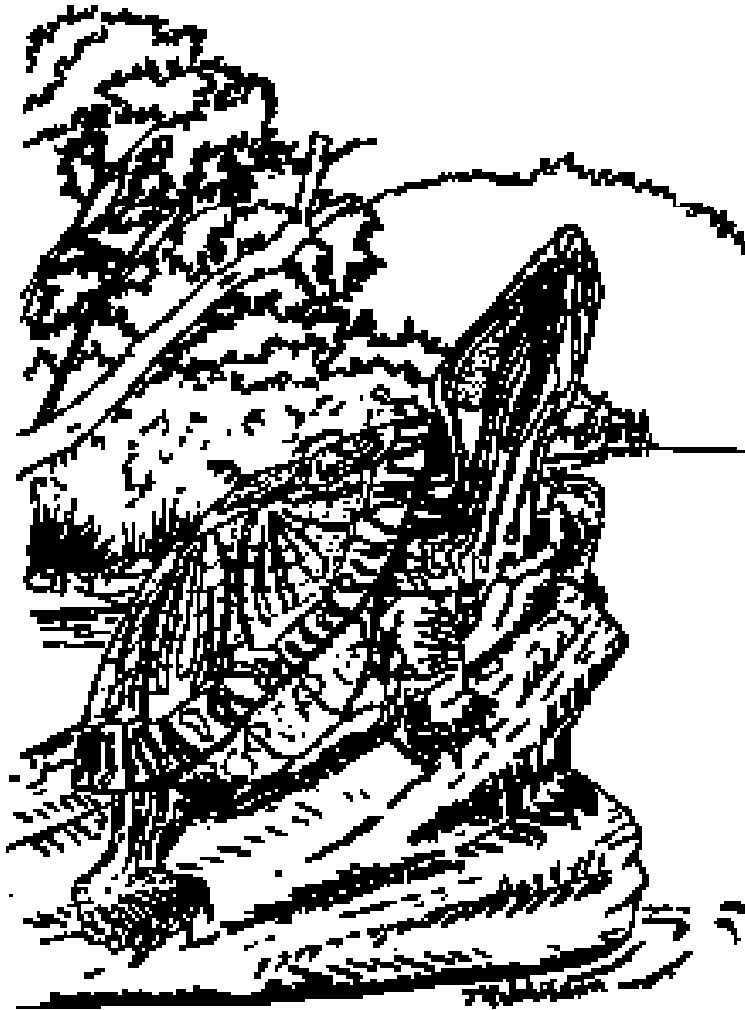


Missouri Herpetological Association



Newsletter

Number 7

1994

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MISSOURI HERPETOLOGICAL ASSOCIATION NEWSLETTER NO. 7

INTRODUCTION

The Seventh Annual Meeting of the **Missouri Herpetological Association** took place on 24-25 September 1994 at the Reis Biological Station near Steelville in Crawford County, Missouri. This organization is designed to provide herpetologists in Missouri and surrounding states with an opportunity to meet and exchange ideas regarding current efforts in research and other professional activities. High on the list of priorities is to provide students, involved in research at either the graduate or undergraduate level, 1) the chance to interact with senior herpetologists, and 2) an outlet to present, in a semi-formal setting, the results of their labors.

This Newsletter is the result of a decision made at the inaugural meeting to provide a means of publicly acknowledging papers presented at this and subsequent Annual Meetings. Further, the Newsletter will inform the herpetological community of new distributional and size records of Missouri's herpetofauna and serve to provide an outlet for the publication of short notes dealing with the state's amphibians and reptiles.

At this time the Association would again like to acknowledge the contribution of Dr. Nevin Aspinwall, of the Reis Biological Station, for allowing us the use of the Station's excellent facilities.

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ANNOUNCEMENT

7th Annual Meeting of the Missouri Herpetological Association

The 8th Annual Meeting of the **Missouri Herpetological Association** will be held on 23-24 September 1995 at the Reis Biological Station. Registration forms and calls for papers will be mailed at a later date. For more information please contact Tom R. Johnson at (314) 751-4115 or write:

Tom R. Johnson
Missouri Department of Conservation
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Jefferson City, MO 65102

**Abstracts of Papers presented at the Seventh Annual Meeting
of the
Missouri Herpetological Association
24-25 September 1994**

THE COST OF REPRODUCTION IN MALE SNAKES

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The cost of reproduction in female snakes is enormous. Females often devote a large amount of their annual energy budget to the production of offspring. In addition, the increase in weight associated with reproduction may restrict foraging for food and hinder escape from predators. In contrast, males contribute little energy directly into the production of offspring; however, other costs associated with reproduction may be high. We examined the frequency of encounters between humans and *Crotalus horridus* and *Arizona elegans* to determine how exposure to and mortalities by humans varies with the season and the sex of the snake. In *C. horridus* we found that encounters between humans and male snakes are much greater than with female snakes (2.9:1.0), particularly so during the mating period (3.9:1.0). Data on mortalities of *C. horridus* resulting from human encounters parallel the above results. In *A. elegans* we found that mortalities resulting from humans were significantly greater for males than females during the mating season (6.5:1) compared to the non-mating season (1.8:1).

We interpret these data as constituting a cost to the male (exposure to predators) resulting from male reproductive behavior (prolonged mate searching polygyny). Although humans are a source of predation in our study, the exposure to humans also represents increased exposure to native predators and thus is a measure of the differential mortality costs to males resulting from mate searching behaviors.

**NATURAL HABITAT DISTURBANCES AND HYBRIDIZATION BETWEEN TWO SPECIES
OF MISSOURI LEOPARD FROGS (*Rana pipiens* COMPLEX)**

Sean M. Stone, Matthew M. Nelson, and Richard D. Sage

Division of Biological Sciences, University of Missouri, Columbia MO 65211

The record flooding of the Missouri River in 1993 washed away the breeding habitat and displaced frogs living on the floodplain. Our goal was to study the effects that this habitat disturbance had on the breeding behavior of two species of leopard frogs (*Rana blairi* and *R. sphenoccephala*) during the first spring after the flood.

We determined the genetic and species identity of 879 tadpoles and frogs using protein electrophoresis. Tadpoles collected from three localities during two years prior to the flooding established that each species bred by itself, with *R. blairi* using ponds in open habitats and *R. sphenoccephala* using ponds at the edge of the floodplain. At the maximum extent of flooding (August 1993), adults of both species were collected together at the edge of the floodplain and at upland sites. Four percent of these adults were first-generation hybrids, and 11% more showed signs of further introgressive hybridization. Collections of larvae taken from 21 breeding ponds this year showed: 1) *R. blairi* reoccupied the open floodplain habitat; 2) the two species bred in ponds at both the edge of the floodplain and in upland valleys; and 3) first-generation hybrids were found in only two of the 12 ponds where the species bred together.

We conclude that the habitat disturbance caused by the flooding led these two species to breed more frequently in the same ponds. But, it is not clear that breeding together has led to more hybridization than occurred prior to the flooding.

**IDENTIFICATION OF THE PARENTS OF HYBRIDS BETWEEN TWO SPECIES OF MISSOURI
LEOPARD FROGS (*Rana pipiens* COMPLEX) USING MATERNALLY INHERITED GENETIC MARKERS**

Matthew M. Nelson, Ronald S. Klann, and Richard D. Sage

Division of Biological Sciences, University of Missouri, Columbia MO 65211

We discovered that 4% of the leopard frogs living along the Missouri River near Jefferson City, Missouri were first-generation hybrids between *Rana blairi* and *R. sphenoccephala*. It was the goal of our research to learn whether there is a bias in which species acts as the male and female parent in interspecific crosses. Understanding the direction of hybridization could provide insights about the mating behavior at the ponds, and about patterns of genetic introgression into the gene pools of these species. An organism's mitochondrial genome is inherited from its mother, and we used this DNA molecule as a marker of the female involved in the interspecific cross.

Nine first-generation hybrids were identified from their genotypes at four enzyme loci that are inherited from both parents. Samples of mtDNA were isolated from these hybrids and from representative individuals of both parental species. Part of the mitochondrial cytochrome *b* gene from each specimen was amplified using the polymerase chain reaction (PCR) method. Amplified DNA was sequenced using the Sanger method and Sequenase™ enzyme. The DNA also was denatured and separated on polyacrylamide gels. The sequencing method shows which base pairs differ between the species. The denaturation method shows mobility differences on the gel between sequences of the two species. Our results indicated that *R. sphenoccephala* was the female parent of one adult and of three hybrid tadpoles from one pond.

A possible explanation for this kind of mating is the partial separation in breeding seasons between the species. Male *R. blairi* start calling towards the end of the breeding season of *R. spenocephala*, giving them the best opportunity to hybridize with females of the latter species.

THE DIET OF THE ENDEMIC HISPANIOLAN TOAD, *Peltophryne guentheri*

Keely J. Parsons and Robert Powell

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The diet of *Peltophryne guentheri* has not been described. This endemic Hispaniolan toad occupies largely xeric lowland habitats throughout Hispaniola. Stomachs taken from a total of 204 individuals (90 juveniles, 65 adult females, and 49 adult males), collected during various months from a variety of locations on Hispaniola, were examined. Adult status was determined by the presence of eggs in females and enlarged testes in males.

Prey was present in the stomachs of 105 individuals (empty stomachs were probably attributable to some animals having been collected early in the evening before feeding had commenced). Stomach contents were analyzed and arthropods were identified to order, counted, and volumes of all food items were determined using fluid displacement. Eleven orders of arthropods were found. Ants were present in the greatest number (636 of 1109 food items) and were found in the most stomachs (59). Adult beetles constituted the greatest volume (1.95 of 6.34 cm³ total prey volume) and were found in 53 stomachs. Eight stomachs contained grit and 49 contained plant matter (ingestion of which was presumably adventitious).

No significant differences (Wilcoxon signed-rank test) existed between the diets of males and females ($Z = -1.14$, $P = 0.26$) or between those of adults and juveniles ($Z = -1.08$, $P = 0.28$). Snout-vent length was positively correlated with mean prey size (Spearman rank correlation, $Z = 3.95$, $P < 0.01$). Importance values were used to calculate Levin's measure of niche breadth. A calculated breadth of 0.61 suggests that *Peltophryne guentheri* is a dietary generalist despite the prevalence of ants and beetles in the stomachs examined.

BODY SUZE ASYMMETRIES INFLUENCE AGONISTIC DISPLAYS BY THE OZARK ZIGZAG SALAMANDER, *Plethodon dorsalis*

Eric Britzke and Alicia Mathis

Department of Biology, Southwest Missouri State University, Springfield MO 65804

When animals differ visibly in competitive ability, contests are predicted to be settled quickly; the asymmetry alone should be sufficient to determine the "winner" of the contest. We tested the hypothesis that asymmetries in body size (a possible indicator of competitive ability) are used to settle contests between adult male Zigzag Salamanders. We paired males with other males of either the same size (± 1 mm SVL) or of a different size (≥ 4 mm difference in SVL) and observed their behavior for 30 min. The primary behavioral pattern that we quantified was ATR (all of the trunk raised off of the substrate), a presumed aggressive display. The males in our study exhibited significantly more ATR when paired with individuals of the same size than when paired with either larger or smaller males. In addition, previous experience appears to influence aggressive displays of smaller salamanders, but apparently not of larger individuals. Therefore, relative body size may be only one of the factors influencing the outcome of aggressive contests between salamanders.

SUMMER DIURNAL HABITAT ANALYSIS OF THE OZARK HELLBENDER, *Cryptobranchus alleganiensis bishopi*

Timothy M. Fobes and Robert F. Wilkinson, Jr.

Department of Biology, Southwest Missouri State University, Springfield MO 65804

During the summers of 1993-4 we investigated the diurnal habitat of the Ozark Hellbender, *Cryptobranchus alleganiensis bishopi*, on the North Fork of the White River in Ozark County, Missouri. We captured 254 hellbenders at 25 different study sites and quantified microhabitat variables at capture locations. The variables measured included cover rock length and width, water depth, water velocity, and substrate association. The data presented indicate a range of values for each variable in which hellbenders normally exist. Hellbenders were found to utilize cover rocks with 0% embeddedness most frequently (143/167 observations). Embeddedness is an estimate of the amount of gravel/rubble present around the edges of a cover rock. Future work will consist of analyzing transect data collected during 1994 to determine which macrohabitat features are most important to hellbenders, and how these features influence hellbender abundance.

PREY DETECTION BY THE RINGNECK SNAKE (*Diadophis punctatus*)

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Detection of prey is the first step in a successful predation event, and the ability of a predator to detect and identify substrate chemicals associated with prey can enhance foraging success. I designed experiments to determine: 1) if a predator (*Diadophis punctatus*) uses substrate chemicals to detect a prey species (*Plethodon cinereus*); 2) if the detection and identification of *P. cinereus* is dependent on the territorial status of *P. cinereus*; 3) if *D. punctatus* responds to the substrate chemicals of a non-prey species (*Ambystoma opacum*); and 4) if substances produced by the ventral surface of the tails and bodies of *P. cinereus* are equally attractive to *D. punctatus*. The predator focused its movements equally in areas marked by substrate chemicals of both residents and floaters (individuals not holding territories) of *P. cinereus*, but failed to respond to the substrate chemicals of *A. opacum*. Individuals of *D. punctatus* also showed an increase in the rate of tongue flicking towards swabs containing substances

obtained from the ventral surface of the tails of *P. cinereus*. Thus, *D. punctatus* may use substrate chemicals originating from the tails of their prey to locate areas where the probability of encountering prey is relatively high by detecting chemicals deposited on the substrate by prey.

UTILIZATION OF LCTA PLOT SUMMARY METHODOLOGY FOR REPTILE AND AMPHIBIAN SURVEYS

R. Brent Thomas and Lynn Robbins

Department of Biology, Southwest Missouri State University, Springfield MO 65804

Surveys of reptiles and amphibians were conducted using LCTA plot methodology. Surveys were conducted separately on two Army National Guard bases in southwestern Missouri (camps Clark and Crowder). This methodology first requires the identification of the most common habitats present on the sites and categorization of these habitats according to slope, vegetation type, and soil type. Transects utilizing a pitfall array then are constructed at random locations within these different habitats. The survey at Camp Crowder yielded 15 species of reptiles and 14 species of amphibians; the survey at Camp Clark yielded 24 species of reptiles and eight species of amphibians. This methodology failed to capture several species that are likely to be present at the two sites. The failures and means to correct them will be discussed.

LIFE HISTORY AND ECOLOGY OF THE MISSOURI RIVER COOTER, *Pseudemys concinna*

Lisa K. Turner, Don Moll, and R. Brent Thomas

Department of Biology, Southwest Missouri State University, Springfield MO 65804

The effects, if any, on the reproduction, diet, and growth of *Pseudemys concinna* in one population inhabiting a thermally depressed environment will be compared to another population inhabiting a normothermic environment. The two sites chosen in Lake Taneycomo, Taney County, Missouri, have exhibited consistent temperature differences since the completion of Table Rock Dam in 1958. The infusion of hypolimnion from Table Rock Lake made Lake Taneycomo a cold water reservoir. A total of 178 individuals (116 males, 62 females) were collected in 1993-4, using fyke nets. Relative abundance of *P. concinna* in 1993 was 13.3% compared to sympatric species, and 18.2% in 1994. Objectives of this project include estimating annual reproductive potential based on the analysis and measurement of enlarged follicles, number of corpora lutea, and weights and measurements of oviductal eggs from dissected females. Egg mass index (EMI) and relative clutch mass (RCM) are presented, as well as estimates of size at sexual maturity and sex ratios. Composition, percent of total volume, and percent frequency of food items found in digestive tracts of individuals of both sexes will be determined. Comparison of growth rates for the two populations will rely on analysis of annually-formed plastral growth zones.

THE ROLE OF CHEMICAL AND VISUAL CUES IN RECOGNITION OF PREDATORS BY LARVAL CENTRAL NEWTS, *Notophthalmus viridescens*

Frank Vincent and Alicia Mathis

Department of Biology, Southwest Missouri State University, Springfield MO 65804

Prey may use a variety of cues to identify potential predators. Chemical cues may be of particular importance when visibility is limited, such as for aquatic animals in cloudy water. Central Newt larvae often occur in the same ponds with predatory larval Tiger Salamanders (*Ambystoma tigrinum*). In our study, larval newts responded to chemical stimuli from larval Tiger Salamanders by decreasing their activity, whereas they generally exhibited increased activity in response to control stimuli (chemical cues from a feeding stimulus [brine shrimp] for from a presumably neutral stimulus [anuran tadpoles]). Decreased activity may function as an antipredator response because it may lead to decreased detection by the predator. When chemical cues were absent, the newt larvae failed to distinguish between Tiger Salamander larvae and anuran tadpoles, suggesting that chemical cues may be more important than visual cues in predator recognition by larval newts. Older newt larvae that were close to metamorphosis were rejected as prey by Tiger Salamander larvae in the laboratory. The older newt larvae did not differ in their responses to chemical stimuli from Tiger Salamanders versus control stimuli. Newt larvae may be safe from predation by Tiger Salamander larvae during the critical time near and during metamorphosis.

A SKELETOCHRONOLOGICAL APPROACH TO DETERMINE THE AGE OF RINGED SALAMANDERS (*Ambystoma annulatum*) BY USING GROWTH RINGS FOUND IN PHALANGES

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In the fall of 1993 in Stone County, Missouri, 220 Ringed Salamanders (*Ambystoma annulatum*) were caught in a semi-permanent pond by using pit-fall traps and drift fence. The sex ratio strongly deviated from a 1:1, and approached 3:1 in favor of males. The average snouth-vent length of females (91.3 ± 7.4 mm) was significantly greater than that of males (83.7 ± 7.3 mm). Age of individuals is being estimated by counting the number of resting lines present in cross-sections of phalanges. Preliminary data suggest that the average number of resting lines present in females is 9.8 ± 2.2 and in males 9.4 ± 2.1 . The data also suggest that the approximate age of sexual maturity in females is 6-8 (SVL > 68 mm) and in males is 7-8 (SVL > 61 mm). The most resting lines present in an individual thus far is 18.

**THE MISSISSIPPI GREEN WATER SNAKE (*Nerodia cyclopion*) IN ILLINOIS:
STATUS AND DISTRIBUTION**

Scott R. Ballard

Illinois Department of Conservation, Alton IL 62002

Fieldwork was carried out in the La Rue Ecological Area of southern Illinois during 1988-93. Forty-four *Nerodia cyclopion* were documented with voucher specimens and/or photographs. Previous literature and documentation of Illinois *Nerodia cyclopion* are summarized. Historical and ecological limiting factors are presented, and the status of *Nerodia cyclopion* at the northern edges of its range are discussed.

NEW RECORDS OF AMPHIBIANS AND REPTILES IN MISSOURI FOR 1994

Robert Powell¹, Tom R. Johnson², and Donald D. Smith³

¹ Avila College, Kansas City MO 64145

² Missouri Department of Conservation, Jefferson City MO 65102

³ University of Kansas Medical Center, Kansas City KS 66103

The new county or maximum size records listed below are those accumulated or brought to our attention since previous updates (Johnson and Powell 1988, Powell et al. 1989, 1990, 1991, 1992, 1993a, 1993b) of records listed in Johnson (1987). Publication of this list allows us to express appreciation to the many individuals who contributed specimens or information. Further, recipients of this list have the opportunity to update range maps and listings of size maxima. Finally, these new records represent information that extends our knowledge of these animals in Missouri.

The specimens listed represent the first records for the given county based on preserved, cataloged voucher specimens (unless indicated as observations only). Size records require the deposition of the specimen in an institutional collection. All specimens collected must be taken under the auspices of a valid state permit.

All new records listed here are presented in the standardized format of Collins (1989, 1990): common and scientific name, county, specific locality (when available or unless withheld for rare or endangered species), date of collection (when available), collector(s), and place of deposition and catalog number (if available or applicable). If the record was published elsewhere, the citation is given. New size maxima are presented in accordance with criteria established by Powell et al. (1982) and are expressed in both metric and English units, but the metric value is the precise measure (the English equivalent is only an approximation).

The following acronyms apply to institutional collections in which specimens are deposited: BWMC - Bobby Witcher Memorial Collection, Avila College, Kansas City, MO; DMNH - Dallas Museum Of Natural History, Dallas, TX; INHS - Illinois Natural History Survey, Wood River, IL; KU - University of Kansas Museum of Natural History, Lawrence, KS; MDC - Missouri Department of Conservation, Jefferson City, MO; NWMSU - Northwest Missouri State University, Maryville, MO; UMC - University of Missouri, Columbia, MO; USNM - U.S. National Museum, Washington, DC.

NEW COUNTY RECORDS

Amphibia: Caudata

SMALLMOUTH SALAMANDER

Ambystoma texanum

RANDOLPH CO: HW 3 at Middle Fork of Chariton River S2 T54N R16W, 25 September 1994, R. Powell (BWMC 05569).

Amphibia: Anura

BLANCHARD'S CRICKET FROG

Acris crepitans blanchardi

KNOX CO: HW E at South Fabius River S23 T60N R10W, 25 September 1994, K.J. Parsons (BWMC 05563).

MADISON CO: HW J at Castor River S4 T33N R8E, 2 August 1994, C. Huntington and R. Powell (BWMC 05556).

PERRY CO: HW O 2.0 mi E HW 51 S28 T34N R10E, 2 August 1994, C. Huntington and R. Powell (BWMC 05551).

RANDOLPH CO: HW C at East Fork of Chariton River S26 T54N R15W, 25 September 1994, R.L. Smith (BWMC 05568).

SHELBY CO: HW T (N of HW 36) at Salt River S31 T57N R9W, 25 September 1994 W.Y. Cashell (BWMC 05562).

Note: This species has now been documented from every county in Missouri, the first amphibian or reptile for which this has been accomplished.

EASTERN AMERICAN TOAD

Bufo americanus americanus

KNOX CO: HW E at South Fabius River S23 T60N R10W, 25 September 1994, R. Powell (BWMC 05564). **PERRY CO:** HW O 2.0 mi E HW 51 S28 T34N R10E, 2 August 1994, C. Huntington and R. Powell (BWMC 05552).

FOWLER'S TOAD

Bufo woodhousii fowleri

ST. CHARLES CO: Ellis Island Riverlands Road S 26 T48N R7E, 2 April 1993, J.K. Tucker (INHS 10981-6) (Tucker and Theiling, 1994a).

NORTHERN SPRING PEEPER

Pseudacris crucifer crucifer

LIVINGSTON CO: Grand River ca. 10 mi SE Chillicothe S31 T57N R22W, 21 August 1994, S. Hogan, D.D. Smith, and F. Blake (BWMC 05549).

WESTERN CHORUS FROG

Pseudacris triseriata

NEWTON CO: Camp Crowder, June 1993, SMSU Survey (BWMC 05572).

BULLFROG

Rana catesbeiana

RANDOLPH CO: HW 3 at Middle Fork of Chariton River S2 T54N R16W, 25 September 1994, R. Powell (BWMC 05570).

GREEN FROG

Rana clamitans melanota

KNOX CO: HW E at South Fabius River S23 T60N R10W, 25 September 1994, R. Powell (BWMC 05565).

WOOD FROG

Rana sylvatica

MACON CO: 3.5 mi W Ethel S28 T59N R17W, 14 March 1994, T.R. Johnson, S. Hein, and D. Hein (KU cat. no. pending). **Note:** Previously reported from this county by Conant (1975), but the specimen was lost. This record reaffirms the presence of this population.

Reptilia: Testudines

COMMON SNAPPING TURTLE

Chelydra serpentina serpentina

AUDRAIN CO: HW N 1.5 mi S Martinsburg S26 T50N R7W, 7 September 1994, T.R. Johnson (KU cat. no. pending). **ST. CLAIR CO:** HW 13 400 m S HW CC S32 T39N R25W DOR, 12 May 1994, R. Powell (BWMC 05559). **TANEY CO:** Lake Taneycomo S29 T23N R20W, April 1992, R.B. Thomas (sight record only, photo on file with MDC).

FALSE MAP TURTLE

Graptemys pseudogeographica pseudogeographica

PEMISCOT CO: Wolf Bayou Conservation Area S3 T20N R13E, 10 August 1994, P. Shipman and D. Riedle (KU cat. no. pending). **TANEY CO:** Lake Taneycomo S29 T23N R20W, May 1992, R.B. Thomas (sight record only, photo on file with MDC).

COMMON MUSK TURTLE

Sternotherus odoratus

ST. CHARLES CO: Ellis Island Riverlands Road S 26 T48N R7E, 8 July 1993, J.K. Tucker (INHS 10987) (Tucker and Theiling, 1994b).

EASTERN BOX TURTLE

Terrapene carolina carolina

PEMISCOT CO: Wolf Bayou Conservation Area S3 T20N R13E, 10 August 1994, P. Shipman and D. Riedle (sight record only, photographs on file at MDC). **Note:** This represents the first record of this subspecies in an unincorporated area of the state and may represent a link to the Illinois population resulting from an historic change in the Mississippi River channel.

THREE-TOED BOX TURTLE

Terrapene carolina triunguis

LAFAYETTE CO: I-70 1.7 mi E HWs M and O S35 T49N R27W DOR, 22 May 1994, D.D. Smith (BWMC 05548). **PERRY CO:** HW J 1.8 mi W HW 51 S26 T34N R9E DOR, 2 August 1994, C. Huntington and R. Powell (BWMC 05555).

RED-EARED SLIDER

Trachemys scripta elegans

ST. FRANCOIS CO: HW 67 in Farmington T35N R5E DOR, 2 August 1994, C. Huntington and R. Powell (BWMC 05558).

Reptilia: Squamata: Sauria

SOUTHERN COAL SKINK

Eumeces antracinus pluvialis

MONITEAU CO: 4 mi SW Sandy Hook S27 T46N R14W, 17 April 1994, R. Krager (KU cat. no. pending). **NEWTON CO:** Camp Crowder, June 1993, SMSU Survey (BWMC 05571).

FIVE-LINED SKINK

Eumeces fasciatus

KNOX CO: HW E at South Fabius River S23 T60N R10W, 25 September 1994, R. Powell (BWMC 05566). **PERRY CO:** HW O 2.0 mi E HW 51 S28 T34N R10E, 2 August 1994, C. Huntington and R. Powell (BWMC 05553).

GROUND SKINK

Scincella lateralis

FRANKLIN CO: Meramec State Park, 16 June 1950, M. Weller (DMNH 1867)(Vance, 1994). **MONITEAU CO:** 1.5 mi S Sandy Hook S14 T46N R14W, 17 April 1994, R. Krager (KU cat. no. pending).

Reptilia: Squamata: Serpentes

WESTERN WORM SNAKE

Carphophis amoenus vermis

MONITEAU CO: 1.5 mi S Sandy Hook S14 T46N R14W, 17 April 1994, R. Krager (KU cat. no. pending).

TIMBER RATTLESNAKE

Crotalus horridus

REYNOLDS CO: Deer Run State Forest Road 10 S16 T29N R1W, 19 April 1993, T.M. Fobes (sight record only, photo on file with MDC).

PRAIRIE RINGNECK SNAKE

Diadophis punctatus arnyi

KNOX CO: HW E at South Fabius River S23 T60N R10W, 25 September 1994, R. Powell (BWMC 05567).

BLACK RAT SNAKE

Elaphe obsoleta obsoleta

LAWRENCE CO: HW 96 at Phelps S32 T29N R27W DOR, 2 August 1994, V.D. von Frese (BWMC 05560). **MADISON CO:** HW J 2.1 mi E HW 72 S7 T33N R7E DOR, 2 August 1994, C. Huntington and R. Powell (BWMC 05557).

PRAIRIE KINGSNAKE

Lampropeltis calligaster calligaster

OSAGE CO: 1.5 mi W Cooper Hill S34 T43N R7W, 2 October 1994, G. Emich (KU cat. no. pending).

RED MILK SNAKE

Lampropeltis triangulum sypila

BENTON CO: 0.2 mi E Edwards S7 T39N R20W DOR, 5 June 1994, P. Bredekopf (BWMC 05547).

YELLOWBELLY WATER SNAKE

Nerodia erythrogaster flavigaster

PERRY CO: HW O 2.0 mi E HW 51 S28 T34N R10E, 2 August 1994, C. Huntington and R. Powell (BWMC 05554).

DIAMONDBACK WATER SNAKE

Nerodia rhombifer rhombifer

RAY CO: Sunshine Lake S30 T51N R27W, 4 July 1994, S.G. Thornhill and D.D. Smith (BWMC 05550).

MASSASAUGA RATTLESNAKE*Sistrurus catenatus*

COOPER CO: I-70 rest area 1.5 mi S Booneville S13 T48N R16W, 15 September 1994, J. Schwartz and W. Roper. **Note:** A visitor to the rest area (W. Roper of Colorado) was bitten on the right hand as he rested near a planter. Other neonates were seen at the site. The snake was taken to the hospital where it was identified, killed, and preserved in alcohol.

MIDLAND BROWN SNAKE*Storeria dekayi wrightorum*

ST. CHARLES CO: Ellis Island Riverlands Road S 26 T48N R7E, 26 May 1993, J.K. Tucker (INHS 10990) (Tucker and Theiling, 1994c).

NORTHERN REDBELLY SNAKE*Storeria occipitomaculata occipitomaculata*

NEWTON CO: Camp Crowder, June 1993, SMSU Survey (BWMC 05573).

WESTERN RIBBON SNAKE*Thamnophis proximus proximus*

REYNOLDS CO: Deer Run State Forest Road 1 S16 T29N R1W, 20 April 1993, T.M. Fobes (sight record only, photo on file with MDC).

NEW MAXIMUM SIZE RECORD**Reptilia: Squamata: Sauria****RED-EARED SLIDER***Trachemys scripta elegans*

LAFAYETTE CO: Lexington T51N R27W, 9 July 1994, P. Libbus (BWMC 05546). Carapace length: 292 mm (11.5 in). This exceeds the record for this subspecies cited in Conant and Collins (1991).

APPENDIX**UPDATED SIZE RECORDS FOR AMPHIBIANS AND REPTILES IN MISSOURI****Robert Powell**

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A number of size records have accumulated since the publication of Johnson (1987). Such records are of considerable interest and may provide important life history information (see Powell et al. 1982). Herein is given a complete list of available size records for all species of amphibians and reptiles known to occur in Missouri.

Size records require the deposition of a catalogued voucher specimen in an institutional collection. Whenever possible, collectors are encouraged to salvage roadkills, for example, rather than unnecessarily kill an exceptionally large individual. All specimens must be collected under the auspices of a valid state permit. Each entry consists of the species name (in alphabetical order), the county from which the specimen was taken, and the museum acronym and number. All measurements are given to the nearest millimeter.

AMPHIBIA: CAUDATA (SVL/TL)

Ambystoma annulatum Stone KU 088905 113/238
Ambystoma maculatum Boone BWMC 01609 100/213
Ambystoma opacum Washington KU 217170 77/128
Ambystoma talpoideum Stoddard UMC 1981C 68/109
Ambystoma texanum Cass BWMC 04955 102/183
Ambystoma tigrinum Camden UMC 117C 127/238
Amphiuma tridactylum Stoddard UMC 1571C 650/811
Cryptobranchus alleganiensis Dallas UMC 1547C 410/601
Eurycea longicauda Carter UMC 538C 57/150
Eurycea lucifuga McDonald KU 028059 65/177
Eurycea tynnerensis Taney UMC 1982C 51/102
Hemidactylium scutatum Wayne KU 115872 49/81
Necturus louisianensis No record available.
Necturus maculosus Morgan KU 089900 222/312
Notophthalmus viridescens Callaway UMC 348C 61/125
Plethodon albagula Butler KU 089732 81/169
Plethodon dorsalis Ozark KU 089681 42/81
Plethodon serratus Iron UMC 1667C 45/103
Siren intermedia Bollinger UMC 1541C 280/419
Typhlotriton spelaeus Stone KU 060779 59/109

AMPHIBIA: ANURA (SVL)

Acris crepitans Phelps KU 090660 33
Bufo americanus Jackson KU 090238 105
Bufo cognatus Jackson KU 090107 74
Bufo woodhousii St. Clair KU 090533 96

Gastrophryne carolinensis Dallas KU 220524 39
Gastrophryne olivacea Ray BWMC 00754 37
Hyla chrysoscelis Until the species identity of individual specimens in this complex can be determined, no record is listed. Powell (1982) listed a *Hyla chrysoscelis* / *versicolor* complex (sic) record of 51 mm (KU 090910 Benton).
Hyla cinerea Stoddard KU 176195 58
Hyla versicolor See note after *H. chrysoscelis*.
Pseudacris crucifer Wayne KU 176204 32
Pseudacris streckeri Dunklin KU 090705 38
Pseudacris triseriata Jackson BWMC 00357 38
Rana areolata Bates KU 220022 112
Rana blairi Jackson KU 091189 89
Rana catesbeiana Montgomery KU 218604
Rana clamitans Miller KU 091093 91
Rana palustris Dade BWMC 01879 66
Rana pipiens Atchison KU 204084 70
Rana sphenoccephala Cape Girardeau KU cat. no. not available 90
Rana sylvatica Stone USNM 58028 63
Scaphiopus holbrookii Dunklin KU 090080 69
Spea bombifrons Jackson KU 090043 52

REPTILIA: TESTUDINES (Carapace length)

Apalone mutica Benton BWMC 04281 305
Apalone spinifera Jackson BWMC 02821 358
Chelydra serpentina Jackson BWMC 04275 358
Chrysemys picta Grundy BWMC 01821 203

Deirochelys reticularia Stoddard UMC 33T 202
Emydoidea blandingii Miller KU 091330 236
Graptemys geographica Benton KU 177222 227
Graptemys ouachitensis Until the specific identity of individual specimens of this species complex is determined, no record is listed.
Graptemys pseudogeographica Pemiscot KU 091332 157
Kinosternon flavescens Barry KU 177109 131
Kinosternon subrubrum Wayne BWMC 03703 117
Macrochelys temminckii Stoddard UMC 36T 425
Pseudemys concinna Taney BWMC 05544 327
Sternotherus odoratus McDonald BWMC 01815 117
Terrapene carolina Stone KU 218670 154
Terrapene ornata Jackson BWMC 04368 140
Trachemys scripta Lafayette BWMC 05546 292

REPTILIA: SQUAMATA: SAURIA (SVL/TL)

Cnemidophorus sexlineatus Barry KU 218611 84/267
Crotaphytus collaris Boone UMC 44L 105/296
 Anderson (1965) listed a 322 mm record, but no specimen is available.
Eumeces anthracinus Stone BWMC 01782 63/166
Eumeces fasciatus Bollinger UMC 147L 72/186
Eumeces laticeps Boone KU 185893 108/268
Eumeces obsoletus Vernon KU 088556 99/248
Eumeces obtusirostris Barton KU 219997 66/177
Eumeces septentrionalis Harrison NWMSU 4015 75/203
Ophisaurus attenuatus Franklin KU cat. no. not available
 SVL unknown/713
Phrynosoma cornutum No record available.
Sceloporus undulatus Cedar BWMC 04267 81/185
Scincella lateralis Barton BWMC 04708 54/138

REPTILIA: SQUAMATA: SERPENTES (SVL/TL)

Agkistrodon contortrix Pettis BWMC 01428 801/913
 Anderson (1965) listed a 1041 mm record, but no specimen is available.
Agkistrodon piscivorus Stoddard KU 084341 921/1086
 Anderson (1965) listed a 1117 mm record, but no specimen is available.
Carphophis vermis Scotland BWMC 02590 333/376
Cemophora coccinea Camden UMC 72S 310/364
Coluber constrictor Pemiscot KU 081154 1015/1330
Crotalus horridus Ray KU 084437 1164/1257 Anderson (1965) listed a 1550 mm record, but no specimen is available.
Diadophis punctatus Holt KU 217202 395/477 See note regarding SVL in Powell et al. (1990).
Elaphe emoryi McDonald KU 081981 1029/1220
 Anderson (1965) listed a 1524 mm record, but no specimen is available.
Elaphe obsoleta Jackson BWMC 02117 1567/1872
 Anderson (1965) listed a 2133 mm record (Chicago

Academy of Science CA 8134) from Crawford County; specimen has not been examined.
Elaphe vulpina Holt KU 082077 970/1155 Anderson (1965) listed a 1524 mm record, but no specimen is available.
Farancia abacura Stoddard UMC 567S 962/1124
Heterodon nasicus Holt KU 082089 425/521 Anderson (1965) listed a 537 mm record, but no specimen is available.
Heterodon platirhinos St. Clair KU 083065 722/842
Lampropeltis calligaster Cass BWMC 01906 1132/1306
Lampropeltis getula Stoddard UMC 264S 923/1074
 Anderson (1965) listed a 1522 mm record, but no specimen is available.
Lampropeltis triangulum Jackson KU 082237 711/835
 Anderson (1965) listed a 914 mm record, but no specimen is available. A 927 mm specimen was collected on 25 June 1993 by C. Shulse in Ralls County, photographed, and released. This record cannot be verified without a voucher specimen. Photograph is on file at MDC.
Liochlorophis vernalis Cass KU 083100 299/462
Masticophis flagellum Wayne UMC 225S 1383/1761
Nerodia erythrogaster Livingston KU 082418 1023/1235
Nerodia fasciata Dunklin KU 082978 796/1014
Nerodia rhombifer New Madrid KU 082719 996/1272
 Anderson (1965) listed a 1370 mm record, but no specimen is available.
Nerodia sipedon Schuyler BWMC 02369 920/1163
Opheodrys aestivus Boone UMC 191S 570/735
Pituophis catenifer Vernon KU 083136 1564/1782
 Anderson (1965) listed a 1978 mm record, but no specimen is available.
Regina grahamii Jackson KU 082597 700/855
Sistrurus catenatus Holt KU 084563 681/764
Sistrurus miliarius Wayne KU 084590 437/550
Sonora semiannulata Taney UMC 568S 287/343
Storeria dekayi Lewis BWMC 02592 290/365
Storeria occipitomaculata Boone KU 185933 250/303
Tantilla gracilis Benton KU 051707 199/249
Thamnophis proximus Boone UMC 331S 578/801
 Anderson (1965) listed a 920 mm record, but no specimen is available.
Thamnophis radix Holt KU 083895 620/787 Anderson (1965) listed a 845 mm record, but no specimen is available.
Thamnophis sirtalis Ray BWMC 01103 788/980
Tropidoclonion lineatum Jackson BWMC 04250 380/438
Virginia striatula Moniteau KU cat. no. not available 262/314 See note regarding SVL in Powell et al. (1990).
Virginia valeriae Jackson BWMC 01714 342/393

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NOTES

A MEDITERRANEAN GECKO (*Hemidactylus turcicus*) FROM MISSOURI

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Hemidactylus turcicus is native to southern Europe and western Asia, but has become well-established in the Americas along the Gulf of Mexico and inland (McCoy, 1970). Numerous notes have documented the range expansion by this species (Censky, 1988), and several have speculated that much of its dispersal is due to transport by humans, for example with nursery stock. Herein I document an unintentional long-distance dispersal event via a private vehicle.

On 11 July 1994 I captured an adult male *Hemidactylus turcicus* in my garage in Lee's Summit, Jackson County, Missouri. Initially suspecting that it was an escaped pet, I soon discovered that my neighbors had recently returned from Homasassa, Citrus County, Florida, where they had purchased a pop-up camper. They noted that geckos were very common in the area. Their return trip consisted of a two-day visit in Orlando, Florida, and a leisurely drive home to Missouri. The camper was not set up after leaving Orlando.

The most probable scenario appears to be that of the lizard stowing-away, most likely in the camper. Although the likelihood of establishing a population in Missouri would appear very slim, similar occurrences of hitch-hiking could easily account for many of the isolated populations established by this species in the Americas.

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A POSSIBLE NEOTENIC TIGER SALAMANDER FROM MISSOURI

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Johnson (1987), in his account of the Tiger Salamander (*Ambystoma tigrinum*), stated that: "Neoteny (the condition of gilled adults) has been reported for this species, but to this date this has not been found in Missouri." A large (127 mm TL) specimen was collected on 25 March 1994 in Levengood Pond, 1 mi W Canton, Lewis County. As Tiger Salamanders in this pond had just begun to breed, this individual was certainly the product of a previous year.

Dorsal ground color was olive green. Numerous small dark green to black spots and blotches were present on all but the ventral surfaces. In addition, dorsolateral rows of small yellowish-green spot extended from behind the head to the base of the tail. Ventral ground color was light green.

Unfortunately the specimen died shortly after collection and was not preserved. Although I cannot confirm neoteny or rule out the possibility that this individual was introduced from stock distributed as fish bait, this large gilled individual does affirm, at least, that metamorphosis can be delayed for at least one year.

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**ADDITIONS TO THE BIBLIOGRAPHY OF REFERENCES
TO THE HERPETOFAUNA OF MISSOURI**

Compiled by

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Following is a list of references addressing the biology of amphibians and reptiles in Missouri which have been brought to my attention since the publication of Powell (1991, 1992, 1993) and Johnson (1987). Readers are requested to notify the author of any additional publications that should be included in future lists.

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