

# Missouri Herpetological Association



# Newsletter

Number 6

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# MISSOURI HERPETOLOGICAL ASSOCIATION NEWSLETTER NO. 6

## INTRODUCTION

The Sixth Annual Meeting of the **Missouri Herpetological Association** took place on 25-26 September 1993 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 7th Annual Meeting of the **Missouri Herpetological Association** will be held on 24-25 September 1994 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:

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P.O. Box 180  
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**Abstracts of Papers presented at the Sixth Annual Meeting  
of the  
Missouri Herpetological Association**

**25-26 September 1993**

**PRELIMINARY RESULTS OF A CRITICAL HABITAT ANALYSIS OF THE OZARK HELLBENDER**

**T.M. Fobes and R.F. Wilkinson, Jr.**

Southwest Missouri State University, Springfield, MO 65804

A critical habitat study of the Ozark Hellbender, *Cryptobranchus alleganiensis bishopi*, was initiated in June 1993 in the Northfork of the White River, Ozark County, Missouri. Data collection consisted of measuring cover rock size, substrate under and adjacent to hellbender cover rocks, and water depth. Preliminary analysis of substrate under cover rocks showed gravel (36/128 observations) and rubble (75/128 observations) occurred most frequently. The most common substrate types adjacent to hellbender cover rocks was rubble (41% of observations) and boulders (41% of observations). Cover rock lengths ranged from 21-140 cm; widths from 11-100 cm. Mean water depth was 90.8 cm. Data collection will continue through 1994.

**PHEROMONES IN *CRYPTOBRANCHUS ALLEGANIENSIS***

**Cary A. Guffey and Robert F. Wilkinson, Jr.**

Southwest Missouri State University, Springfield, MO 65804

Observations of *Cryptobranchus alleganiensis* during the breeding season have suggested that prior to breeding, males experience a sexual attraction to females. The purpose of this current research is to determine if the source of this attraction is a pheromone with releaser effects. Male hellbenders were placed at the downstream end of a Y-shaped maze with a female in one of the upstream arms. The arm chosen by the male and the amount of time spent in each arm were recorded. In addition, each female was placed in one liter of water for 15 min. This water was then collected for analysis. At the present time, no obvious attraction to females has been observed in tested males. Also, only one female water sample has yielded a product which may have attractive properties. As the breeding season progresses, we hope to collect more conclusive evidence.

**THE EFFECT OF THE GREAT FLOOD OF '93 ON LEOPARD FROGS**

**Sean M. Stone and Richard D. Sage**

University of Missouri, Columbia, MO 65211

We report on the 1993 pre- and post-flood distributions of two species of leopard frogs (*Rana blairi* and *R. sphenoccephala*) along the Missouri River near Jefferson City, Missouri. In May and June, prior to flooding, tadpoles were collected from three ponds on the floodplain. In August, at flood crest, juvenile and adult frogs were collected at seven localities along the edge of the river. The genetic identity of 154 tadpoles and frogs was determined from species-specific alleles of 2-3 enzyme loci that were assayed using starch gel electrophoresis. Results showed that the two species bred at different sites, with *R. blairi* tadpoles in ponds that were farthest out on the floodplain. During the flood, *R. blairi* was displaced into the territory of *R. sphenoccephala*, and both species were collected together at most localities. Future studies will determine whether the two species return to their different breeding sites and whether the number of F1 hybrids increases next year.

**DEPRESSED GROWTH RATES OF *TRACHEMYS SCRIPTA* AND *GRAPTEMYS GEOGRAPHICA*  
IN A THERMALLY ALTERED ENVIRONMENT**

**R. Brent Thomas and Don Moll**

Southwest Missouri State University, Springfield, MO 65804

Lake Taneycomo has been a thermally altered environment since the completion of Table Rock Dam in 1958; since then cold water from the hypolimnion of Table Rock Lake has been released directly into Lake Taneycomo. Utilizing several methods, we captured turtles from coves within this highly variable lake as well as turtles from coves in Bull Creek, a normothermic tributary of the lake. Using plastral annuli, we compared growth rates of both juvenile *T. scripta* and *G. geographica* inhabiting Lake Taneycome to those of turtles from Bull Creek. Using analysis of covariance, rates varied significantly between areas in both species ( $P < 0.0001$ ).

## EVIDENCE OF A SYMBIOTIC RELATIONSHIP BETWEEN CELLULOLYTIC BACTERIA AND A FRESHWATER HERBIVOROUS TURTLE

**R. Brent Thomas, Jack Steiert, and Don Moll**  
Southwest Missouri State University, Springfield, MO 65804

While conducting an unrelated project on turtle diet, we observed that digestive tracts of both *Pseudemys concinna* and *Trachemys scripta* contained high quantities of green algae. Closer observation of the digestive tracts of both species revealed that the algae was well digested in the *Pseudemys*, whereas in the *Trachemys* the algae was hardly digested and still identifiable in the large intestine. We used serial dilution and the most probable number method for enumerating the number of bacteria that exhibited cellulolytic activity. We found that the adult *Pseudemys* digestive tracts contained cellulolytic bacteria in concentrations of  $2.5 \times 10^9$  cells/g of intestinal matter and that adult *Trachemys* digestive tracts contained concentrations of  $1.5 \times 10^6$  cells/g of intestinal matter. We have incubated *Pseudemys concinna* eggs and upon hatching performed the serial dilution technique and found the concentration of cellulolytic bacteria to be 700 cells/g of intestinal matter.

## NICHE PARTITIONING BY A LIZARD COMMUNITY IN THE SIERRA DE BAORUCO, HISPANIOLA

**S.P. Sowell, R. Powell, J.S. Parmerlee, Jr., A. Lathrop, and D.D. Smith**  
Avila College, Kansas City, MO 64145

In June 1993 we examined aspects of niche partitioning in a community of lizards from a cafetal along a road on the eastern slope of the Sierra de Baoruco, Hispaniola. The south-facing roadside was covered with grasses and low herbaceous shrubs. The adjacent cafetal consisted of a three-tiered canopy composed of low coffee trees and intermediate-sized citrus trees, both in the shadow of a very large *Clusia rosea* tree. The latter was characterized by numerous adventitious aerial roots. Ground cover was lacking, except for two patches of pineapples. Five species of anoles (*Anolis bahorucoensis*, *A. barahonae*, *A. coelestinus*, *A. cybotes*, and *A. distichus*) occupied the cafetal, with *Anolis bahorucoensis* and *A. barahonae* restricted to the shaded area. A grass anole (*A. olssoni*) and a ground-dwelling tropidurid *Leiocephalus barahonensis* were found only along the edge of the road. A terrestrial anguid (*Celestus costatus*) was found both along the road and among the pineapples in the cafetal. A dwarf gecko (*Sphaerodactylus* sp.) had been consumed by an *A. cybotes*. Examination of stomach contents to elucidate food habits and comparisons of cloacal and environmental temperatures failed to resolve distinct niche dimensions. All species were largely opportunistic feeders, and temperatures varied only between the shade-dwelling anoles and occupants of the exposed roadside. However, horizontal and vertical aspects of the habitat were distinctly partitioned among the species studied.

## NEW RECORDS OF AMPHIBIANS AND REPTILES IN MISSOURI FOR 1993

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

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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) 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 64145; KU - University of Kansas Museum of Natural History, Lawrence, KS 66045; MDC - Missouri Department of Conservation, Jefferson City, MO 65102; NWMSU - Northwest Missouri State University, Maryville, MO 64468; UMC - University of Missouri - Columbia, Columbia, MO 65211.

## NEW COUNTY RECORDS

### Amphibia: Caudata

#### SPOTTED SALAMANDER

*Ambystoma maculatum*

**PIKE CO:** Ranacker Wildlife Area 9.5 km N Curryville S26 T54N R4W, 16 November 1991, B.S. Edmond and J.D. Blackwell (UMC 1984C) (Edmond, 1992a).

#### MARbled SALAMANDER

*Ambystoma opacum*

**CALLOWAY CO:** Reform Wildlife Area 0.25 mi E of shooting range S7 T46N R7W (larva in temporary pond), 25 May 1993, T.R. Johnson and M. Schroer (KU cat. no. pending). **MONTGOMERY CO:** Danville Wildlife Area S6 T47N R5W, 9 September 1992, B.S. Edmond and K.J. Edmond (UMC 2107C) (Edmond, 1993a). **OSAGE CO:** 1.7 mi SSW Copper Hill S34 T43N R7W, 10 April 1993, G. Emick (KU cat. no. pending).

#### SMALLMOUTH SALAMANDER

*Ambystoma texanum*

**PLATTE CO:** Schimmel City Platte River Access S10 T28N R35W, 30 August 1992, V.D. von Frese (BWMC 04951). **PUTNAM CO:** Near pond next to Dean Cemetery, Rebel's Cove Wildlife Area 11 km N Livonia S32 T67N R16W, 29 February 1992, B.S. Edmond (UMC 1987C) (Edmond, 1992b).

#### EASTERN TIGER SALAMANDER

*Ambystoma tigrinum tigrinum*

**CLARK CO:** Iliniwck State Historic Site S16 T65N R6W, 4 October 1993, R. Boyl and L. Grantham (KU cat. no. pending). **PUTNAM CO:** Pond on J. Polson farm 3 km S Omaha and 8 km NW Livonia S23 T66N R17W, 29 February 1992, B.S. Edmond (UMC 1986C) (Edmond, 1992c).

#### LONGTAIL SALAMANDER

*Eurycea longicauda longicauda*

**CAPE GIRARDEAU CO:** HW OO 2 mi W Bufordsville S26 T31N R11E, 30 September 1992, M. Kahle (observation, photograph on file at MDC).

#### CENTRAL NEWT

*Notophthalmus viridescens louisianensis*

**PIKE CO:** Pond on C. Blackwell farm 8 km NNW Curryville S5 T53N R4W, 1 February 1992, B.S. Edmond (UMC 1985C) (Edmond, 1992d). **WEBSTER CO:** Woodland pond 1.5 mi SE Rogersville S29 T28N R19W, 16 April 1993, C.D. Cole and J.S. Tulloch (BWMC 04983).

### Amphibia: Anura

#### BLANCHARD'S CRICKET FROG

*Acris crepitans blanchardi*

**MONTGOMERY CO:** Little Bear Creek at HW 19 S34 T47N R5W, 27 September 1992, J.S. Tulloch (BWMC 04961).

#### WOODHOUSE'S TOAD

*Bufo woodhousii woodhousii*

**LAWRENCE CO:** HW N 2 mi N HW 44 S27 T28N R26W AOR, 1 October 1993, V.D. von Freese (BWMC 05536).

### NORTHERN SPRING PEEPER

*Pseudacris crucifer crucifer*

**DOUGLAS CO:** Woodland pond S6 T26N R16W, 16 April 1993, C. Huntington and G.T. Lahey (BWMC 04982). **HARRISON CO:** 3.5 mi N Martinsville and 2 mi E HW D S35 T64N R29W, 9 April 1993, S. Smith (KU cat. no. pending); Dunn Ranch, 10 April 1992, D.A. Easterla and M.D. Meadows (NWMSU 4017-8) (Easterla and Meadows, 1993). Northwesternmost recorded locality in Missouri.

### PLAINS LEOPARD FROG

*Rana blairi*

**DUNKLIN CO:** 1 mi S Hornersville along bank of drainage ditch S17 T16N R9E, 29 July 1993, T.R. Johnson (KU cat. no. pending); extends the known range of this species ca. 65 mi to the southeast from the nearest previously recorded site.

### BULLFROG

*Rana catesbeiana*

**LAWRENCE CO:** Pond of HW 174 0.75 mi W HW 44 S21 T28N R26W, 17 September 1992, V.D. von Frese (BWMC 04952). **STONE CO:** HW K 1 mi S Union City S16 T26N R23W, 17 April 1993, J.S. Tulloch (BWMC 04984).

### GREEN FROG

*Rana clamitans melanota*

**PIKE CO:** ca. 5.5 km N Curryville S18 T53N R4W, 23 August 1992, B. S. Edmond (UMC 1322-3A) (Edmond, 1993b).

### SOUTHERN LEOPARD FROG

*Rana sphenocephala*

**CAPE GIRARDEAU CO:** Jct. HW 34 and HW 72 S6 T31N R12E, 2 July 1992, M. Kahle (KU cat. no. pending).

### Reptilia: Testudines

#### WESTERN SPINY SOFTSHELL

*Apalone spinifera hartwegi*

**HARRISON CO:** HW EE over Panther Creek S19-20 T64N R29W DOR, 8 July 1993, J.W. Grace (observation, photograph on file at MDC).

#### EASTERN SPINY SOFTSHELL

*Apalone spinifera spinifera*

**CRAWFORD CO:** Reis Biological Station in flood waters of Huzzah Creek S5 T37N R2W, 2 October 1993, S. Ballard (KU cat. no. pending).

#### COMMON SNAPPING TURTLE

*Chelydra serpentina serpentina*

**LAWRENCE CO:** S12 T27N R25W, 18 April 1993, C.D. Cole (BWMC 04991).

#### WESTERN PAINTED TURTLE

*Chrysemys picta bellii*

**COOPER CO:** HW 179 1.5 mi NW Wooldridge S15 T48N R15W, 15 May 1993, T.R. Johnson and R. Krager (KU cat. no. pending).

#### BLANDING'S TURTLE

*Emydoidea blandingii*

**ST. CHARLES CO:** Busch Memorial Conservation Area

near HW D 1.75 mi W HW 94 S25 T46N R2E, 28 April 1991, J. Garr and J. Miller (KU cat. no. pending). This record extends the known range of the species south of the nearest Missouri record and southwest of the nearest Illinois record.

#### COMMON MAP TURTLE

*Graptemys geographica*

**TANEY CO:** Lake Taneycomo (Rockaway Slough) S30 T23N R20W, 19 September 1992, B. Thomas, D. Peterson, K. Thompson, and C. Guffey (BWMC 05001-2).

#### ALLIGATOR SNAPPING TURTLE

*Macrolemys temminckii*

**DUNKLIN CO:** Ben Cash Wildlife Area S22 T18N R8E, 28 July 1993, S. Santhuff and T.R. Johnson (observation, photograph on file at MDC).

#### MISSOURI RIVER COOTER

*Pseudemys concinna metteri*

**TANEY CO:** Lake Taneycomo (Rockaway Slough) S30 T23N R20W, 19 September 1992, B. Thomas, D. Peterson, K. Thompson, and C. Guffey (BWMC 04999-5000).

#### COMMON MUSK TURTLE

*Sternotherus odoratus*

**MILLER CO:** Osage Catfish Farm near HW 54 S8 T40N R15W, 19 July 1993, G. Pinson (KU cat. no. pending).

#### RED-EARED SLIDER

*Trachemys scripta*

**TANEY CO:** Lake Taneycomo (Rockaway Slough) S30 T23N R20W, 19 September 1992, B. Thomas, D. Peterson, K. Thompson, and C. Guffey (BWMC 04998).

#### Reptilia: Squamata: Sauria

##### FIVE-LINED SKINK

*Eumeces fasciatus*

**LAWRENCE CO:** S14 T26N R25W, 18 April 1993, C. Huntington (BWMC 04988). **PIKE CO:** ca. 5.5 km NW Curryville S18 T53N R4W, 21 August 1992, B. S. Edmond (UMC 633L) (Edmond, 1993c).

##### BROADHEAD SKINK

*Eumeces laticeps*

**JEFFERSON CO:** Victoria Glade Natural History Area S14 T40N R4E, G. Yatskiyevych (observation, photograph on file at MDC).

##### GREAT PLAINS SKINK

*Eumeces obsoletus*

**CHRISTIAN COUNTY:** Busiek Wildlife Area S15 T25N R25W, 16 April 1993, S.G. Thornhill (BWMC 04993). This record extends the known range of this species in Missouri approximately 55 km (34 mi) NE of the nearest known locality in Barry County (Thornhill and Powell, 1993). **CLAY CO:** HW 35 and HW 92 W edge of Kearney S34 T53N R31W, 12 July 1993, D. Dennis (KU cat. no. pending).

##### NORTHERN PRAIRIE SKINK

*Eumeces septentrionalis*

**HARRISON CO:** Dunn Ranch, 31 May 1992, D.A. Easterla and M.D. Meadows (NWMSU 4010-2) (Easterla and Meadows, 1993).

##### WESTERN SLENDER GLASS LIZARD

*Ophisaurus attenuatus attenuatus*

**FRANKLIN CO:** near Washington, June 1992, M. Baumer (KU cat. no. pending).

#### GROUND SKINK

*Scincella lateralis*

**DADE CO:** RR crossing HW MM S23 T30N R25W, 18 April 1993, J.S. Parmerlee (BWMC 04992). **PIKE CO:** Ranacker Wildlife Area S13 T54N R4W, 22 August 1992, B.S. Edmond (UMC 634L); ca. 5 km N Curryville S18 T53N R4W, 22 August 1992, B.S. Edmond and K.J. Edmond (UMC 635L) (Edmond, 1993d).

#### Reptilia: Squamata: Serpentes

##### OSAGE COPPERHEAD

*Agkistrodon contortrix phaeogaster*

**DADE CO:** HW 39 100 m E Sons Creek (Stockton Lake) S26 T32N R27W DOR, 2 October 1993, V.D. von Freese (BWMC 05540).

##### EASTERN YELLOWBELLY RACER

*Coluber constrictor flaviventris*

**BUCHANAN CO:** HW B 0.75 mi S HW 116 S29 T55N R33W AOR, 3 October 1993, V.D. von Freese (BWMC 05542). **MACON CO:** S20 T56N R14W DOR, 19 July 1993, S.G. Thornhill (BWMC 05535). **HARRISON CO:** Dunn Ranch, 16 June 1992, D.A. Easterla and M.D. Meadows (observation per Easterla and Meadows, 1993).

##### PRAIRIE RINGNECK SNAKE

*Diadophis punctatus arnyi*

**LAWRENCE CO:** S14 T26N R25W, 18 April 1993, R. Powell (BWMC 04989). **OSAGE CO:** 2 mi SSW Useful S34 T43N R7W, 19 November 1993, G. Emick (KU cat. no. pending).

##### GREAT PLAINS RAT SNAKE

*Elaphe emoryi*

**OSAGE CO:** S9 T41N R11W, 17 June 1993, A. Wallen and R. Krager (KU cat. no. pending).

##### BLACK RAT SNAKE

*Elaphe obsoleta obsoleta*

**CEDAR CO:** HW 32 300 m N Alder Creek S21 T29N R35W DOR, 2 October 1993, V.D. von Freese (BWMC 05541). **OSAGE CO:** 2 mi SSW Useful S34 T43N R7W, 27 May 1991, G. Emick (KU cat. no. pending).

##### PRAIRIE KINGSSNAKE

*Lampropeltis calligaster calligaster*

**LAFAYETTE CO:** HW YY 3.7 mi E HW 13 S21 T48N R25W DOR, 6 September 1993, D.D. Smith and C.B. Cohick (BWMC 05545). **LAWRENCE CO:** HW M 2 mi S HW 96 S3 T28N R26W DOR, 1 October 1993, V.D. von Freese (BWMC 05537).

##### SPECKLED KINGSSNAKE

*Lampropeltis getula holbrooki*

**HARRISON CO:** Dunn Ranch, 16 June 1992, D.A. Easterla and M.D. Meadows (observation per Easterla and Meadows, 1993). **HICKORY CO:** Pomme de Terre Lake S23 T36N R22W, 3 July 1992, J.S. Tulloch (BWMC 04954).

DIAMONDBACK WATER SNAKE

*Nerodia rhombifer*

**PIKE CO:** S Ted Shanks Wildlife Area visitor center S18 T55N R2W, 4 October 1992, B.S. Edmond (UMC 774S) (Edmond, 1993e).

MIDLAND WATER SNAKE

*Nerodia sipedon pleuralis*

**DOUGLAS CO:** Highwater crossing HW Y 3 mi W Ava S8 T26N R16W, 16 April 1993, R. Seibolt (BWMC 04981).

NORTHERN WATER SNAKE

*Nerodia sipedon sipedon*

**BUCHANAN CO:** HW 116 0.5 mi E HW MM S27 T55N R34W DOR, 3 October 1993, V.D. von Freese (BWMC 05543). **PIKE CO:** ca. 5.5 km NW Curryville S12 T53N R5W, 21 August 1992, B.S. Edmond (UMC 771S); S Ted Shanks Wildlife Area visitor center S18 T55N R2W, 4 October 1992, B.S. Edmond (UMC 775S) (Edmond, 1993f).

GRAHAM'S CRAYFISH SNAKE

*Regina grahamii*

**PIKE CO:** S Ted Shanks Wildlife Area visitor center S18 T55N R2W, 10 August 1992, B.S. Edmond (UMC 769S) (Edmond, 1993g).

MIDLAND BROWN SNAKE

*Storeria dekayi wrightorum*

**MONITEAU CO:** S28 T46N R14W, 7 October 1993, T.R. Johnson and R. Krager (KU cat. no. pending).

NORTHERN REDBELLY SNAKE

*Storeria occipitomaculata occipitomaculata*

**PIKE CO:** ca. 7 km NNW Curryville S5 T53N R4W, 23 August 1992, B.S. Edmond (UMC 772S) (Edmond, 1993h).

FLATHEAD SNAKE

*Tantilla gracilis*

**DADE CO:** HW WW 0.25 mi E Turnback Creek S35 T30N R26W AOR, 2 October 1993, V.D. von Freese (BWMC 05539). **MONTGOMERY CO:** Danville Wildlife Area S5 T47N R5W, 30 September 1992, B.S. Edmond and K.J. Edmond (UMC 773S) (Edmond, 1993i).

WESTERN RIBBON SNAKE

*Thamnophis proximus proximus*

**DOUGLAS CO:** HW A S24 T25N R17W DOR, 16 April 1993, R. Powell (BWMC 04980). **LAWRENCE CO:** Pond of HW 174 0.75 mi W HW 44 S21 T28N R26W, 17 SEPTEMBER 1992, V.D. von Freese (BWMC 04953).

RED-SIDED GARTER SNAKE

*Thamnophis sirtalis parietalis*

**DADE CO:** HW WW 200 m E Turnback Creek S3 T28N R26W DOR, 2 October 1993, V.D. von Freese (BWMC 05538). **OSAGE CO:** 2 mi SSW Useful S34 T43N R7W, 27 July 1992, G. Emick (KU cat. no. pending).

NORTHERN LINED SNAKE

*Tropidoclonion lineatum lineatum*

**HARRISON CO:** Dunn Ranch, 16 June 1992, D.A. Easterla and M.D. Meadows (NWMSU 4013) (Easterla and Meadows, 1993).

EASTERN EARTH SNAKE

*Virginia valeriae valeriae*

**PIKE CO:** ca. 5 km NW Curryville S18 T53N R4W, 22 August 1992, B.S. Edmond and K.J. Edmond (UMC 770S) (Edmond, 1993j).

NEW MAXIMUM SIZE RECORDS

**Amphibia: Caudata**

SMALLMOUTH SALAMANDER

*Ambystoma texanum*

**CASS CO:** S Raymore S21 T46N R32W, 20 March 1993, J.L. Gebauer (BWMC 04955). Snout-vent length: 102 mm (4.0 in), total length: 183 mm (7.2 in).

**Amphibia: Anura**

SOUTHERN LEOPARD FROG

*Rana sphenocephala*

**CAPE GIRARDEAU CO:** Jct. HW 34 and HW 72 S6 T31N R12E, 2 July 1992, M. Kahle (KU cat. no. pending). Snout-vent length: 90 mm (3.5 in).

**Reptilia: Testudines**

MISSOURI RIVER COOTER

*Pseudemys concinna metterii*

**TANEY CO:** Lake Taneycomo (Rockaway Slough) S30 T23N R20W, April 1993, R.B. Thomas (BWMC 05544). Carapace length: 327 mm (12.9 in).

**Reptilia: Squamata: Sauria**

NORTHERN PRAIRIE SKINK

*Eumeces septentrionalis*

**HARRISON CO:** Dunn Ranch, 31 May 1992, D.A. Easterla and M.D. Meadows (NWMSU 4011) (Easterla and Meadows, 1993). Snout-vent length: 76 mm (3.0 in), total length: 184 mm (7.2 in). Dunn Ranch, 16 June 1992, D.A. Easterla and M.D. Meadows (NWMSU 4015) (Easterla and Meadows, 1993). Snout-vent length: 75 mm (3.0 in); total length: 203 mm (8.0 in).

WESTERN SLENDER GLASS LIZARD

*Ophisaurus attenuatus attenuatus*

**FRANKLIN CO:** near Washington, June 1992 (held in captivity until April 1993), M. Baumer (KU cat. no. pending). Total length: 713 mm (28.1 in).

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## APPENDIX.

### UPDATED DISTRIBUTION MAPS FOR AMPHIBIANS AND REPTILES IN MISSOURI

Robert Powell<sup>1</sup>, Tom R. Johnson<sup>2</sup>, and John S. Parmerlee, Jr.<sup>1</sup>

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<sup>2</sup> Missouri Department of Conservation, P.O. Box 180, Jefferson City, MO 65102

Many taxonomic changes and a number of new distributional records have accumulated since the publication of Johnson (1987). One species, *Nerodia cyclopion*, is thought to have been extirpated in Missouri. Also, a few historical records are no longer considered valid due to a lack of recent supportive data (*Macroclémys temminckii* and *Liochlorophis vernalis*). In order to provide herpetologists working in Missouri with current information in a compact package suitable for use in the field, we present on the following pages distribution maps for those species known to occur in Missouri. Counties in which catalogued museum specimens have been taken are shaded. Lighter shading is used to indicate counties in which specimens have been sighted, but from which vouchers are lacking. No effort has been made to distinguish the ranges of subspecies, in part due to uncertainty regarding the validity of some such taxa and in part due to the lack of definitive information that would elucidate more precisely the boundaries of some subspecific ranges. To facilitate the use of these maps, a state map with county names is presented on page 8 (overleaf).

Taxonomy is constantly changing, and new combinations may not be universally recognized or accepted, depending on the nature and strength of the data used to support the change in question. Often only the test of time and additional information are capable of resolving some disputes. As a result, when faced with new combinations and insufficient time or data with which to make conclusive decisions, disagreements may arise even among coauthors regarding the proper use of names. Such is the situation in this appendix. The resultant compromises leave none of us entirely satisfied, and readers should note that neither they nor the authors should feel compelled to follow the current presentation.

The most difficult decisions included the treatment of the *Graptemys pseudogeographica* complex. In 1987, Johnson chose to be conservative, but herein we follow Vogt (1993) by elevating *G. ouachitensis* to species status and treating *G. kohnii* as a race of *G. pseudogeographica*. Other disagreements deal with the status of *Elaphe (guttata) emoryi*, *Necturus (maculosus) louisianensis*, and *Eumeces (septentrionalis) obtusirostris*. Over the strong objections of one author (TRJ), we have followed Collins (1993) in recognizing these taxa as distinct species.

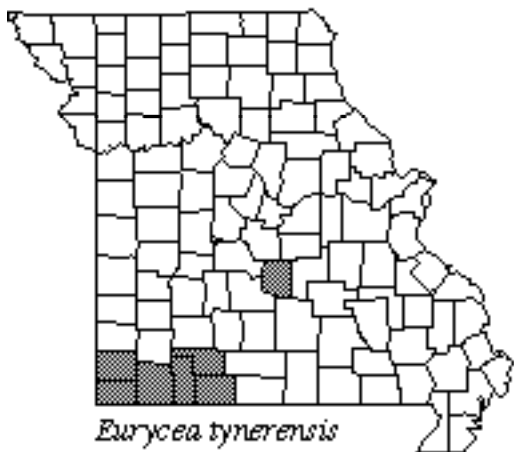
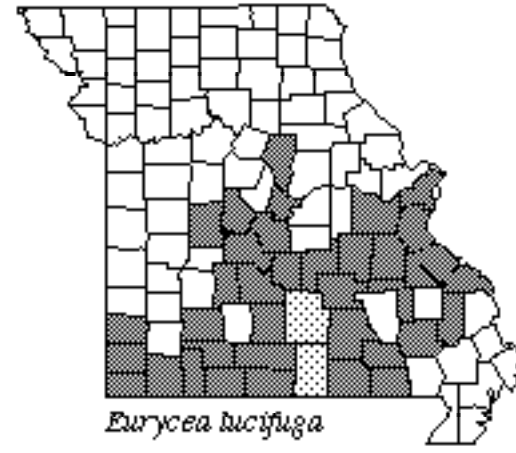
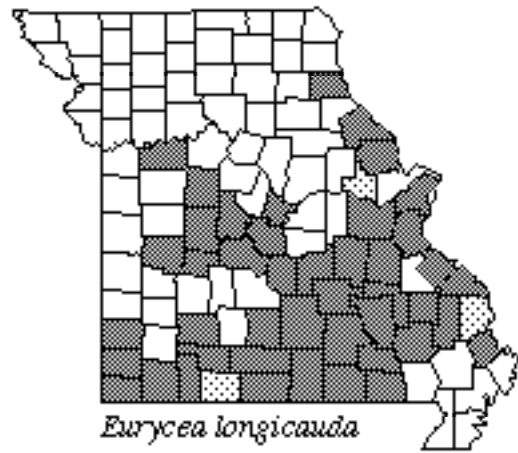
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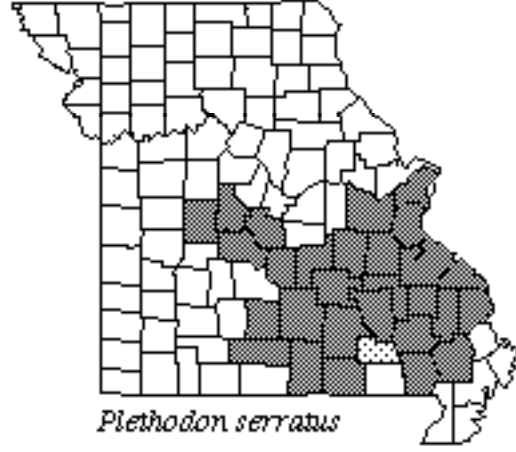
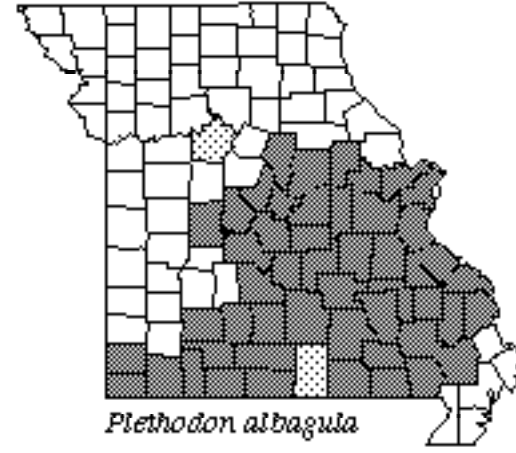
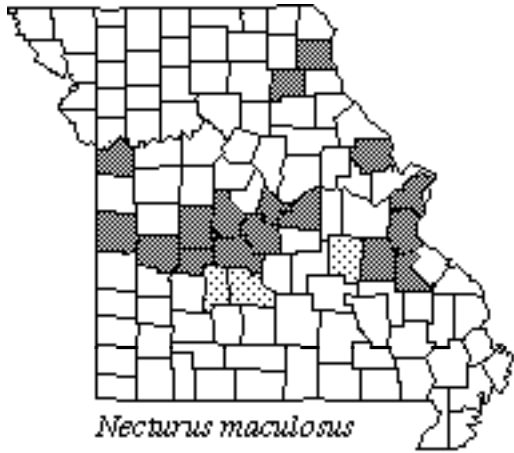
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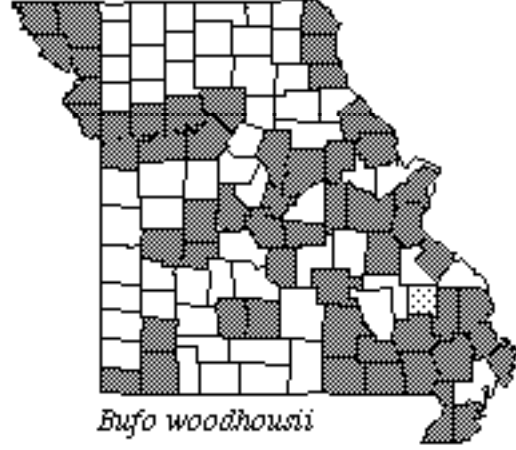
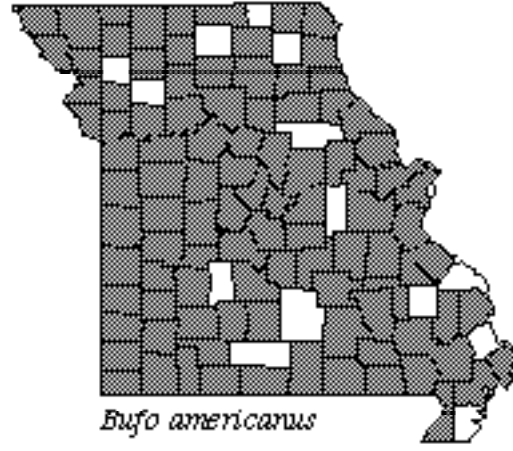
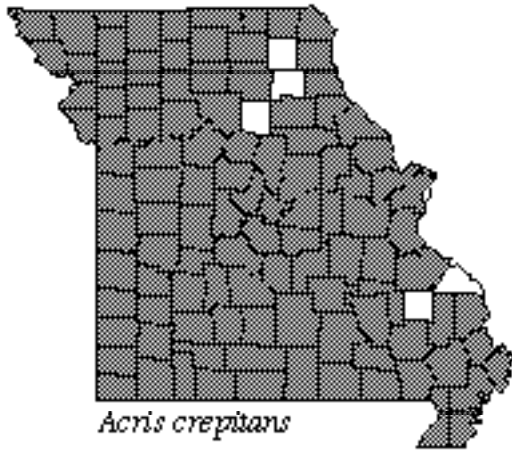


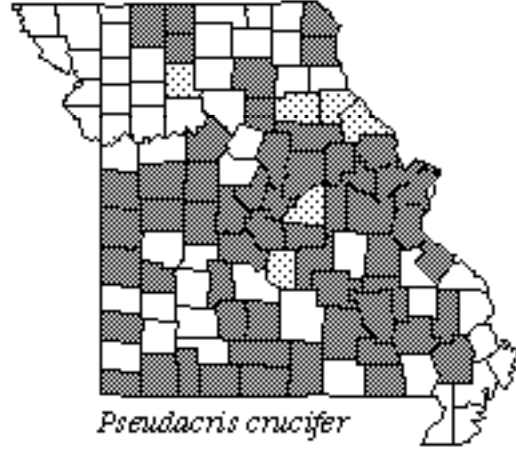
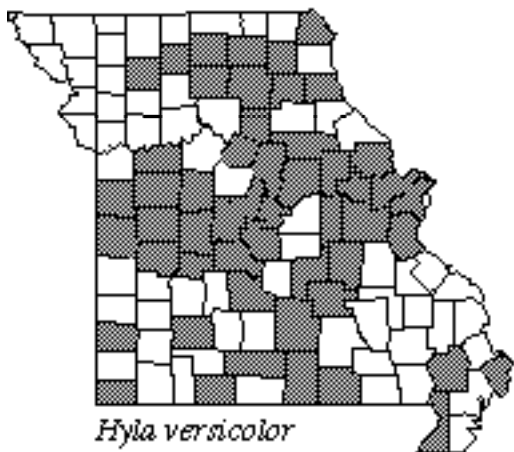
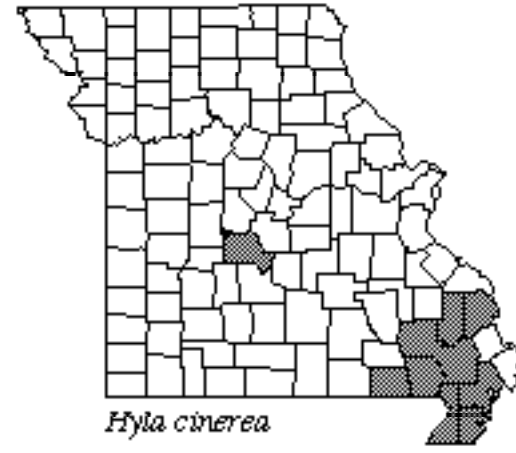
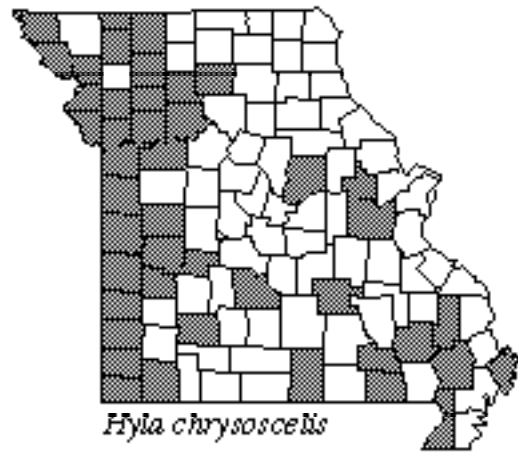
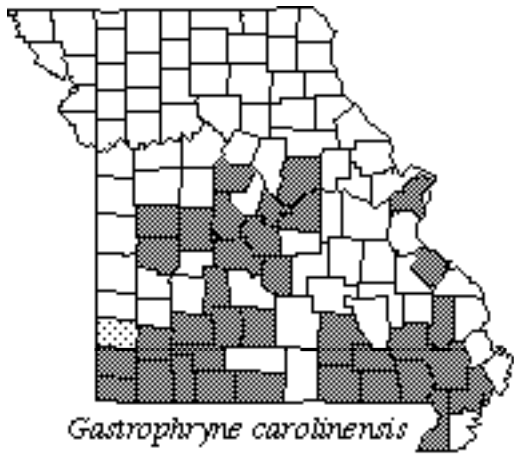


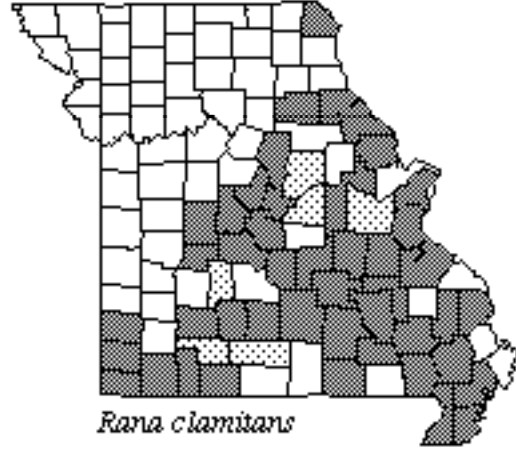
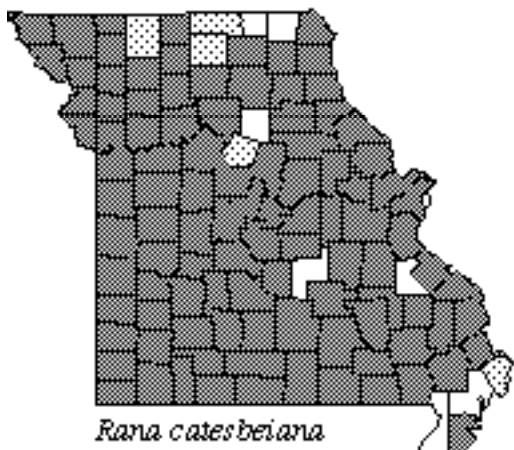
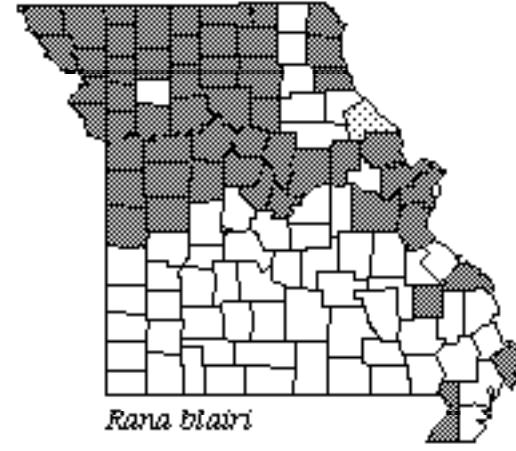
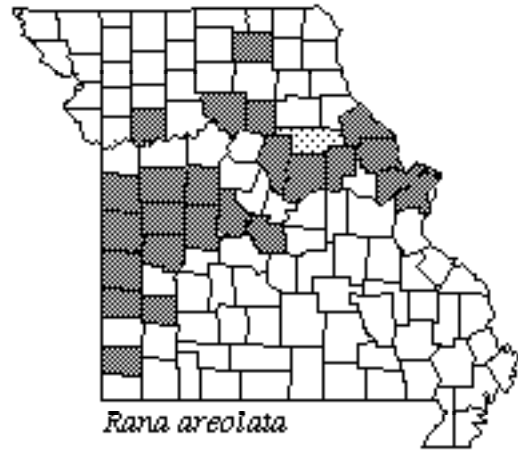
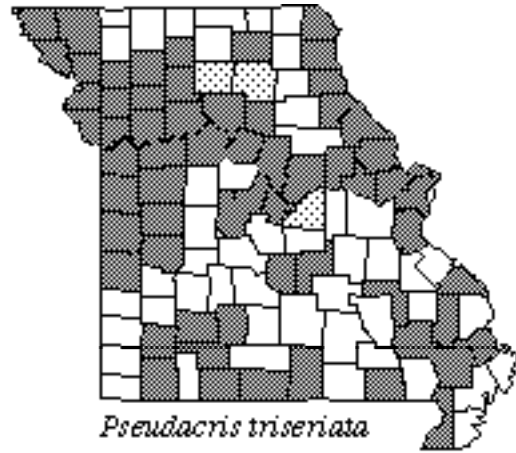


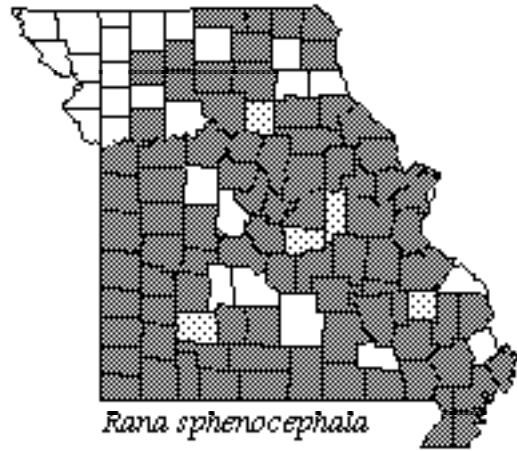
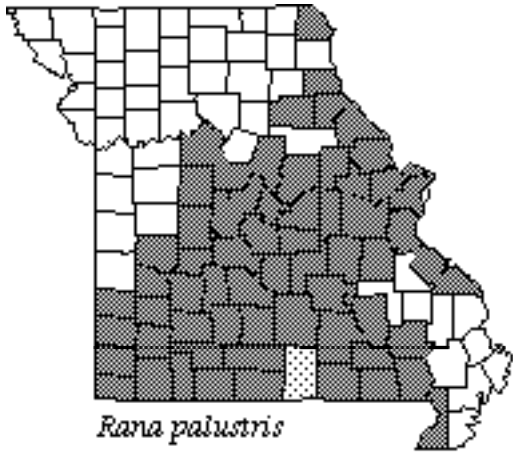




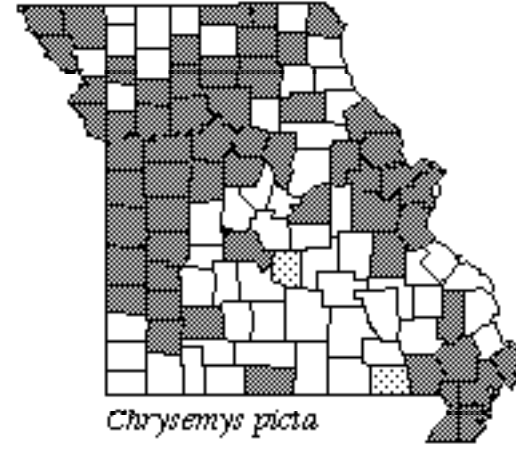
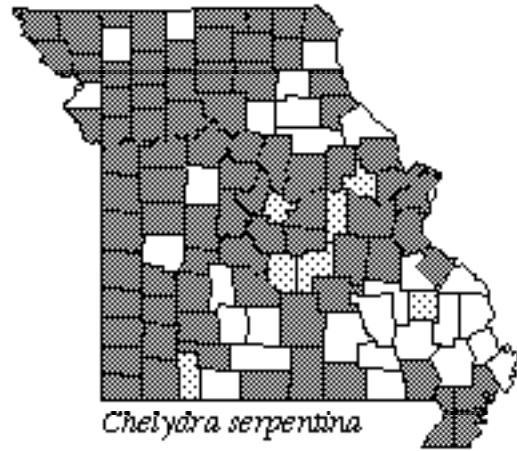
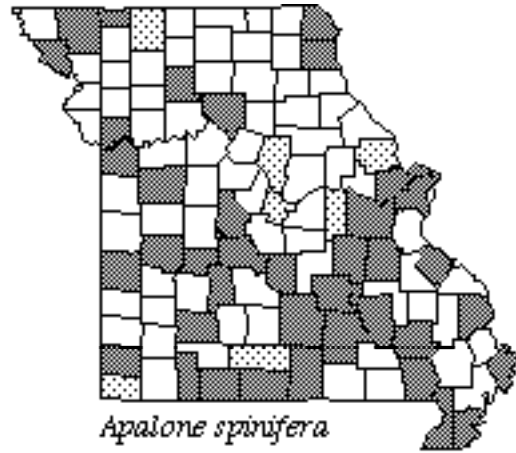


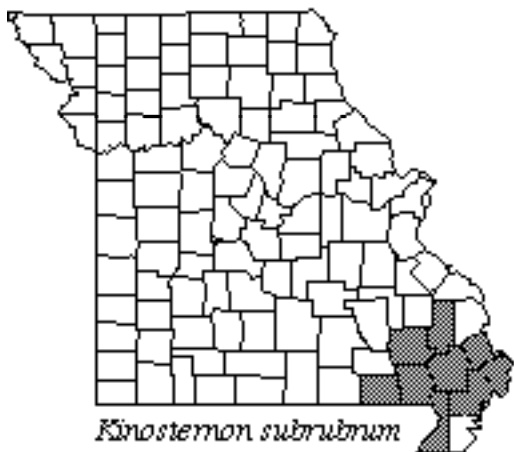
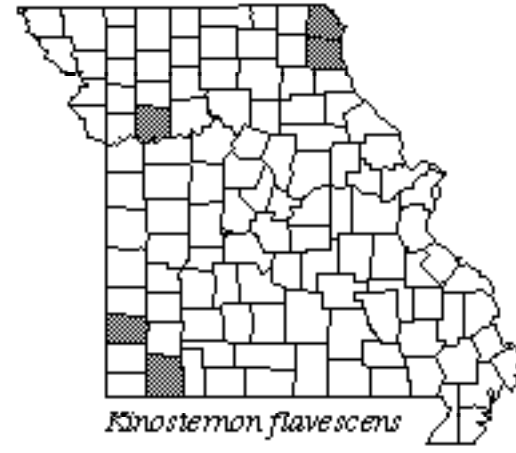


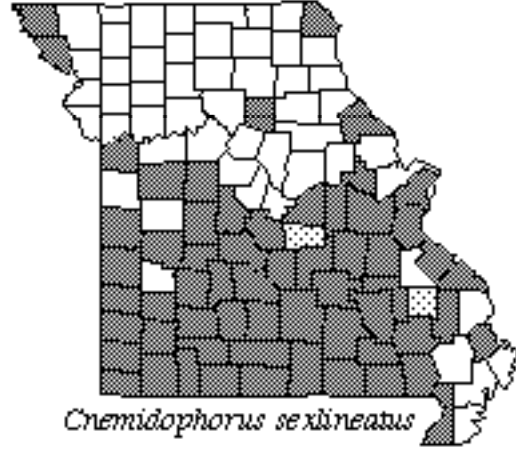
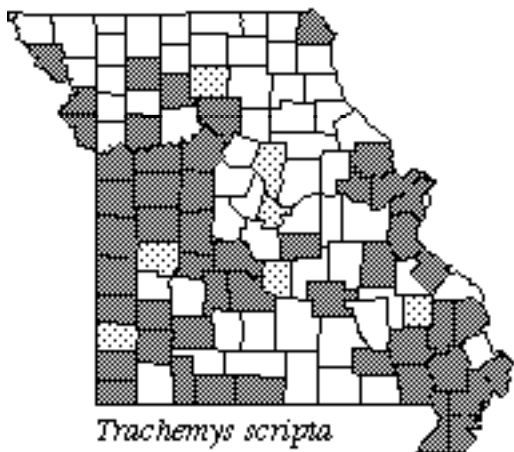
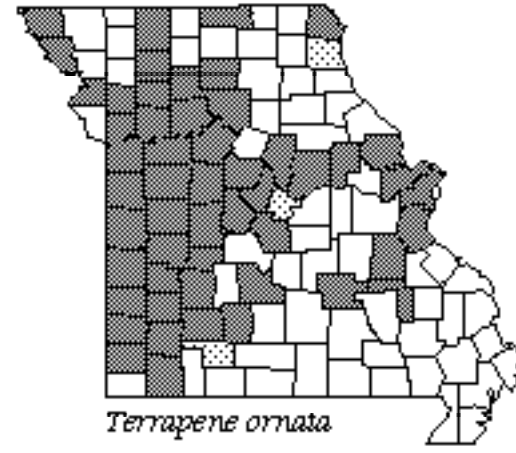
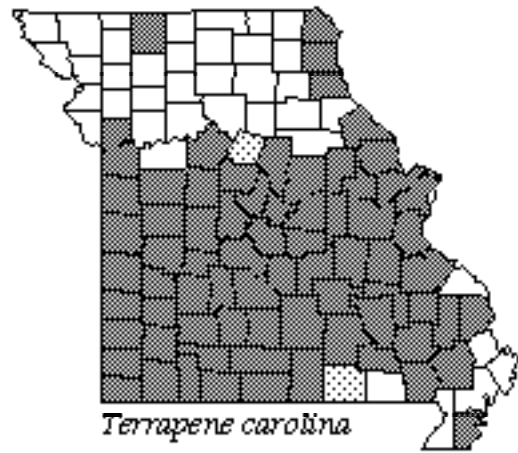
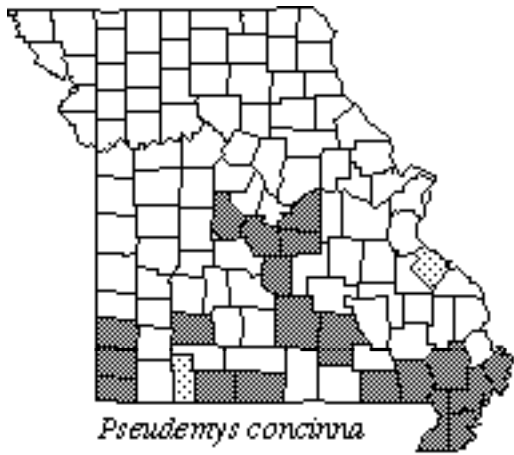


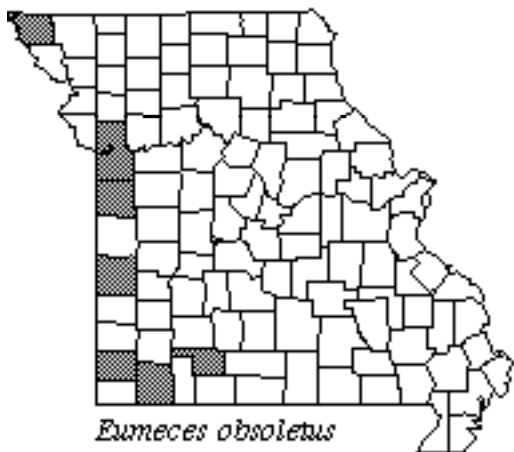
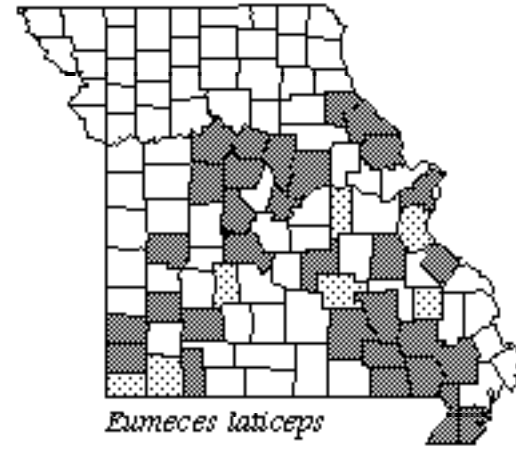
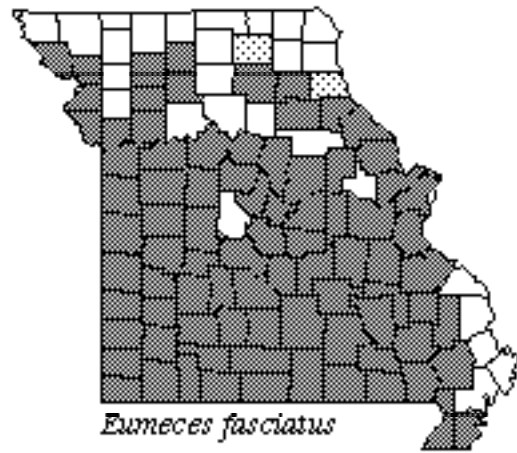
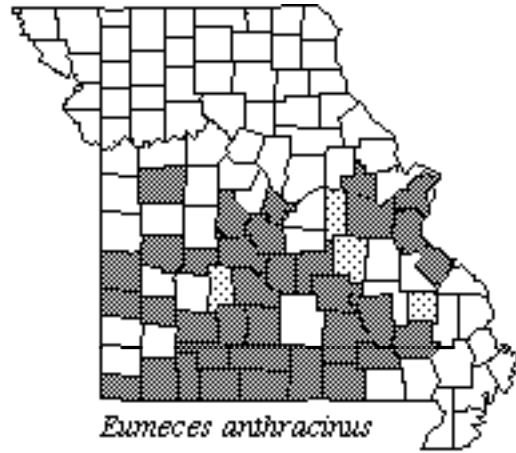
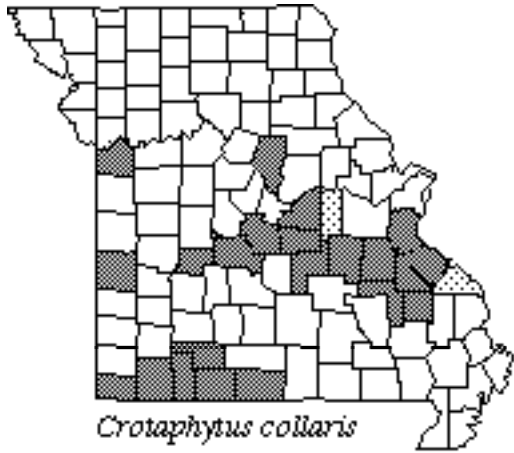


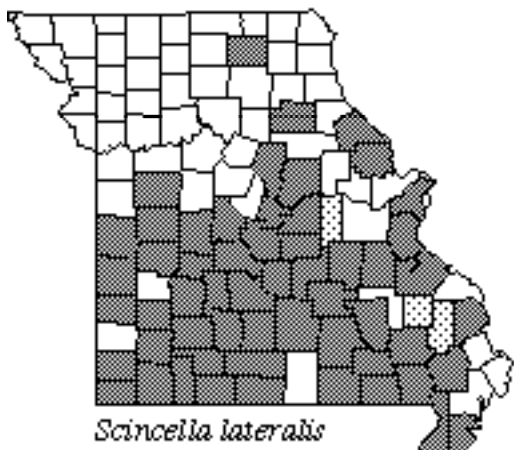
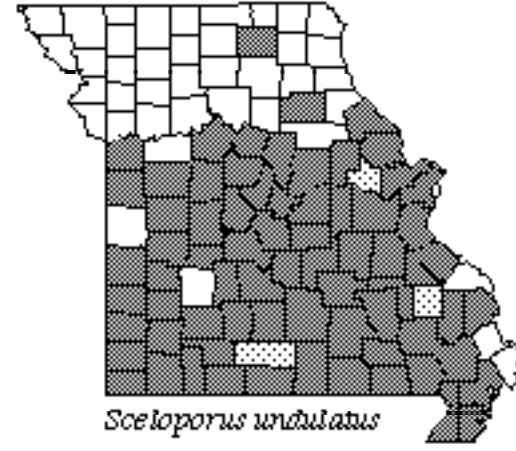
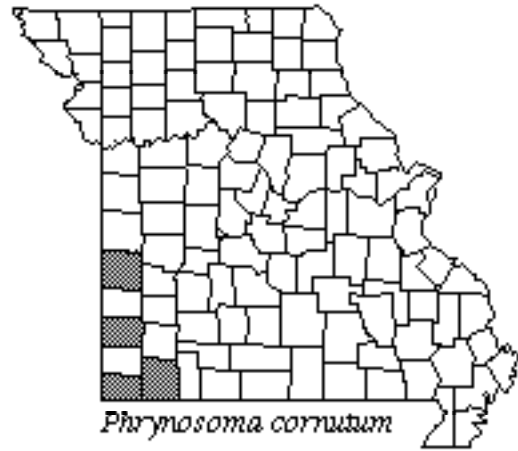
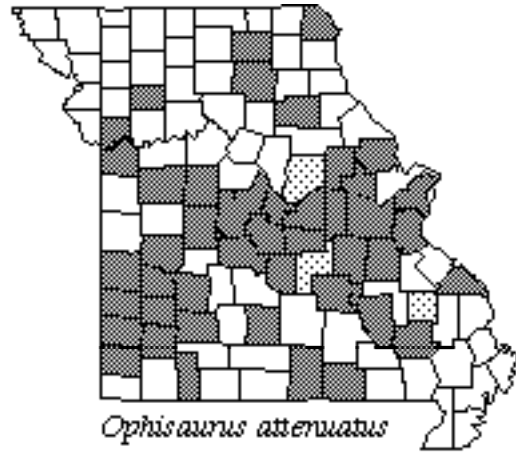


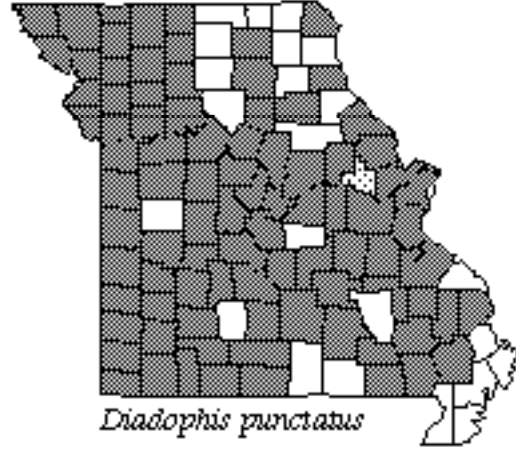
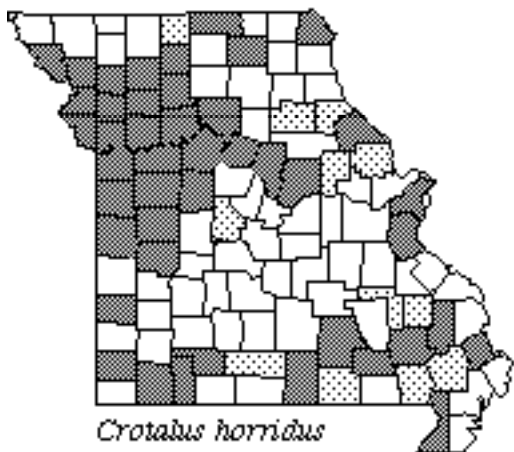
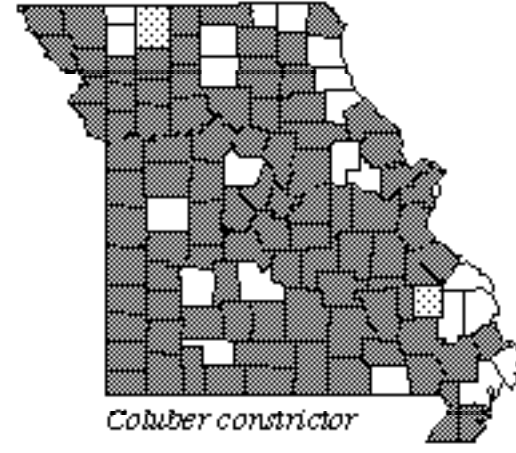
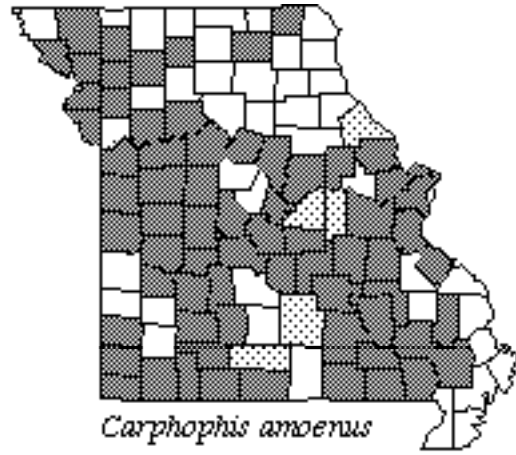


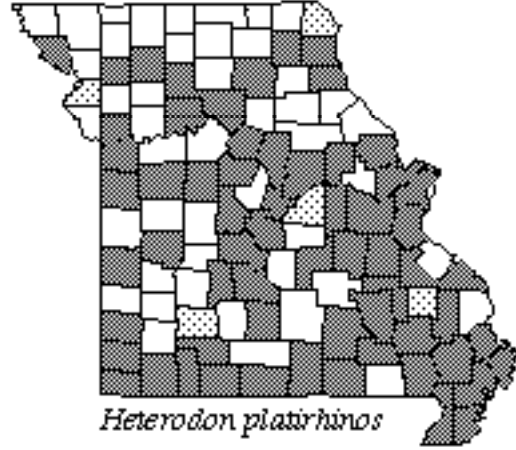
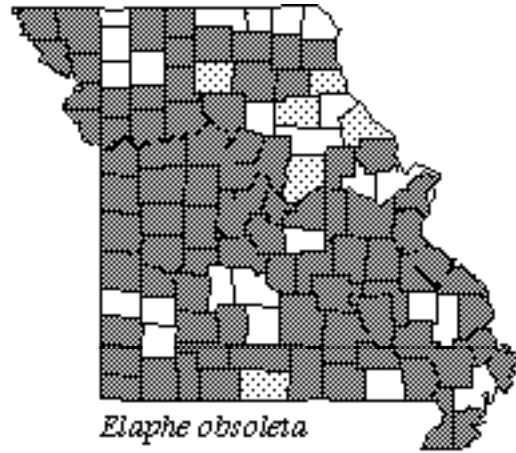
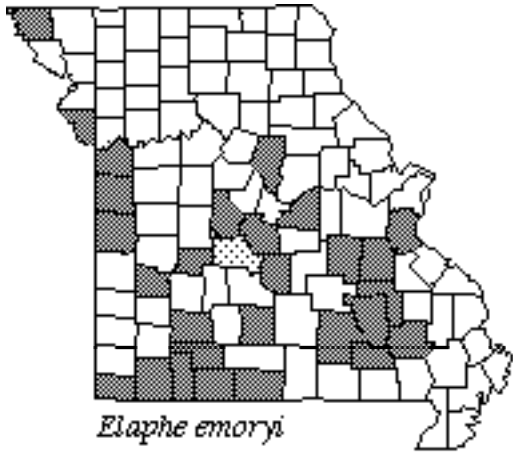


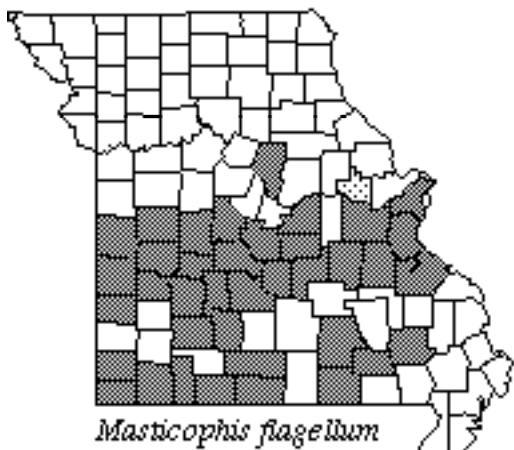
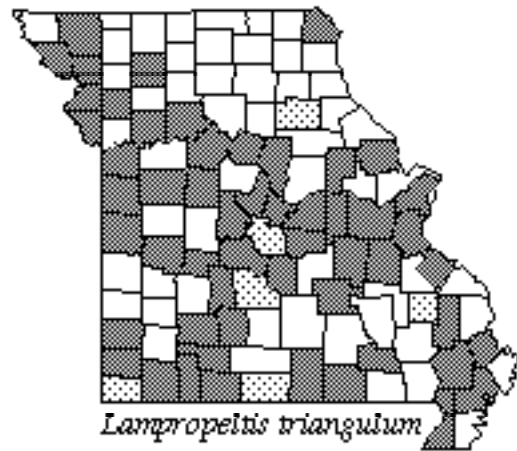
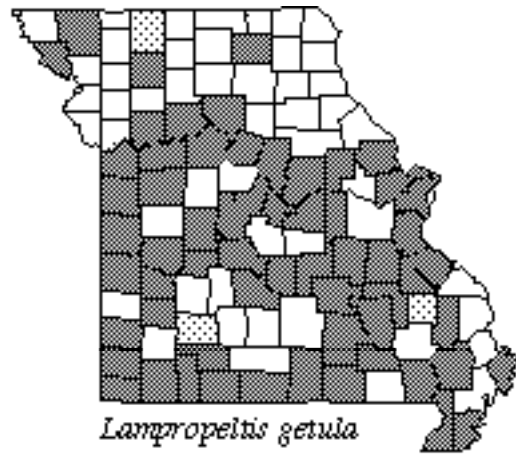
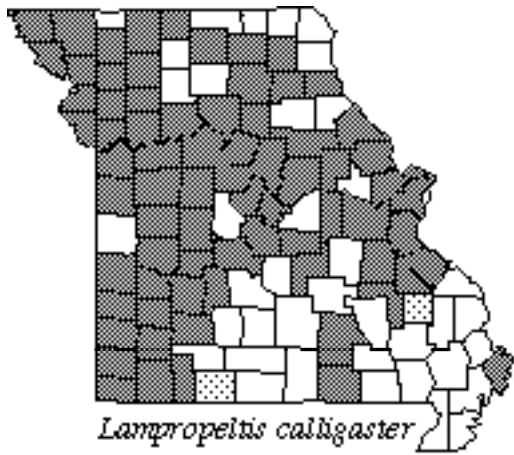




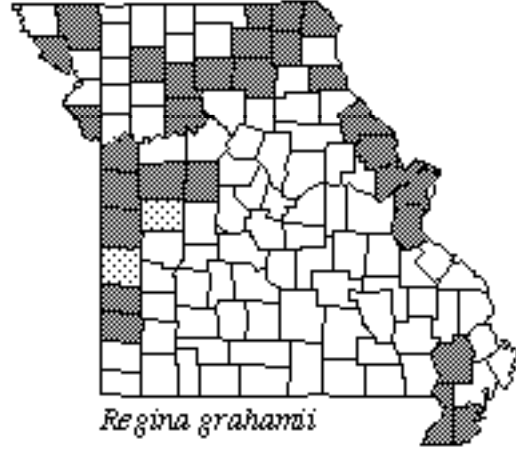
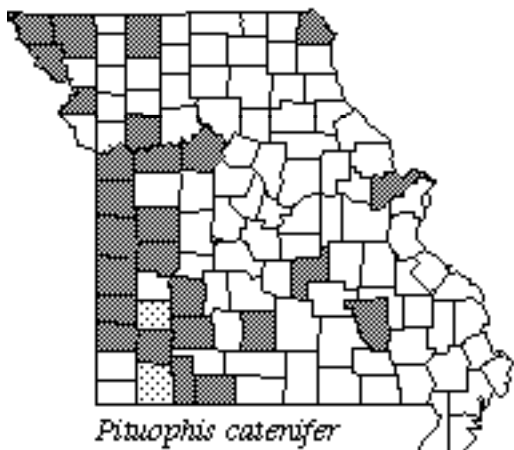
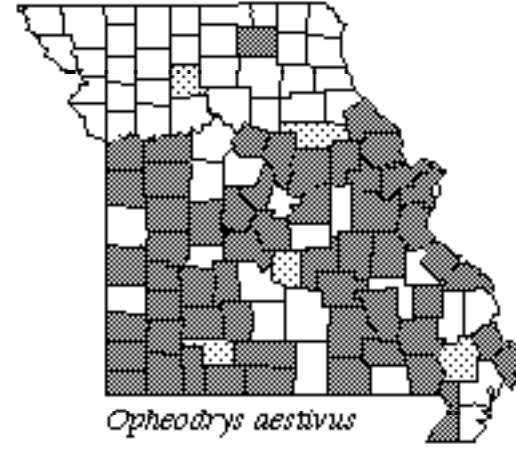
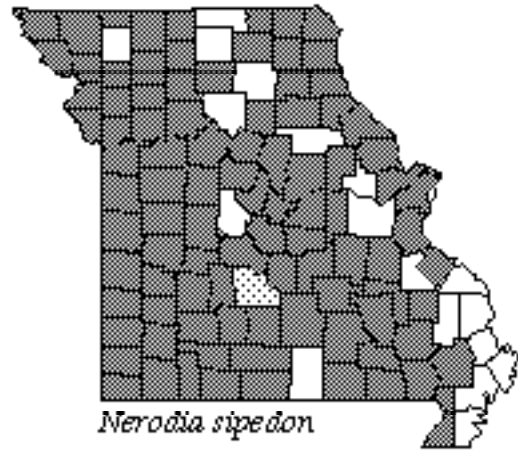
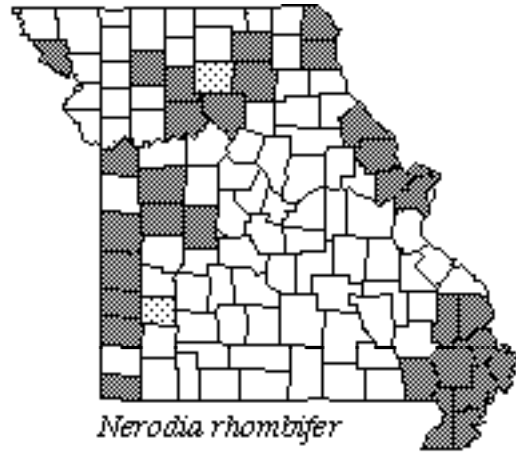


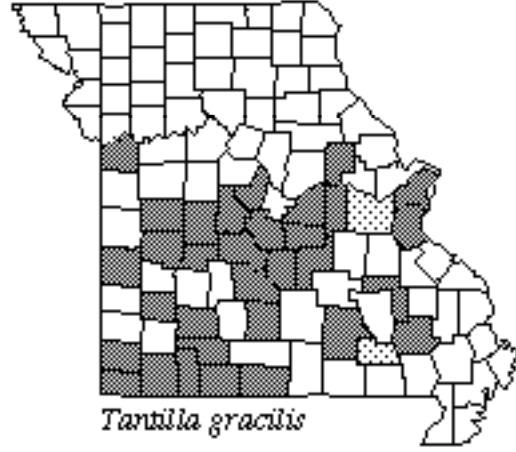
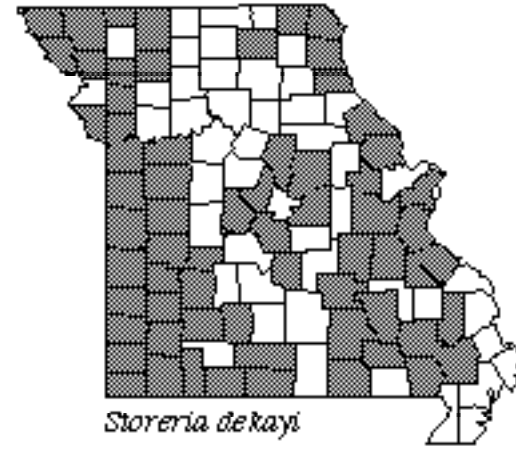
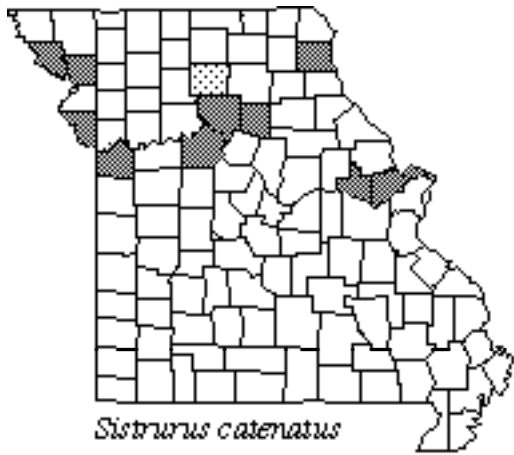


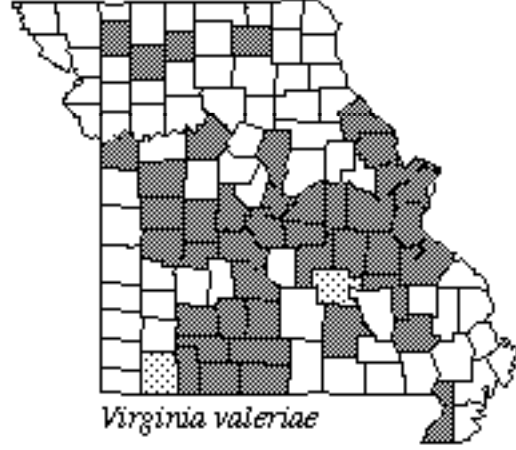
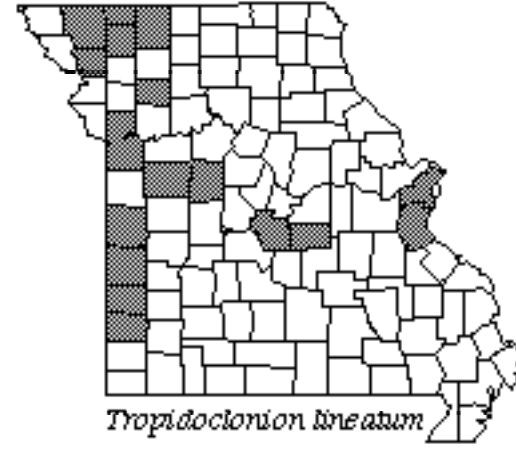
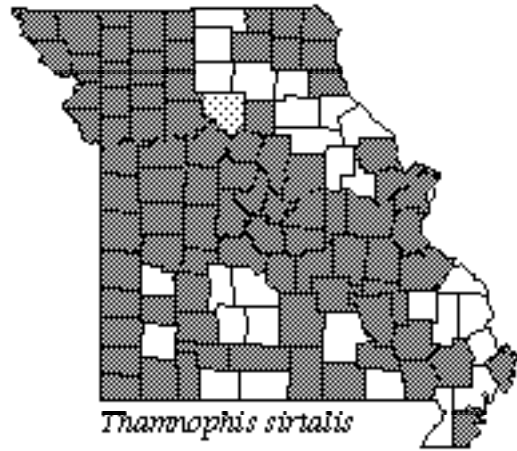












# LIFE HISTORY OBSERVATIONS OF AMPHIBIANS AND REPTILES FROM MISSOURI

Donald D. Smith<sup>1</sup> and Robert Powell<sup>2</sup>

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With this issue of the Newsletter we initiate a new section in order to make available to herpetologists life history observations of amphibians and reptiles from Missouri. Observations are presented in tabular form, and include information pertaining to food habits, predation and parasitism, reproduction, body temperatures, winter activity, and miscellaneous observations. Observations are limited to those of amphibians and reptiles within Missouri and the first two tiers of contiguous counties in adjoining states. These records, insufficient in themselves for publication, collectively may provide significant insights into the natural history of amphibians and reptiles from Missouri.

The format in which these observations are presented follows that of Smith et al. (1983). Updates will be included annually, if the number of submissions is adequate. Appropriate observations may be submitted to RP (address above). Standardized data sheets are available upon request.

In the accompanying tables, scientific and common names follow Collins (1990). Measurements are made as illustrated in Conant and Collins (1991). Length is given in millimeters (mm) or microns ( $\mu\text{m}$ ), weight in grams (g), and temperature in degrees Celsius ( $^{\circ}\text{C}$ ). Dates are recorded as day/month/year. Localities are given only by county (followed by an abbreviation of the state, if other than Missouri). The final entry includes the initials of the contributor (acknowledged below) and the accession number of the submitted record. For additional methods utilized in the construction of tables, please consult Smith et al. (1983).

**Table 1. Observations of food habits.**

Species	Food Item	Type Observation *	Date	Locality	Contributor
<b>ANURA (frogs &amp; toads)</b>					
<i>Spea bombifrons</i> (Plains Spadefoot)	Mole cricket	3	08 JN 74	Jackson	DDS
<b>SQUAMATA: SERPENTES (snakes)</b>					
<i>Coluber constrictor flaviventris</i> (Eastern Yellowbelly Racer)	Orthopteran, <i>Scincella lateralis</i> (Ground Skink) - tail only	3	18 MY 85	Camden	DDS
<i>Crotalus horridus</i> (Timber Rattlesnake)	<i>Tamias striatus</i> (Eastern Chipmunk), n = 2	2	14 JY 71	St. Louis	EPO
<i>Elaphe o. obsoleta</i> (Black Rat Snake)	<i>Microtus o. ochrogaster</i> (Prairie Vole)	3	21 MY 74	Jackson	DDS
<i>Lampropeltis c. calligaster</i> (Prairie Kingsnake)	<i>Eumeces fasciatus</i> (Five-lined Skink)	2	02 AP 85	Cass	DDS
	<i>Microtus o. ochrogaster</i> (Prairie Vole)	3	19 MY 74	Jackson	DDS
<i>Nerodia rhombifer</i> (Diamondback Water Snake)	Fish remains	3	28 JN 74	Barton	DDS
<i>Nerodia s. sipedon</i> (Northern Water Snake)	<i>Bufo w. woodhousii</i> (Woodhouse's Toad)	1	01 MY 85	Wyandotte KS	DDS
<i>Regina grahamii</i> (Graham's Crayfish Snake)	Crayfish	3	21 MY 74	Jackson	DDS
<i>Thamnophis sirtalis parietalis</i> (Red-sided Garter Snake)	<i>Rana blairi</i> (Plains Leopard Frog)	1	15 AG 62	Jackson	DDS
	<i>Rana blairi</i> (Plains Leopard Frog)	1	04 SE 77	Johnson	DDS

\* 1 = visual observation of feeding activity in the wild. 2 = examination of regurgitated food item. 3 = analysis of gastrointestinal tract contents.

**Table 2. Observations of predation and parasitism.**

Prey or Parasitized Species	Predator or Parasite	Type Observation *	Date	Locality	Contributor
<b>ANURA (frogs &amp; toads)</b>					
<i>Bufo w. woodhousii</i> (Woodhouse's Toad)	<i>Nerodia s. sipedon</i> (Northern Water Snake)	1	01 MY 85	Wyandotte KS	DDS
<i>Rana blairi</i> (Plains Leopard Frog)	<i>Thamnophis sirtalis parietalis</i> (Red-sided Garter Snake)	1	15 AG 62	Jackson	DDS
	<i>Thamnophis sirtalis parietalis</i> (Red-sided Garter Snake)	1	04 SE 77	Johnson	DDS
<b>TESTUDINES (turtles)</b>					
<i>Sternotherus odoratus</i> (Common Musk Turtle)	<i>Placobdella</i> sp. (Turtle Leech), n = 8	6	25 AP 87	Dallas	AMS
<b>SQUAMATA: LACERTILIA (lizards)</b>					
<i>Eumeces fasciatus</i> (Five-lined Skink)	<i>Lampropeltis c. calligaster</i> (Prairie Kingsnake)	2	02 AP 85	Cass	DDS
<i>Scincella lateralis</i> (Ground Skink)	<i>Coluber constrictor flaviventris</i> (Eastern Yellowbelly Racer)	3	18 MY 85	Camden	DDS

\* 1 = visual observation of predation in the wild. 2 = examination of regurgitated prey item. 3 = dissection and examination of predator's gastrointestinal tract. 6 = direct observation of parasites.

**Table 3. Observations of reproduction — courtship and breeding behavior (Amphibia).**

Species	Type Observation*	Date	Locality	Contributor
<b>ANURA (frogs &amp; toads)</b>				
<i>Pseudacris t. triseriata</i> (Western Chorus Frog)	2	16 MY 85	Jackson	DDS
<i>Spea bombifrons</i> (Plains Spadefoot)	2	01 MY 85	Wyandotte KS	DDS

\* 1 = courtship behavior. 2 = breeding congregations. 3 = amplexus or copulation. 4 = egg deposition.

**Table 4. Observations of reproduction — egg deposition or delivery (Reptilia).**

Species	Size of Female Total Length/Weight	Date	Number of Eggs	Size of Eggs	Locality	Contributor
<b>TESTUDINES (turtles)</b>						
<i>Chrysemys picta bellii</i> (Western Painted Turtle)	—	09 MY 85	9	35.2 x 20.7 mm	Lincoln	BS
Eggs laid in a nest 70 cm deep, egg chamber 77 x 67 mm, 7 hatched 23-28 JY 85 (75 days), mean carapace length 27.2 mm						
<b>SQUAMATA: LACERTILIA (lizards)</b>						
<i>Eumeces fasciatus</i> (Five-lined Skink)	140 mm	04 JY 60	6	8-10 mm long	Franklin	EPO
Female with eggs found under corkboard debris, 6 hatched 27 JY 60, mean total length 60 mm						
	—	09 JY 93	9	—	Lincoln	BS, PP
Female and eggs found in nest in railroad tie, 9 hatched 14-16 JY 93, mean total length 56.0 mm						
	—	13 JY 92	8	—	Lincoln	BS, JR
Female and eggs found in nest under limestone rock						
<i>Eumeces laticeps</i> (Broadhead Skink)	—	02 JY 82	15	15.2 x 11.2 mm	Lincoln	BS, PP
Nest found in earthen bank, 9 hatched 10 AG 82, mean total length 70.2 mm						
<i>Sceloporus undulatus</i> <i>hyacinthinus</i> (Northern Fence Lizard)	—	08 AG 82	13	16.2 x 11.6 mm	Lincoln	BS
Eggs found in nest 50-75 mm deep in sandy soil, 11 hatched 13-15 AG 82, mean total length 50.4 mm						
<b>SQUAMATA: SERPENTES (snakes)</b>						
<i>Carphophis amoenus vermis</i> (Western Worm Snake)	—	08 AG 86	2	33 x 10 mm	Jackson	NAL, JSP
Eggs found under limestone rock, 1 hatched 24 AG 86, total length 111 mm, weight 13.7 g						
<i>Coluber constrictor</i> <i>flaviventris</i> (Eastern Yellowbelly Racer)	~ 600 mm	09 JN 79	16	30.4 x 20.4 mm	Lincoln	BS, MG
9 hatched 15-17 JN 79 (67 days), mean total length 253.9 mm						
<i>Opheodrys aestivus</i> (Rough Green Snake)	635 mm	17 JY 61	6	25.0 mm	Franklin	EPO
6 hatched 25-27 AG 61 (39 days), mean snout-vent length 125 mm, mean tail length 70 mm						
	~ 600 mm	02 JY 85	7	—	Wyandotte KS	MH
	~ 600 mm	01 JY 85	8	—	Wyandotte KS	MH
	730 mm, 30 g	19 JY 85	6	27.1 x 10.0 mm	Lincoln	BS
6 hatched 8-10 SE 85 (51 days), mean total length 171 mm, mean weight 1.4 g						

**Table 5. Observations of reproduction from dissected specimens.**

Species	Size	Sex	Weight of Gonads	Weight of Fat Bodies	Number/ Size of Yolked Follicles	Number/ Size of Oviductal Eggs	Date	Locality	Contributor
<b>SQUAMATA: SERPENTES (snakes)</b>									
<i>Regina grahamii</i> (Graham's Crayfish Snake)	717 mm 139.0 g	F	5.1 g	trace	4 (3 rt, 1 lft) 13.6 x 7.5 mm	—	21 MY 74	Jackson	DDS
	607 mm 69.9 g	F	18.2 g	2.6 g	6 (4 rt, 2 lft) 24.5 x 13.5 mm	—	JN 74	Jackson	DDS
<i>Storeria dekayi</i> (Brown Snake)	369 mm 18.1 g	F	3.9 g	0.5 g	—	6 (4 rt, 2 lft) ~ 10 mm long	01 MY 85	Wyandotte KS	DDS

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