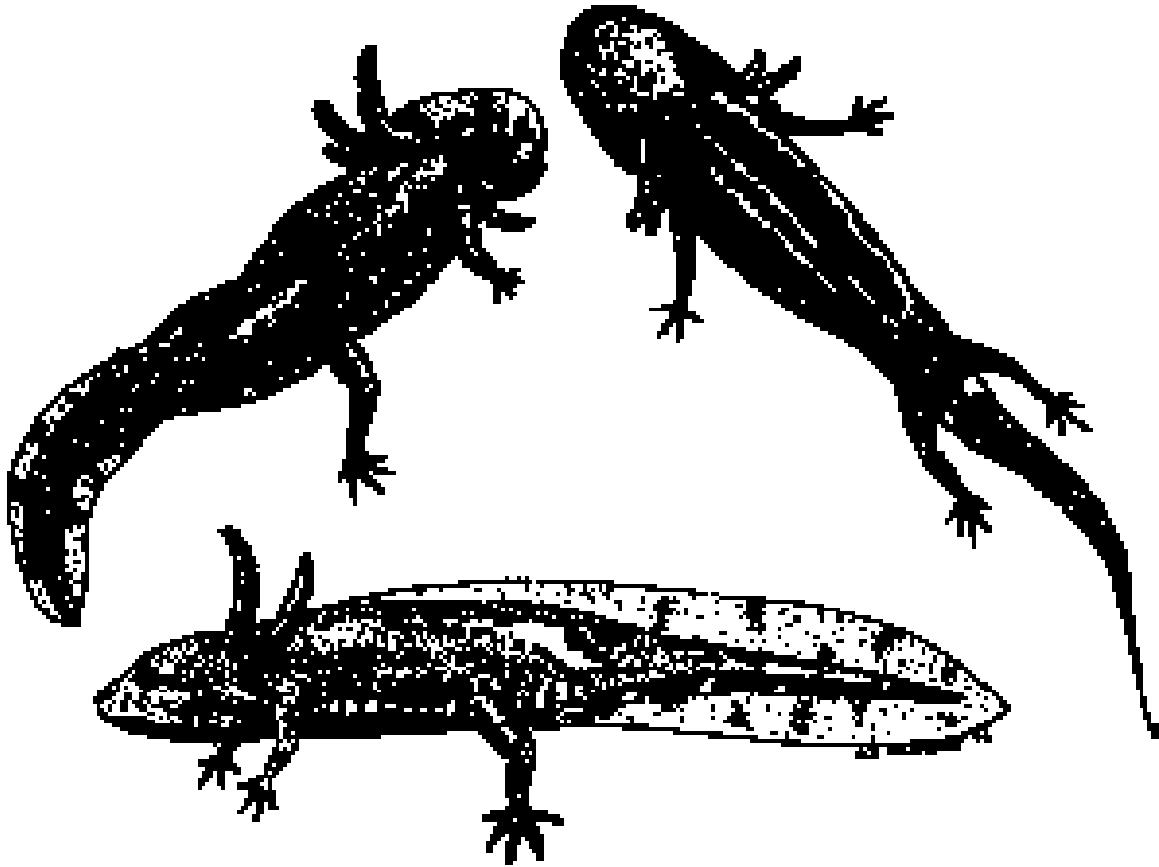


# Missouri Herpetological Association



# Newsletter

Number 9

1996

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MISSOURI HERPETOLOGICAL ASSOCIATION NEWSLETTER NO. 9

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Cover: *Ambystoma talpoideum* larvae by A J. Hendershott.

## INTRODUCTION

The Ninth Annual Meeting of the **Missouri Herpetological Association** took place on 28 September 1996 at Bennett Springs State Park, Lebanon, 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.

## ANNOUNCEMENT

### **10th Annual Meeting of the Missouri Herpetological Association**

The 10th Annual Meeting of the **Missouri Herpetological Association** will be held on 27 September 1997 at the Runge Conservation Nature Center, Jefferson City, Missouri. A "call for papers" and registration packet will be sent in mid-July. For more information please contact **Ray D. Semlitsch** at:

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## TEAMING WITH WILDLIFE

During the 1996 meeting, a 20-minute presentation was given on the proposed nongame wildlife conservation initiative called "Teaming with Wildlife." This grass roots, nationwide funding campaign is being endorsed by a wide variety of organizations, agencies, and companies that wish to see state-dedicated funds for fish and wildlife conservation, recreation, and education. This special funding will help support the conservation of nongame wildlife and unique, natural habitats that have, in the past, not been adequately funded. The "Teaming with Wildlife" initiative will encourage congress to establish a special fund via user fees placed on outdoor equipment, supplies, birdseed, nature guide books, and related products. The user fee will not exceed 5% of the retail cost of any item. A typical family of four will pay an average of \$25/year. Each state will receive funds from this program based on population. Funding will help states conserve their wildlife and fish diversity, purchase critical habitat, monitor nongame wildlife populations, create new recreation areas devoted to viewing wildlife, hiking, photography, outdoor education, and interpretation.

A vote was taken of those present at the meeting to become part of the national coalition to support this conservation initiative. The vote passed and MHA is on record as a supporter of "Teaming with Wildlife."

**Abstracts of Papers presented at the Ninth Annual Meeting  
of the  
Missouri Herpetological Association**

**28 September 1996**

**POPULATION DECLINE IN *Bolitoglossa subpalmata*,  
A NEOTROPICAL SALAMANDER**

**Allison Welch,<sup>1</sup> Gabriela Parra,<sup>2</sup> and Shannon McCauley<sup>3</sup>**

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High-altitude populations of the plethodontid salamander, *Bolitoglossa subpalmata*, have been systematically monitored by Organization for Tropical Studies (OTS) courses since 1984. Permanent study sites have been established near the PanAmerican Highway at an elevation of 3200 m on Costa Rica's Cerro de la Muerte. Consistent sampling techniques have allowed collection of reliable long-term data, which are often lacking for tropical amphibians. These data indicate a population crash seven years ago, with observed densities dropping from 0.447 salamanders/m<sup>2</sup> to 0.010/m<sup>2</sup>. No salamanders were found on this site between May 1988 and July 1996. Initial sampling of control transects about 2 km away from the Highway indicated that *B. subpalmata* population declines at high altitudes on Cerro de la Muerte are not restricted to locally disturbed habitats such as those along the Highway.

Many of the moist microhabitats required by *Bolitoglossa subpalmata* may have disappeared during the unusually dry weather associated with the 1986–7 El Niño. Other mon-tane Costa Rican amphibian populations experienced similar declines during or following this El Niño, including the Golden Toad, *Bufo periglenes*, which is now presumed extinct.

Snapshot density estimates may not accurately represent the status of *Bolitoglossa subpalmata* populations because these salamanders can take refuge in crevices in the earth during dry periods. This ability, combined with the long lifespan (to 18 yrs), may have buffered these populations from extinction during the extended dry weather of the late 1980s and early 1990s. Recovery of populations to previous density levels is expected to be slow, however, given the low reproductive rate and poor colonizing ability of this salamander.

**THE BOON OF PREDATION:  
COMPETITIVE AND PREDATORY INTERACTIONS OF  
AMBYSTOMATID SALAMANDERS IN LARGE-SCALE FIELD ENCLOSURES**

**Michelle D. Boone,<sup>1</sup> David C. Scott,<sup>2</sup> and Peter H. Niewiarowski<sup>3</sup>**

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Species abundance in amphibian populations fluctuate greatly among years and among sites within the same year; therefore, understanding the components which affect natural variation may be helpful in distinguishing natural fluctuations from human-induced population declines.

The three main causes associated with oscillations of amphibian abundance are pond hydroperiod, competitive interactions, and predation. Interspecific predation among salamander species could dramatically influence species abundance and may explain differences not attributable to pond hydroperiod or competitive interactions. A terrestrial breeder like *Ambystoma opacum* may have the potential to prey upon the larvae of *A. talpoideum*, which breed later in the season. This experiment was designed to: (1) determine differences in larval period, size at metamorphosis, and survivorship of early- and late-hatched *A. opacum*, and (2) estimate the impact that early and late *A. opacum* have on larval period, size at metamorphosis, and survivorship of *A. talpoideum*. Results indicate that early-hatched *A. opacum* have a significantly larger body size, longer larval period, and greater larval survival than late-hatched individuals. *Ambystoma opacum* did not significantly affect *A. talpoideum* larval period or size at metamorphosis. Early-hatched *A. opacum* dramatically reduced *A. talpoideum* survival in three of four enclosures; although results were not significantly different, presumably due to variation among replications, a strong trend of reduced survival was evident. These data suggest that these species could be affected more strongly by predation than by interspecific competition. Although environmental conditions that allow *A. opacum* to gain a size advantage over *A. talpoideum* may be infrequent, such events could dramatically impact the abundance of these species for several generations.

### **EFFECTS OF DISSOLVED OXYGEN ON DEVELOPMENT AND HATCHING OF *Ambystoma maculatum* AND *Rana sphenoccephala***

**Nathan E. Mills and M. C. Barnhart**

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

Dissolved oxygen available to amphibian embryos fluctuates due to a number of factors and is often quite low. In *Ambystoma maculatum*, we found that low levels of dissolved oxygen resulted in slowed development, delayed hatching, and less developed embryos at the time of hatching. Dissolved oxygen concentration had no effect on hatchling weight. Due to the short amount of time spent in the egg by *Rana sphenoccephala*, we did not observe a significant difference in the rate of development. However, we did find that embryos exposed to low dissolved oxygen concentrations hatched earlier and were less developed at the time of hatching than embryos raised at higher concentrations.

Since hatching occurred at an earlier stage of development in both *A. maculatum* and *R. sphenoccephala*, and since the egg capsule presumably provides some protection to the embryo, a reasonable hypothesis is that low dissolved oxygen levels may cause higher levels of embryo mortality. In addition, the slowed development rate observed in *A. maculatum* could affect reproductive fitness, as indications in the literature point to the fact that larvae which metamorphose earlier are more likely to reproduce in their first year.

### **DEVELOPMENT OF GENETIC MARKERS FOR PARENTAGE DETERMINATIONS IN THE GRAY TREEFROG (*Hyla chrysoscelis*)**

**John D. Krenz and Paul A. Mahoney**

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

Genetic assays for parentage were developed using regions of simple repetitive DNA (srDNA). This class of highly variable markers was selected to permit future field experiments

regarding mate choice in *Hyla*. Our immediate objectives were to locate several sr DNA loci and develop a means of genotyping individuals using non-lethal tissue samples. We constructed a genetic library by inserting fragments of frog DNA into bacteria. We screened these bacterial clones with synthetic DNA composed of a repeated short motif (e.g., CCACACACACA, denoted [CA]<sub>6</sub>). Positive (matching) clones were sequenced to identify the srDNA loci and to design a pair of unique DNA primers that flank each locus. Subsequently, these primer pairs and genomic DNA isolated from individuals were used (in the Polymerase Chain Reaction) to determine genotypes for individual frogs. A brief overview of the experimental power and innovation provided by the use of srDNA genetic markers is compared to the utility of protein markers.

## NOTES ON THE LIFE HISTORIES OF THREE SYMPATRIC TROPICAL TREEFROGS FROM SOUTHERN MÉXICO

**Shelly Grow,<sup>1</sup> Suzanne Daniels,<sup>2</sup> Alicia Mathis,<sup>3</sup> and Richard C. Vogt<sup>4</sup>**

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We examined several life-history characteristics in three sympatric tropical treefrogs (*Smilisca baudinii*, *S. cyanosticta*, and *Agalychnis callidryas*) in southern Veracruz, México. Mean wet masses of both sexes were significantly greater for *S. baudinii* than for the other two species. In contrast, snout-vent lengths (SVL) did not differ substantially among species. Average clutch size ranged from 95 for *A. callidryas* to 2875 for *S. baudinii*. A negative relationship between SVL and clutch size was evident for female *S. cyanosticta*, whereas a positive relationship existed for *A. callidryas*. Size assortative mating was observed for amplexant pairs of *S. cyanosticta*. Stomach contents indicated that all three species consumed a wide variety of invertebrate prey, with both species of *Smilisca* exhibiting slightly less diverse dietary niche breadths than *A. callidryas*.

## LARVAL PERFORMANCE IN *Rana blairi* AND *R. sphenoccephala*: EFFECTS OF POND DRYING

**Matthew J. Parris and Raymond D. Semlitsch**

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

Temporary pond-breeding amphibians are often faced with the risk of variable pond hydroperiods. The ability of larvae to adapt to drying pond environments is critical for successful survival and metamorphosis. The effect of pond drying on larval performance in *Rana blairi* and *R. sphenoccephala* was measured using artificial ponds. The experiment was designed to measure the effects of species composition and pond drying regime on the following larval responses: larval period length, mass at metamorphosis, proportion of a pond surviving, and proportion of the survivors reaching metamorphosis.

Analysis of variance indicated that *R. blairi* produced a significantly greater proportion of survivors and metamorphs than *R. sphenoccephala*, but metamorphs of the latter were larger. Drying regime had a significant effect on survival: fast drying ponds had lower survival rates than ponds with constant water levels. Multivariate analysis of variance indicated a significant

drying regime effect on all larval responses. Analysis of covariance using survival as the covariate removed the species effect on all responses, but did not remove the multivariate effect of drying regime. Use of survival as the covariate in an analysis of covariance for larval period length eliminated the confounding effects of differential survival on larval period length. Least squares means plots after the analysis of covariance was performed indicated that both *R. blairi* and *R. sphenoccephala* effectively reduced their larval period lengths when faced with a drying regime. This is some of the first evidence of the ability of larval amphibians responding adaptively to environmental pressures. These results suggest that these two species may be affected differently by fluctuations in pond hydroperiod.

## **EFFECTS OF AN AGRICULTURAL CHEMICAL ON TADPOLE ACTIVITY AND SWIMMING PERFORMANCE**

**Christine M. Bridges**

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

General activity and aspects of swimming performance (sprint speed and distance) of Plains Leopard Frogs (*Rana blairi*) were examined after acute exposure to three sublethal concentrations (3.5, 5.0, and 7.2 mg/l) of carbaryl. Both swimming performance and activity were observed after 24, 48, 72, and 96 h, then at 24 and 48 h post-exposure for indication of recovery. Tadpole activity diminished by nearly 90% at the lowest carbaryl concentration and completely ceased at the highest concentration after only one-half-hour exposure, and did not change over time. Sprint speed and distance also decreased after 24 h, suggesting that this may be an adequate length of exposure to alter tadpole behavior. Tadpoles exhibited slightly higher activity levels at 24 and 48 h post-exposure; however, no recovery of swimming performance was observed. Reduction in activity and swimming performance may result in increased susceptibility to predation and, because activity is closely associated with feeding, may result in slowed growth, leading to smaller body size as maturation or even a failure to metamorphose before pond drying. Acute, sublethal exposure to pesticides such as carbaryl may not only affect immediate survival of tadpoles, but impact critical life history traits (e.g., feeding, growth, development), which subsequently may alter amphibian population dynamics. This is especially important when considering the growing concern over widespread declines of amphibians populations.

## **AQUATIC TURTLE DISTRIBUTION AND ABUNDANCE IN MISSOURI RIVER FLOOD PLAIN WETLANDS**

**J. Russell Bodie and Raymond D. Semlitsch**

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

We investigated aquatic turtle species distribution and abundance relative to Missouri River flood plain characteristics. Randomly selected wetlands were classified based on origin, hydroperiod, and associated vegetation. Wetland classes were as follows (n = number of sites sampled from April–August 1996): remnant (n = 4), wooded (n = 3), non-connected scoured (n = 3), connected scoured (n = 3), and temporary (n = 4). Individual sites were sampled once for three consecutive nights. Sampling consisted of two types of baited hoop-net traps (baited with two bait types) and winged hoop-net traps. Traps were placed systematically within each site and scaled to one trap/ha. Trapping events were interspersed throughout the season according to wetland class. Species captured were (total n = 1107): *Trachemys scripta* (n = 569), *Graptemys*

*pseudogeographica* (376), *Chrysemys picta* (73), *Chelydra serpentina* (68), *Apalone mutica* (6) and *A. spinifera* (5). Relative species distribution and abundance are presented by total captures and/or capture rates versus wetland type, area, sampling date, and distance from the river. Hypotheses regarding effects on turtle community structure are presented.

### **WESTERN CHICKEN TURTLE IN MISSOURI: A TRAP, MARK, AND RELEASE PROJECT**

**Arron J. Hendershott, Carol A. Cunningham, and Neal Young**

Department of Biology, Southeast Missouri State University, Cape Girardeau, MO 63701

Sightings of Western Chicken Turtles (*Deirochelys reticularia miaria*) in Missouri have been nonexistent since the summer of 1965. However, in 1995, a population was discovered at Big Cane Conservation Area. This turtle is one of many wetland species which has declined due to habitat loss. As little is known about *D. reticularia miaria* in Missouri, an intense trapping effort was undertaken to find other populations in the south-central lowlands. Counties surveyed were Ripley, Butler, Dunklin, and Mississippi. No additional populations were found; however, the population at Big Cane Wildlife Area was confirmed with an additional nine adult turtles, all marked and released. No juveniles were found. The Red-eared Slider (*Trachemys scripta elegans*) accounted for the majority of all species trapped in the turtle arrays. Management recommendations consist of conserving remaining wetlands, purchasing property for reclamation, and creation of artificial wetlands which will provide corridors between natural areas.

### **ASPECTS OF THE ECOLOGY OF *Anolis barkeri*, A SEMI-AQUATIC LIZARD FROM SOUTHERN MÉXICO**

**Randy Birt,<sup>1</sup> Robert Powell,<sup>2</sup> and Alicia Mathis<sup>3</sup>**

<sup>1</sup> Department of Biology, Evangel College, Springfield, MO 65802

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<sup>3</sup> Department of Biology, Southwest Missouri State University, Springfield, MO 65804

*Anolis barkeri* is a semi-aquatic lizard from Veracruz and adjacent regions in southern México, where it occurs along the shores of streams in lowland tropical rainforest. At the Estación Biología "Los Tuxtlas" in June 1996, we studied several aspects of the ecology of these anoles, including elements of demography, activity, diet, and thermal characteristics. We estimated the population density of males as 1/19 m of linear stream, and that of females as 1/10 m of stream at our principal study site along a permanent stream draining into Lago Escondido. Both males and females consumed a wide variety of invertebrate prey, including both terrestrial and aquatic insects. Females demonstrated a broader dietary niche than did males, and the dietary niche breadths of males, females, and all individuals was indicative of a generalist/opportunist mode of feeding. Individuals were active throughout the day and early evening, with the greatest amount of activity occurring during the morning and evening hours. Activity was almost exclusively limited to shaded areas; no lizard was ever observed in direct sunlight. Cloacal temperatures were lower for *A. barkeri* than for another local forest-dwelling anole, *A. uniformis*. In *A. barkeri*, cloacal temperatures were significantly and positively correlated with perch temperatures, but were almost always higher than perch temperatures. Air temperature gradually increased with vertical distance from water, and we hypothesized that *A. barkeri* may select perches at varying heights as a thermoregulatory technique.

## **MATING SEASON AND COST OF REPRODUCTION IN THE GLOSSY SNAKE (*Arizona elegans*)**

**Robert D. Aldridge**

Department of Biology, Saint Louis University, St. Louis, MO 63103

This study compares the activity of adult male and female Glossy Snakes during mating and non-mating seasons. The snakes' encounters with humans, which often result in roadkill mortality, is used as the measure of the cost of reproduction. The snakes examined are from New Mexico and adjacent states. Sexual maturity of males and mating season was determined by examining the sexual segment of the kidney. The first half of the active season (April–June) was the mating season, and the second half (July–September) was the non-mating season. The abundance of males ( $n = 98$ ) was significantly greater than of females ( $n = 19$ ) in the mating season ( $\chi^2 = 53.3$ ,  $df = 1$ ,  $P < 0.001$ ). In the non-mating season, the abundance of males ( $n = 33$ ) was not significantly different than of females ( $n = 21$ ;  $\chi^2 = 2.7$ ,  $df = 1$ ,  $P > 0.20$ ). The frequency of males versus females in the early season versus the late season indicated that the ratio of the sexes changed significantly ( $\chi^2 = 10.6$ ,  $df = 1$ ,  $P < 0.001$ ). Thus, the cost of reproduction, as measured by human-caused mortality, was much greater for males than for females.

## **HERPETOLOGICAL SURVEY OF UNION RIDGE CONSERVATION AREA, SULLIVAN, PUTNAM, AND ADAIR COUNTIES, MISSOURI**

**Kristin Harford and Donald Kangas**

Department of Biology, Truman State University, Kirksville, MO 63501

A herpetofaunal survey of Union Ridge Conservation Area was initiated in the spring of 1996. The area is located approximately 20 mi NW Kirksville, Missouri. To date, 65 survey days in the late spring and summer months involved the use of artificial hide sites, aquatic traps, seines, dipnets, and cruising to determine established prairie species, and whether the crayfish frog, *Rana areolata circumlosa*, occurs in the area. The potential exists for 64 species of amphibians and reptiles to be found, although over half are unlikely. Many of these species have been recorded in only one of the three counties, so the potential exists for documenting a number of county distributional records. We have collected 21 taxa, 9 amphibians and 12 reptiles. County records include 11 species from Sullivan County, five from Putnam County, and one from Adair County. *Rana areolata circumlosa* has not been documented, but sampling will continue through May 1997.

## NEW RECORDS OF AMPHIBIANS AND REPTILES IN MISSOURI FOR 1996

Robert Powell,<sup>1</sup> Tom R. Johnson,<sup>2</sup> and Donald D. Smith<sup>3</sup>

<sup>1</sup> Avila College, Kansas City, MO 64145

<sup>2</sup> Missouri Department of Conservation, Jefferson City, MO 65102

<sup>3</sup> 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 1994, Powell et al. 1989, 1990, 1991, 1992, 1993a, 1993b, 1994, 1995) 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, catalogued voucher specimens (unless indicated as observations only). Size records require the deposition of the specimen in an institutional collection. All specimens must be taken under the auspices of a valid state permit.

All new records listed here are presented in the standardized format of Collins (e.g., 1989): common and scientific name, county, specific locality (when available or unless withheld for rare and 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: APSU — Austin Peay State University Museum of Zoology, Clarksville TN; BWMC — Bobby Witcher Memorial Collection, Avila College, Kansas City MO; KU — Natural History Museum, University of Kansas, Lawrence KS; MDC — Missouri Department of Conservation, Jefferson City MO; SEMSU — Southeast Missouri State University, Cape Girardeau MO; UMC — University of Missouri, Columbia MO.

### NEW COUNTY RECORDS

#### Amphibia: Caudata

##### MOLE SALAMANDER

*Ambystoma talpoideum*

**BOLLINGER CO:** Duck Creek Wildlife Area, 4 March 1968, N. Holler (UMC 1579).

##### EASTERN TIGER SALAMANDER

*Ambystoma tigrinum tigrinum*

**MARION CO:** Hannibal, 13 August 1966, R. Gramm (UMC 5340).

**RANDOLPH CO:** Huntsville, 10 April 1955, Schmitt (UMC 0116).

##### DARK-SIDED SALAMANDER

*Eurycea longicauda melanopleura*

**TANEY CO:** 10 mi S Kissee Mills, 2 May 1970, collector unknown (UMC 0543, 0546).

##### CAVE SALAMANDER

*Eurycea lucifuga*

**CAPE GIRARDEAU CO:** Trail of Tears State Park S11 T32N R14E, 3 May 1996, D. Ostendorf and A.J. Hendershott (SEMO 0526).

##### CENTRAL NEWT

*Notophthalmus viridescens louisianensis*

**TANEY CO:** Hercules Glade near fire tower, Spring 1971, UMC Herpetol. class (UMC 1539, 5408).

SOUTHERN REDBACK SALAMANDER

*Plethodon serratus*

**LACLEDE CO:** Lost Mary Cave, 12 July 1969, UMC Herpetol. class (UMC 1439-40).

**Amphibia: Anura**

EASTERN AMERICAN TOAD

*Bufo americanus americanus*

**MADISON CO:** HW E S18 T32N R5E, 24 July 1996, N. Young (SEMO 0546).

FOWLER'S TOAD

*Bufo fowleri*

**MONROE CO:** Elk Fork of Salt River Union Covered Bridge, 5 August 1996, R. Daniel and P. Niekamp (UMC 6094).

**STONE CO:** ca 8 mi WSW Reed Springs, 2 May 1970, UMC Herpetol. class (UMC 2983).

**WARREN CO:** near Gore, 15 October 1969, collector unknown (UMC 2977-8, 2989).

GRAY TREEFROG

*Hyla chrysoscelis/versicolor*

**ST. FRANCOIS CO:** S7 T35N R6E, 20 March 1996, T. Mattingly (SEMO 0472).

GREEN TREEFROG

*Hyla cinerea*

**REYNOLDS CO:** 4 mi S Lesterville, 200 ft from Black River S 24 T32N R2E, 24 August 1996, R. Price (KU cat. no. pending).

EASTERN GRAY TREEFROG

*Hyla versicolor*

**LEWIS CO:** Deer Ridge Wildlife Area North Fabius River floodplain, 15 May 1996, J. Roberts (KU cat. no. pending).

**REYNOLDS CO:** exact locality unknown, 20 June 1965, D. Hazelwood (UMC 2226).

**ST. FRANCOIS CO:** 0.25 mi S jct HW A and HW 67, 18 July 1958, collector unknown (UMC 2234).

**STONE CO:** HW 00 2 mi N HW 76, 2 May 1970, UMC Herpetol. class (UMC 2225, 2227).

NORTHERN SPRING PEEPER

*Pseudacris crucifer crucifer*

**CAPE GIRARDEAU CO:** S21 T31N R11E, 9 March 1996, A.J. Hendershott (SEMO 0473).

**PULASKI CO:** Mud Cave, 15 April 1967, UMC Herpetol. class (UMC 2367).

WESTERN CHORUS FROG

*Pseudacris triseriata*

**MACON CO:** Atlanta Wildlife Area, 15 July 1996, E.D. Hooper, Jr. (KU cat. no. pending).

NORTHERN CRAWFISH FROG

*Rana areolata circulosia*

**OREGON CO:** McCorn Lake, 30 July 1965, D. Hazelwood (UMC 2919).

PLAINS LEOPARD FROG

*Rana blairi*

**CAPE GIRARDEAU CO:** HW 34 T31N R12E, 14 April 1996, A.J. Hendershott (SEMO 0494).

**WARREN CO:** HW Y along stream on N side of HW, 1 October 1994, R. Daniel and J. Daniel (UMC 4606).

BULLFROG

*Rana catesbeiana*

**PHELPS CO:** 1.0 mi W Powerville, 15 April 1967, UMC Herpetol. class (UMC 2858).

GREEN FROG

*Rana clamitans*

**LEWIS CO:** Deer Ridge Wildlife Area North Fabius River floodplain, 12 April 1996, E.D. Hooper, Jr. (KU cat. no. pending).

**MACON CO:** Missouri National Guard Macon Area Training site ca. 4 km NW Excello 39°39'28"N 92°30'53"W, 26 June 1994, A.P. Bufalino (APSU 5428)(Bufalino, 1996a); Atlanta Wildlife Area, 14 May 1996, E.D. Hooper, Jr. (KU cat. no. pending).

**MARIES CO:** Clifty Creek Conservation Area, 15 August 1994, R. Daniel and B. Edmond (UMC 2136).

**Reptilia: Testudines**

MIDLAND SMOOTH SOFTSHELL

*Apalone mutica mutica*

**JOHNSON CO:** Ralph & Martha Perry Wildlife Area 1/4 mi NE HW 23 at Blackwater River S33 T48N R24W, 26 October 1966, S.G. Thornhill and D.D. Smith (BWMC 06035).

**LEWIS CO:** Deer Ridge Wildlife Area North Fabius River, 27 June 1996, E.D. Hooper, Jr. (photograph on file at project office, see Hooper and Elmeer, this issue).

WESTERN SPINY SOFTSHELL

*Apalone spinifera hartwegi*

**BOONE CO:** Hinkson Creek ca 0.1 mi S Rock Quarry Road Bridge, 26 August 1994, R. Daniel and M. Rueter (UMC 5239); exact locality and date of collection unknown, S. Cox (UMC 6089).

**GENTRY CO:** E fork Grand River S26 T63N R31W, 17 September 1993, J.W. Grace (KU cat. no. pending).

**MONROE CO:** Elk Fork of Salt River 100 m downstream Union Covered Bridge, 5 August 1996, R. Daniel and P. Niekamp (UMC 6096).

COMMON SNAPPING TURTLE

*Chelydra serpentina serpentina*

**BOLLINGER CO:** HW 51 1 km from Stoddard Co line S32 T28N R9E, 22 July 1996, C.A. Cunningham and A.J. Hendershott (SEMO 0565).

**MADISON CO:** HW E S18 T31N R5E, 22 July 1996, N. Young (SEMO 0547).

**RIPLEY CO:** HW 160 1 km from Butler Co line near Fairdealing S11 T23N R4E, 15 July 1996, C.A. Cunningham and A.J. Hendershott (SEMO 0551).

WESTERN PAINTED TURTLE

*Chrysemys picta bellii*

**GENTRY CO:** south side of 11th st Stanberry, 29 June 1996, M.M. Donovan (photograph on file at MDC).

COMMON MAP TURTLE

*Graptemys geographica*

**LEWIS CO:** Fenway Landing ca 5 mi N Canton, 2 July 1995, B. Edmond (UMC 6000).

OUACHITA MAP TURTLE

*Graptemys ouachitensis*

**CRAWFORD CO:** Meramec River ca 1 mi downstream Campbell Bridge (HW N), July 1995, M. Rueter (UMC 5707).

FALSE MAP TURTLE

*Graptemys pseudogeographica*

**COOPER CO:** across from Rocheport, 3 April 1946, Owens (UMC 4095-6).

RIVER COOTER

*Pseudemys concinna concinna*

**SCOTT CO:** S29 T30N R14E, 29 February 1996, D. Ostendorf (SEMO 0469).

THREE-TOED BOX TURTLE

*Terrapene carolina triunguis*

**ADAIR CO:** HW 11 5 mi NE Kirksville S33 T63N R14W, October 1995, T. Farley (photograph on file at MDC).

**RIPLEY CO:** near Fairdealing HW 160 3 km from Butler Co line S11 T23N R4E, 13 May 1996, C.A. Cunningham and A.J. Hendershott (SEMO 0553).

**SCOTT CO:** HW AB 0.5 km N Commerce S29 T29N R16E, 10 March 1996, A.J. Hendershott (SEMO 0496); S2 T29N R14E, 20 September 1996, D. Ostendorf (SEMO 0543).

RED-EARED SLIDER

*Trachemys scripta elegans*

**RIPLEY CO:** near Fairdealing HW 160 1 km from Butler Co line S11 T23N R4E, 15 July 1996, C.A. Cunningham and A.J. Hendershott (SEMO 0550).

**Reptila: Squamata: Sauria**

SIX-LINED RACERUNNER

*Cnemidophorus sexlineatus*

**MONTGOMERY CO:** Danville Wildlife Area 0.4 mi SE campground, 13 May 1994, R. Daniel (UMC 2115).

SOUTHERN COAL SKINK

*Eumeces anthracinus pluvialis*

**STODDARD CO:** Mingo National Wildlife Refuge, 7 April 1975, UMC Herpetol. class (UMC 5436).

FIVE-LINED SKINK

*Eumeces fasciatus*

**GENTRY CO:** McFall S1 T61N R30W (dead in home), 9 November 1996, B. Busenbarick (KU cat. no. pending).

**HARRISON CO:** exact locality unknown, 11 April 1968, SMSU Zool. class (UMC 3590).

**MERCER CO:** S34 T65N R24W, 14 March 1991, J. Palmer (KU cat. no. pending).

**MISSISSIPPI CO:** S13 T23N R16E, 27 July 1996, A.J. Hendershott, C.A. Cunningham, N. Young (SEMO 0556).

**SCOTT CO:** Scott City High School S1 T29N R13E, 13 May 1996, A.J. Hendershott (SEMO 0528).

BROADHEAD SKINK

*Eumeces laticeps*

**CALLAWAY CO:** Union Electric plant site, 3 March 1975, D.E. Metter (UMC 3703).

**CAPE GIRARDEAU CO:** Trail of Tears State Park S22 T32N R14E, 29 May 1996, A.J. Hendershott (SEMO 0538).

**MACON CO:** Missouri National Guard Macon Area Training site ca. 2.1 km NW Excello 39°39'02"N 92°29'29"W, 10 August 1994 (APSU 5431), 12 August (APSU 5430), 13 August (APSU 5429), A.P. Bufalino (Bufalino, 1996b).

**TANEY CO:** exact locality unknown, 25 April 1975, UMC Herpetol. class (UMC 3793).

WESTERN SLENDER GLASS LIZARD

*Ophisaurus attenuatus attenuatus*

**BOONE CO:** exact locality unknown, 7 July 1933, Bennett (UMC 3662).

**LINN CO:** Mussel Fork Conservation Area S23 T57N R18W, date unknown, J.W. Grace (KU cat. no. pending).

**OZARK CO:** Eliah, date unknown, J. Williams (UMC 3664).

**PIKE CO:** S Co Rd 33 ca 0.9 mi W HW E NNW Curryville, 7 July 1995, B. Edmond (UMC 6001).

**TANEY CO:** exact locality unknown, 8 April 1948, Portman (UMC 3663).

**TEXAS CO:** Huston S6 T30N R9W, 21 October 1996, R. Fleming (KU cat. no. pending).

#### TEXAS HORNED LIZARD

*Phrynosoma cornutum*

**BOONE CO:** Columbia, date and collector unknown (UMC 3711). Note: due to the fact that this record is extralimital and the specimen was taken in an urban area, caution would dictate that this be considered an introduction.

#### Reptilia: Squamata: Serpentes

##### COPPERHEAD

*Agkistrodon contortrix*

**OSAGE CO:** 1.5 mi W Cooper Hill S34 T43N R7W, 20 August 1996, G. Emich (KU cat. no. pending).

**SCOTT CO:** 1.2 km N Commerce S29 T29N R15E, 10 March 1996, A.J. Hendershott (SEMO 0429).

##### RACER

*Coluber constrictor*

**COOPER CO:** Prairie Home Conservation Area 0.2 mi NE Schaaf Creek parking lot, 12 April 1996, R. Daniel; 12 mi N Otterville S4 T47N R19W, 9 May 1996, R. Krager (KU cat. no. pending).

**LINN CO:** Pershing State Park, 5 May 1984, R. Daniel, C. Daniel, D. Combs (UMC 4689).

**MONTGOMERY CO:** 4 mi SE Danville S16 T47N R5W, 11 May 1996, R. Krager (KU cat. no. pending).

**RIPLEY CO:** Fairdealing HW 160 1 km from Butler Co line S11 T23N R4E, 13 May 1996, C.A. Cunningham and A.J. Hendershott (SEMO 0552).

**WARREN CO:** ca. 15 mi W Marthasville S34 T46N R3W, 22 May 1996, R. Krager (KU cat. no. pending).

##### TIMBER RATTLESNAKE

*Crotalus horridus*

**OSAGE CO:** private farm 5 mi SW Koeltztown S18 T41N R10W, 23 July 1996, J. Hoeller and K. Hoeller (KU cat. no. pending).

**STODDARD CO:** Mingo National Wildlife Refuge, April 1969, UMC Herpe-tol. class (UMC 4894).

**WARREN CO:** Little Lost Creek Conservation Area, S5 T46N R4W, 5 May 1993, N. Wright (KU cat. no. pending).

##### PRAIRIE RINGNECK SNAKE

*Diadophis punctatus arnyi*

**LINN CO:** Pershing State Park, 5 May 1984, R. Daniel, C. Daniel, D. Combs (UMC 4689).

##### RAT SNAKE

*Elaphe obsoleta*

**BOLLINGER CO:** Duck Creek Conservation Area, 8 April 1995, R. Daniel (UMC 6097).

##### WESTERN FOX SNAKE

*Elaphe vulpina vulpina*

**MARION CO:** Hannibal S11 T57N R4W, 17 June 1996, T. Gollacher (KU cat. no. pending).

##### EASTERN HOGNOSE SNAKE

*Heterodon platirhinos*

**CAPE GIRARDEAU CO:** Trail of Tears State Park S14 T32N R14E, 11 May 1996, A.J. Hendershott (SEMO 0533).

##### PRAIRIE KING SNAKE

*Lampropeltis calligaster calligaster*

**BOLLINGER CO:** S11 T33N R9E, June 1996, N. Young (SEMO 0541).

**LIVINGSTON CO:** Chillicothe S25 T58N R2W, 9 May 1996, R. Cassity (KU cat. no. pending).

##### RED MILK SNAKE

*Lampropeltis triangulum sypila*

**CAPE GIRARDEAU CO:** near Apple Creek at Riviere de la Pomme Lodge T33N R12E, 24 October 1996, R. Hrabik (KU cat. no. pending).

**COOPER CO:** 2.0 mi W Booneville, 31 March 1966, collector unknown (UMC 4327).

**MILLER CO:** 2 mi SE Eldon S22 T41N R15W, 4 May 1996, R. Krager (KU cat. no. pending).

**SHANNON CO:** HW 106 1.3 mi W HW HH, 6 May 1994, B. Daniel and P. Niekamp (UMC 2112).

##### EASTERN COACHWHIP

*Masticophis flagellum flagellum*

**MONITEAU CO:** 7 mi NNE California S20 T46N R15W, 27 April 1996, R. Krager (KU cat. no. pending).

##### DIAMONDBACK WATER SNAKE

*Nerodia rhombifer*

**LINN CO:** Fountain Grove Wildlife Area Meadville, 1960, R. McLaren (UMC 4450).

##### NORTHERN WATER SNAKE

*Nerodia sipedon sipedon*

**GENTRY CO:** Weldon Branch Creek S8 T63N R30W, 29 September 1996, J.W. Grace (photograph on file at MDC).

**MACON CO:** Atlanta Wildlife Area, 1 July 1996, E.D. Hooper, Jr. (KU cat. no. pending).

**MISSISSIPPI CO:** S21 T24N R16E, 29 July 1996, N. Young, A.J. Hendershott, C.A. Cunningham (SEMO 0563).

##### ROUGH GREEN SNAKE

*Ophedrys aestivus*

**BARTON CO:** 1 mi NW Shawnee Trails Conservation Area 1 mi S Mindenmines gravel road

on state line S7 T31N R33W, 23 May 1996, T.R. Johnson (KU cat. no. pending).

**IRON CO:** HW 49 ca 3.0 mi N county line, 14 October 1979, collector unknown (UMC 4628).

#### BULLSNAKE

*Pituophis catenifer*

**BOONE CO:** Columbia, May 1946, Rowe (UMC 4363).

#### GRAHAM'S CRAYFISH SNAKE

*Regina grahamii*

**HENRY CO:** Montrose Lake, 1 May 1979, J. McPherson (UMC 4629).

**LEWIS CO:** Deer Ridge Wildlife Area North Fabius River floodplain, 13 May 1996, E.D. Hooper, Jr. (KU cat. no. pending).

#### MASSASAUGA RATTLESNAKE

*Sistrurus catenatus*

**LINN CO:** Swan Lake near Fountain Grove, 1 September 1955, collector unknown (UMC 4386).

#### BROWN SNAKE

*Storeria dekayi*

**CALDWELL CO:** Mirabil C-1 School, Mirabil, off HW D S34 T56N R29W, 31 August 1994, A.D. Bradford (KU cat. no. pending).

**CAMDEN CO:** exact locality unknown, 31 March 1967, M. Bauman (UMC 4297).

**COOPER CO:** 12 mi N Otterville S4 T47N R19W DOR, 9 May 1996, R. Krager (KU cat. no. pending).

**GENTRY CO:** HW J S35 T64N R30W DOR, date unknown, J.W. Grace (KU cat. no. pending).

**LINN CO:** Pershing State Park, 28 April 1984, R. Daniel and D. Combs (UMC 4687).

#### NORTHERN REDBELLY SNAKE

*Storeria occipitomaculata occipitomaculata*

**CAPE GIRARDEAU CO:** Indian Creek Natural Area Trail of Tears State Park S9/10 T32N R14E, 13 May 1996, R. Essener and A.J. Hendershott (SEMO 0470).

**LEWIS CO:** Deer Ridge Wildlife Area North Fabius River floodplain, 2 May 1996, E.D. Hooper, Jr. (KU cat. no. pending).

**MACON CO:** Atlanta Wildlife Area, 1 May 1996, J. Roberts (KU cat. no. pending).

#### WESTERN RIBBON SNAKE

*Thamnophis proximus proximus*

**LEWIS CO:** Deer Ridge Wildlife Area North Fabius River floodplain, 22 May 1996, J. Roberts (KU cat. no. pending).

**MARIES CO:** 5.0 mi S Dixon, 15 April 1967, UMC Herpetol. class (UMC 4388).

**RIPLEY CO:** Black River S9 T22N R4E, 15 July 1996, C.A. Cunningham and A.J. Hendershott (SEMO 0540).

**WASHINGTON CO:** S17 T36N R1E, 26 October 1996, V.D. von Frese (photograph on file at MDC).

#### PLAINS GARTER SNAKE

*Thamnophis radix*

**LINN CO:** Pershing State Park, 5 May 1984, R. Daniel, C. Daniel, D. Combs (UMC 4688).

#### EASTERN GARTER SNAKE

*Thamnophis sirtalis sirtalis*

**LINN CO:** Pershing State Park, 11 May 1984, R. Daniel (UMC 4688), D. Combs (UMC 4693).

**MACON CO:** Atlanta Wildlife Area, 20 April 1996, E.D. Hooper, Jr. (KU cat. no. pending).

#### WESTERN EARTH SNAKE

*Virginia valeriae elegans*

**CAPE GIRARDEAU CO:** Trail of Tears State Park S9 T32N R14E, 13 March 1996, D. Ostendorf and A.J. Hendershott (SEMO 0471).

### NEW MAXIMUM SIZE RECORDS

#### Amphibia: Caudata

##### MOLE SALAMANDER

*Ambystoma talpoideum*

**BUTLER CO:** S25 T33N R10E, 8 April 1996, A.J. Hendershott, D.E. Ostendorf, R. Essner (SEMO 0499). SVL = 78.0 mm (3.1 in), TL = 120.5 mm (4.7 in).

#### Reptilia: Testudines

##### THREE-TOED BOX TURTLE

*Terrapene carolina triunguis*

**BOONE CO:** 2 November 1996 (UMC 6149). Female. Carapace length = 153 mm (6.0 in).

#### Reptilia: Squamata: Serpentes

##### NORTHERN WATER SNAKE

*Nerodia sipedon sipedon*

**LEWIS CO:** 6 June 1996, M. Smith (KU cat. no. pending). SVL = 941 mm (37.0 in), TL = 1198 mm (47.2 in).

##### MIDLAND BROWN SNAKE

*Storeria dekayi wrightorum*

**MACON CO:** Atlanta Wildlife Area, 1 May 1996, J. Roberts (KU cat. no. pending). Gravid female. SVL = 300 mm (11.8 in), TL = 368 mm (14.5 in).

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**NOTES**  
**COTTONMOUTHS AT THE LAKE OF THE OZARKS,**  
**CAMDEN COUNTY, MISSOURI**

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In spite of hair-raising tales of water skiers falling into "nests of moccasins" and lurid accounts of numerous fatalities attributed to any aquatic serpent, verified records of the Western Cottonmouth (*Agkistrodon piscivorus leucostoma*) from the Lake of the Ozarks area are scanty. Until recently, only one specimen was known from Camden County (Bobby Witcher Memorial Collection, Avila College, BWMC 01945). This juvenile was taken in an area which is now part of Ha Ha Tonka State Park by Harry Gregory on 1 May 1982. However, on 2 October 1996, the senior author collected a roadkilled individual on US 7, 1 km W of Co. Rd. J. This specimen (BWMC 06036) represent the northernmost locality record for this species in Camden County and extends the known distribution in the area north of the Niangua Arm of the Lake of the Ozarks almost to the Osage Arm of the Lake.

However, two snakes taken over a 14-year period suggest at best a sparse population in the region, which is what one would suspect at the very margin of the species' total range (Johnson 1987, Conant and Collins 1991). Neither visiting tourists nor residents of the area should let unfounded and irrational fear of Cottonmouths deter them from any activities, as encounters with these snakes are extremely unlikely.

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**NEW MISSOURI RECORDS OF AMPHIBIANS AND REPTILES**  
**AND ADDITIONAL OBSERVATIONS RESULTING FROM**  
**AN INVENTORY AND MONITORING PROJECT**

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Range maps for the amphibians and reptiles of Missouri show that many species occur in the northern part of the state, and suggest that a number of these species have a wide distribution (Conant and Collins 1991, Johnson 1987). However, the presence of voucher specimens, as indicated by dots in the range maps of Johnson (1987), illustrate the need for distributional documentation of several species in northern Missouri, especially in northeastern Missouri. Although updated range maps by Powell et al. (1993) and subsequent reports of new county and maximum size records (Powell 1994; Powell et al. 1994, 1995) allude to the considerable amount of inventory work taking place in Missouri and add many new records for the state, but reports of species from northeastern Missouri are few in number.

In 1996, the amphibian and reptile inventory and monitoring team for the Missouri Department of Conservation's Riparian Ecosystem Assessment and Management Project, based at the Atlanta Wildlife Area, Macon Co., Missouri, preserved voucher specimens. Herein are reported new county and maximum size records resulting from this season's work at the Atlanta and Deer Ridge conservation areas. Observations of additional records resulting from the project and from project-related travel also are reported. A species list for each area is included. Systematic methods, drift fences with pitfalls and funnel traps, turtle traps, and refugia, as well as opportunistic methods such as turning cover and visual and auditory surveying, were used to inventory species.

Vouchers representing new records are included in Table 1. Detailed data are included in Powell et al. (1996, this issue); except for a photograph of an *Apalone mutica* from Lewis County, all vouchers have been deposited in the Natural History Museum, University of Kansas (catalog numbers are pending).

Turtle trapping on the North Fabius River and associated oxbows yielded some interesting results. Three methods were employed: baited hoop nets with funnels, baited trap nets (Fyker Nets) with center barrier netting, and pitfall traps.

Two *Apalone mutica* were captured on 27 June and 10 July. Both individuals were released and the first was photographed to confirm the county record. Both were large females (carapace length = 245 mm and 260 mm, respectively) which exceeded the current Missouri size record for the species. These turtles were taken on a large sandbar in pitfall traps (5 gal plastic buckets), which had been placed where tracks in the sand indicated that individuals had moved to basking or egg deposition sites. Tracks were easily followed from the river to a single spot, and return tracks usually paralleled the others.

All other turtles were captured in aquatic traps. On 1 August, five *Apalone spinifera*, three females and two males, were taken in a Fyker Net with a barrier set to direct individuals passing downstream into the trap. It had also been baited to attract turtles from downstream. Carapace lengths of the three females were 293 mm, 296 mm, and 320 mm, all of which exceed the current state record for the species. Male carapaces measured 155 mm and 160 mm. Other *A. spinifera* were observed and captured, but only one *Chelydra serpentina* was seen in the river, and no other species were collected in the river.

Two species were captured or observed in a large oxbow. One *Chelydra serpentina* was trapped and two *Chrysemy picta* were observed, but eluded capture. Neither species has been reported from the county. Vouchers were not preserved because of constraints imposed by limited space and equipment. Additional species not previously reported from the counties were observed, but not captured and preserved: *Coluber constrictor* (Lewis Co.) and *Lampropeltis getula*, *Storeria occipitomaculata*, and *Virginia valeriae* (Macon Co.). Species lists for both conservation areas are given in Table 2 (next page), but include only those species captured within study site parameters, timbered floodplain of the riparian ecosystem (associated uplands were excluded).

**Table 1.** Vouchers representing new county and maximum size records taken in 1996 by the Riparian Ecosystem Assessment and Management Project.

<b>Lewis County</b>	<b>Macon County</b>
<i>Hyla versicolor</i>	<i>Pseudacris triseriata</i>
<i>Rana clamitans</i>	<i>Rana clamitans</i>
<i>Apalone mutica</i>	<i>Nerodia sipedon</i>
<i>Nerodia sipedon*</i>	<i>Storeria dekayi**</i>
<i>Regina grahamii</i>	<i>Thamnophis sirtalis</i>
<i>Storeria occipitomaculata</i>	
<i>Thamnophis proximus</i>	

\* Size record.

\*\*Size and county record.

**Table 2.** Species lists for timbered floodplains of the riparian ecosystem in the Atlanta Conservation Area, Macon Co., Missouri, and the Deer Ridge Conservation Area, Lewis Co., Missouri.

Atlanta Conservation Area	Deer Ridge Conservation Area
<i>Ambystoma texanum</i>	<i>Ambystoma texanum</i>
<i>Bufo americanus</i>	<i>Bufo americanus</i>
<i>Acris crepitans</i>	<i>Acris crepitans</i>
<i>Hyla versicolor</i>	<i>Hyla versicolor</i>
<i>Pseudacris crucifer</i>	<i>Pseudacris crucifer</i>
<i>Pseudacris triseriata</i>	<i>Pseudacris triseriata</i>
<i>Rana blairi</i>	<i>Rana blairi</i>
<i>Rana catesbeiana</i>	<i>Rana catesbeiana</i>
<i>Rana clamitans</i>	<i>Rana clamitans</i>
<i>Rana sphenocephala</i>	<i>Rana sphenocephala</i>
<i>Rana sylvatica</i>	
<i>Chelydra serpentina</i>	<i>Chelydra serpentina</i>
<i>Chrysemys picta</i>	<i>Apalone mutica</i>
	<i>Apalone spinifera</i>
<i>Eumeces fasciatus</i>	
<i>Coluber constrictor</i>	<i>Nerodia sipedon</i>
<i>Lampropeltis calligaster</i>	<i>Regina grahamii</i>
<i>Nerodia sipedon</i>	<i>Storeria dekayi</i>
<i>Storeria dekayi</i>	<i>Storeria occipitomaculata</i>
<i>Storeria occipitomaculata</i>	<i>Thamnophis proximus</i>
<i>Thamnophis sirtalis</i>	
<i>Virginia valeriae</i>	

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## HERPETOFAUNAL SURVEYS

### AMPHIBIANS AND REPTILES OF SOUTHEASTERN MISSOURI

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Amphibians and reptiles from Trail of Tears State Park, Cape Girardeau Co., Missouri in 1996.

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*Ambystoma maculatum*  
*Eurycea longicauda*\*  
*Eurycea lucifuga*\*\*  
*Plethodon albagula*\*  
*Plethodon serratus*\*

*Acris crepitans*\*  
*Gastrophryne carolinensis*  
*Hyla chrysoscelis/versicolor*  
*Pseudacris crucifer*\*\*  
*Rana catesbeiana*\*  
*Rana clamitans*  
*Rana sphenocephala*\*

*Apalone mutica*  
*Apalone spinifera*  
*Chelydra serpentina*  
*Terrapene carolina*\*  
*Trachemys scripta*

*Eumeces fasciatus*\*  
*Eumeces laticeps*\*\*  
*Sceloporus undulatus*\*  
*Scincella lateralis*\*

*Agkistrodon contortrix*\*  
*Carphophis vermis*  
*Coluber constrictor*\*  
*Crotalus horridus*  
*Diadophis punctatus*\*  
*Elaphe obsoleta*\*  
*Heterodon platirhinos*\*\*  
*Lampropeltis getula*\*  
*Lampropeltis triangulum*  
*Nerodia erythrogaster*  
*Nerodia sipedon*\*  
*Opheodrys aestivus*\*  
*Storeria occipitomaculata*\*\*  
*Thamnophis sirtalis*  
*Virginia valeriae*\*\*

\* Voucher taken

\*\*County record.

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Amphibians and reptiles collected in cypress swamps throughout southeastern Missouri in 1996.

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#### **Bollinger County**

*Chelydra serpentina*\*\*  
*Kinosternon subrubrum*\*  
*Sternotherus odoratus*\*  
*Trachemys scripta*

#### **Butler County**

*Amphiuma tridactylum*

*Acris crepitans*, *Bufo americanus*, *B. fowleri*, *Gastrophryne carolinensis*, *Hyla chrysoscelis/versicolor*, *H. cinerea*, *Rana catesbeiana*, *R. clamitans*, *R. sphenocephala*

*Chelydra serpentina*, *Chrysemys picta*, *Deirochelys reticularia*, *Kinosternon subrubrum*, *Pseudemys concinna*, *Sternotherus odoratus*, *Trachemys scripta*\*

*Eumeces fasciatus*, *E. laticeps*, *Sceloporus undulatus*, *Scincella lateralis*

*Agkistrodon contortrix*\*, *A. piscivorus*, *Nerodia erythrogaster*, *N. fasciata*\*, *N. rhombifer*, *N. sipedon*, *Thamnophis proximus*, *T. sirtalis*

#### **Dunklin County**

*Ambystoma talpoideum*

*Acris crepitans*, *Bufo americanus*, *B. fowleri*, *Rana sphenocephala*

*Chrysemys picta*, *Terrapene carolina*\*, *Trachemys scripta*

*Cnemidophorus sexlineatus*

#### **Mississippi County**

*Acris crepitans*, *Bufo americanus*, *B. fowleri*, *Rana clamitans*, *R. sphenocephala*

*Trachemys scripta*

*Eumeces fasciatus*\*\*

*Nerodia erythrogaster*, *N. sipedon*\*\*

#### **Ripley County**

*Rana sphenocephala*

*Apalone spinifera*, *Chelydra serpentina*\*\*  
*Terrapene carolina*\*\*  
*Trachemys scripta*\*\*

*Coluber constrictor*\*\*  
*Nerodia sipedon*, *Thamnophis proximus*\*\*

# ADDITIONS TO THE BIBLIOGRAPHY OF AMPHIBIANS AND REPTILES IN MISSOURI

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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, 1994, 1995) 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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