

Missouri
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MISSOURI HERPETOLOGICAL ASSOCIATION NEWSLETTER NO. 14

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Cover art: Ozark Hellbender (*Cryptobranchus alleganiensis bishopi*) by Tom R. Johnson. The holotype of the Ozark Hellbender (UMMZ 68930) was collected by Edwin P. Creaser from the Current River near Big Spring, Carter County, Missouri on 25 August, 1930. Grobman, A.B. (1943) Notes on salamanders with the description of a new species of *Cryptobranchus*. Occas. Pap. Mus. Zool. Univ. Michigan (470): 1-12.

INTRODUCTION

The Fourteenth Annual Meeting of the **Missouri Herpetological Association** was held 29-30 September 2001 at the Reis Biological Station 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 distribution records of Missouri's herpetofauna, additions to the bibliography dealing with the state herpetofauna and provide an outlet for the publication of short notes dealing with the natural history of Missouri amphibians and reptiles.

ANNOUNCEMENTS

Newsletters: Past, Present and Future

Members attending the 2001 MHA meeting voted unanimously to convert the newsletter to an electronic format. Future issues will be sent to members via e-mail. Anyone wishing to receive the newsletters should contact **Richard Daniel** (e-mail: danielr@missouri.edu) to be added to the mailing list. Past issues of the MHA newsletter are currently available at the following temporary website: <http://members.tripod.com/moherp/>.

15th Annual Meeting of the Missouri Herpetological Association

The 15th Annual Meeting of the **Missouri Herpetological Association** will be held on 28-29 September 2002 at the **Reis Biological Station** near Steelville, Crawford County, Missouri. A "call for papers" and registration materials will be sent in mid-July. For more information please contact **Jeff Briggler** at:

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**Abstracts of Papers Presented at the
14th Annual Meeting
of the
Missouri Herpetological Association**

**Reis Biological Station
29-30 September 2001**

**PRELIMINARY DATA FROM TRRP
(TIMBER RATTLESNAKE RESEARCH PROJECT)**

Corey Anderson and Wayne Drda

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Eureka, MO 63025

There have been several published reports of arboreal behavior in timber rattlesnakes, and numerous personal commentaries. In the first year of a long-term radio telemetry study of timber rattlesnakes (N=6, 444 point samples) at the Tyson Research Center (St. Louis County, MO) we observed one bout of arboreal behavior in a mature female; this snake spent 30 consecutive days in the canopy of a box elder/grape vine tangle, at 8-10m. This female was captured previously during a consort with a transmitted male on 9 August 2000, and released with her own surgically implanted radio transmitter on 12 August 2000. The female was then located in the tree/vine tangle 26 times between 28 August and 28 September 2000, where she shed. In the second year of our study (N=20, 2360 total point samples) we did not observe any bouts of arboreal behavior, although the same female was not followed because her transmitter failed shortly after emergence in spring 2001. Although no strong conclusions can be made from our data alone, this observation seems to confirm a trend of arboreal behavior in pre-shed, female timber rattlesnakes. In addition to a possible correlation with ecdysis, we hypothesize that a tendency to display arboreal behavior may be idiosyncratic; that is, one individual may show a pattern of arboreal behavior while most other individuals show little to no arboreal behavior. This arboreal tendency in individuals could possibly be associated with historic flooding in certain habitats, but more data needs to be collected to test this hypothesis. Finally, we argue that researchers need to specify the difference between arboreal behavior (tree associated behavior) and arboreal locations (actually being elevated off the ground located in a tree). Confounding these two categories may lead to different conclusions when considering correlation between trees and timber rattlesnakes.

LIZARD COMMUNITIES AND HABITAT SUBSIDIES ON ISLANDS IN THE GULF OF CALIFORNIA.

Kyle Barrett, Wendy Anderson, and Alexander Wait.

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Islands in the Midriff Region of the Gulf of California offer a unique opportunity to study the effect of productivity on terrestrial communities. These islands receive very little rainfall in most years; therefore, primary productivity is typically very low. The islands are situated in the extremely productive Gulf of California (in an area that is subject to almost constant upwelling). The productivity from the marine system makes its way onto the islands and "subsidizes" the islands with nutrients. Marine subsidies are deposited onto the islands in two ways: (1) tidal activity washes algae and marine detritus onto island coastlines and (2) seabird communities deposit large amounts of guano, fish scraps, and bird carcasses on the islands. Both of these subsidy types can increase the density of insect communities and bird subsidies have been demonstrated to change plant composition. To determine if lizard communities are also affected by marine subsidies, tissue samples were collected from lizards on "Bird Islands" and "Non-bird Islands" as well as from lizards in coastal and inland areas. The tissues were analyzed to determine the stable isotopic values for nitrogen and carbon. The former reveals the importance of subsidies derived via the seabird pathway, and the latter can be used to differentiate between C₃ plant-based diets and algae-based diets. Initial analysis of the data indicates lizards do feed on insects that consume bird materials; however, coastal subsidies were not significant in lizard diets. Future studies will be conducted to determine lizard density on islands with birds and those without, as well as density in coastal and inland areas. These values can then be paired with stable isotope results to further quantify the effects of the land-water connection.

CURRENT AND FUTURE HERPETOLOGICAL STUDIES AT SQUAW CREEK NATIONAL WILDLIFE REFUGE, MISSOURI

Frank Durbain

Squaw Creek National Wildlife Refuge, Mound City, MO 64470

Squaw Creek National Wildlife Refuge (SCNWR) is located on the Missouri River flood plain in the northwest corner of the state. This 7,400 acre area consists of approximately 3,100 acres of managed wetlands, 2,100 acres of wet and mesic prairie, 1,600 acres of bottom land and Loess Hill forest, and 600 acres of cropland. As part of the U.S. Fish and Wildlife Service's (USFWS) National Wildlife Refuge System, SCNWR has progressively demonstrated an interest in refuge biodiversity and ecosystem oriented management. Part of this approach includes research and conservation of species, such as reptiles and amphibians, which were not traditionally incorporated into refuge management. Thirty-five species of reptiles and amphibians can be found on SCNWR, including 2 salamanders, 10 frogs and toads, 6 turtles, 2 lizards, and 15 snakes. Several species of special concern that occur on the refuge include Blanding's Turtle (*Emydoidea blandingii*), Western Fox Snake (*Elaphe vulpina vulpina*) and Eastern Massasauga Rattlesnake (*Sistrurus catenatus catenatus*). All three species are listed as endangered in Missouri, with the Eastern Massasauga also being a federal candidate species. Past herpetological research efforts have focused on massasauga ecology, specifically habitat use, population demographics and prey usage and general snake reproductive biology. Ongoing research and monitoring efforts include massasauga population demographics, Blanding's Turtle habitat use, frog and toad calling surveys, and amphibian deformity surveys. All monitoring and survey results are incorporated into national databases whenever applicable. Basic monitoring will continue and future research efforts will be centered on Blanding's Turtle habitat use and massasauga habitat use, population demographics, hibernation ecology, and landscape management effects. The USFWS will continue to promote and play an active role in the research and management of reptiles and amphibians on SCNWR as well as other refuges across the country.

THE ECOLOGY AND CONSERVATION OF THE TIMBER RATTLESNAKE (*Crotalus horridus*) IN AN AGRICULTURAL LANDSCAPE: PRELIMINARY RESULTS

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The timber rattlesnake (*Crotalus horridus*) has a wide distribution in eastern North America. However, timber rattlesnake populations have been declining throughout the species' range, including Iowa. We initiated a radiotelemetry study to gather information that can be used to develop a plan to conserve the remaining timber rattlesnake populations in Iowa. Snakes were surgically implanted with radio transmitters and followed throughout their active season to gather data on their movements, habitat preferences, and behavior. Locations of animals were recorded with a GPS unit twice a week from May through September 2001. We found that 45% of 125 snake locations were in edge/shrub habitat, 30% were in woodland habitat, and 25% were in grassy/open habitat. Average canopy coverage was 60%. Dominant vegetation at snake locations consisted of oak trees, dogwood shrubs and brome grass. Average home range (minimum convex polygon) of three snakes was 3.24 hectares. Mean straight-line distance moved was 392 m and maximum straight-line distance moved was 500 m. Timber rattlesnakes in Madison County, Iowa tended to have smaller home ranges and move shorter distances than timber rattlesnakes in eastern populations. General habitat favored by *C. horridus* in Madison County was a savanna type natural community. We recommend restoration and management of savanna and woodland habitat, education of the public landowners, and at least a 1000 m radius buffer of protected habitat around a den site for an adequate level of protection for a den colony.

ECOLOGY OF THE WESTERN COTTONMOUTH, *Agkistrodon piscivorus leucostoma*, IN SOUTHWEST MISSOURI

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The western cottonmouth, *Agkistrodon piscivorus leucostoma*, is patchily distributed throughout the Missouri Ozarks where it primarily occupies medium-sized streams. I investigated life history aspects of a western cottonmouth population in Stone County, Missouri from 1999-2001 using mark-recapture techniques. A total of 105 individuals was marked and released, including 45 field-collected adults and juveniles, and 60 neonates born in captivity. Males attained the largest adult body sizes although length/weight relationships were not statistically different among the sexes. Surface activity occurred from late March-mid October. Diet composition consisted entirely of terrestrial prey, particularly mammals. Parturition occurred in early September. Litter size averaged 7.3 offspring and was highly correlated with maternal body size. Gravid females aggregated at exposed, rocky outcrops that offer appropriate cover and thermoregulatory

opportunities. The presence of such habitat features may explain the sparse distribution of the western cottonmouth at the northern limits of its range.

MALE ACOUSTIC PREFERENCES PARALLEL FEMALE MATE CHOICE PREFERENCES

Sarah C. Humfeld and H. Carl Gerhardt

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Male green treefrogs (*Hyla cinerea*) attract potential mates, as well as sexual parasites, with their advertisement calls. Males using the alternative satellite mating tactic, position themselves silently near a calling male and attempt to intercept females attracted to the caller. In this study, we wished to test the prediction that satellite males will associate with males producing the most attractive advertisement calls.

Females exhibit mate choice based on the value of the lower-frequency spectral component located between 700 and 1200 Hz. Using a two-speaker playback system and synthetic advertisement calls, we conducted choice tests with a population of female green treefrogs from southeast Missouri. When given a choice between a signal with an average low frequency peak (840 Hz) and those 16.7 and 25% higher (1008, 1120 Hz), all females preferred the lower frequency signals. Females consistently preferred low frequency calls across the natural distribution of low frequency values.

In a second set of experiments, non-calling males were asked to make the same phonotactic choices. Of the males that responded, 75% preferred the 700 Hz signal to the 840 Hz signal and 65% preferred the 840 Hz signal to the 1008 Hz signal. Males exhibit phonotactic behavior very similar to that of females, and their acoustic preferences roughly parallel those of females. This phonotactic response may enable males using the satellite mating tactic to maximize reproductive fitness.

EFFECTS OF CADMIUM-CONTAMINATED SOIL ON OVERWINTERING AMERICAN TOADS (*Bufo americanus*)

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Amphibian species that are terrestrial hibernators may be at risk of chronic contaminant exposure from polluted soil. Hibernation is arguably one of the most stressful periods for amphibians because individuals rely on limited energy stores while in a severe environment. We hypothesized that amphibians hibernated in contaminated soil would suffer greater mortality due to the combined effects of natural winter and chemical stress. In order to test this hypothesis, fifty American toads (*Bufo americanus*) were hibernated in soil dosed with either 0, 12.5, 25, 50, or 100 µg/g cadmium, a highly toxic and ubiquitous heavy metal. Toads were individually hibernated for six months at 4°C. No significant differences were found among treatments in overwintering survival, percent weight loss, or locomotory performance. However, there was a nearly significant effect on time to initiate burrowing. While our results seem to suggest that environmentally relevant levels of cadmium do not pose a risk to American toads, this is not necessarily true. Soil types differ in bioavailable cadmium, thus affecting uptake and toxicity. More intensive research is recommended with multiple soils and species of amphibians.

A PRELIMINARY DESCRIPTION OF THE COMMUNICATION BEHAVIOR OF THE CANYON TREEFROG (*Hyla arenicolor*)

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The canyon treefrog, *Hyla arenicolor*, is a member of the gray treefrog complex and is closely related to the two species of gray treefrogs, *H. chrysoscelis* and *H. versicolor*. *H. arenicolor* has a signaling repertoire vary similar to that of the gray treefrogs, and males produce advertisement calls consisting of a series of stereotyped pulses. Pulse rate and pulse shape are known to be important in female choice for gray treefrogs, and males typically time their calls to avoid overlap with those of nearby neighbors. However, pair recordings demonstrate that the calls of individual *H. arenicolor* males overlap extensively with neighbors (average of 98% of calls for five pairs of males), and histograms of call latencies suggest that these interactions may result in stable leader-follower relationships. The lack of any other closely related species breeding in the same habitat suggests that female *H. arenicolor* may be less attentive to pulse structure than other species in the complex. Males may therefore not pay a cost by having signals overlap. Why males would actively synchronize signals, however, remains to be tested.

***Geckobia hemidactyli* (Lawrence 1935) FROM *Hemidactylus mabouia* IN PUERTO RICO AND ADJACENT ISLANDS**

Carlos César Martínez Rivera^{1,2}, Alberto González Negrón¹ and Jaime Acosta¹

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We found that adult individuals of the gekkonid lizard *Hemidactylus mabouia* from Puerto Rico are infested with mites. We identified these mites as *Geckobia hemidactyli*, Family Pterigosomidae, which includes a large number of reptilian ectoparasites, mostly from the Eastern Hemisphere. *Geckobia hemidactyli* has been reported from Africa and Southeast Asia in various *Hemidactylus* species, including *H. mabouia*, *H. mercatorius*, *H. tasmani*, and *H. frenatus*. Other species of *Geckobia* have been found in Guyana and in Cuba on *Tarentola americana*. This is the first report for *G. hemidactyli* in Puerto Rico and its satellite islands. Our data suggest that *H. mabouia* arrived in the Americas or at least Puerto Rico replete with mite colonies, further suggesting that these mites have been isolated from their African relatives for the same period of time as their hosts.

DIRECT AND INDIRECT EFFECTS OF AN INSECTICIDE ON THE SOUTHERN LEOPARD FROG

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Humans are altering their environment and consequently the environment of innumerable other species. These changes in the environment can affect a species directly by altering that species behavior and physiology or indirectly by altering the community of which that species is a part. This study examined the relative importance of direct and indirect effects of a chemical insecticide (carbaryl) on the southern leopard frog (*Rana sphenoccephala*). We found that carbaryl caused few significant direct effects at environmentally relevant concentrations. Rather, carbaryl changed important anuran life history traits by altering aquatic community structure. These changes in life history traits included slower growth, smaller size at metamorphosis, and a longer larval period. The mechanisms by which carbaryl indirectly change anuran life history traits are still being investigated. Based on changes observed in zooplankton populations, it appears that understanding how zooplankton compete with amphibians for algal resources is important. Understanding the effects of carbaryl on periphyton and phytoplankton interactions may also be relevant. The results of this experiment demonstrate the need for biologists to better understand the diets of tadpoles and how tadpoles compete with other organisms in the aquatic environment. Until we understand how anurans fit into the aquatic community mechanistically, we will have difficulty predicting the impact of insecticides on anuran populations.

DO SOLITARY ANOLES EXHIBIT ECOLOGICAL RELEASE?

Robert Powell

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If interspecific competition selects for specialization, then solitary anoles without congeneric competitors should experience ecological release and reflect more generalized traits than their progenitors. Using data generated primarily by studies on *Anolis monensis* (a solitary anole of Greater Antillean origin), I tested six hypotheses that support the contention that, during its isolation from other members of the *A. cristatellus* species group, ecological release would occur and that *A. monensis* should have acquired a more generalized suite of traits indicative of an incipient stage in the *Anolis* radiation. The prediction that *A. monensis* would demonstrate convergence toward the “ideal” body size for a solitary anole (H_1) was not supported by the data, nor were the predications that *A. monensis* would demonstrate greater sexual size dimorphism (H_2), less discriminant use of structural habitats (H_3), or a wider range of body temperatures (H_4) than its closest relatives. Further, *A. monensis* did not demonstrate any variance from the morphology, ecology, or behavior of a typical trunk-ground anole, contrary to the prediction (H_5) that it would tend to evolve toward a more generalized trunk-crown ecomorphology. Finally, the display action pattern of *A. monensis* was not more similar to the presumed ancestral pattern than those of closely related congeners (H_6). Thus, all six hypotheses were rejected.

NEW AND PREVIOUSLY UNREPORTED RECORDS OF AMPHIBIANS AND REPTILES FROM MISSOURI FOR 2001

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The following list represents new county records accumulated or brought to our attention since the publication of Johnson (2000) and Daniel and Edmond (2000). Publication of these records extends our knowledge of the amphibians and reptiles native to Missouri. In addition, recipients of this list have the opportunity to update checklists and range maps. Finally, the publication of this list allows us to acknowledge the contributions of the many individuals who have provided information or specimens.

The specimens listed below represent the first reported occurrence of the species within a given county and are based on catalogued voucher specimens or photographs deposited in a public institution. Distribution records are presented in the standardized format of Collins (1989): common and scientific name, county, specific locality (unless withheld for species of special concern), legal description of locality, date of collection, collector(s), catalogue number and institution where the specimen is deposited. The citation is provided for all records that have been published elsewhere.

The following acronyms indicate the institutional collections where specimens are deposited: CMSU- Central Missouri State University, Warrensburg, MO; INHS-Illinois Natural History Survey, Champaign, IL; KU- Museum of Natural History, University of Kansas, Lawrence, KS; UMC-Dean E. Metter Memorial Collection, University of Missouri, Columbia, MO.

We would like to extend our appreciation to J. Briggler, E. East, P. Frese, and J. Hess for generously providing information or specimens included in this note.

AMPHIBIA: CAUDATA

RINGED SALAMANDER

Ambystoma annulatum

Dallas Co: Berry Bluff Conservation Area (S12 T36N R18W); 5 May 2001; B. Edmond, R. Daniel, B. Maltase (larvae, UMC 7150).

SPOTTED SALAMANDER

Ambystoma maculatum

Texas Co: Barn Hollow Natural Area (S34 T28N R7W); 30 March 2001; J. Briggler, B. Elliott, R. Rimer (egg mass, color print, UMC 373P).

MARBLED SALAMANDER

Ambystoma opacum

Laclede Co: (S19 T35N R17W); 28 April 1991; C. Hartford (CMSU 1529-1530).

SMALLMOUTH SALAMANDER

Ambystoma texanum

Benton Co: Lost Valley Hatchery (S4 T40N R22W); date unknown; K. Freeburger, J. Freeburger (color print, UMC 374P).

Gentry Co: Albany Marsh, ca. 1.5 mi. S Albany (S1 T62N R31W); 15 June 2001; P. Frese (larvae, UMC 7215).

Greene Co: (S35 T29N R21W); 17 April 1993; S. Moss (CMSU 1638).

Marion Co: CR230, 0.9mi W Jct. MO 168 (S21 T58N R6W); 8 June 2001; Eric East, Mitchell Brogdon (color photograph, UMC 290P).

TIGER SALAMANDER

Ambystoma tigrinum

Ozark Co: Hawksley's Property (S18 T23N R12W); 25 July 1969; coll. unknown (CMSU 1162).

Stone Co: (S29 T22N R23W); 26 April 1991; P. Millard (CMSU 1553).

LONGTAIL SALAMANDER

Eurycea longicauda

Dallas Co: Barclay Conservation Area (S12 T35N R18W); 2 May 2001; J. Briggler, M. Johnson (UMC 7232).

Johnson Co: (S5 T46N R25W); 26 March 1991; B. Saunders (CMSU 1563).

Montgomery Co: Danville Conservation Area (S5 T47N R5W); 14 April 2001; R. Daniel, B. Edmond (UMC 7144-7146).

CAVE SALAMANDER

Eurycea lucifuga

Texas Co: Little Barn Hollow Cave, Barn Hollow Natural Area (S34 T28N R7W); 30 March 2001; J. Briggler, B. Elliott, R. Rimer (color print, UMC 372P).

WESTERN SLIMY SALAMANDER

Plethodon albagula

Shannon Co: (S13 T31N R6W); 12 April 1997; E. Murphy (CMSU 1796).

SOUTHERN RED-BACKED SALAMANDER

Plethodon serratus

Osage Co: (S3 T41N R10W); 22 April 1995; B. Hearrold (CMSU 1685).

RED RIVER MUDPUPPY

Necturus louisianensis

Taney Co: Location unknown; 13 February 1993; K. Yersak (CMSU 1597).

CENTRAL NEWT

Notophthalmus viridescens

Iron Co: (S25 T34N R2W); 15 September 2001; J. Briggler, R. Rambo (larvae, UMC 7233).

Marion Co: MO 168, 2.5 mi. W Jct. Bus US 61 (S22 T58N R6W); 6 August 2001; E. East, M. Brogdon (color photograph, UMC 291P).

AMPHIBIA: ANURA

AMERICAN TOAD

Bufo americanus

Texas Co: Paddy Creek Campground (S21 T33N R10W); 16 April 1976; M.A. Dicello (CMSU 316).

FOWLER'S TOAD

Bufo fowleri

Texas Co: Paddy Creek Campground (S21 T33N R10W); 16 April 1976; M.A. Dicello (CMSU 324-325).

GRAY TREEFROG

Hyla versicolor

Monroe Co: Main entrance Indian Creek Rec. Area, \approx 7.0 airmiles E Stoutsville (S13 T55N R8W); 27 July 2001; B. Edmond (UMC 7149).

SPRING PEEPER

Pseudacris crucifer

Johnson Co: Pertle Springs (S35 T46N R26W); 20 April 1976; G. Heidrich (CMSU 202).

Worth Co: Seat Conservation Area (S26 T65N R30W); 5 April 2001; P. Frese, H. Frese (color slide, UMC 356P).

WESTERN CHORUS FROG

Pseudacris triseriata

Gentry Co: Albany Marsh, ca. 1.5 mi. S Albany (S1 T62N R31W); 23 March 2001; P. Frese (color slide, UMC 357P).

Harrison Co: Dunn Ranch, ca. 5 mi W Eagleville (S32 T66N R28W); 5 April 2001; P. Frese, H. Frese (color slide, UMC 359P).

Pettis Co: LaMonte (T46N R23W); 7 March 1973; M. McAllister (CMSU 610).

Worth Co: Seat Conservation Area (S26 T65N R30W); 22 June 2001; P. Frese (color slide, UMC 358P).

EASTERN NARROWMOUTH TOAD

Gastrophryne carolinensis

Polk Co: MO 123, S Stockton Lake at Aldridge (S3 T32N R24W); 16 September 2001; B. Edmond (UMC 7212).

PLAINS LEOPARD FROG

Rana blairi

Morgan Co: (S23 T40N R19W); 21 March 1997; M. Long (CMSU 1727).

Ozark Co: nr. Zanoni (S18 T23N R12W); 4 April 1976; G. Hiedrich (CMSU 221).

St. Clair Co: Schell-Osage Conservation Area (S31 T38N R28W); 15 September 2001; B. Edmond (UMC 7205).

Vernon Co: Schell-Osage Conservation Area (S35 T38N R29W); 15 September 2001; B. Edmond (UMC 7204).

GREEN FROG

Rana clamitans

Dallas Co: Berry Bluff Conservation Area (S12 T36N R18W); 1 September 2001; R. Daniel, B. Edmond (UMC 7197).

PICKEREL FROG

Rana palustris

Johnson Co: Pertle Springs (S35 T46N R26W); 10 April 1976; S. Cooper (CMSU 441).

SOUTHERN LEOPARD FROG

Rana sphenoccephala

Texas Co: nr. US 63 (S23 T32N R9W); 9 March 1987; S.R. Penn (CMSU 1244).

REPTILIA: SQUAMATA: SAURIA

SOUTHERN COAL SKINK

Eumeces anthracinus

Pettis Co: (S28 T44N R22W); 12 March 1991; K. Jones (CMSU 1541).

BROADHEADED SKINK

Eumeces laticeps

Miller Co: Location unknown; 1 August 1970; B. Krager (CMSU 645).

GROUND SKINK

Scincella lateralis

Gasconade Co: Mint Spring Seep, Mint Spring Conservation Area (S3 T40N R6W); 14 May 2001; J. Briggler, G. Manning (UMC 7231).

Ralls Co: Rt. A, 2 mi. E Jct. Rt. J (S36 T56N R7W); 2001; E. East (color photograph, UMC 382P).

REPTILIA: SQUAMATA: SERPENTES

EASTERN YELLOWBELLY RACER

Coluber constrictor

Lewis Co: US 61 Service Rd, N of Rt. V (S26 T60N R6W); 18 May 2001; E. East (color photograph, UMC 288P).

PRAIRIE RINGNECK SNAKE

Diadophis punctatus

Ralls Co: Rt. A, 2 mi. E Jct. Rt. J (S36 T56N R7W); 24 May 2001; E. East (color photograph, UMC 289P).

Webster Co: CR 356, 0.4 mi. E Jct. Rt. U (S25 T28N R19W); 20 October 2001; B. Edmond (UMC 7235).

GREAT PLAINS RATSNAKE

Elaphe emoryi

Texas Co: Paddy Creek Campground (S21 T33N R10W); 15 April 1976; M.A. Dicello (CMSU 8).

BLACK RATSNAKE

Elaphe obsoleta

Davies Co: 4 mi S Gallatin (S17 T58N R27W); 21 May 2001; P. Frese, R. Morrow (color slide, UMC 350P).

Monroe Co: CR 203 at Elk Fork, Salt River (S26 54N R10W); April 2001; W. Sadler (UMC 7162).

Worth Co: MO 46, 4.5 mi. E Grant City (S32 T66N R30W); 17 May 2001; P. Frese, C. Thomas (color slide, UMC 349P).

WESTERN FOX SNAKE

Elaphe vulpina

Lewis Co: Bus US 61/Rt. B, 1.5 mi. N Jct. MO 16 (S23 T62N R6W); 11 April 1998; E. East (color photograph, UMC 297P).

EASTERN HOGNOSE SNAKE

Heterodon platirhinos

Randolph Co: CR 232, 1.0 mi. S Renick (S6 T52N R13W); 15 May 2001; R. Daniel (UMC 7152).

PRAIRIE KINGSNAKE

Lampropeltis calligaster

Butler Co: US 60 (S3 T25N R4E); 11 April 2001; coll. unknown (UMC 7230).

Ralls Co: Rt. F, ~ 4 mi. S Jct. MO 19 (S9 T54N R5W); 22 May 2001, E. East (color photograph, UMC 300P).

Reynolds Co: MO 106, 2.3 mi. W Jct. MO 21 (S1 T29N R1W); 20 May 2001; L. Norman (UMC 7226).

SPECKLED KINGSNAKE

Lampropeltis getula

Gentry Co: MO 169, 2.5 mi. N Gentry (S8/9 T64N R31W); 17 May 2001; P. Frese (color slide, UMC 353P).

Polk Co: MO 123, 2.3 mi. S Jct. MO 215 (S3 T31N R24W); 16 September 2001; B. Edmond (UMC 7209).

Warren Co: Lost Creek Rd., 5.0 air miles SW Warrenton (S2 T46N R3W); 31 May 2001; R. Daniel (UMC 7170).
Webster Co: Rt. P, 2.4 mi. S Jct. MO 38 (S31 T30N R17W); 10 October 2001; B. Edmond (UMC 7223).
Worth Co: Rt. T, 4 mi. N Allendale (S3/4 T66N R30W); 25 September 2001; P. Frese (color slide, UMC 352P).

RED MILK SNAKE

Lampropeltis triangulum

Harrison Co: 3.5 mi. E Gilman City (S27 T62N R26W); 15 May 2001; P. Frese (color slide, UMC 354P).
Marion Co: MO 168, 2.5 mi. W Jct. Bus US61 (S21 T58N R6W); 1 June 2001; E. East, M. Brogdon (color photograph, UMC 292-294P).

EASTERN COACHWHIP

Masticophis flagellum

Johnson Co: Warrensburg (T46N R25/26W); 28 April 1976; G. Heidrich (CMSU 464).
Texas Co: Paddy Creek; 14 April 1976; S. Cooper (CMSU 505).

DIAMONDBACK WATER SNAKE

Nerodia rhombifer

St. Clair Co: 9 mi. NE Osceola (T38/39N R24W); 24 April 1976; S. Cooper (CMSU 544).

NORTHERN WATER SNAKE

Nerodia sipedon

Warren Co: Bear Creek X High Hill Rd. (S20 T47N R4W); 31 May 2001; R. Daniel (UMC 7171).

ROUGH GREEN SNAKE

Ophedryus aestivus

Texas Co: Paddy Creek; 15 April 1976; S. Cooper (CMSU 536).

GRAHAM'S CRAYFISH SNAKE

Regina grahamii

Gentry Co: Albany Marsh (S1 T62N R31W); 15 June 2001; P. Frese (UMC 7213-7214).

BROWN SNAKE

Storeria dekayi

Laclede Co: Bennett Spring State Park (S18 T34N R17W); 13 April 2001; B. Churchwell, B. Edmond (color slide, UMC 375P).

Putnam Co: Linnermann Farm (S32 T67N R17W); 17 April 2001; B. Edmond (UMC 7155).

REDBELLY SNAKE

Storeria occipitomaculata

Cooper Co: Prairie Home Conservation Area, 3.65 air miles SSE Prairie Home (S8 T46N R15W); 3 October 2001; R. Daniel (UMC 7220).

Howard Co: Rudolf Bennitt Conservation Area (S36 T52N R14W); 1 June 2001; R. Daniel (UMC 7173).

Randolph Co: Rudolf Bennitt Conservation Area (S35 T52N R14W); 1 June 2001; R. Daniel (UMC 7172).

FLAT-HEADED SNAKE

Tantilla gracilis

Henry Co: Rt. C, Truman Reservoir (S31 T42N R24W); 15 April 1982; D. Paul (CMSU 911).

Texas Co: Paddy Creek (S20/21 T33N R10W); 14 April 1976; G. Heidrich (CMSU 524).

WESTERN RIBBON SNAKE

Thamnophis proximus

Dallas Co: CR 64-999 at Niangua River (S1 T35N R18W); 5 June 2001; R. Daniel, J. Daniel (UMC 7175).

Wayne Co: Mingo National Wildlife Refuge (S36 T27N R7E); 21 April 2001; E. Blaine (UMC 7153).

EASTERN GARTER SNAKE

Thamnophis sirtalis

Warren Co: Tower Rd., (S34 T47N R4W); 14 April 2001; R. Daniel, D. Clark, J. Haffner (UMC 7140).

WESTERN EARTH SNAKE

Virginia valeriae

Carter Co: (S35 T28N R2W); 8 April 1989; M. Rogers (CMSU 1394).

Monroe Co: US 24, 3.7 mi. S Jct. US 36 (S36 T56N R8W); 15 September 2001; E. East (color photograph, UMC 380P).

OSAGE COPPERHEAD

Agkistrodon contortrix

Harrison Co: 3.5 mi. E Gilman City (S27 T62N R26W); 16 August 2001; P. Frese (color slide, UMC 342P).

Marion Co: CR 230, 0.9 mi. W Jct. MO 168 (S21 T58N R6W); 8 June 1998; E. East, M. Brogdon (color photograph, UMC 299P).

TIMBER RATTLESNAKE

Crotalus horridus

Monroe Co: Indian Creek Rec. Area (S30 T55N R8W); 15 September 2001; E. East, C. Mock, M. Ingrasci (color photograph, UMC 379P).

REPTILIA: TESTUDINES

COMMON SNAPPING TURTLE

Chelydra serpentina

Dallas Co: Barclay Conservation Area (S11 T35N R18W); 5 June 2001; R. Daniel, J. Daniel (UMC 7176).

Gentry Co: MO 136, 3 mi. E Albany (S15 T63N R30W); 5 May 2001; P. Frese (color slide, UMC 346P).

Monroe Co: Middle Fork Salt R., 0.6 mi. SW MO 15 (S3 T54N R10W); May 2001; Kelly Duncan (color slide, UMC 330P).

Randolph Co: CR 232, 0.2 mi. N Jct. CR 249 (S19 T52N R13W); 18 May 2001; R. Daniel (UMC 7180).

Webster Co: CR 615, 0.1 mi W Jct. CR 613 (S10 T31N R18W); 9 September 2001; B. Edmond (color slide, UMC 365P).

COMMON MUSK TURTLE

Sternotherus odoratus

Stone Co: James River; 1 May 1949; Zoology Class Trip (CMSU 1532).

WESTERN PAINTED TURTLE

Chrysemys picta

Morgan Co: Hatchery pond (S6 T43N R19W); 4 April 1987; T. Priesendorf (CMSU 1198).

WESTERN CHICKEN TURTLE

Deirochelys reticularia

Ripley Co: Sand Ponds Conservation Area (S35 T22N R4E); 14 March 2001; N. Young (color print, UMC 371P).

BLANDING'S TURTLE

Emydoidea blandingii

Holt Co: Squaw Creek National Wildlife Refuge (S19 T61N R39W); 17 October 2000; F.E. Durbain (color slide, KU 11820) (Durbain, *et al.* 2001).

COMMON MAP TURTLE

Graptemys geographica

Cole Co: Jefferson City, S. Country Club Dr. (S8 T44N R12W); 12 June 2000; C. Carpenter (color photograph, UMC 370P).

FALSE MAP TURTLE

Graptemys pseudogeographica

Cole Co: Missouri River (S35 T46N R13W); 12 October 2001; J. Briggler, D. Urich, T. Smith (color slide, UMC 368P).

RIVER COOTER

Pseudemys concinna

St. Charles Co: Portage Island, Mississippi River backwater (T48N R6E); 8 August 2000; E. Ratcliff and E.J. Gittinger (INHS 15207) (Tucker, *et al.* 2001).

THREE-TOED BOX TURTLE

Terrapene carolina

Monroe Co: Paris (S10 T54N R10W); May 2001; Kelly Duncan (color slide, UMC 331P).

Ozark Co: MO 181; 29 April 1984; S. Otis (CMSU 1053).

ORNATE BOX TURTLE

Terrapene ornata

Ralls Co: Rt. F, ~4 mi. S Jct. MO 19 (S9 T54N R5W); 22 May 2001; E. East (color photograph, UMC 295P).

RED-EARED TURTLE

Trachemys scripta

Morgan Co: Hatchery pond (S6 T43N R19W); 4 April 1987; T. Priesendorf (CMSU 1199).

St. Clair Co: Atkinson Lake, Schell-Osage Conservation Area (S6 T37N R28W); 15 September 2001; B. Edmond (color slide, UMC 367P).

WESTERN SPINY SOFTSHELL

Apalone spinifera

Randolph Co: Moniteau Creek at CR 229 (S16 T52N R14W); 29 June 2001; R. Daniel (UMC 7188).

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Natural History Notes

OBSERVATIONS ON THE HERPETOFAUNAL COMMUNITY OF A NATURAL MARSH IN NORTHERN MISSOURI

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In Missouri, natural freshwater marshes are an uncommon natural community and often harbor a wide variety of rare and uncommon species. Many amphibians and reptiles are closely tied to wetland communities through some part of their natural history. Gathering and reporting observational data on amphibian and reptile communities can be important in understanding their ecology. In this note, I report observations on the herpetofaunal community found in an isolated freshwater marsh in Gentry County, Missouri.

The study site was located south of the town of Albany, in Gentry County, Missouri (Sec. 1 T62N R31W). 'Albany Marsh' is relatively well known in the natural resource community (Kramer 1993). It consisted of approximately 20 hectares of marsh, open water, and wet to wet-mesic grassland. The dominant vegetation consisted of reed's canary grass (*Phalaris arundinacea*) in the wet/wet-mesic grassland areas, *Eleocharis spp./Scirpus fluviatilis/Polygonum spp.* in the marsh, and *Typha latifolia* in the open water area.

I placed nine wire minnow traps in a random array through a small part of the marsh (ca. 0.40 hectares) on 21 March 2001 and left them through 15 November 2001. Traps remained open and active except for two weeks in late April and two weeks in late July. Traps were checked every 24 to 36 hours. Captures were counted, identified and returned to the marsh immediately. Twelve cover objects also were placed in a random fashion along the edge of the marsh and into the adjacent wet-mesic grassland area. Cover objects consisted of four corrugated metal pieces (ca. 50 x 90 cm), seven wooden boards (ca. 40 x 60 cm) and one cement piece (ca. 20 x 30 cm). The objects were checked nearly every trip.

I recorded over 151 captures among the 12 species of amphibians and reptiles encountered between March-December 2001 (Table 1).

Species	Total number of captures			
	Traps	Cover Boards	Observed	Heard
<i>Ambystoma texanum</i> ‡	>100 †	28	0	-
<i>Bufo americanus</i>	3*	1	-	Y
<i>Acris crepitans</i>	0	0	1	Y
<i>Hyla versicolor</i> complex	1*	0	1	Y
<i>Pseudacris triseriata</i> ‡	0	0	-	Y
<i>Rana blairi</i>	16*	0	-	Y
<i>Rana catesbeiana</i>	0	0	-	Y
<i>Chelydra serpentina</i>	0	0	1	-
<i>Nerodia sipedon</i>	1	1	0	-
<i>Regina grahamii</i> ‡	58	0	0	-
<i>Storeria dekayi</i>	0	32	0	-
<i>Thamnophis proximus</i>	3	6	1	-
<i>Thamnophis sirtalis</i>	0	3	0	-

Table 1. Amphibians and reptiles found at Albany Marsh. (‡Represents first reported occurrence of the species in Gentry County, photographic documentation deposited in University of Missouri-Columbia herpetology collection; *Adults/Metamorphs only; † Larvae and Adults)

Small-mouthed salamander (*Ambystoma texanum*) adults were first captured in the marsh on 23 March. Eggs were first observed on 21 March. Larvae were first captured on 23 May. Metamorphs were first observed on 22 June. From mid-September to early December, many young of the year juveniles and some adults were observed using crayfish burrows under cover objects located in wet-mesic grassland. All adults and juveniles observed under cover objects were found within 70 m of the standing water marsh area.

Western chorus frog (*Pseudacris triseriata*) males were heard calling on 21 March until 25 April. One suspected larva was captured on 30 May. No metamorphs were captured or observed. Males called sporadically in October after light precipitation (>20 mm).

Plains leopard frog (*Rana blairi*) males were first heard calling on 9 April. Larvae were first captured on 7 June and metamorphs were first captured on 13 June.

American toad (*Bufo americanus*) males were first heard calling on 9 April, however, no larvae or metamorphs were captured.

Members of the gray treefrog complex (*Hyla versicolor-chrysocelis*) were first heard calling on 21 May. Larvae were first captured on 1 June.

A total of 5 species of snakes was observed in the marsh (see Table 1). Graham's crayfish snake (*Regina grahamii*) was the most commonly captured snake and was first captured on 10 May and last captured on 8 August. Graham's crayfish snakes were not observed under cover objects despite their reported use of rocks and other cover (Johnson 2000). Captures of *Regina* stopped abruptly in early August. Seigel (1992) reported that *R. grahamii* from Squaw Creek National Wildlife Refuge probably went into aestivation during the summer. Crayfish snakes at Albany Marsh may have been aestivating, however, I propose an alternative hypothesis. Crayfish at Albany Marsh (*Procambarus gracilis*) were commonly captured in funnel traps, along with *R. grahamii*, until late July. Crayfish snakes may have been attracted to the funnel traps due to the abundance of their primary prey in the traps. When the captures of crayfish stopped, so did *R. grahamii* captures. Therefore, crayfish captures may have influenced *R. grahamii* captures. Again, this does not preclude the possibility that *R. grahamii* may have been aestivating. Pflieger (1996) reported that in Missouri, *P. gracilis* juveniles were found in open water during March-June and in October. Therefore, crayfish snakes may have decreased activity in late summer in response to decreased activity in crayfish. Radio-telemetry methods are needed to determine the whereabouts of *R. grahamii* during late summer.

The brown snake (*Storeria dekayi*) was the second most commonly captured snake at the marsh. They were found exclusively under cover objects in wet-mesic grassland. Young of the year juveniles were first captured on 17 August.

The ribbon snake (*Thamnophis proximus*) was the third most commonly captured snake at the marsh. Young of the year juveniles were first captured on 22 August and spent some time using cover objects. An adult captured in a trap regurgitated a *Rana blairi* tadpole.

The northern water snake (*Nerodia sipedon*) was much less common than expected, although lack of significant numbers of fishes in the marsh probably influenced their population at the marsh. Several green sunfish (*Lepomis cyanellus*) were captured in traps after a large rain and subsequent flood in early July. No fish were captured after the flooding event.

Red-sided garter snakes (*Thamnophis sirtalis*) were also much less common than expected, with only three individuals observed.

The marsh is also a focal point for a variety of other uncommon organisms. Notable animal species observed at the marsh include: meadow jumping mouse (*Zapus hudsonicus*), masked shrew (*Sorex cinereus*), meadow vole (*Microtus pennsylvanicus*), American bittern (*Botaurus lentiginosus*), marsh wren (*Cistothorus palustris*) and black tern (*Laterallus jamaicensis*). A variety of uncommon wetland plants was observed at the marsh as well.

Based on my observations, a relatively diverse assemblage of amphibians and reptiles occurs at Albany Marsh, making this marsh an important ecological area in a heavily modified landscape of agricultural crop fields. Also, significant viable populations of the small-mouthed salamander and Graham's crayfish snake inhabit Albany Marsh. Both species are evidently very reliant on the resident crayfish (*P. gracilis*) population for shelter, potential hibernacula, and prey.

Albany Marsh is a significant resource for a variety of marsh dwelling organisms. Although it is somewhat degraded as a natural community, it deserves special attention as a reservoir and refuge for many species in the highly fragmented and agricultural northern Missouri plains.

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MAXIMUM SIZE RECORDS FOR AMPHIBIANS AND REPTILES FROM MISSOURI

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Although often overlooked, size maxima records for amphibians and reptiles represent a very basic and easily measured life history attribute. Published records can be found for Missouri in Johnson (2000) and for North America in Conant and Collins (1998). The following list is an updated summary of the largest of each species known from Missouri. Previous summaries can be found in Powell *et al.* (1982) and Powell (1994)

To qualify for inclusion in this list, a catalogued voucher specimen from an institutional collection is required. Notable literature records, particularly those of Anderson (1965), are mentioned where appropriate but are not considered valid unless supported by an extant specimen. Furthermore, some species are not represented with qualifying Missouri specimens and are therefore listed without a measurement.

Each entry consists of the species name (in alphabetical order within each group), the county from which the specimen was taken, measurement (cm), and the collection acronym and catalogue number in parentheses. Species indicated by asterisks are listed as extirpated by Missouri Department of Conservation. Any comments for the record follow the entry. Measurements differ for each group. Snout-vent length (SVL) and total length (TL) are reported for salamanders, lizards, and snakes, SVL is reported for anurans, and carapace length is reported for turtles.

The following acronyms indicate the institutional collections where specimens are deposited: BWMC- Bobby Witcher Memorial Collection, Avila College, Kansas City, MO; CMSU- Central Missouri State University, Warrensburg, MO; KU- Museum of Natural History, University of Kansas, Lawrence, KS; NWMSU- Northwest Missouri State University, Maryville, MO; SEMSU- Southeast Missouri State University, Cape Girardeau, MO; UMC-Dean E. Metter Memorial Collection, University of Missouri, Columbia, MO; USNM- United States National Museum, Washington, DC.

AMPHIBIA: CAUDATA (SVL/TL)

Ambystoma annulatum Stone Co: 11.3/23.8 (KU 88905).
Ambystoma maculatum Boone Co: 10.0/21.3 (BWMC 1609).
Ambystoma opacum Montgomery Co: 7.5/13.2 (UMC 2114).
Ambystoma talpoideum Cass Co: 6.9/13.2 (UMC 2806).
Ambystoma texanum Cass Co: 10.2/18.3 (BWMC 4955).
Ambystoma tigrinum Camden Co: 12.7/23.8 (UMC 117).
Amphiuma tridactylum Stoddard Co: 65.0/81.1 (UMC 1571).
Cryptobranchus alleganiensis Dallas Co: 41.0/60.1 (UMC 1547).
Eurycea longicauda Carter Co: 5.7/15.0 (UMC 538).
Eurycea lucifuga McDonald Co: 6.5/17.7 (KU 28059).
Eurycea tynerensis Taney Co: 5.1/10.2 (UMC 1982).
Hemidactylum scutatum Wayne Co: 4.9/8.1 (KU 115872).
Necturus louisianensis Morgan Co: 22.2/31.2 (KU 89900).
Necturus maculosus Stone Co: 18.5/26.9 (UMC 454).
Notophthalmus viridescens Callaway Co: 6.1/12.5 (UMC 348).
Plethodon albagula Butler Co: 8.1/16.9 (KU 89732).
Plethodon angusticlavius Ozark Co: 4.2/8.1 (KU 89681).
Plethodon serratus Cape Girardeau Co: 5.5/10.7 (SEMSU 289).
Siren intermedia Bollinger Co: 28.0/41.9 (UMC 1541).
Typhlotriton spelaeus Stone Co: 5.9/10.9 (KU 60779).

AMPHIBIA: ANURA (SVL)

Acris crepitans Taney Co: 4.1 (CMSU 106).
Bufo americanus Jackson Co: 10.5 (KU 90238).
Bufo cognatus Jackson Co: 7.4 (KU 90107).
Bufo fowleri No record available.
Bufo woodhousii St. Clair Co: 9.6 (KU 90533).
Gastrophryne carolinensis Dallas Co: 3.9 (KU 220524).
Gastrophryne olivacea Ray Co: 3.7 (BWMC 754).
Hyla chrysoscelis Ozark Co: 5.6 (KU 223375).
Hyla cinerea Stoddard Co: 5.8 (KU 176195).
Hyla versicolor Ozark Co: 5.7 (KU 222854).
Pseudacris crucifer Wayne Co: 3.2 (KU 176204).
Pseudacris illinoensis Dunklin Co: 3.8 (KU 90705).
Pseudacris triseriata Jackson Co: 3.8 (BWMC 357).

Rana areolata Bates Co: 11.2 (KU 220022).
Rana blairi Johnson Co: 10.0 (CMSU 226).
Rana catesbeiana Montgomery Co: 17.0 (KU 218604).
Rana clamitans Miller Co: 9.1 (KU 910903).
Rana palustris Dade Co: 6.6 (BWMC 1879).
Rana pipiens Atchison Co: 7.0 (KU 204084).
Rana sphenocephala Callaway Co: 9.4 (UMC 7135).
Rana sylvatica Stone Co: 6.3 (USNM 58028).
Scaphiopus holbrookii Dunklin Co: 6.9 (KU 90080).
Spea bombifrons Jackson Co: 5.2 (KU 90043).

REPTILIA: SQUAMATA: SAURIA (SVL/TL)

Cnemidophorus sexlineatus Barry Co: 8.4/26.7 (KU 218611).
Crotaphytus collaris Boone Co: 10.5/29.6 (UMC 3475).
Anderson (1965) reported a maximum size of 32.2 cm, but no voucher specimen exists.
Eumeces anthracinus Stone Co: 6.0/17.0 (CMSU 835).
Eumeces fasciatus Bollinger Co: 7.3/19.9 (CMSU 832).
Eumeces laticeps Boone Co: 10.8/26.8 (KU 185893).
Eumeces obsoleta Vernon Co: 9.9/26.8 (KU 88556).
Eumeces obtusirostris Barton Co: 6.6/17.7 (KU 219997).
Eumeces septentrionalis Harrison Co: 7.5/20.3 (NWMSU 4015); Worth Co: 8.6/15.0 (incomplete tail) (NWMSU 4020).
Ophisaurus attenuatus Franklin Co: TL= 71.3 (KU 222320).
Phrynosoma cornutum no record available
Sceloporus undulatus Cedar Co: 8.1/18.5 (BWMC 4267).
Scincella lateralis Barton Co: 5.4/13.8 (BWMC 4708).

REPTILIA: SQUAMATA: SERPENTES (SVL/TL)

Agkistrodon contortrix Wayne Co: 80.9/93.0 (UMC 6688).
Anderson (1965) reported a maximum size of 99.2 cm, but no voucher specimen exists.
Agkistrodon piscivorus Stoddard Co: 87.7/110.5 (CMSU 98).
Anderson (1965) reported a maximum size of 111.7 cm, but no voucher specimen exists.
Carpophis vermis Scotland Co: 33.3/37.6 (BWMC 2590).
Cemophora coccinea Camden Co: 31.0/36.4 (UMC 4167).

- Coluber constrictor* Pemiscot Co: 101.5/133.0 (KU 81154).
Crotalus horridus Ray Co: 116.4/125.7 (KU 84437). Anderson (1965) reported a maximum size of 182.6 cm, but no voucher specimen exists.
- Diadophis punctatus* Holt Co: 39.5/47.7 (KU 217202).
Elaphe emoryi McDonald Co: 102.9/122.0 (KU 81981). Anderson (1965) reported a maximum size of 152.4 cm, but no voucher specimen exists.
- Elaphe obsoleta* Jackson Co: 156.7/187.2 (BWMC 2117). Anderson (1965) reported a specimen (CA 8134) with a total length of 213.3 cm, but the specimen could not be located in the Chicago Academy of Science collection.
- Elaphe vulpina* Holt Co: 97.0/115.5 (KU 82077). Anderson (1965) reported a maximum size of 152.4 cm, but no voucher specimen exists.
- Farancia abacura* Stoddard Co: 96.2/112.4 (UMC 4673).
 **Heterodon nasicus* Holt Co: 42.5/52.1 (KU 82089). Anderson (1965) reported a maximum size of 53.7 cm, but no voucher specimen exists.
- Heterodon platirhinos* St. Clair Co: 72.2/84.2 (KU 83065).
Lampropeltis calligaster Cass Co: 113.2/130.6 (BWMC 1906).
Lampropeltis getula Maries Co: 103.6/119.9 (UMC 6890). Anderson (1965) reported a maximum size of 152.2 cm, but no voucher specimen exists.
- Lampropeltis triangulum* Jackson Co: 71.1/83.5 (KU 82237). Anderson (1965) reported a maximum size of 91.4 cm, but no voucher specimen exists.
- **Liochlorophis vernalis* Harrison Co: 36.5/51.6 (NWMSU, catalogue number unavailable).
Masticophis flagellum Texas Co: 162.5/193.0 (CMSU 505).
Nerodia cyclopion Dunklin Co: 69.3/91.1 (KU 82394).
Nerodia erythrogaster Livingston Co: 102.3/123.5 (KU 82418).
Nerodia fasciata Dunklin Co: 79.6/101.4 (KU 82978).
Nerodia rhombifer St. Clair Co: 118.5/129.5 (CMSU 544). Anderson (1965) reported a maximum size of 137.0 cm, but no voucher specimen exists.
- Nerodia sipedon* Lewis Co: 94.1/119.8 (KU 223910).
Opheodrys aestivus Randolph Co: 50.2/78.3 (UMC 6701).
Pituophis catenifer Vernon Co: 156.4/178.2 (KU 83136). Anderson (1965) reported a maximum size of 197.8 cm, but no voucher specimen exists.
- Regina grahamii* Jackson Co: 70.0/85.5 (KU 82597).
Sistrurus catenatus Holt Co: 68.1/76.4 (KU 84563).
Sistrurus miliarius Wayne Co: 43.7/55.0 (KU 84590).
Sonora semiannulata Taney Co: 28.7/34.3 (UMC 4674).
Storeria dekayi Macon Co: 30.0/36.8 (KU 223913).
Storeria occipitomaculata Boone Co: 25.0/30.3 (KU 185933).
Tantilla gracilis Benton Co: 19.9/24.9 (KU 51707).
Thamnophis proximus Johnson Co: 86.3/92.7 (CMSU 1810).
Thamnophis radix Holt Co: 62.0/78.7 (KU 83895). Anderson (1965) reported a maximum size of 84.5 cm, but no voucher specimen exists.
- Thamnophis sirtalis* Ray Co: 78.8/98.0 (BWMC 1103).
Tropidoclonion lineatum Jackson Co: 38.0/43.8 (BWMC 4250).
Virginia striatula Moniteau Co: 26.2/31.4 (KU 218665).
Virginia valeriae Jackson Co: 34.2/39.3 (BWMC 1714).
- REPTILIA: TESTUDINES
 (Carapace Length)
Apalone mutica Benton Co: 30.5 (BWMC 4281).
Apalone spinifera Jackson Co: 35.8 (BWMC 2821).
Chelydra serpentina Jackson Co: 35.8 (BWMC 4275).
Chrysemys picta Grundy Co: 20.3 (BWMC 1821).
Deirochelys reticularia Stoddard Co: 20.2 (UMC 4106).
Emydoidea blandingii No record available. The specimen given by Powell (1995) as size record (KU 91330) is actually a *G. geographica*.
Graptemys geographica Miller Co: 23.6 (KU 91330).
Graptemys ouachitensis No record available.
Graptemys pseudogeographica Pemiscot Co: 15.7 (KU 91332).
Kinosternon flavescens Barry Co: 13.1 (KU 177109).
Kinosternon subrubrum Wayne Co: 11.7 (BWMC 3703).
Macrochelys temminckii Wayne Co: 42.5 (UMC 4109).
Pseudemys concinna Taney Co: 32.7 (BWMC 5544).
Sternotherus odoratus McDonald Co: 11.7 (BWMC 1815).
Terrapene carolina Howard Co: 15.5 (UMC 6612).
Terrapene ornata Jackson Co: 14.0 (BWMC 4368).
Trachemys scripta Lafayette Co: 29.2 (BWMC 5546).

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ADDITIONS TO THE BIBLIOGRAPHY OF AMPHIBIANS AND REPTILES IN MISSOURI

Compiled by

Richard E. Daniel

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The following is a compilation of references dealing with the biology of amphibians and reptiles in Missouri that have been brought to my attention since the publication of Powell (1999), Johnson (2000) and Daniel (2000). Readers are requested to notify the author of any additional references that should be included in future lists.

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ADDENDUM: SMALL GRANT REPORTS SUBMITTED TO THE MISSOURI DEPARTMENT OF CONSERVATION

Compiled by

Jeffrey T. Briggler

Missouri Department of Natural History, Jefferson City, MO 65102

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HERPETOLOGICAL THESES AT UNIVERSITY OF MISSOURI-COLUMBIA

Compiled by

Richard E. Daniel

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

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HERPETOLOGICAL THESIS FROM NORTHWEST MISSOURI STATE UNIVERSITY

Compiled by

Paul W. Frese

Natural Resources Conservation Service, Albany, MO 64402

- McGuire, W. D. 1981. Distribution and habitat preference of the herpetofauna of southwest Missouri. MS Thesis. Advisor: K. Minter.

HAVE YOU SEEN A TIMBER RATTLESNAKE?

Timber Rattlesnake Survey

Please Help: The timber rattlesnake has declined throughout its northern range. At one time this species may have occurred nearly statewide. It is now documented from a few counties, and likely to occur in most of the Ozarks. Sighting reports of this species will provide valuable data for future management.

Please fill in the appropriate data for your county, or management area(s). Sighting **date** and **location** will be very important information for this survey. Recent timber rattlesnake sightings (within the last 5 years) are vital data, but older sightings (over 10 years) will also be of use. Please fill in as much of the form as possible and use one form for each observation. Return to: **Jeff Briggler, Natural History Division, MO Dept. of Conservation, P.O. Box 180, Jefferson City, MO 65102.**



MDC Photograph - T.R. Johnson

Name _____
Title _____
Address _____

Phone _____ E-mail _____

Check One: () Individual sighting () Known overwintering den

Date of Observation _____
Missouri County _____
Name of area _____
Ownership _____

Exact Location (town, lake, roads, etc.) _____

Legal description: T _____ R _____ Sec. _____ 1/4 Sec. _____

(If possible, please attach map)

Habitat where observed: _____

Comments _____

If possible, please attach a **photograph** plus a **map** of each snake location or den site and note **direction** of snake movement (if known) on the map. Direction of snake movement could help in determining locations of den sites.