the individual submitting the count.

For your convenience a checklist is available on page 3 of this issue, or alternatively it can be downloaded in the PDF format from the KHS website (www.ku.edu/~khs). KDOT county maps can be downloaded at the following website (www.ksdot.org/burtransplan/maps/Mapscounties.asp) to assist you in determining precisely the location of your count.

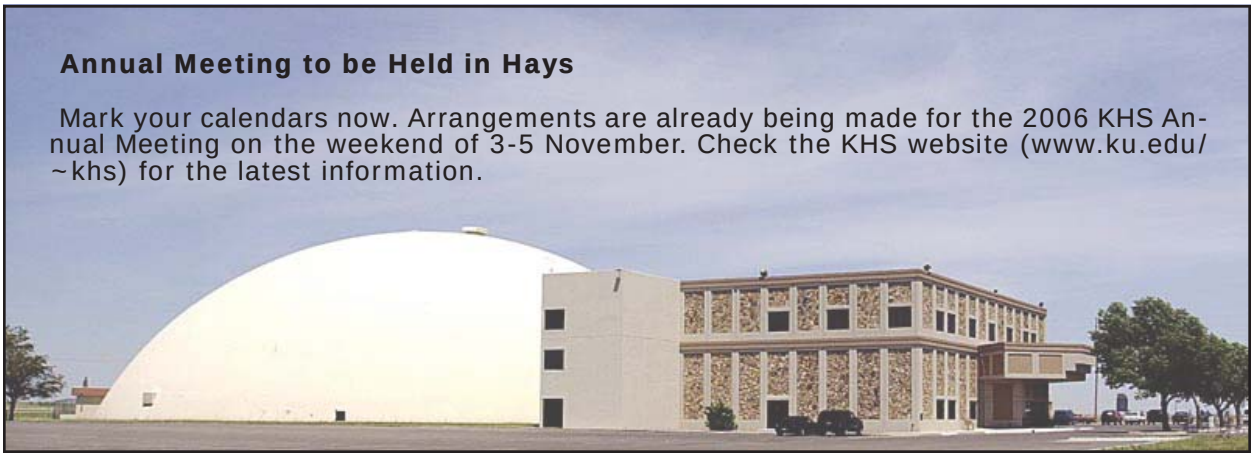
Counts made should be submitted directly to the Editor or Associate Editor of the *Journal* (see inside front cover). They will be published as individual submissions.

2005 KHS Financial Report

Previous balance 1 January 2005	*$6,132.04*
Income	*7,174.70*
Membership Dues	2,820.00
Regular	2,040.00
Contributing	780.00
Annual Meeting	2,698.31
Registration	985.00
Auction	1,443.31
Sale of Logo Mugs	200.00
Sale of Logo License Plates	70.00
Donations	1,139.52
CNAH for The Collins Award	1,000.00
General Societal	139.52
Endowed Funds Interest/Donations	516.87
Expenses	*6,624.96*
Office of the Secretary/Treasurer	198.89
Office of the Editor	2,876.14
Postal Permit	300.00
KHS Journals (printing 4 issues)	2,302.66
Publication Mailing to KHS members	273.48
Annual Meeting	1,301.67
Awards	2,248.26
The Collins Award	1,000.00
The Kamb Grant	100.00
The Gloyd/Taylor Scholarship	100.00
Addition to Endowed Funds	1,048.26
Current Balance 31 December 2005	*6,681.78*
Other Assets	*7,000.00*
Endowed Funds	7,000.00
Alan H. Kamb Grant	3,700.00
Gloyd/Taylor Scholarship	3,300.00
Total Assets	*$13,681.78*

Respectfully submitted by

Mary Kate Baldwin, Secretary
Eric Kessler, Treasurer



2006 Spring Field Trip to Kiowa County

The 2006 Spring KHS Field Trip will be held at Kiowa County State Lake in Kiowa County, Kansas. KHS members will gather as early as Friday evening (21 April 2006) at Kiowa County State Lake (just NW of Greensburg) at the location displaying a large KHS sign.

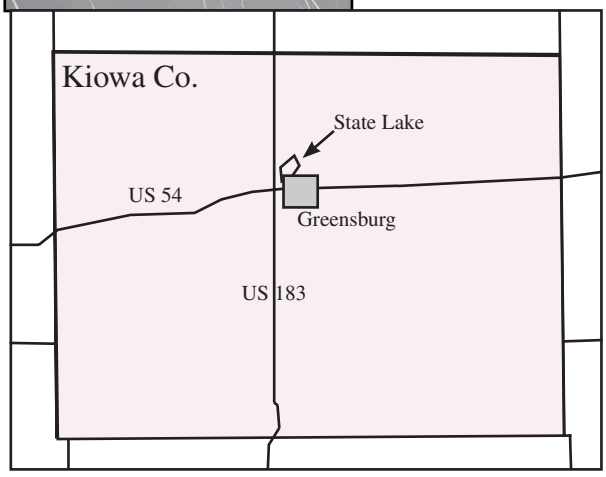
Motels are available in Greensburg. Maps and other information will be available at the campsite each day at 9:00 am. Fine dining can be found in Greensburg, Belvidere, and Sun City.

KHS herpetofaunal counts will officially take place from 9:00 am to 5:00 pm on Saturday, 22 April 2006, and on Sunday morning (23 April 2006) from 9:00 am to noon. Individuals wishing to participate should meet at the KHS sign at Kiowa County State Lake on both dates at 9:00 am.

While most specimens observed and counted during the KHS field trip will be released, selected specimens also will be collected by individuals with current Kansas Scientific Collecting Permits and kept for deposition in research collections at accredited institutions, where they (and their tissues) will be available for research use by any qualified investigators. Field trip participants wishing to assist in this research effort are encouraged to donate their specimens to those individuals qualified to receive them.

Kiowa County has a nice mix of plains habitat types offering the chance to observe a wide diversity of species. Over much of the northern half of the county are areas of dune sand. Some broken out as farmland, but much of it remains as sand prairie. The southwest corner of the county is relatively level and primarily converted to agriculture. The southeastern portion is drained by the Medicine Lodge River and much of it is either Gypsum Hills or Kiowa Shale and Cheyenne Sandstone.

Seldom seem Kansas herps that can be found in Kiowa County include the Eastern and Western Hognose Snakes, New Mexico Blind Snakes, Longnose Snakes, and Eastern Glossy Snakes. Of course, we'll always be on the lookout for Checkered Garter Snakes, Night Snakes, and Red-spotted Toads as these sensitive species have been found near, but not in, Kiowa County.



Kiowa County Records:

Milk Snake
Red-spotted Toad
Night Snake
Checkered Garter Snake
Strecker's Chorus Frog
Northern Painted Turtle
Graham's Crayfish Snake

Species reported from Kiowa County:
Great Plains Toad
Woodhouse's Toad
Northern Cricket Frog
Spotted Chorus Frog
Boreal Chorus Frog
GP Narrowmouth Toad
Plains Leopard Frog
Bullfrog
Plains Spadefoot
Barred Tiger Salamander
Common Snapping Turtle
Ornate Box Turtle
Slider
Yellow Mud Turtle
Spiny Softshell
W. Slender Glass Lizard
Eastern Collared Lizard
Lesser Earless Lizard
Texas Horned Lizard
Prairie Lizard
Great Plains Skink
Southern Prairie Skink
Ground Skink
Six-lined Racerunner
Eastern Glossy Snake
Eastern Racer
Ringneck Snake
Western Hognose Snake
Eastern Hognose Snake
Prairie Kingsnake
Common Kingsnake
Coachwhip
Plainbelly Water Snake
Northern Water Snake
Great Plains Rat Snake
Bullsnake
Longnose Snake
Ground Snake
Brown Snake
Plains Blackhead Snake
Western Ribbon Snake
Plains Garter Snake
Common Garter Snake
Lined Snake
New Mexico Blind Snake
Prairie Rattlesnake
Massasauga

Lodging in Greensburg

Green Acres B&B
620.723.2492
Best Western Jayhawk
620.723.2121
Motel Kansan Inn
620.723.2141
Pleasant View Motel
620.723.2105

or
join us at the campsite, regardless, this is one field trip you won't want to miss!

Any questions about this KHS field trip should be directed to Mark Ellis or Derek Schmidt (contact information is located inside the front cover).

KANSAS HERPETOLOGICAL SOCIETY

Herpetofaunal Count Data Sheet

Version 1.2006

The following check-list of the amphibians, reptiles, and turtles of Kansas was compiled from the Kansas Herpetofaunal Atlas (KHA) (webcat.fhsu.edu/ksfauna/herps). Data derived from this count will be incorporated into the KHA and help us to better understand the current distribution of the Kansas herpetofauna, and as an aid in detecting future trends. Specific localities are needed to accurately map the observations, however they are not provided to the public via the KHA. **Please write legibly.**

Date: ____/_____/_____

Time: from _____am/pm to _____am/pm. Temp: _____

County: _____

Locality: _____

_____

Wind speed: ☐ Calm; ☐ Light; ☐ Moderate; ☐ Heavy; ☐ Strong

Sky cover: ☐ Clear; ☐ Ptly Cldy; ☐ Ovrcast; ☐ Lgt Rain; ☐ Showers

Verifier: _____

Observers: _____

_____

_____

Comments: _____

_____

_____

_____

_____

_____

To the left of each species name record the total number of individuals observed. To the right list the number per observation type (e.g. 1 AOR, 2 DOR, 8 Active, 23 Cover, 4 Basking, 100+ Calling)

Frogs

___ American Toad _____
___ Dwarf American Toad _____
___ Great Plains Toad _____
___ Green Toad _____
___ Fowler's Toad _____
___ Red-spotted Toad _____
___ Woodhouse's Toad _____
___ Northern Cricket Frog _____
___ Gray Treefrog complex _____
___ Spotted Chorus Frog _____
___ Spring Peeper _____
___ Boreal Chorus Frog _____
___ Strecker's Chorus Frog _____
___ Eastern Narrowmouth Toad _____
___ G. P. Narrowmouth Toad _____
___ Crawfish Frog _____
___ Plains Leopard Frog _____
___ Bullfrog _____
___ Green Frog _____
___ Pickerel Frog _____
___ Plains Spadefoot _____

Salamanders

___ Barred Tiger Salamander _____
___ Smallmouth Salamander _____
___ Eastern Tiger Salamander _____
___ Longtail Salamander _____
___ Cave Salamander _____
___ Grotto Salamander _____
___ Oklahoma Salamander _____
___ Red River Mudpuppy _____
___ Common Mudpuppy _____
___ Eastern Newt _____

Lizards

___ W. Slender Glass Lizard _____
___ Eastern Collared Lizard _____
___ Western Green Lacerta _____
___ Italian Wall Lizard _____
___ Lesser Earless Lizard _____
___ Texas Horned Lizard _____
___ Prairie Lizard _____
___ Five-lined Skink _____
___ Broadhead Skink _____
___ Great Plains Skink _____
___ Southern Prairie Skink _____
___ Northern Prairie Skink _____
___ Ground Skink _____
___ Six-lined Racerunner _____

Snakes

___ Eastern Glossy Snake _____
___ Western Worm Snake _____
___ Eastern Racer _____
___ Ringneck Snake _____
___ Western Hognose Snake _____
___ Eastern Hognose Snake _____
___ Night Snake _____
___ Prairie Kingsnake _____
___ Common Kingsnake _____
___ Milk Snake _____
___ Coachwhip _____
___ Plainbelly Water Snake _____
___ Diamondback Water Snake _____
___ Northern Water Snake _____
___ Rough Green Snake _____
___ Great Plains Rat Snake _____
___ Western Rat Snake _____
___ Bullsnake _____
___ Graham's Crayfish Snake _____
___ Longnose Snake _____
___ Ground Snake _____
___ Brown Snake _____
___ Redbelly Snake _____
___ Flathead Snake _____
___ Plains Blackhead Snake _____
___ Checkered Garter Snake _____
___ Western Ribbon Snake _____
___ Plains Garter Snake _____
___ Common Garter Snake _____
___ Lined Snake _____
___ Rough Earth Snake _____
___ Smooth Earth Snake _____
___ New Mexico Blind Snake _____
___ Copperhead _____
___ Cottonmouth _____
___ Timber Rattlesnake _____
___ Prairie Rattlesnake _____
___ Massasauga _____

Turtles

___ Common Snapping Turtle _____
___ Alligator Snapping Turtle _____
___ Northern Painted Turtle _____
___ Common Map Turtle _____
___ False Map Turtle _____
___ Eastern River Cooter _____
___ Eastern Box Turtle _____
___ Ornate Box Turtle _____
___ Slider _____
___ Yellow Mud Turtle _____
___ Common Musk Turtle _____
___ Smooth Softshell _____
___ Spiny Softshell _____

Other, not listed

___ _____
___ _____
___ _____
___ _____

Return completed check-list to:

Kansas Herpetofaunal Atlas Project
Sternberg Museum of Natural History
3000 Sternberg Drive
Hays, Kansas 67601

or e-mail data to
ttaggart@fhsu.edu

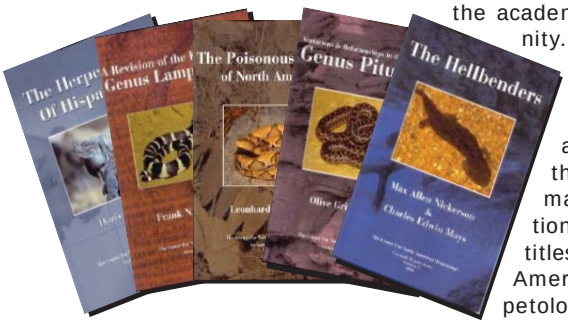
Herpetological Happenings

An adult Smooth Earth Snake discovered by Chad Whitney in Anderson Co. during mid-May of 2003. Recorded observations of this and other small secretive herps are valuable in that they are seldom seen otherwise. This is the only record for Anderson Co.

CNAH Announces New Publication Series

The Center for North American Herpetology has initiated a facsimile reprint series, produced and published in cooperation with Eric Thiss of Serpent's Tale & Zoo Book Sales.

The CNAH facsimiles are designed to make available long out-of-print herpetological works about North America and adjoining countries in order to better serve the academic community. Titles will be issued as they become available to the public domain. Suggestions for future titles on North American herpetology are appreciated; let CNAH know what you want. See the CNAH website for additional details (cnah.org)



Currently five titles are available:

The Herpetology of Hispaniola by Doris Cochran, 1941, $29.95

A Revision of the Kingsnakes: Genus Lampropeltis by Frank N. Blanchard, 1921, $22.95

The Poisonous Snakes of North America by Leonard Stejneger, 1895, $17.95

Variations and Relationships in the Snakes of the Genus Pituophis by Olive Griffith Stull, 1940, $19.95

The Hellbenders by Max Allen Nickerson and Charles Edwin Mays, 1972, $12.95.

Prices are discounted to CNAH contributors.

Oklahoma Herp Book Now Available

No need to bug them about it any longer, KHS members Greg and Lynnette Sievert have announced their long-awaited treatise, *A Field Guide to Oklahoma's Amphibians and Reptiles*. The 205 page full-color book contains detailed accounts of the 58 amphibian and 102 reptile species that occur within Oklahoma. Species accounts describe the appearance, diet, and habitat for each taxon. A remarks section in each account gives insight into the biology of each species from such things as what its habits are, providing local names, and comments on its distribution and abundance. The book also contains a short bibliography of key regional and general references, as well a glossary.

No field guide reaches its ultimate utility without maps. And the shaded range maps provided do not disappoint. They should clearly guide you to the appropriate parts of the state in search of specific species. Of particular interest to Kansans are the maps of species such as the Western Diamondback Rattlesnake, Cottonmouth, and New Mexico Spadefoot showing their relatively close geographic proximity to our border.

Greg's excellent color photography is used throughout, and includes pictures of all species For many species there are multiple images available depicting various life stages (larval and adult frogs and salamanders), color and pattern variations, or ontonogenic changes (as in the Eastern Racer, Coachwhip, and Western Rat Snake).

The book is available from the Oklahoma Department of Wildlife Conservation, PO Box 53465, Oklahoma City, Oklahoma 73152.

New Book Available on Fort Riley Herps

The Fort Riley Military Reservation is a 101,000-acre tract in the northern Flint Hills region of north-central Kansas that sports a diverse herpetofauna composed of 52 species—one salamander, ten frogs and toads, seven turtles, nine lizards, and twenty-five snakes. For that reason, the Kansas Biological Survey at the University of Kansas is pleased to announce the publication of a new edition of "*The Snakes, Lizards, Turtles, and Amphibians of Fort Riley and Vicinity*" by Bill Busby, Joe Collins, and Gibran Suleiman. Originally published in 1996, this completely revised edition is profusely illustrated with 72 exquisite color images, most by noted wildlife photographer Suzanne L. Collins of Lawrence. This book reveals the natural history of the amphibians, turtles, lizards, and snakes that abound in and around the Fort Riley Military Reservation in the beautiful Flint Hills of north-central Kansas. A must for all Kansans interested in wild places and the creatures that roam them. 84 pages, 72 color photographs, one map, and a bibliography. Published 12 December 2005.

Single copies of the 84-page book are available free by writing to the Fort Riley Conservation Office, Building 1020, Huebner Road, Fort Riley, Kansas 66442. Please include a self-addressed 7x10-inch envelope marked "Media" with $2.00 U.S. postage attached.

Field Notes

A Crawfish Frog from Crawford County

RANA AREOLATA (Crawfish Frog). USA: KANSAS: CRAWFORD CO: 37.340183° N, 94.690217° W. 5 August 2005. Observed by: Fred and Leigh Tweet. Verified by Mike Rochford from photograph (below). Single specimen discovered by day while mowing a neglected pasture with 12" high mixed grasses (predominately *Fescue*). The burrow is 200' from a 1.75 acre pond. The frog was not otherwise disturbed, but was gone the next day. This observation is only the fourth known locality for this extremely secretive species in the county and helps to fill in the distributional hiatus between populations to the north, west, and south (Taggart, Travis W. 2006. Kansas Herpetofaunal Atlas: An Online Reference. Electronic Database accessible at http://webcat.fhsu.edu/ksfauna/herps. Sternberg Museum of Natural History, Fort Hays State University, Hays, Kansas, USA.)

FRED and LEIGH TWEET, 876 East Highway K 171, Pittsburg, Kansas 66762; ftweet@mobile1.net.

An Extension to the Known Range of the Northern Curlytail Lizard

LEIOCEPHALUS CARINATUS ARMOURI (Northern Curlytail Lizard). USA: FLORIDA: MONROE COUNTY: Lower Matecumbe Key. Area surrounding restaurant, motel, and other buildings located along U.S. Highway 1 (24.922917° N, 80.630333° W). 7 January 2006. Approximately 50 individuals of all size-classes were observed and one juvenile (49.8 mm SVL) was collected by D. Greene. Verified by Travis Taggart, Sternberg Museum of Natural History (MHP 12244). This colony represents a range extension of c.a. 22 km south from Key Largo (Duquesnel. 1998. FL. Dept. Environ. Protection, Res. Mgmt. Notes 10:9; Krysko et al. 2005. Herpetol. Rev. 36:85-87), which makes it the southernmost verified locality of this exotic species in the United States (Duquesnel. op. cit.; Krysko and King. 2002. Herpetol. Rev. 33:148; McCoid. 2002. Herpetol. Rev. 33:322; Campbell and Klowden. 2003 Herpetol. Rev. 34:384; Meshaka et al. 2004. The Exotic Amphibians and Reptiles of Florida. Krieger Publ. Co., Malabar, Fl. 166 pp.; Smith and Engeman. 2004. Florida Field Nat. 32:107-113; Smith et al. 2004. Internat. Biodeterioration and Biodegradation 54:261-264; Krysko et al. op. cit; Meshaka et al. 2005. Southeastern Natural. 4:521-526) and of a species that is likely to spread extensively on the keys in light of the open rocky habitat, subtropical climate, and proximity to a main road.

WALTER E. MESHAKA, Jr., State Museum of Pennsylvania, 300 North Street, Harrisburg, Pennsylvania, 17120-0024, wmeshaka@state.pa.us, HENRY T. SMITH, Florida Department of Environmental Protection, Florida Park Service, 13798 S. E. Federal Highway, Hobe Sound, Florida 33455, USA, DANIEL GREENE, Florida Department of Environmental Protection, John Pennekamp Coral Reef State Park, P.O. Box 487, Key Largo, Florida, 33037, and JANICE A. DUQUESNEL, Florida Department of Environmental Protection, Lignumvitae Key State Botanical Site, P.O. Box 1052, Islamorada, Florida, 33036.

An Addition to the Herpetofauna of Ohio

DESMOGNATHUS MONTICOLA (Seal Salamander). USA: OHIO: ADAMS CO: MHP 12169, 38.71861° N 83.42583° W, and; MHP 12170, 38.71833° N, 83.42916° W. 5 November 2005. Verified by Travis T. Taggart. Two specimens, each found at a different seepage approximately 150 feet apart. Dominant tree species were *Fagus grandifolia* and *Acer saccarhum*. Other salamander species found in the vicinity were *Desmognathus fuscus*, *Pseudotriton ruber*, and *Eurycea cirrigera*. Skies were overcast, and the temperature was near 70 ° F. New state record (Salamanders of Ohio, 1989, edited by Ralph A. Pfingsten and Floyd L. Downs. Ohio Biological Survey Bulletin, Volume 7, Number 2). Extends the known range ca. 40 miles north northwest of the nearest population in Kentucky, also are the first records north of the Ohio River (Conant and Collins, 1991, A Field Guide to Reptiles and Amphibians: Eastern and Central North America, Houghton Mifflin Co., 450 pp). Specimens and tissues deposited in the Sternberg Museum of Natural History (MHP), Hays, Kansas.

MICHAEL PAUL GRAZIANO, 966 Chatham Lane, Unit D, Columbus, OH 43221 and MARK LANE REID, 2955 Neil Avenue Apt. 271 C, Columbus, OH 43202

Late Fall Ringneck Snake activity

Twenty-three Ringneck Snakes (*Diadophis punctatus*) were discovered under flat limestone rocks on the afternoon of 13 November 2005 in southern Shawnee County, Kansas. They ranged in size from neonates to adults. The limestone rocks under which they were found were on a south-facing slope near Colby Creek. Some were in the partial shade of brush and trees that were to the north and others were in direct sunlight. Soil temperature under all of the rocks was ±60° F with a cool breeze out of the north. The sky was clear. All of the rocks were between 30 and 50 cm across (approximate diameter since they were somewhat circular) and all were 4-6 cm thick. Air temperature measured about one meter above the ground and in the shade in the area was 63° F. The rocks were turned between 1300 and 1305 hours CST. A total of seven rocks were turned. Snakes were found under three of the seven rocks. Nine were found under one of the rocks, seven were found under each of the other two. Several insects were also observed. The soil under all of the rocks was dry.

The previous day the temperature had reached 83° F in the area as measured by a remote sensor located two meters above the ground in the shade. The temperature in Topeka was recorded at 79° F at the official recording site located about 20 miles north of the area where the snakes were observed. Northern Cricket Frogs were observed active around a small pond near where the snakes were observed on 12 November, but the frogs were gone on 13 November.

LARRY L. MILLER, Biology Department, Northern Hills Junior High School, USD 345, Topeka, Kansas.

A World Record Crawfish Frog

On the evening of 31 March 2005 we collected an exceptionally large female Crawfish Frog (*Rana areolata*) (MHP 10447; photo at right) alive on a county road one mile north and 1.5 miles west of the US 54/US 69 intersection north of Fort Scott in Bourbon County, Kansas (37.90553° N, 94.73175° W).

The frog measured at 122 mm (4.8 inches) in snout-vent length. This measurement exceeded the largest previously known specimen from Kansas (Collins and Collins (1993. Amphibians and Reptiles in Kansas. Third Edition. Univ. Press Kansas, Lawrence. xx + 397 pp.) and the previous record length for the species nationwide as reported in Conant and Collins (1998. A Field Guide to Reptiles, Eastern and Central North America. Fourth Edition. Houghton Mifflin, Boston. 634 pp.)

Additional Crawfish Frogs were heard chorusing in a nearby pond. The pond was relatively shallow (max depth of 3 feet) and surrounded by rangeland. The Crawfish Frogs were calling among a stand of cattails along the border of the pond. In all, eight Crawfish Frogs were observed at this site during this evening.

Boreal Chorus Frogs (*Pseudacris maculata*) and Southern Leopard Frogs (*Rana sphenocephala*) were chorusing from the same site as well.

DEREK WELCH, Fort Scott, Kansas, and CURTIS J. SCHMIDT, Sternberg Museum of Natural History, Hays, Kansas.

Nate Davis, blues harmonicist and KHS member from Pratt, attempts to re-hydrate a Red-spotted Toad in Barber County. The specimen was discovered under a rock in the vicinity of a cave Nate and his colleagues were surveying. In spite of its brief displacement, the toad seemed to enjoy the impromptu shower.

KHS member Derek Welch, of rural Bourbon County, poses with a Harper County Western Hognose Snake. Derek is a enthusiastic field biologist and through his energy and efforts we have a better understanding of the distribution and natural history of the herps in Bourbon County.

Longtime KHS member Stan Roth looks for life in a pool inside Schermerhorn Park Cave, Cherokee County. Long recognized as one of the state's premiere naturalists, Stan has made several significant herpetological discoveries over the years.

A larval Grotto Salamander from a pool just inside Schermerhorn Park Cave. Oddly, no transformed adults of this species have ever been collected in Kansas. Ongoing research into the genetics of this species should yield interesting results. All photographs by Travis W. Taggart

ARTICLES

Hemidactylus (House Gecko) Assemblage Dynamics on South Florida Buildings

[1]* Walter E. Meshaka, Jr., [2] Heather L. Cress, [3] Kimber L. Kingsland, [4,3] Henry T. Smith, [3] Stephanie A. Fitchett, [3] Jon A. Moore, and [4] Ernest M. Cowan

[1] The State Museum of Pennsylvania, 300 North Street, Harrisburg, Pennsylvania, 17120-0024, USA. [2] John U. Lloyd Beach State Park, 6503 North Ocean Drive, Dania Beach, Florida, 33004, USA. [3] Florida Atlantic University, Wilkes Honors College, 5353 Parkside Drive, Jupiter, Florida, 33458, USA. [4] Florida Park Service, 13798 S. E. Federal Highway, Hobe Sound, Florida, 33455, USA. * Author to whom correspondence should be addressed. E-mail wmeshaka@state.pa.us

INTRODUCTION

Previous surveys in Florida first documented the presence of the exotic Indo-Pacific Gecko (*Hemidactylus garnotii*) native to southeast Asia, in Miami-Dade County during the early 1960s (King and Krakauer, 1966), or perhaps slightly earlier (Wilson and Porras, 1983). More recently, the exotic Tropical Gecko (*H. mabouia*), native to Africa, was first recorded in the Florida Keys, Monroe County during 1991 (Lawson et al., 1991), and may have invaded Florida as recently as the early 1980s (Meshaka et al., 1994). As competing, introduced, ecological analogs in Florida these two species (as well as other exotic Florida hemidactylines) appear unable to stably co-occupy sympatric niches (see species accounts and citations therein in Meshaka et al., 2004); and, this phenomenon has been observed on park lands in South Florida at Dry Tortugas National Park (Meshaka and Moody, 1996) and Everglades National Park (Meshaka, 2000), and most recently at Savannas Preserve State Park in East-central Florida (Meshaka et al., 2005).

METHODS AND SITES

To further our knowledge of these colonization processes, and in particular winter status of these species in Florida, we surveyed two sites: A.) five buildings at the recently constructed (1998 - ongoing) Florida Atlantic University (FAU) campus in Jupiter, (Palm Beach County) Florida during 3 January 2005 - 30 March 2005, a total of 9 surveys; and, B.) nine buildings at John U. Lloyd Beach State Park (JULBSP) in Dania Beach, (Broward County) Florida during 18 August 2004 - 10 March 2005, a total of 20 surveys. The two sites are approximately 99 km straight line distance apart along the east coast of Florida. JULBSP also is the site of a long-term herpetofauna road-kill study and has previously been described in great detail (see Smith et al., 2003).

Gecko surveys were conducted in the same fashion as previous work (Meshaka, 2000; Meshaka et al., 2005); all reptiles and amphibians on buildings were counted during a single walk around each one starting ½ - ¾ hr. after sunset on nights with less than ¾ moon phase. Relative abundance is presented as means of total counts for each species on each building and followed by standard deviation.

RESULTS AND DISCUSSION

At FAU we found *H. mabouia* and *H. garnotii* on all five buildings (Figure 1). Their relative frequencies varied significantly among the buildings (2 X 5 contingency table comparison; $X^2 = 43.18$; df = 4; $P < .001$). At the FAU site, *H. mabouia* greatly outnumbered *H. garnotii* on four buildings (No. 2-5). These four buildings appear to represent advancing stages of species replacement by *H. mabouia*, whereby *H. mabouia* very quickly replaces or otherwise marginalizes *H. garnotii* with greater numbers of itself (Meshaka and Moody, 1996; Meshaka, 2000; Meshaka et al., 2005).

Building No. 5, which had the smallest total number of geckos (N = 8) for the entire nine week survey period, also was the only building with a significant population of a known predator of geckos, the exotic Cuban Treefrog, *Osteopilus septentrionalis* (mean = 3.3 ± 4.2). Elsewhere, it was rare (mean = 0.1 ± 0.3 on buildings 1,2,4; mean = 0.4 ± 0.5 on building 3). This species has been shown to suppress localized deme densities of both gecko species (Meshaka, 2000; Meshaka, 2001; Meshaka et al., 2005), and in particular, the explosive faunal assemblage dominance/replacement by *H. mabouia* reported in previous studies (Meshaka and Moody, 1996; Meshaka, 2000; Meshaka et al., 2005). No green treefrogs (*Hyla cinerea*) were seen at FAU during this study, and the squirrel treefrog (*H. squirella*), was either rare (mean = 0.1 ± 0.3 on buildings 1,3,4) or absent altogether (buildings 2,5).

Hemidactylus garnotii outnumbered *H. mabouia* only

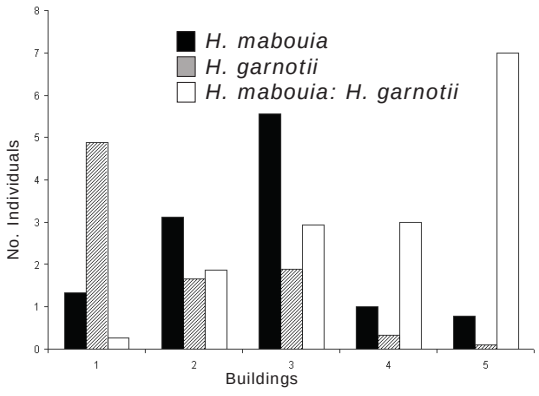


Figure 1. Relative abundance of the Tropical Gecko (*Hemidactylus mabouia*) and Indo-Pacific gecko (*H. garnotii*) and the ratio of both species on five buildings at Florida Atlantic University, Jupiter, Florida.

on Building No. 1 (3.7:1), thereby representing the last or nearly last colonization by *H. mabouia* on a building otherwise very well-populated by *H. garnotii*. Building No. 1 also was the only building of the five which is all white in color; the other four are at least 50% beige-brown in color. Most *H. garnotii* on building No. 1 were almost ghostly pale-white and virtually disappeared on the building surface. Whereas, most of the darker brown, chevron-patterned, *H. mabouia* observed on No. 1 were found underneath the very limited area of the wooden-plank (mottled brown in color) canopy overhanging the front walkway of the building where they likewise were very well camouflaged. We wonder if some local selection for cryptically colored *H. garnotii* on the white walls of building No. 1 also may have been a synergistic factor slowing or stalling the turnover rate to *H. mabouia* previously reported for Everglades National Park (Meshaka, 2000), currently occurring at Savannas Preserve State Park (Meshaka et al., 2005), and apparent for other darker buildings on our study site.

At JULBSP we found *H. mabouia* and *H. garnotii* on all nine buildings (Figure 2). Their relative abundances, like those at FAU, varied significantly among the buildings (2 X 9 contingency table comparison; $X^2 = 42.29$; df = 8; $p < 0.001$). Also like FAU, more typically advanced assemblages dominated by *H. mabouia* (Meshaka, 2000; Meshaka et al., 2005) were found on the nine buildings. Notable among the buildings was No. 1, a very small pump house on which the fewest geckos and the lowest *H. mabouia*: *H. garnotii* ratio occurred (Figure 2). It also was the only building repainted during the survey, which may have negatively impacted both species. We suspect that with age, future visits to this shed will likely be greeted with mostly *H. mabouia*, as at the other large buildings surveyed at JULBSP.

In stark contrast to building No. 1 at FAU which is all white and the only building dominated by *H. garnotii* in our study, building No. 9 at JULBSP is at the opposite end of the color spectrum. Building 9 was a completely black shade cloth-covered greenhouse framed with aging gray-black planks and was overwhelmingly dominated by *H. mabouia*, with its ratio to *H. garnotii* at 6.6:1 (Figure 2). As with the strongly camouflaged, ghostly pale-white *H. garnotii* on FAU building No. 1, the *H. mabouia* on JULBSP building No. 9 were equally cryptic. When on the gray-black planks and motionless, individuals which were very dark gray-brown to nearly black were almost undetectable. Contrary to the effect on building No. 1 at FAU, in this arena the advantage of cryptically-colored *H. mabouia* on building No. 9 at JULBSP may have provided an edge against predation, thereby accelerating the turnover rate in its favor. These two phenomena confound in opposite ways the faunal turnover process associated with these two ecological analogues.

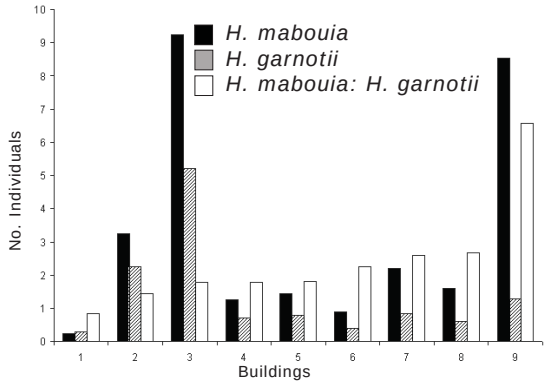


Figure 2. Relative abundance of the Tropical Gecko (*Hemidactylus mabouia*) and Indo-Pacific gecko (*H. garnotii*) and the ratio of both species on nine buildings at John U. Lloyd Beach State Park, Dania Beach, Florida.

New species continue to colonize Florida, and new hemidactyline species cannot be ruled out. In the present circumstances, however, whereas species dominance by *H. mabouia* has thus far occurred primarily through its secondary invasion and replacement of congenerics, the scale of its increasing success will eventually tip to a point where *H. mabouia* will be the initial colonizer of most new construction projects in Florida. Such a shift would begin in its southern Florida stronghold, thereby avoiding these vanishing congenerics altogether.

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Collapse of a Fauna: Reptiles and Turtles of the University of Kansas Natural History Reservation

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The University of Kansas Natural History Reservation is a 590 acre area, set aside in 1947 from part of the Robinson Farm, the former holdings of Dr. Charles Robinson, first governor of the state of Kansas. It consists essentially of the low; flat-topped hills of the Cuesta formation projecting into the northern edge of the Kansas River Valley. The flat hilltop average some 1,040 feet elevation, and the valley sloping away gradually from an elevation of about 920 feet to the Kansas River at about 820 feet at its nearest point. When the tract was dedicated it was almost equally divided between a forest (with American elm, hackberry, shagbark hickory, black oak, chestnut oak, Kentucky coffee tree, black walnut, honey locust, osage orange, and more than a dozen others) and open land. The forest was mostly on the hillsides, with relatively small acreages on the hilltops. The open land was in turn divided almost evenly between pastures that had been heavily grazed and cultivated fields in the valleys of the western and southeastern parts and a block of hilltop in the northeast. The forested parts were separated from the pastures by barbwire fences that had protected trees from browsing, perhaps for several decades.

The fauna included 17 species of snakes, seven of lizards and two to turtles. Over periods of years all of them made some degree of adjustment to the local habitats, but the area was far from stable. Kind and amount of grazing pressure, tree-cutting, hunting of small game, and the progressive growth and spread of forest brought about gradual change. The sudden cessation of cultivation and discontinuance of grazing brought about drastic changes, and after 56 years these are still in progress, with a strikingly altered herpetofauna.

The area is in an ecotone between the deciduous forests that were characteristic of the eastern United States and the grasslands of the Great Plains. The local tall-grass prairie is a sub-climax that can be invaded by forest trees unless it is burned at intervals. Burning and browsing check the spread of the forest. Severe overgrazing of the area eliminated many grassland species of tall-grass or mid-grass prairies and damaged the habitat for many species of animals. The year after cattle were removed the former pastures changed their aspect, with a grass-weed mixture usually growing to a height of one to three feet.

The Oread Limestone underlies the shallow soil of the hilltops. At hilltop edges it formed a prominent outcrop. South exposures of the outcrop are favorite hibernation sites for most species of local snakes. Hibernating singly seemed to be the usual rule, but several of the same species or even of mixed species may sometime hibernate together. The actual hibernation sites were inaccessible in limestone crevices. Some of the local species are known to gather in large groups for hibernation, in more northern areas.

Species accounts follow for each of the 22 kinds that were found on the area. Turtles, lizards and snakes are listed separately, with the species of each group in alphabetical order. For each species there is a statement concerning its response to the successional change that occurred.

Chelydra serpentina. The Common Snapping Turtle was present in small numbers. Nearly always, several individuals resided at the pond, but probably there was frequent replacement, as these residents shifted, following the small intermittent creek, either upstream or downstream. On many occasions, in June, egg-bearing females that had left the pond in search of suitable nesting sites were encountered. They tended to follow along the driveway from the County road to the headquarters, keeping to relatively open areas. There was no noticeable change in numbers from year to year (Collins, 1993).

Terrapene ornata. Ornate Box Turtles were moderately abundant at the start. In general they kept to the overgrazed pastures, and fed to a large extent on the dung insects that were found in the cattle droppings, but they were known to cross wooded areas and to hibernate in them. With the removal of livestock hard times began for the box turtles. The grass-weed association grew tall and lush, making travel difficult, and the supply of dung insects was terminated. The turtles persisted for several years, but gradually became scarcer and then disappeared from the area. The driveway to headquarters facilitated their travel, allowing them to avoid dense vegetation, and it was a favorite place for the survivors as their numbers dwindled (Legler, 1960).

Aspidoscelis sexlineatus. The Six-lined Racerunner, long known under the generic name *Cnemidophorus*, was extremely common on the Reservation when I came to it in 1948. The overgrazing to which much of the area had been subjected favored the racerunner.

Soil was almost barren in places subject to heavy trampling, as near salt blocks or watering places. High Field in the northeastern part of the area had been cultivated and in a period of heavy rainfall, severely eroded, so that a series of gullies were relatively barren. This created habitat favorable to the lizards. A refugium that was especially favorable was the diversion ditch in the pasture north of the residence, extending about 1000 feet from the pond to a gully. The eroding banks of the gully had strips of loose bare soil several inches wide, extending almost continuously along the bank and the barren strips were runways of the lizards. As vegetation in the pasture grew tall and lush after removal of cattle, the lizards were increasingly limited to the ditch bank, but this colony survived until 1958. An old quarry was another favorite refugium. The sparse vegetation and exposed rock surfaces favored the lizards (Fitch, 1958).

Crotaphytus collaris. The Eastern Collared Lizard was not a member of the original fauna but in the spring of 1949 ten (mostly first-year young) captured in the northern Flint Hills near Manhattan, Kansas, were released at the abandoned quarry, within a 100 foot radius in the northern part of the Reservation. The colony thrived and reproduced, and several generations passed before the last survivor disappeared in July, 1955. In all this time the lizards were never known to wander beyond the limits of the quarry and area of south-facing hilltop edge 420

feet long and up to 50 feet wide. There was forest on the southern, southwestern and northeast sides of the quarry, with pasture to the north. The limestone outcrop was continuous for the quarry's length and each lizard kept to a small area of limestone boulders, never venturing into the nearby woodland or grassland. The quarry was within the territory of a pair of broadwing hawks, and they were known to have taken the last survivors, but probably the habitat had deteriorated, with more small trees and more herbaceous vegetation making it more difficult to avoid such predators (Fitch, 1958, 1974).

Plestiodon fasciatus. The Five-lined Skink was abundant on the Reservation during the early years. It was especially common on two wooded hillside tracts that were accessible to livestock and connected the hilltop pastures with the bottomland pastures. Browsing and grazing in Horse Woods and Skink Woods altered the aspects of these areas. They were more open than other parts of the woodland, with less ground vegetation. Branches that were within reach of cattle had been eaten back resulting in more sunlight reaching the ground. The sunnier habitat favored the skinks, but when the area became a reservation, livestock were removed and both areas developed thicker canopies and thicker ground vegetation. As a result the skinks' habitat deteriorated, and over a period of years they underwent drastic reduction in numbers. By the year 2000 they were seen regularly only at the laboratory building, the residence, and the 60 foot sidewalk between them (Fitch, 1954).

Plestiodon obsoletus. This large fossorial skink was limited to hot and dry places, and over a period of several years it rapidly dwindled and disappeared. It was present at the quarry site, but probably few individuals lived there. A larger colony was found a Rat Ledge, a limestone outcrop of southeastern exposure, where cattle had browsed and grazed rendering the habitat relatively open, but with shortgrass and flat rocks. In 1950 41 adults and large young, and 18 small young of the preceding year were caught and marked within the 2 acre area of favorable habitat. Their combined weight totaled 1.5 kg. But habitat rapidly deteriorated and after several years none remained. Herbaceous plants grew luxuriantly where formerly there was only sparse low grass, and brush and trees also had invaded (Fitch, 1954).

Plestiodon septentrionalis. Three were recorded at the base of a sparsely wooded hillside in the 1950s. In the 1960s it was found that a small relict colony was still present on the mowed area just to the east of the laboratory building, and this colony persisted for several years (Fitch, 1965b).

Ophisaurus attenuatus. Tall-grass is the habitat of the Western Slender Glass Lizard. When field work on the Reservation was begun, its habitat was almost lacking and the lizards were correspondingly scarce. None was seen in the first year of field work, and only one in the second year. However, after removal of livestock its habitat improved rapidly. On the overgrazed pastures a grass-weed mixture thrived, usually attaining a height of a meter or more. Because several years are required for a Western Slender Glass Lizard to attain breeding maturity, increase was slow in the early years. The population peaked about 1965, but by then habitat changes unfavorable to *Ophisaurus* were occurring. Tree species including honey locust, osage orange, American elm and hackberry, along with shrubs (dogwood, sumac, etc) were springing up throughout the former pastures, and the grass-weed mixture was losing ground. By the year 2000 trees, some as much as a foot in trunk diameter occurred throughout the former pastures, with relict grass-weed patches still growing between the trees. A few Western Slender Glass Lizard were still present in the larger grassy patches (Fitch, 1978b)

Scincella lateralis. Ground Skinks were rare on the Reservation when field work was initiated, but they increased steadily over a period of years as herbaceous vegetation that had been held in check by grazing became more luxuriant. Ground Skinks usually live in leaf litter, but all those found on the Reservation were in the former pastures and they seemed to avoid the woodland. In grassland they were seen especially in the first warm days of spring. No actual counts are available, but it is my impression that they increased over the first decade of field work, and began to dwindle as woody vegetation invaded the pastures (Fitch and Greene, 1965a).

In southern states Ground Skinks may produce five or more egg clutches during the long growing season. A clutch contains from one to seven eggs, and the average is slightly more in Kansas than in the southern states, where there are more clutches per female. Ground Skinks are relatively short-lived, and most breeders are in their first or second year.

Agkistrodon contortrix. When the Reservation was created the Copperhead was moderately common in wooded areas, and the white-footed mouse (*Peromyscus leucopus*) was its principal food species. The removal of livestock favored the Copperhead, permitting herbaceous vegetation to thrive in open areas, and this was especially beneficial for the prairie vole (*Microtus ochrogaster*) causing it to spread into the former pastures and to undergo a veritable population explosion. The abundance and availability of the vole caused the Copperhead to concentrate on this favorite prey species, taking fewer white-footed mice. In the early years Copperheads grew larger and had larger litters as a result of this shift. In 1949 and 1950 the voles were at their peak, thriving in favorable habitat, and Copperheads were increasing. However, successional changes soon brought about less favorable conditions. The grass, mainly *Bromus inermis*, thrived to the extent that it began to crowd out some of the weedy forbs, important as food for the voles. Within a few years woody vegetation, shrubs and young trees became established on the former pastures, and began to crowd out the grass-weed community, and both voles and Copperheads began a long period of progressive decline. Excluding recaptures of Copperheads already caught and marked, and limiting counts to the Reservation and areas immediately adjacent, the counts by decade were 1950s: 1,138, 1960s: 776, 1980s: 548, 1990s: 92. By the year 2000 Copperheads were much reduced but still present. They were feeding on a variety of prey other than voles, and they were not growing as large as they had been 50 years earlier (Fitch, 1960).

Carphophis vermis. The Western Worm Snake is fossorial, and its habitat is in forest in well shaded places. No clear cut changes in its number have been observed. (Clark, 1979)

Coluber constrictor. The Eastern Racer is a tall-grass species that did not thrive on any of the major habitats found on the Reservation originally: forest, heavily grazed pastures and cultivated fields, but it was present in scrubby woodland and edges. With the removal of livestock and the development of a lush grass-weed community in the former pastures, much of the Reservation became favorable habitat (Fitch, 1963a).

Early maturity and high reproductive potential allowed the Eastern Racer to respond with rapid increase but then it was unfavorably affected by the invasion of trees in the 1960s. Captures per decade (excluding re-

captures and young hatched in the laboratory reveal a trend. 1950s: 634, 1960s: 399, 1970s: 266, 1980s: 415, 1990s 34. By the 1990s only small patches of tall-grass persisted between the trees. The low number of Eastern Racer captures (only 34 in the decade) was mostly of hatchings. There seemed to be no resident adults and the hatchlings evidently were transients from distant nests in other habitats.

Crotalus horridus. In the beginning Timber Rattlesnakes were fairly common and were reproducing. Most of those seen were at hilltop limestone outcrops of southeastern exposure. The Timber Rattlesnake is considered to be a forest inhabitant; in fact its geographic range corresponds with the Deciduous Forest Biome of southeastern North America (the eastern one-third of the continental United States). Surprisingly, the species did not thrive on the Reservation where it was protected from killing by humans and where forest was invading areas of former pastures and cultivated fields. Numbers captured per year were as follows. 1949: 8, 1950s: 2, 1951: 6, 1952: 3, 1953: 5, 1954: 3, 1956: 4, 1957: 2, 1958: 12, 1959: 4, 1960: 7, 1961: 4, 1963: 2, 1964: 3. In the forty years since 1965 several have been found on the Reservation or very near its boundaries, but probably these were transients. Most have been found at or near the northern edge and presumably were from dens farther to the north where the species was known to have survived, but one was found in the yard of a dwelling near the southwestern boundary. Presumably the dense growth of young trees on formerly open areas eliminated former basking places and "shaded out" the rattlesnakes (Fitch, 1999).

Diadophis punctatus. At the outset, the Ringneck Snake was extremely abundant on rocky, wooded slopes, but there were few if any in the overgrazed pastures. The development of a dense grass-weed cover during the first year of protection encouraged their invasion of the former pastures, and they became even more abundant that in the woodland. There was probably a steady increase until 1968. By then invasion of the former pastures by trees was well underway, shading became an important factor, and Ringneck Snakes began to decline. Numbers have declined to a fraction of their peak abundance, but they still outnumber all other snake species combined. Because of the large numbers, counts will be limited to those captured in April each year. By decades, April counts were 1950s: 1,024, 1960s: 1,971, 1970s: 2,450, 1980s: 1,701, and 1990s: 601. These figures suggest that the species increased for more than 20 years, then declined to less than one-fourth of its peak abundance. Another index of abundance is the number caught per day when they were hunted. A total of 880 were caught in 15 days (58 per day) in the 1960s, but only 195 in 14 days (14 per day) in the 1990s (Fitch, 1975).

Lampropeltis calligaster. The Prairie Kingsnake is usually an inhabitant of tall-grass prairie, but at the outset this habitat was almost nonexistent on the area. After removal of livestock a dense grass-weed association developed in the former pastures and by 1956 Prairie Kingsnakes had become moderately common. Numbers recorded per decade were as follows 1950s: 55, 1960s: 68, 1970s: 38, 1980s: 40, and 1990s: 5. These numbers are compatible with the idea that at the start they increased for more than a decade, then with decline of the grass-weed community and the spread of forest they decreased drastically. Then small number caught in the 1990s probably reflects the fact that field work was to a large extent shifted away from the Reservation as snakes became scarcer (Fitch, 1978a).

Lampropeltis triangulum. The Milk Snake locally prefers forest edge with shortgrass and flat rocks as hiding places. The catch averaged less than two per year throughout my study; by decades, 1950s: 14, 1960s: 33, 1970s: 22, 1980s: 21, 1990s: 5. Its population trend is somewhat parallel with that of *L. calligaster* (Fitch and Fleet, 1970)

Nerodia sipedon. The Northern Water Snake was present on the Reservation over more than five decades by virtue of the two small creeks draining the area, and the pond. They followed the water supply and traveled freely along the intermittent creeks. They were encountered most frequently at the pond; usually several lived there, but there was frequent replacement of individuals as they wandered off either upstream or downstream. Where the creek left the Reservation on its western edge it passed through a tunnel under the county road, and there was a drop of more than six feet. This prevented fish from reaching the pond by swimming, and shiners were the only fish present. Amphibians including *Bufo americanus*, *B. woodhousii*, *Rana blairi*, *R. catesbeiana*, and *Acris crepitans* were important food for the snakes (Fitch, 1999).

Pantherophis obsoletus. On the newly created Reservation the Western Rat Snake was fairly common, found mainly on sparsely wooded slopes. With the spread of forest it was able to become established on formerly open areas that had been cultivated or heavily grazed. Numbers captured per decade were 1950s: 231, 1960s: 92, 1970s: 64, 1980s: 113, and 1990s: 44. The abrupt reduction from the fifties to the sixties is due mainly to the fact that by the sixties a substantial proportion of those on the study area had already been caught and marked, and the many recaptures of these were not counted. Even great reduction in the nineties can be explained by the fact that field work was to a large extent shifted from the Reservation to the adjacent Nelson Experimental Area, and only those from the Reservation were counted. There was probably some reduction in numbers as shady habitat prevailed and former basking places were no longer available. It is my impression that Western Rat Snakes were definitely fewer during the later years (Fitch, 1963b).

Pituophis catenifer. The Bullsnake was the only species of snake that found habitat to its liking in the overgrazed pastures of the Reservation. Known prey species upon which it subsisted were the Plains pocket gopher (*Geomys bursarius*) and deer mouse (*Peromyscus maniculatus*). Habitat decline was rapid. With the early development of a grass-weed community and its replacement by trees and brush Bullsnakes lasted only a few years on the area. Some continued to come to hilltop limestone outcrops to hibernate after the resident population had been eliminated. A few survived on KU's Rockefeller Experimental Tract and the Nelson Experimental Tract where grassland areas were mowed annually (Fitch, 1999).

Storeria dekayi. The Brown Snake is found mainly within the Deciduous Forest Biome of eastern North America, but its range extends west into the Great Plains and south into the tropics. Because of its secretiveness few were found. At first these were in the more open woodlands, but after a dense grass-weed cover was established it invaded the former pastures. So few Brown Snakes were found that no clear cut trends were evident. Perhaps its numbers have remained fairly stable (Fitch, 1999)

Thamnophis sirtalis. For the Common Garter Snake the Reservation's small pond and two intermittent creeks were the essential features. It has an affinity for water and feeds to a large extent on aquatic prey. However, adult females, substantially larger than males, have a tendency to disperse to upland field far from water to feed

on mammals as well as the amphibians and fish taken by smaller Common Garter Snakes. In these upland fields the prairie vole is usually abundant and seems to make up a major portion of the food of gravid females, but its availability varies from year to year. This is reflected in the changing number of Common Garter Snakes from one decade to the next, 1960s: 582, 1970s: 370, 1980s: 442, and 1990s: 661. Unlike most other snake species, it did not undergo drastic decline as forest became established on formerly open areas (Fitch, 1965a, 1999).

CONCLUSIONS

The principal habitats on the newly created Natural History Reservation in 1948 were: 1) Bare soil and rock, 2) Short-grass, 3) Tall-grass, 4) woodland, 5) riparian-aquatic. Each had a different set of reptile and turtle species, 22 in all. With the discontinuance of grazing and cultivation rapid successional change occurred on the formerly heavily grazed pastures and cultivated fields, with somewhat parallel changes. At first a dense ground cover of herbaceous vegetation, a grass-weed mixture of many species developed, and it was present in the first growing season. After a period of years young trees and shrubs became established and initiated the long-time transformation of the open lands to forest. Surprisingly these changes constituted habitat deterioration for most of the reptile species. Ten species (45%) disappeared from the area completely and seven others (27%) dwindled in numbers and/or in area occupied, but none was definitely benefited by the changes. The following lists show the species, by habitat, and for each a superscript number indicates how it responded to successional changes; 1 indicates the it was eliminated; 2 indicates that it was unfavorably affected; 3 indicates that there was no significant change.

Bare soil and rock
- *Aspidoscelis sexlineata* [1]
- *Crotaphytus collaris* [1]
- *Tantilla gracilis* [1]

Short-grass
- *Terrapene ornata* [1]
- *Plestiodon obsoletus* [1]
- *Lampropeltis triangulum* [2]
- *Pituophis catenifer* [1]

Tall-grass
- *Plestiodon septentrionalis* [1]
- *Ophisaurus attenuatus* [2]
- *Scincella lateralis* [2]
- *Coluber constrictor* [1]
- *Diadophis punctatus* [2]
- *Lampropeltis calligaster* [1]

Woodland
- *Plestiodon fasciatus* [2]
- *Agkistrodon contortrix* [2]
- *Carphophis vermis* [2]
- *Crotalus horridus* [1]
- *Pantherophis obsoletus* [2]
- *Storeria dekayi* [2]

Riparian-aquatic
- *Chelydra serpentina* [3]
- *Nerodia sipedon* [3]
- *Thamnophis sirtalis* [3]

It is ironic that on this area dedicated to preserving the native fauna and protected from anthropogenic disturbances for more than half a century, nearly three-fourths of the herpetofauna was lost, or set back and severely reduced by the process of natural succession. The lesson to be learned is that management with some manipulations may be necessary to maintain suitable habitats for all species.

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New Records of Amphibians, Turtles, and Reptiles in Kansas for 2005

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The seventeen new county records and two maximum size records listed below are those accumulated or brought to my attention since the publication of records for 2004 (Collins, 2005). Publication of these new records permits me to give credit and express my appreciation to the many individuals who collected or obtained specimens and donated them to me for deposition in an institutional collection. Further, recipients of this list are permitted an opportunity to update the range maps and size maxima sections in *Amphibians and Reptiles in Kansas Third Edition* (Collins, 1993). Finally, these new records represent information that greatly increases our knowledge of the distribution and physical proportions of these creatures in Kansas, and thus gives us a better understanding of their biology. This report is my 31st in a series that has appeared annually since 1976, and the data contained herein eventually will be incorporated into my new forthcoming book, Amphibians, Turtles, and Reptiles in Kansas.

The Kansas specimens listed below represent the first records for the given county based on a preserved, cataloged voucher specimen in an institutional collection, or represent size maxima larger than those listed in Collins (1993). Any information of this nature not backed by a voucher specimen is an unverifiable observation. All new records listed here are presented in the following standardized format: standard common and current scientific name, county, specific locality, date of collection, collector(s), and place of deposition and catalog number. New size maxima are presented with the size limits expressed in both metric and English units. Common names are those now standardized for North America, as compiled by Collins & Taggart (2002), and are given at the species level only.

The records listed below are deposited in the herpetological collection of the Sternberg Museum of Natural History, Fort Hays State University, Hays, Kansas (MHP).

I am most grateful to the members of the Kansas Herpetological Society, and to the staff of the Kansas Department of Wildlife and Parks and the Kansas Biological Survey, who spent many hours in search of some of the specimens reported herein. Some of the records contained herein resulted from field studies sponsored by funds from the Kansas Department of Wildlife and Parks' Chickadee Checkoff Program. Travis W. Taggart and Curtis Schmidt, Sternberg Museum of Natural History, Fort Hays State University, diligently assigned catalog numbers to the specimens listed below, and to them I am most indebted.

NEW COUNTY RECORDS

WOODHOUSE'S TOAD (*Bufo woodhousii*)

MIAMI CO: 38.57285° N, 95.04667° W. 8 September 2004. Collectors: Travis Taggart & Curtis J. Schmidt. MHP 9476. Verified by Joseph T. Collins. Recorded by Taggart et al. (2005).

CRAWFISH FROG (*Rana areolata*)

CHAUTAUQUA CO: 37.00830° N, 96.06506° W. 24 March 2005. Collector: Travis W. Taggart and Jennifer Taggart. MHP 10437. Verified by Richard S. Hayes. Recorded by Taggart & Schmidt (2005); MONTGOMERY CO: 37.11445° N, 95.94651° W. 24 March 2005. Collector: Travis W. Taggart and Jennifer Taggart. MHP 10436. Verified by Richard S. Hayes. Recorded by Taggart & Schmidt (2005); NEOSHO CO: 37.54390° N, 95.31507° W. 30 March 2005. Collectors: Curtis J. Schmidt & Dan Murrow. MHP 10432. Verified by Richard S. Hayes. Recorded by Schmidt et al. (2005).

BULLFROG (*Rana catesbeiana*)

HODGEMAN CO: 38.04914° N, 100.08189° W. 13 August 2004. Collectors: Curtis J. Schmidt & Richard S. Hayes. MHP 9297. Verified by Joseph T. Collins. Recorded by Taggart et al. (2005).

GREAT PLAINS NARROWMOUTH TOAD (*Gastrophryne olivacea*)

ROOKS CO: 39.39398° N, 99.36186° W. 8 July 2004. Collectors: Travis W. Taggart & Richard S. Hayes. MHP 9044. Verified by Joseph T. Collins. Recorded by Taggart et al. (2005).

COMMON SNAPPING TURTLE (*Chelydra serpentina*)

FINNEY CO: 37.97535° N, 101.01130° W. 8 September 2005. Collector: Peggy Minter. MHP 12120. Verified by Travis W. Taggart. Recorded by Schmidt (2005); SEWARD CO: 37.06902° N, 100.89437° W. 23 May 2005. Collectors: Travis W. Taggart & Curtis J. Schmidt. MHP 11155. Verified by Richard S. Hayes. Recorded by Taggart & Schmidt (2005).

SPINY SOFTSHELL (*Apalone spinifiera*)

BOURBON CO: 37.85580° N, 94.63978° W. 19 August 2004. Collectors: Curtis J. Schmidt & Richard S. Hayes. MHP 9332. CLARK CO: 37.30954° N, 99.68475° W. 22 July 2004. Collectors: Travis W. Taggart & Richard S. Hayes. MHP 9173. Verified by Joseph T. Collins. Recorded by Taggart et al. (2005).

PRAIRIE LIZARD (*Sceloporus consobrinus*)

DECATUR CO: 39.76263° N, 100.57440° W. 8 July 2004. Collectors: Travis W. Taggart & Richard S. Hayes. MHP 9059. Verified by Joseph T. Collins. Recorded by Taggart et al. (2005).

BROADHEAD SKINK (*Plestiodon laticeps*)
BOURBON CO: 37.77603° N, 94.83066° W. 5 May 2005. Collectors: Derek Welch, Curtis J. Schmidt & Travis W. Taggart. MHP 10799. Verified by Richard S. Hayes. Recorded by Welch (2005).

RINGNECK SNAKE (*Diadophis punctatus*)
SEWARD CO: 37.14947° N, 100.74735° W. 23 May 2005. Collectors: Travis W. Taggart & Curtis J. Schmidt. MHP 11156. Verified by Richard S. Hayes. Recorded by Taggart & Schmidt (2005).

COACHWHIP (*Masticophis flagellum*)
MIAMI CO: 38.44358° N, 94.81539° W. 8 September 2004. Collectors: Travis W. Taggart & Curtis J. Schmidt. MHP 9680. SHERMAN CO: 39.51004° N, 101.58336° W. 4 August 2004. Collectors: Curtis J. Schmidt & Richard S. Hayes. MHP 9234. Verified by Joseph T. Collins. Recorded by Taggart et al. (2005). The specimen from Miami County is well outside the known range of this serpent in Kansas and is questionable; corroboration in the form of additional records and/or observations is desirable.

LINED SNAKE (*Tropidoclonion lineatum*)
LOGAN CO: 38.78168° N, 100.86217° W. 18 September 2004. Collector: Travis W. Taggart. MHP 9535. Verified by Joseph T. Collins. Recorded by Taggart et al. (2005).

TIMBER RATTLESNAKE (*Crotalus horridus*)
ALLEN CO: 37.80950° N, 95.08798° W. 3 May 2005. Collectors: Travis W. Taggart & Curtis J. Schmidt. MHP 11157. Verified by Richard S. Hayes. Recorded by Taggart & Schmidt (2005).

NEW MAXIMUM SIZE RECORDS

TEXAS HORNED LIZARD (*Phrynosoma cornutum*)
STEVENS CO: Sec. 2, T33S, R39W. 31 May 2002. Collectors: Travis W. Taggart & Curtis J. Schmidt. MHP 7469. Total length = 123 mm (4 7/8 inches). Female.

PRAIRIE LIZARD (*Sceloporus consobrinus*)
CHEROKEE CO: Sec. 36, T33S, R35E. 29 April 1967. Collector: L. H. Panks. MHP 4254. Total length = 165 mm (6 1/2 inches). Sex undetermined.

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Gopher Snakes, Bullsnakes and Pine Snakes

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My early memories of snakes go back more than 90 years. On my father's fruit orchard in southwestern Oregon some fields were reserved for growing grain and alfalfa as livestock feed, and *Pituophis catenifer* was the most frequently encountered snake there. As a four-year-old I was fascinated by these big snakes, and whenever I saw one I would grab it up and examine it. My father was aware that this was a harmless species and he did not discourage me. I was usually bitten on my hands and bare arms. Our shepherd dog, Jack, had been trained by his former owner to kill Gopher Snakes, and one purpose of my catching them was to rescue them from him. Spectators often remarked on my courage in risking and enduring the bites, or pitied me for the pain and "horror" of it. Either way it bolstered my ego and encouraged my snake handling.

When I came to the KU Natural History Reservation in 1948, one of the first snakes that I saw was the Bullsnake, *Pituophis catenifer sayi*. It was the one species that thrived on the overgrazed terrain, and its favorite prey species, the pocket gopher, *Geomys bursarius* was common enough to support a few Bullsnakes. The large size of the Bullsnake is likely an adaptation for it to prey on the relatively large pocket gopher. The prominent and compressed rostral scale may be regarded as an adaptation for preying on gophers, allowing it to cut through the earthen plug of the gopher's burrow. A promising subject for studies still to be made is the correlation of snake size with that of each of the kinds of gophers with which it is sympatric. The Bullsnake is large and robust. Perhaps other populations depending on smaller kinds of gophers (*Thomomys*) for food are correspondingly smaller. Both the Bullsnake and the gopher are now long gone since changes in the habitat unfavorable to them have developed. Like many other species of our local biota, they have faded away and disappeared as trees and other woody plants have invaded formerly open areas of pasture and cultivated fields.

The binomial *Pituophis sayi* was long applied to the Bullsnake, honoring the American naturalist Thomas Say, whose name has been applied to several members of North American fauna (e.g. *Sayornis sayi*, Say's Phoebe). More recently the Bullsnake has been found to be merely a subspecies of the more western Gopher Snake, *Pituophis catenifer*, and *catenifer* has priority over *sayi* since it was named first. The vernacular "gopher snake", first applied by California naturalists, is appropriate. The species seems to have evolved its defining characters as specializations to prey on pocket gophers. Wherever it occurs, these seem to be the principal prey. It is sympatric with a multitude of kinds of pocket gophers. In an early paper, Hisaw and Gloyd (1926) described its ability to penetrate the loose earth with which gophers plug their burrow entrances, and its ability to kill gophers by pressing them against the earth wall of the burrow, rather than coiling around them in close confines of the tunnel.

In the Ruthven era at the University of Michigan one of the important herpetological monographs produced there was revision of the genus *Pituophis* by Ruthven's student (Olive Griffith Stull, 1940). In a review of her findings, Klauber (1941) was sharply critical. He noted that she did not discuss areas of intergradation between subspecies, but in fact was quite careless about accepting erroneous or questionable locality records. More than

one subspecies (up to six) might be recorded from the same general area. In some cases subspecies were reported as occurring hundreds of miles beyond their actual range limits on the basis of erroneous records by early herpetologists.

In a later revision Conant (1956) included as subspecies of *catenifer*, besides the Bullsnake, *sayi*, the several members of the genus in the eastern United States known as Pine Snakes. Later work with better collections suggest that the Louisiana Pine Snake, *P. ruthveni*, and perhaps the Black Pine Snake, *P. melanoleucus lodingi* in the Mobile, Alabama area, do not intergrade with others and are best considered full species, (Rodriquez-Robles and Jesus Escobar, 2000). These authors thus recognize three different species in the *melanoleucus* complex: *P. melanoleucus*, *P. catenifer* and *P. ruthveni*, and further state that the recognition of other species within *P. catenifer* remains questionable.

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Herpetological Collections and Collecting in Kansas

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Scientific collections are a vital component to the study of life. And as stated by the second author on more than one occasion, 'biology is the study of dead things.' Current estimates have the number of specimens in all natural history collections around the world to be between 1.5 and 2 billion. This permanent library has been amassed over several centuries and is the result of billions of dollars in acquisition and maintenance costs. The goal of scientific collections is to record biodiversity for today and tomorrow, and through the foresight of collectors, specimens of species now extinct currently only exist in scientific collections.

There is an enormous amount of knowledge to be gained by the collecting, proper preservation, and curation of scientific specimens. And as more analytical tools have become available to explore the Earth's biodiversity, biologists are becoming more reliant on past and current collections. Therefore, the need for such collections is greater now than ever before.

The rich history of herpetological investigations in Kansas has been summarized most recently by Collins (1993). His account reflects the wealth of literature that has accumulated between 1857 and 1993. But there is more to the story than published papers alone.

Recently, data have been compiled that allow us to examine the role of scientific collecting and collections in the accumulation of knowledge of the state's herpetofauna. The data are derived from 36 institutions in North

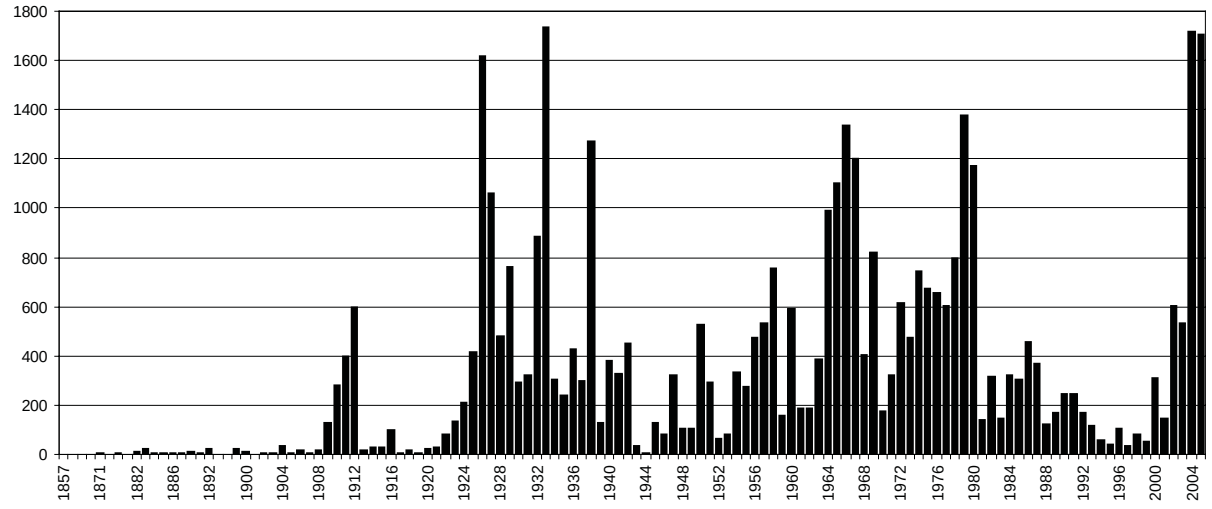

Figure 1. The number of Kansas cataloged vouchers from all surveyed museums from 1857 through 2005. Collection totals for individual museums are given in Table 1.

America that house scientific specimens from Kansas (Taggart, 2006).

The first specimen collected in Kansas, from which a reliable year can be discerned, was a Common Kingsnake taken in Shawnee Mission, Johnson County on 6 July 1857 and placed in the USNM (=Smithsonian Institution). Unfortunately, the collector's name was not recorded. Since then an additional 51,400 specimens have been deposited in collections around the country.

Since 1908, continual acquisition of specimens from Kansas has occurred. However, the effort has varied. Peaks and valleys are evident in the relative yearly numbers of specimens collected (Figure 1), but collectors overall have contributed an average of 350 specimens a year over the past 150 years.

The first collections were made during government sponsored expeditions around 1850. However, the territorial boundaries of Kansas didn't exist, so accurate localities were lacking. Shortly after this period, Dr. Hammond of the U.S. Army was stationed at Fort Riley and sent many specimens to the Academy of Natural Sciences in Philadelphia. By then, Kansas had become a territory, defined north to south between the 40th and 37th parallels, respectively (as it is today), but stretching from the western border of Missouri to the front range of the Rockies. While the given localities were as good as could be expected for the mid-1800s, many of Dr. Hammond's collecting sites are problematic (i.e. 400 miles west of Ft. Riley on the Republican River) and those localities that were reasonably well-defined by him (i.e. Fort Riley) are still questionable as to their accuracy and utility (see Rundquist, 1979 for another pertinent example).

The small but regular growth in herpetological collecting in Kansas that occurred between 1900 and 1920 was largely the result of collections made by field parties associated with the State Biological Survey. Starting around 1908, researchers and students at the University of Kansas, and much later Fort Hays State University, began to acquire substantial collections from across the state (Figure 2).

The University of Kansas Museum of Natural History (KU) maintains the largest collection of Kansas herpetofauna at 23,294 cataloged specimens (Table 1). The

Table 1. Acronyms of the 36 museum collections (of 55 queried) that contain specimens from Kansas and the number of specimens in each. These data were derived from Taggart (2006). Acronyms are explained in Appendix 1.

AMNH	741
ANSP	297
ASU	31
AUNHMLC	25
BC	80
BYU	343
CAS	922
CAS-SUA	330
CHAS	346
CMNH	982
FLMNH	663
FMNH	1,545
INHS	42
JFBM	72
KU	23,294
LACM	221
LSUMZ	94
MCZ	771
MHP	10,383
MPM	7
MSU	620
MVZ	828
OU	64
ROM	76
SDSNH	446
SIUC	52
TCWC	224
TNHC	102
TTU	82
UC	911
UG	2
UIMNH	1,022
UMMZ	888
USNM	1,607
UTEP	551
YPM	5

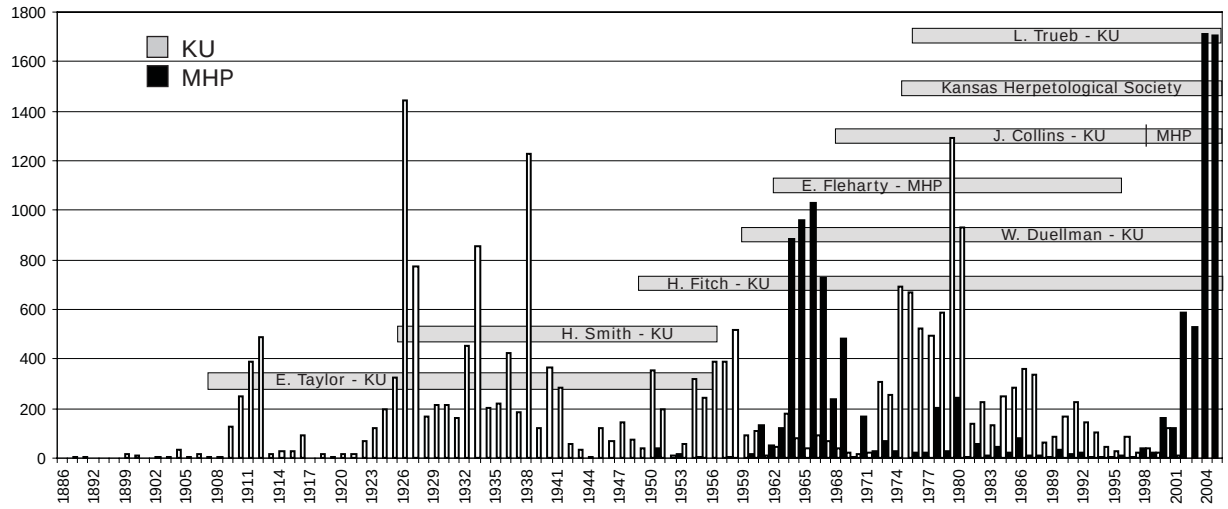

Figure 2. Number of Kansas voucher specimens deposited in the collection of the University of Kansas Museum of Natural History and the Sternberg Museum of Natural History from 1886 through 2005. The named gray horizontal bars show the time periods each named individual (and their respective students) made significant contributions.

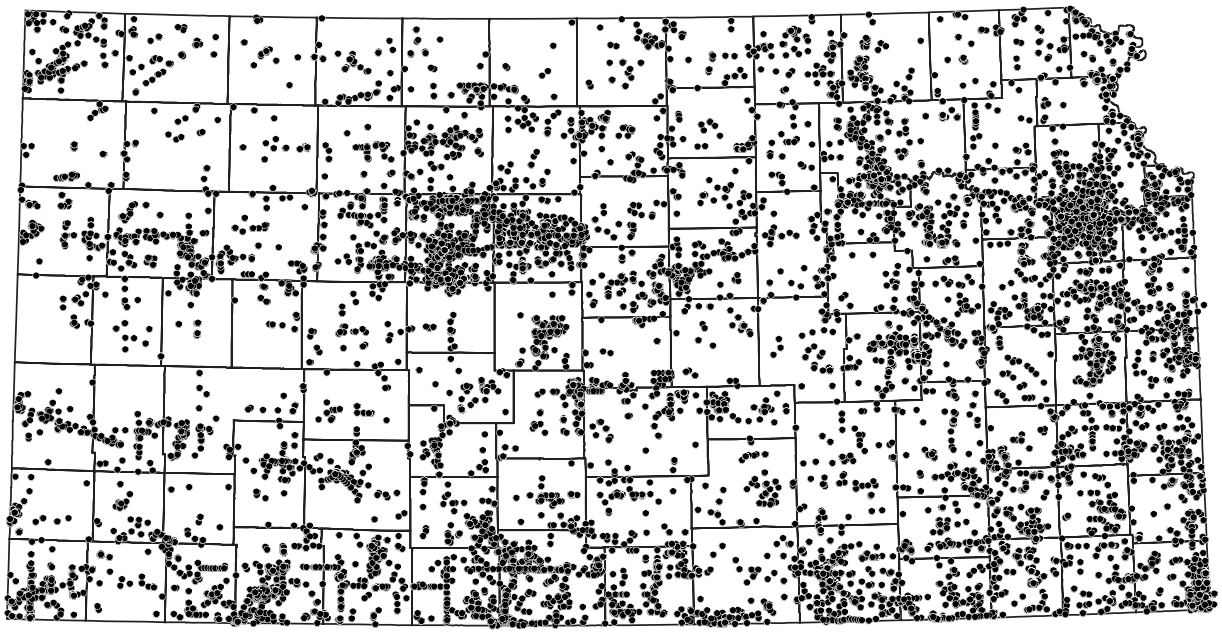

Figure 3. Distribution of all voucher specimens deposited in the 36 collections. Several records are not plotted because their associated locality data was too imprecise (i.e., only to county) to map. The figure clearly illustrates particular regions of intense collecting activity as well as other areas that may need more attention.

second largest collection is housed at the Sternberg Museum of Natural History, Fort Hays State University, and consists of 10,383 cataloged specimens.

Other museums with substantial holdings of material from Kansas include US National Museum (1,607), Field Museum of Natural History (1,545), University of Illinois Museum of Natural History (1,022), Museum of Vertebrate Zoology (828), Museum of Comparative Zoology (771), and American Museum of Natural History (741).

Dr. Edward H. Taylor of the University of Kansas ushered in a new age of Kansas herpetology by initiating extensive field work throughout the state starting in 1910 and tapering off in 1956. While much of his later work was not centered in Kansas, several of his graduate students (Claude Hibbard, A. Byron Leonard, Wilmer W. Tanner, Joseph R. Tihen, and most notably Hobart M. Smith) continued to steadily add to our knowledge of the taxonomy and distribution of the state's herpetofauna.

Taylor and Smith were prolific collectors and maintained a combined personal collection. Upon the hiring of Smith at the University of Illinois they split the collection in half. Smith's portion followed him to the Natural History Museum at the University of Illinois, while Taylor ultimately sold his to the Field Museum of Natural History.

During the 1950s, 1960s, and 1970s much herpetological collecting in Kansas persisted under the direction of Henry Fitch and William Duellman and their respective graduate and undergraduate students and KU staff. Notable among them were Michael Plummer, Richard Seigel, Joseph Slowinski, Robert Henderson, John M. Legler, Laurence M. Hardy, Charles J. Cole, Donald R. Clark, Dwight R. Platt, John Simmons, Linda Trueb, George Pisani, Charles W. Meyers, Janalee P. Caldwell, Harry Greene, Robert Fleet, Richard Lattis, Kelly Irwin, Al Kamb, David M. Hillis, Darrel R. Frost, Errol Hooper, Tom A. Titus, Joseph R. Mendelson III, James L. Knight, and Eric Rundquist (to name a few).

The late 1960s saw the arrival of Joseph T. Collins, and a renewed and focused interest in the distribution and natural history of herpetofauna across the state that has continued to present. In 1974, the Kansas Herpetological Society (KHS) was founded, which served to coordinate the efforts of academia with an eager supply of interested volunteers, having a common goal of increasing our overall understanding of the state's herpetofauna. While field trips were always a popular component of the KHS, they became more standardized during the late 1980s with the introduction of organized herpetofaunal counts by Larry L. Miller and Joseph T. Collins. In the 1990s, systematic road surveys were added to the KHS field trips.

The collection of the Sternberg Museum (MHP) got a boost upon the arrival of Gene Fleharty in 1962. He and his students contributed significant numbers of specimens from western and southeastern Kansas. Much of the activity at the Sternberg Museum since 1997 can be attributed to the authors, with special reference to the past two years (2004/5) during which, with assistance of a State Wildlife Grant from the Kansas Department and Wildlife and Parks and United States Fish and Wildlife Service, they contributed more cataloged Kansas specimens than in any previous two-year period.

The cumulative result of a century and a half of herpetofaunal collecting in Kansas is illustrated in Figure 3. The distribution of Kansas' amphibians, reptiles, and turtles is probably better understood than any similar sized geographic region in the world.

Recent collections have taken into account the future need to assess molecular characters (karyotypes, proteins, DNA, etc.) by properly preserving and storing specific tissues. And from the foresight of their collection, they become immediately available when a researcher requires them. While there are still many gaps to fill, Kansas overall is well represented in the amount of tissues stored and available for such analyses. The next step is to continue these efforts at finer levels. The results will allow us to examine how the herpetofauna interacts at various ecological levels across the state and will provide the data needed to assess future changes in

distribution and diversity.

State law prohibits the collection of Threatened, Endangered, or SINC amphibians, reptiles, or turtles without a scientific collecting permit. Kansas has a rich supply of amateur herpetologists conducting field work throughout the state. We believe the Kansas Department of Wildlife and Parks should allow the collection of sensitive species by willing individuals, as they are encountered. To do so, would provide positive proof of identification, verify occurrences, and in the process increase our knowledge of their respective habits, habitats, and distribution in the state.

Over our careers we have become aware of innumerable discoveries of sensitive species; however, the discoverer was unable to collect the animal; nor could they legally position it for a photograph. The herpetological permit reviewers at the Louisiana Department of Wildlife and Fisheries encourage the collection of sensitive species, and it has produced several substantial contributions to the collective knowledge of sensitive species in that state (Jeff Boundy [LDWF], pers. com.).

Commercial collecting aside, most states need a better working relationship with herpetological enthusiasts, recognizing them as the important volunteers they are. Most, if not all, of the sensitive herpetological species in Kansas are not rare. For any number of reasons (e.g., being secretive, fossorial, or aquatic), rarity is perceived and not actual. It is therefore important that any observations of our sensitive taxa be verified and documented to the greatest extent possible.

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Appendix 1. Museum collections containing Kansas material.
AMNH, American Museum of Natural History, New York; *ANSP*, Academy of Natural Sciences, Philadelphia; *ASU*, Arizona State University, Tempe; *AUNHMLC*, Auburn University Museum, AL; *BC*, Bethel College, Newton, KS; *BYU*, Monte L. Bean Life Science Museum, Brigham Young University, Provo, UT; *CAS*, California Academy of Science, San Francisco; *CAS-SUA*, Stanford University, now at CAS; *CHAS*, Chicago Academy of Sciences, IL; *CMNH*, Carnegie Museum of Natural History, Pittsburgh, PN; *FLMNH*, Florida State Museum, Gainesville, FL; *FMNH*, Field Museum of Natural History, Chicago, IL; *INHS*, Illinois Natural History Survey, Champaign; *JFBM*, Bell Museum of Natural History, St. Paul, MN; *KU*, University of Kansas Museum of Natural History, Lawrence; *LACM*, Los Angeles County Museum; *LSUMZ*, Louisiana State University Museum of Natural Science, Baton Rouge; *MCZ*, Museum of Comparative Zoology, Cambridge, MA; *MHP*, Sternberg Museum of Natural History, Hays, KS; *MPM*, Milwaukee Public Museum, WS; *MSU*, The Museum, Michigan State University, East Lansing; *MVZ*, Museum of Vertebrate Zoology, University of California, Berkeley; *OU*, Sam Noble Museum of Natural History, Norman; *ROM*, Royal Ontario Museum, Toronto, CAN; *SDSNH*, San Diego Natural History Museum, CA; *SIUC*, Southern Illinois University, Carbondale; *TCWC*, Texas Cooperative Wildlife Collection, College Station; *TNHC*, Texas Natural History Collection, University of Texas, Austin; *TTU*, Texas Tech University, now at TNHC; *UCM*, University of Colorado Museum, Boulder; *UG*, University of Georgia, Athens; *UIMNH*, University of Illinois Center for Biodiversity, Champaign; *UMMZ*, Museum of Zoology, University of Michigan, Ann Arbor; *USNM*, United State National Museum, Washington, DC; *UTEP*, Centennial Museum, University of Texas El Paso; *YPM*, Yale Peabody Museum, New Haven, CT.

The Kansas Herpetological Society

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

Membership

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, either gratis or at a discount.

Field Trips

The KHS hosts two or more field trips each year, one in the spring and one in the fall. Field trips are an enjoyable educational experience for everyone, and also serve to broaden our collective understanding of the distribution and abundance the amphibians, reptiles, and turtles in Kansas. All interested persons are invited to attend.

Editorial Policy

The Journal of Kansas Herpetology, issued quarterly (March, June, September, and December), publishes all society business.

Submission of Manuscripts

As space allows, *JKH* publishes all manner of news, notes, and articles. Priority of publishing is given to submissions of Kansas herpetological subjects and by KHS members, however all submissions are welcome. The ultimate decision concerning the publication of a manuscript is at the discretion of the Editor. Manuscripts should be submitted to the Editor in an electronic format whenever possible. Those manuscripts submitted in hard copy may be delayed in date of publication. 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. In the interest of consistency and clarity the common names used in *JKH* will follow the latest edition of standardized common names as organized by CNAH (www.cnah.org), which are also used in the prior, current and subsequent editions of *Amphibians and Reptiles in Kansas* (currently Collins and Collins, 1993).

Submission of Original Artwork.

Pen and ink illustrations and photographs are also welcomed. Illustrations and photographs will be returned to the author only upon request.

Advertisements

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.

Peer-reviewed manuscripts

JKH publishes original peer-reviewed submissions under the Articles section. Upon review, acceptance, and publication, Portable Document File (PDF) copies are provided gratis to the author on request.

Societal Awards, Grants, and Recognitions

Distinguished Life Members

Individuals selected as Distinguished Life Members are chosen by the KHS Executive Council based on their distinguished research publications on Kansas herpetology.

Bronze Salamander Award

Established in 1987, this Award is presented to those individuals whose efforts and dedication to the Kansas Herpetological Society go far beyond the normal bounds. The recipients of this Award have given exemplary service to the KHS, and are presented with an elegant bronze sculpture of a Barred Tiger Salamander. Candidates for the Award are chosen by the KHS Executive Council.

The Howard K. Gloyd - Edward H. Taylor Scholarship

The Gloyd-Taylor Scholarship is present annually by the Kansas Herpetological Society to an outstanding herpetology student. 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.

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 will be selected by the KHS Awards Committee. The award of $100 is given annually. If no qualified proposals are submitted, no award will be made for that year.

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

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, reptiles, and turtles 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. In even-numberd years, the Award is bestowed upon an individual who, in the preceding two calendar years, had published a paper of academic excellence on the native species of Kansas amphibian, reptile, and/or turtle and 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, reptiles, and/or turtles. The Collins Award is minimally $1,000.00, and is neither a grant nor a scholarship. No nominations or applications can be made for it.

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