

Missouri  
Herpetological  
Association



Newsletter

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**MISSOURI HERPETOLOGICAL ASSOCIATION NEWSLETTER NO. 19**

**Contents**

**INTRODUCTION** ..... 2

**ANNOUNCEMENTS** ..... 2

**ABSTRACTS OF PAPERS PRESENTED AT THE NINETEENTH ANNUAL MEETING OF THE MHA** ..... 4

    Are experimental techniques stressful for amphibians? A test with the gray treefrog, *Hyla versicolor*. **N.M. Gordon and H.C. Gerhardt.**

    Interagency wetland guidance using amphibian health indicators. **C. Shulse and R.D. Semlitsch.**

    Learning by embryos: experience with predatory cues in the egg stage influences post-hatching behavior of salamanders. **A. Mathis and N. Windel.**

    The relative roles of biotic and abiotic factors in determining the distribution and abundance of fence lizards in Missouri glades. **W.A. Ryberg.**

    Diet composition of a stream-associated cottonmouth (*Agkistrodon piscivorus*) population in southwest Missouri. **J. Gatewood and B. Greene.**

    Population ecology and feeding activity of *Sternotherus odoratus* at Reelfoot Lake, Tennessee. **B.M. Glorioso and V.A. Cobb.**

    Multi-year comparison of the male reproductive biology of the brown treesnake (*Boiga irregularis*). **S.S. Wisniewski and R.D. Aldridge.**

    Courtship behavior and evacuation of the urinary ducts in captive African brown house snakes (*Lamprophis fuliginosus*). **R.D. Aldridge.**

    Movements and growth of neonate eastern massasaugas (*Sistrurus catenatus*). **B.C. Jellin and M.J. Kowalski.**

    State wildlife grants and important herpetofauna areas. **J.T. Briggler.**

**NEW HERPETOLOGICAL RECORDS FROM MISSOURI FOR 2006.** R.E. DANIEL, B.S. EDMOND AND J.T. BRIGGLER ..... 9

**NATURAL HISTORY NOTES**

**REDISCOVERY OF KIRTLAND'S SNAKE (*Clonophis kirtlandii* KENNICOTT) IN MISSOURI.** C. SHULSE ..... 13

**NEW STATE SIZE RECORDS FOR MISSOURI REPTILES.** R.E. DANIEL .....14

**RESULTS OF THE SPRING AND FALL 2006 FIELD TRIPS.** B.S. EDMOND .....15

**ADDITIONS TO THE BIBLIOGRAPHY OF REFERENCES ON THE HERPETOFAUNA OF MISSOURI.** R.E. DANIEL ..... 17

**Cover art:** *Pseudacris crucifer* by Tom R. Johnson

## INTRODUCTION

The Nineteenth Annual Meeting of the **Missouri Herpetological Association** was held 30 September-1 October 2006 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

### 20<sup>th</sup> Annual Meeting of the Missouri Herpetological Association

The Twentieth Annual Meeting of the **Missouri Herpetological Association** will be held on 29-30 September 2007 at Missouri State University's **Bull Shoals Field Station**, Taney County, Missouri. A "call for papers" and registration materials will be sent electronically in mid-July. For more information please contact **Jeff Briggler** at:

Missouri Department of Conservation  
P.O. Box 180  
Jefferson City, MO 65102-0180  
(573) 751-4115  
E-mail: [briggj@mdc.mo.gov](mailto:briggj@mdc.mo.gov)

### Wanted

We still need artwork for future cover illustrations. Any species native to the state is acceptable; however, species described from Missouri type specimens and state species of conservation concern are particularly desirable. The species described from Missouri type specimens that haven't appeared on past covers are: *Acris crepitans blanchardi*, *Eurycea (Typhlotriton) spelaea*, *Nerodia fasciata confluens*, *Carphophis vermis*. Anyone wishing to contribute drawings for future issues can send submissions to **Richard Daniel** at:

Division of Biological Sciences  
114 Lefevre Hall  
University of Missouri  
Columbia, MO 65211  
E-mail: [danielr@missouri.edu](mailto:danielr@missouri.edu)

### MHA on the Net

The Association has an official site on the Internet. Point your browser to <http://www.moherp.org/> to find copies of current and past publications and to view photos and information from past meetings. Send ideas, suggestions, comments, and content to the Webmaster ([webmaster@moherp.org](mailto:webmaster@moherp.org)).

### **New On-line Herpetology Journal**

The editorial staff of *Herpetological Conservation and Biology* announces the release of the inaugural issue on September 27, 2006. The first issue is 70 pages long and contains 12 articles. We proudly invite everyone to peruse the articles posted on the journal website (<http://www.herpconbio.org>) and welcome feedback that might help improve the journal. Herpetological Conservation and Biology is an international open-use electronic journal published in partnership with PARC and the World Congress of Herpetology. All material except Editorials and Announcements receive anonymous peer review. The current acceptance rate for submitted articles is ca. 50%. There are no page charges or download fees for *HCB* users. Print versions of *HCB* are planned for release at the end of each year. The journal is indexed by BioAbstracts and Zoological Record. The current editorial staff is around 60 members and there are plans to expand the International presence this fall. If you have any questions or comments regarding the journal or its operations please contact any member of the editorial staff.

Sincerely,

R. Bruce Bury, Editor-in-Chief ([buryb@herpconbio.org](mailto:buryb@herpconbio.org))

Malcolm L. McCallum, Managing Editor ([Malcolm.mccallum@herpconbio.org](mailto:Malcolm.mccallum@herpconbio.org))

Raymond A. Saumure, Technical and Copy Editor ([insculpta@herpconbio.org](mailto:insculpta@herpconbio.org))

Stanley E. Trauth, Special Sections Editor ([trauth@herpconbio.org](mailto:trauth@herpconbio.org))

### **Spring Field Trip**

A field trip is planned for late May 2007 to search for historical populations of *Sonora semiannulata* in St. Clair County. This species was documented in the vicinity of Osceola by Paul Anderson in *The Reptiles of Missouri*. These populations represent the extreme northern extension of the range of this species in Missouri. Searches during the early 1980's failed to locate any specimens.

Information detailing the dates and location of the field trip will be sent out to members and posted on the MHA website in April. The field trip is open to any one with an interest in amphibians and reptiles.

**Abstracts of Papers Presented at the  
19<sup>th</sup> Annual Meeting  
of the  
Missouri Herpetological Association**

**Reis Biological Station  
30 September – 1 October 2006**

**ARE EXPERIMENTAL TECHNIQUES STRESSFUL FOR AMPHIBIANS? A TEST WITH THE  
GRAY TREEFROG, *Hyla versicolor***

**Noah M. Gordon and H. Carl Gerhardt**  
University of Missouri, Columbia

Stress responses in vertebrates are characterized by a rapid, neural response and a slower, more prolonged endocrine response. This endocrine response is reflected by increased plasma corticosterone released from the adrenals and may be associated with changes in behavior in some organisms. With increased scrutiny of animal care and use in research it has become crucial to determine whether perceived stressors actually induce stress, particularly in non-model organisms, so that research and policy recommendations can be made based on evidence rather than conjecture.

We set out to test whether typical experimental techniques associated with amphibian behavioral research are stressful. We did this by measuring corticosterone levels in the gray treefrog, *Hyla versicolor*, after exposure to different potential stressors. The potential stressors tested were: blood sampling via cardiocentesis, anesthesia with MS-222, a combination of anesthesia and cardiocentesis, toe clipping, cage cleaning, cage switching, and prolonged handling. We found no significant effect of treatment on corticosterone levels suggesting our treatments were not stressful.

To test whether experimental techniques may be stressful by influencing behavior, we monitored oviposition in two groups of females approaching a breeding chorus. One group had blood sampled via cardiocentesis and the other acted as a control. We found no difference in the proportion of females ovipositing between groups suggesting that cardiocentesis is not stressful enough to influence behavior.

Our results combined with other recent work on amphibians suggest that while the stress response may be universal among vertebrates, what is stressful may not be universal.

**INTERAGENCY WETLANDS GUIDANCE USING AMPHIBIAN HEALTH INDICATORS**

**Chris Shulse and R.D. Semlitsch**  
University of Missouri, Columbia, MO

Habitat loss is probably the greatest reason for the decline of many organisms, including amphibians. In our attempts to mitigate for habitat lost due to development and to create new habitat for conservation purposes, one must ask the question – do our efforts really meet the ecological needs of amphibians? If the answer to that question is no, then another question arises – how can we improve our efforts? In this project we attempt to answer these questions through several phases of research. The first examines the association between amphibian species at 50 existing constructed wetlands and both “within wetland” characteristics and the surrounding landscape. We examined 23 wetlands constructed as compensatory mitigation by the Missouri Department of Transportation (MoDOT) and 27 “wildlife ponds” and small wetlands constructed for conservation purposes by the Missouri Department of Conservation (MDC). Preliminary results of this phase indicate that average maximum species at both MoDOT and MDC sites are similar. In the second phase, we will examine the effects of several wetland design features and their effects on natural population establishment. These experiments will take place at a series of replicated pools constructed on both MoDOT and MDC sites. Variables examined are presence of mosquitofish (*Gambusia affinis*), in-pool slope, and vegetation establishment. The third research phase examines the translocation techniques of variable stocking densities and larval protection from predation in order to create scientifically tested methods for amphibian population establishment. Our focus is on

species that are rare or declining due to impaired dispersal capabilities from habitat fragmentation. Our goal is to provide state and federal agencies with guidance to assist them in their efforts to construct aquatic habitats that will benefit amphibians in need of enhanced conservation efforts.

### **LEARNING BY EMBRYOS: EXPERIENCE WITH PREDATORY CUES IN THE EGG STAGE INFLUENCES POST-HATCHING BEHAVIOR OF SALAMANDERS**

**Alicia Mathis and Nathan Windel**  
Missouri State University, Springfield, MO

Most research on the effects of exposure to stressful stimuli during embryonic development has focused on post-embryonic behaviors that appear to be abnormal or maladaptive. Here we tested whether exposure to some stressful stimuli (predatory cues) can lead to post-embryonic behaviors that are adaptive. When eggs of ringed salamanders were exposed to chemical cues from predators, post-hatching larvae showed reduced activity and shelter-seeking behavior that was consistent with antipredator behavior; larvae that had been exposed to control cues did not show these behaviors. Therefore, if embryonic experience is a good predictor of future risk, learning associated with exposure to negative stimuli during development may be adaptive.

### **THE RELATIVE ROLES OF BIOTIC AND ABIOTIC FACTORS IN DETERMINING THE DISTRIBUTION AND ABUNDANCE OF FENCE LIZARDS IN MISSOURI GLADES**

**Wade A. Ryberg**  
Washington University in St. Louis, St. Louis, MO

Anecdotal observations suggest that the distribution and abundance of Fence lizards, *Sceloporus undulatus*, on Missouri glades diminish with the onset of the Collared lizard, *Crotaphytus collaris*, activity season. Both biotic, interspecific competition and/or predation between lizards, and abiotic, shifting thermal environment, mechanisms have been proposed to explain this pattern. To test the relative contributions of biotic and abiotic mechanisms to the shifting behavioral and numerical response of *S. undulatus* to *C. collaris*, I describe microhabitat (perch) selection and density of *S. undulatus* in glades with and without *C. collaris* in early and late summer. *Sceloporus undulatus* showed no shift in perch selection in the absence of *C. collaris* in early and late summer; however, *Sceloporus undulatus* density was higher in the absence of *C. collaris* in early but not late summer. These data indicate that biotic mechanisms are unimportant relative to abiotic mechanisms in determining the behavioral response or distribution of *S. undulatus* in Missouri glades. Alternatively, biotic mechanisms are more important relative to abiotic mechanisms in determining the numerical response or abundance of *S. undulatus* in Missouri glades during early but not late summer. The relative importance of biotic and abiotic processes to patterns of *S. undulatus* distribution and abundance appears to shift through time and depend on the type of response in question, behavioral or numerical.

### **DIET COMPOSITION OF A STREAM-ASSOCIATED COTTONMOUTH (*Agkistrodon piscivorus*) POPULATION IN SOUTHWEST MISSOURI**

**Jessica Gatewood and Brian Greene**  
Missouri State University, Springfield, MO

Variation in snake diet composition may be explained by numerous factors including prey size selection, differences in foraging tactics, and prey availability. We investigated the diet of a cottonmouth (*Agkistrodon piscivorus*) population associated with a stream environment in southwest Missouri using analysis of stomach and intestinal contents. Relatively little dietary ontogeny was observed with mammals representing the dominant prey at all snake body sizes. Reptiles, amphibians, birds, and cicadas formed the

remainder of the diet. In addition, telemetric monitoring of adult individuals indicates relatively little activity associated with the aquatic environment. We suggest that the apparent lack of aquatic foraging activity in this population may be explained by the stable hydrology and cold (spring fed) nature of the stream environment which collectively presents challenging circumstances to an opportunistically piscivorous species. Moreover, the dietary breadth of *A. piscivorus* may confer an unusual degree of dietary plasticity allowing exploitation of whatever prey are most abundant or accessible in a given degree environment.

### **POPULATION ECOLOGY AND FEEDING ACTIVITY OF *Sternotherus odoratus* AT REELFOOT LAKE, TENNESSEE**

**Brad M. Glorioso, and Vincent A. Cobb**

Middle Tennessee State University, Murfreesboro, TN

Precise times of feeding activity for aquatic turtles are poorly documented in the literature because of passive capture techniques. In a roadside slough adjacent to Reelfoot Lake, we sampled a population of stinkpots, *Sternotherus odoratus*, periodically from September 2004 to November 2005 using deep-water crawfish nets baited with chicken. This novel technique, in 32 samplings with an average duration of 7.5 h, captured 866 stinkpots, consisting of 655 individuals. The overall and individual sex ratio was significantly male-biased, but the recapture sex ratios did not differ. Jolly-Seber estimate predicted a population of 876 individuals, which yielded a density of 984/ha, and a biomass of 104 kg/ha. We estimated the feeding activity season to be 218 days for 2005 (16 April – 19 November). We did not observe gender or size differences for feeding times. Stinkpot feeding activity was crepuscular, with a peak between 0600 – 1100 h, and a less pronounced peak between 1600 – 1900 h. Although we captured some individuals overnight, nocturnal feeding was not prevalent. Stinkpot capture was affected by the time of initial net placement; 52% of total captures came within the first three hours of setting the nets. Density and biomass estimates for stinkpots in this study were larger than any reported in the literature. By late 2005, we were obtaining recapture percentages of 40 – 50%, which provided reliability for our Jolly-Seber estimate. We propose that our capture technique may lead to more efficient sampling of some turtle species, and provide detailed accounts of feeding activity.

### **MULTI-YEAR COMPARISON OF THE MALE REPRODUCTIVE BIOLOGY OF THE BROWN TREESNAKE (*Boiga irregularis*)**

**Samantha S. Wisniewski and Robert D. Aldridge**

Saint Louis University, St Louis, MO

The brown treesnake (*Boiga irregularis*) an introduced species on Guam which has caused the extinction or extirpation of several species of lizards and birds. Moore et al. (2005) suggested that reproduction in this species is reduced because of elevated stress hormones caused by limited food availability. The purpose of this study is to compare the reproductive anatomy of male brown treesnakes on Guam over several years (1985, 1995 and 1999) to determine if the size at maturity and development of the testis and sexual segment of the kidney varied between years. These measurements were compared to a sample of brown treesnakes collected from the native range of this species. Reproductive adults on Guam were present in all years examined. The snout-vent length at which snakes were reproductive was similar between years. Mean seminiferous tubule and sexual segment of the kidney (SSK) diameters were not significantly different between years. However the number of SSK tubules hypertrophied per snake varied greatly. In general, snakes from the native range matured at a smaller SVL, and had many more hypertrophied SSK tubules per kidney than did the populations on Guam.

## **COURTSHIP BEHAVIOR AND EVACUATION OF THE URINARY DUCTS IN CAPTIVE BROWN HOUSE SNAKES (*Lamprophis fuliginosus*)**

**Robert D. Aldridge**

Saint Louis University, St Louis, MO

Successful mating in male snakes involves identification of a receptive female and the ability to the transport sperm and secretions of the sexual segment of the kidney (SSK) to the female. We examined the ability of male snakes to detect a female by olfaction alone by placing the female in an opaque cage containing holes for odors to escape. Two males were used with one female in each trial. After 15 min the female was placed directly in the aquarium with the two males to determine her level of attractiveness. Females were attractive and courted by males in 88% of the trials (76 of 86). Males never courted other males. Males failed to detect the presence of caged females by olfaction alone. In none of the 86 trials did males investigate the holes on the cages of the females, indicating that the pheromone is not volatile. Uric acid/feces was excreted only in phase 3 (female in aquarium with males) of the experiments. In 40 of the 86 trials (47%) at least one male excreted uric acid/feces and in these trials the female was described as very attractive. Of the 46 males that excreted, 41 excreted uric acid without feces (89%). This paper documents the method snakes use to transmit SSK secretions to the female without contamination of uric acid.

## **MOVEMENTS AND GROWTH OF NEONATE EASTERN MASSASAUGAS (*Sistrurus catenatus*)**

**Benjamin C. Jellen and Mathew J. Kowalski**

St. Louis University, St. Louis, MO and Western Pennsylvania Conservancy, Pittsburg, PA

Throughout the geographic range, adult Eastern Massasaugas (*Sistrurus catenatus*) exhibit plasticity in movement, fecundity, diet, and activity range size; however, the spatial ecology of subadults remains unknown. We externally attached radio transmitters to sixteen free-ranging neonate *S. catenatus* and monitored their movements and growth for up to 56 days prior to their initial hibernation. Neonate movement frequency (70 %) was consistent with values reported for adults throughout the geographic range, but activity range size and mean daily distance moved were not, suggesting population differences in the spatial distribution of resources. Neonate activity range size (0.36 Ha) and mean daily distance moved (5.3 m) were similar to values reported for adults from the same geographic region. Males gained significantly more mass than females over the first 50 days, but no difference in length was detected. *Sistrurus catenatus* hibernate individually, and contrary to reports of communally denning pitvipers, neonate *S. catenatus* returned to their general birthing area to over-winter suggesting an alternate method to conspecific pheromonal trailing for initial den location. Because of ontogenetic shifts and differences in resource distribution, regionally-specific management plans based on data for all age classes are essential in providing effective conservation measures.

## **STATE WILDLIFE GRANTS AND IMPORTANT HERPETOFAUNA AREAS**

**Jeffrey T. Briggler**

Missouri Department of Conservation, Jefferson City, MO

Funds were appropriated in 2002 by the Federal Government for states that submit a Comprehensive Wildlife Strategy by 2005. These funds, known as State Wildlife Grants (SWG), are provided to support cost effective conservation aimed at keeping common wildlife species common, including amphibian and reptile species. The Missouri Comprehensive Wildlife Strategy includes 33 focus areas, known as Conservation Opportunity Areas (COA), scattered throughout the state. These COAs were chosen by habitat type, species of conservation concern, amount of land owned by government agencies or private conservation groups, and conservation partnership opportunities. Information regarding specific COA's is located at <http://www.mdc.mo.gov/nathis/cws/coa/>. Guidelines for review of projects requesting funds within COAs were discussed. Another opportunity to keep common species common is the Midwest PARC (Partners in Amphibian and Reptile Conservation) request for states to develop plans that identify



important herpetofauna areas throughout the Midwest. These ideas were shared among the participants of the Missouri Herpetological Association (MHA) annual meeting. Both of these strategies are important to ongoing amphibian and reptile conservation in Missouri.

## NEW HERPETOLOGICAL RECORDS FROM MISSOURI FOR 2006

Richard E. Daniel<sup>1</sup>, Brian S. Edmond<sup>2</sup> and Jeffrey T. Briggler<sup>3</sup>

<sup>1</sup>Division of Biological Sciences, University of Missouri, Columbia, MO 65211

<sup>2</sup>Computer Services, Missouri State University, Springfield, MO 65897

<sup>3</sup>Missouri Department of Conservation, P.O. Box 180, Jefferson City, MO 65102

The following list represents new county records accumulated or brought to our attention since the publication of Johnson (2000), Daniel and Edmond (2000, 2001, 2006) and Daniel *et al.* (2002, 2003, 2004, 2005). 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 distribution 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), institution and catalogue number where the specimen is deposited.

The following acronyms indicate the institutional collections where specimens reported in this note have been deposited: SEMO- Southeast Missouri State University, Cape Girardeau, MO; UMC- Dean E. Metter Memorial Collection, University of Missouri, Columbia, MO. Unless otherwise indicated, all distribution records are documented by post-metamorphic/hatchling fluid preserved specimens.

We would like to extend our appreciation to R. Dames, B. Day, D. Drake, F. Durbian, E. East, Z. Fratto, C. Gemming, D. Harrison, E. Hooper, B. McKeage, G. Pitchford, P. Pitts, R. Powell, R. Rimer, C. Shulse and R. Wittenberg for generously providing information and specimens included in this note.

### AMPHIBIA: CAUDATA

#### HELLBENDER

*Cryptobranchus alleganiensis*

**Gasconade Co.:** Gasconade River (T44N R6W); 28 February 2006; J. Briggler, P. Pitts, B. McKeage, T. Grace (digital photo, UMC 1046P).

#### COMMON MUDPUPPY

*Necturus maculosus*

**Crawford Co.:** Meramec River (S28 T38N R4W); 16 September 2006; J. Briggler, K. Larson, K. Kelly, M. Hubbard (digital photo, UMC 1045P).

**Dallas Co.:** Niangua River (S25 T36N R18W); 15 June 2006; J. Briggler, K. Larson, C. Fuller, J. Burns, M. Perry, J. Huntley (digital photo, UMC 1043P).

**Gasconade Co.:** Gasconade River (S4 T44N R6W); 1 March 2006; B. McKeage, P. Pitts (digital photo, UMC 1052P).

**Pulaski Co.:** Big Piney River (S8 T34N R10W); 24 July 2006; J. Briggler, K. Kelly (digital photo, UMC 1044P).

### AMPHIBIA: ANURA

#### GRAY TREEFROG

*Hyla versicolor*

**Miller Co.:** Saline Valley Conservation Area (S23 T41N R14W); 19 May 2006; J. Briggler, R. Daniel, B. Edmond, A. Edwards (UMC 7958) (verified by call) This county record was reported in Johnson 2000, however the voucher specimen could not be positively identified to species.

#### SPRING PEEPER

*Pseudacris crucifer*

**Hickory Co.:** John Fisher Murphy Conservation Area (S20 T37N R22W); 15 March 2006; B. Edmond (UMC 7952).

#### WESTERN CHORUS FROG

*Pseudacris triseriata*

**Putnam Co.:** Rt. NN, 0.8 mile N Jct. US 136 (S6 T65N R21W); 10 April 2006; C. Shulse, A. Drayer, D. Drake (digital photo, UMC 953P).

#### PICKEREL FROG

*Rana palustris*

**Audrain Co.:** Robert M. White Conservation Area (S1 T52N R9W); 22 March 2006; A.

Drayer, D. Drake, C. Shulse (digital photo, UMC 917P).

**REPTILIA: SAURIA**  
PRAIRIE LIZARD

*Sceloporus consobrinus*

**Scott Co.:** 6.5 km S Chaffee on MO 77 (S1 T28N R12E); 21 September 2005; A.B. Heeb, J.D. Heeb (color photo, SEMO 15105) (Heeb 2006).

WESTERN GLASS LIZARD

*Ophisaurus attenuatus*

**Cass Co.:** Lake Winnebago (S9 T46N R31W); Summer 2006; R. Wittenberg, P. Koontz (color photograph, UMC 967P).

**REPTILIA: SERPENTES**

WESTERN WORM SNAKE

*Carphophis vermis*

**Linn Co.:** Pershing State Park (S14 T57N R21W); 14 August 2006; B. Graves, T. Crabill, M. Rochford (digital photo, UMC 1090P).

**Marion Co.:** CR 230, 0.9 mile SW Jct. MO 168 (S21 T58N R6W); 1 September 2006; E. East (digital photo, UMC 927P).

KIRTLAND'S SNAKE

*Clonophis kirtlandii*

**Clark Co.:** Location withheld (T65N R6W); 28 April 2006; C. Shulse (UMC 7936). See article this issue.

WESTERN MUDSNAKE

*Farancia abacura*

**Ripley Co.:** Sand Pond Conservation Area (S35 T22N R4E); 10 May 2006; J. Briggler, T. Johnson, R. Rimer, S. Paes, M. Pelton (digital photo, UMC 1040P).

RED MILKSNAKE

*Lampropeltis triangulum*

**Texas Co.:** Lead Hill (Dunn) Glade, King Rd, 0.4 miles S Dunn (S6 T28N R11W); 1 April 2006; B. Edmond, B. Ince (digital photo, UMC 975P).

YELLOW-BELLIED WATERSNAKE

*Nerodia erythrogaster*

**Howell Co.:** 0.6 mile N Brandsville (S13 T23N R7W); 11 July 2006; A. Day (UMC 7965).

DIAMONDBACK WATERSNAKE

*Nerodia rhombifer*

**Cass Co.:** Amarugia Highlands Conservation Area (S11 T43N R32W); 2004; R. Wittenberg, P. Koontz (color photo, UMC 965P).

ROUGH GREEN SNAKE

*Ophedryx aestivus*

**Cass Co.:** E-343<sup>rd</sup> Str., 0.6 air miles NE Main City (S29 T43N 32W); 2004; R. Wittenberg, P. Koontz (color photo, UMC 966P).

BROWN SNAKE

*Storeria dekayi*

**Ralls Co.:** Rt. F, 3.75 miles S Jct. MO 19 (S4 T54N R5W); 10 June 2005; E. East (UMC 7962).

NORTHERN REDBELLY SNAKE

*Storeria occipitomaculata*

**Ralls Co.:** Rt. F, 3.75 miles S Jct. MO 19 (S4 T54N R5W); 10 June 2005; E. East (UMC 7963).

EASTERN GARTER SNAKE

*Thamnophis sirtalis*

**Ripley Co.:** Little Black Conservation Area (S13 T24N R2E); 5 April 2006; R. Rimer, S. Paes (digital photo, UMC 1049P).

WESTERN EARTH SNAKE

*Virginia valeriae*

**Newton Co.:** Joplin I-44 at Shoal Creek (S 27 T27N R33W); 9 April 2006; D. Harrison (digital photo, UMC 920P).

**REPTILIA: TESTUDINES**

MIDLAND SMOOTH SOFTSHELL

*Apalone mutica*

**Cooper Co.:** Lamine River, ~2.5 miles NE Otterville (S26 T46N R19W); 18 May 2006; C. Gemming (digital photo, UMC 1037P).

**Gasconade Co.:** Gasconade River (S20 T44N R6W); 1 June 2006; Z. Fratto, B. Swallow (digital photo, UMC 1083P). Missouri River (S6 T45N R5W); 15 June 2006; P. Pitts, K. Singer, M. Kramer (digital photo, UMC 1084P). Gasconade River (S22 T44N R6W); 5 July 2006; B. McKeage, W. Casner, D. Shertz (digital photo, UMC 1085P).

**Marion Co.:** South Fabius River (S23 T59N R6W); 18 May 2006; R. Dames (digital photo, UMC 1078P).

#### WESTERN SPINY SOFTSHELL

*Apalone spinifera*

**Carroll Co.:** Grand River (S27 T54N R21W); 7 June 2006; G. Pitchford (digital photo, UMC 1060P).

**Cooper Co.:** Lamine River,  $\approx$ 2.2 miles NE Otterville (S26 T46N R19W); 18 May 2006; C. Gemming (digital photo, UMC 1036P).

**Linn Co.:** Pershing State Park (S14 T57N R21W); 8 August 2006; T. Crabill, M. Rochford (digital photo, UMC 1089P).

**Osage Co.:** Gasconade River (S34 T43N R7W); 19 June 2006; Z. Fratto, P. Pitts (digital photo, UMC 1073P). Gasconade River (S25 T43N R7W); 26 May 2006; B. McKeage, R. Tilley, K. Singer (digital photo, UMC 1074P).

**Platte Co.:** Platte River,  $\approx$ 150m N Jct. Grove Creek (S13 T54N R34W); 24 May 2006; J. Briggler, J. Allman (digital photo, UMC 1047P).

#### COMMON SNAPPING TURTLE

*Chelydra serpentina*

**Gasconade Co.:** Gasconade River (S20 T44N R6W); 1 June 2006; Z. Fratto, B. Swallow (digital photo, UMC 1062P). Gasconade River (S4 T44N R6W); 5 July 2006; B. McKeage, W. Casner, D. Shertz (digital photo, UMC 1063P).

#### WESTERN PAINTED TURTLE

*Chrysemys picta*

**Lewis Co.:** MO 6, just N Jct. Rt. AA (S22 T60N R7W); 4 June 2005; E. East (UMC 7961).

#### COMMON MAP TURTLE

*Gratemys geographica*

**Marion Co.:** South Fabius River (S36 T59N R7W); 25 May 2006; R. Dames (digital photo, UMC 1075P).

#### OUACHITA MAP TURTLE

*Gratemys ouachitensis*

**Gasconade Co.:** Gasconade River (S20 T44N R6W); 1 June 2006; Z. Fratto, B. Swallow (digital photo, UMC 1066P). Gasconade River (S29 T44N R6W); 1 June 2006; P. Pitts, M. Kramer, S. Barrioz (digital photo, UMC 1067P).

**Marion Co.:** Mississippi River, Pool 22 (S17 T57N R4W); 7 June 2006; R. Dames (digital photo, UMC 1081P).

**Osage Co.:** Gasconade River (S25 T43N R7W); 24 May 2006; B. McKeage, K. Singer, R. Tilley (digital photo, UMC 1071P).

#### FALSE/MISSISSIPPI MAP TURTLE

*Gratemys pseudogeographica*

**Montgomery Co.:** Missouri River, Heckman's Island (S11 T45N R6W); 15 June 2006; P. Pitts, K. Singer, M. Kramer (digital photo, UMC 1082P).

**Gasconade Co.:** Gasconade River (S20 T44N R6W); 1 June 2006; Z. Fratto, B. Swallow (digital photo, UMC 1064P). Missouri River (S3 T45N R6W); 15 June 2006; P. Pitts, K. Singer, M. Kramer (digital photo, UMC 1065P).

**New Madrid Co.:** Donaldson Point Conservation Area (S6 T22N R15E); 16 May 2006; Z. Fratto, B. Swallow (digital photo, UMC 1057P).

**Ralls Co.:** Indian Creek Campground, Mark Twain Lake (S29 T55N R7W); 21 July 2006; B. Ince, S. Ince, B. Grote, B. Edmond (digital photo, UMC 1024P).

#### RIVER COOTER

*Pseudemys concinna*

**Gasconade Co.:** Gasconade River (S20 T44N R6W); 1 June 2006; Z. Fratto, B. Swallow (digital photo, UMC 1068P).

#### STINKPOT

*Sternotherus odoratus*

**Cooper Co.:** Lamine River,  $\approx$ 2.5 miles NE Otterville (S26 T46N R19W); 14 June 2006; C. Gemming (digital photo, UMC 1035P).

**Gasconade Co.:** Gasconade River at Jct. Second Creek (S22 T44N R6W); 28 June 2006; Z. Fratto, B. Swallow (digital photo, UMC 1061P).

**Osage Co.:** Gasconade River (S31 T43N R7W); 14 June 2006; Z. Fratto, K. Swallow (digital photo, UMC 1072P).

#### ORNATE BOX TURTLE

*Terrapene ornata*

**Adair Co.:** MO 11, 0.25 mile W Jct. MO 149 (S1 T61N R17W); 8 September 2005; E.D. Hooper (UMC 7947).

#### RED-EARED SLAIDER

*Trachemys scripta*

**Christian Co.:** MO 14, 0.4 mile W Jct. US 65 (S21 T27N R21W); 21 April 2006; J. Briggler (digital photo, UMC 1039P).

**Gasconade Co.:** Gasconade River (S20 T44N R6W); 1 June 2006; Z. Fratto, B. Swallow (digital photo, UMC 1070P). Gasconade River (S15 T45N R6W); 18 May 2006; P. Pitts, M. Kramer, S. Barrioz (digital photo, UMC 1069P).

**Marion Co.:** South Fabius River (S19 T59N R6W); 18 May 2006; R. Dames (digital photo, UMC 1076P).

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## Natural History Notes

### REDISCOVERY OF KIRTLAND'S SNAKE (*Clonophis kirtlandii* Kennicott) IN MISSOURI

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On April 28, 2006 a dead *Clonophis kirtlandii* (21.7 cm total length, 4.5 cm tail length; 20.7% of the total length) was collected by the author along the shore of a 5.5-acre (2.2 hectare) human-made pond in Clark County, Missouri. Subsequent turning of rocks along the edge of the pond resulted in the discovery of a live specimen of approximately the same size. A second, much larger live specimen (43 cm total length, 11 cm tail length; 25.6 % of the total length) was discovered the following day beneath a rock approximately four meters from the edge of the pond. Two more live specimens were observed on May 31, 2006 at the same location. One of these specimens was discovered under a rock along the shore of the pond, and the other was found within decomposing cardboard, approximately 50 meters away from the pond's edge. All live specimens were photographed and released at the point of capture. The dead specimen has been preserved and placed in the collection at the University of Missouri, Columbia (UMC 7936). Data recorded for the dead specimen are as follows: dorsal body scales keeled, anal plate divided, 19 scale rows at mid body, 135 ventrals, 6 supralabials, 7 infralabials, 1 preocular, 2 postoculars, and 45 indistinct lateral body spots. No caudal scale counts could be recorded due to the decomposed condition of the tail.

Prior to these recent sightings, Kirtland's snake had been reported only once in Missouri. On May 10, 1964, a female specimen was collected in Marion County near Taylor, Missouri. This specimen was found beneath a railroad tie surrounded by weeds in the vicinity of a small creek (Jones, 1967). No additional specimens were recorded in the state, and therefore this species was not included as part of Missouri's herpetofauna by Johnson (2000). The recent discovery of four live and one dead specimen at a single location in Clark County indicates that a population occurs in extreme northeast Missouri. Therefore, this species should be added to Missouri's list of extant native snakes.

*Clonophis kirtlandii* is declining in every state in which it occurs. Illinois, Indiana, and Ohio list the species as threatened. Pennsylvania, Michigan, and Kentucky, which are on the periphery of the snake's range, list the species as endangered (Ernst and Ernst, 2003). Kirtland's snakes are usually associated with moist prairies, wetlands, and grassy edges of creeks and ponds (Bavetz, 1994). The specimens discovered in Missouri have all been found under rocks or debris near permanent bodies of water. Crayfish burrows may also be used for hiding as well as foraging (Briggler, pers. comm.). Over-collecting for the pet trade, as well as the draining of wetlands for agriculture and development, likely contribute to the decline of this species. Surveys should be conducted in other locations in Clark County, as well as in neighboring counties where suitable habitat exists, in order to determine if additional populations are present in Missouri.

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Photographs of *Clonophis kirtlandii* Kennicott from Clark County, Missouri taken by the author

## NEW STATE SIZE RECORDS FOR MISSOURI REPTILES

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Edmond and Daniel (2001) provided the most recent compilation of maximum size records for Missouri amphibians and reptiles. Here I am reporting two exceptionally large specimens that were brought to my attention during 2006. Both specimens have been deposited in the herpetology collection at the University of Missouri-Columbia.

During June 2006, Mr. John Schnieders of St. Louis caught a large female *Apalone spinifera* while fishing in the Meramec River near the Simpson Sand and Gravel pits approximately 2.2 miles NW of Arnold. The specimen (UMC 7968) had a carapace length of 44.3 cm. The previous size record, housed at Avila University (BWMC 2821), had a carapace length of 35.8 cm.

On 11 July 2006, Mr. Andy Day killed a large female *Nerodia erythrogaster* (UMC 7965) on a farm approximately 0.6 mile north of Brandsville in southeast Howell County. The snake was discovered near a livestock waterer. The snake had a snout-vent length of 109.9 cm and a total length of 131.9 cm. The former record was a Livingston County specimen collected in 1962 by Paul Anderson and deposited in the University of Kansas collection (KU 82418). It had a total length of 123.5 cm.

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## **RESULTS OF THE SPRING AND FALL 2006 FIELD TRIPS**

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### **Introduction**

Unlike many regional and state herpetological organizations, the Missouri Herpetological Association (MHA) was initiated primarily as a communication conduit for academic research and conservation activities throughout the state. It has served that purpose well with this fall marking another successful meeting--the 19th--that featured ten scientific presentations from individuals representing seven organizations (see "Abstracts" article on page 4 of this issue). However, in recent years, there has been an interest in organizing official field trips like those held annually in other states, such as Arkansas (AHS, 2006) and Kansas (KHS, 2006). Although a field trip, yielding 14 species, was held at Squaw Creek after the 2004 meeting (MHA, 2004), this year marks the first time that a spring trip was organized.

Many members of the MHA are involved in field activity throughout the year. Organizing regular field trips allows members to meet away from the context of research presentations and compare field notes and techniques. Furthermore, the field trips are designed for those who are interested in herpetology from an educational or conservation perspective. The two trips described here were basic surveys at Missouri Department of Conservation (MDC) public areas and the results are available for use by MDC managers. Some future trips will also follow this methodology while others may target specific species, groups of species, or particular natural communities. The trip for spring 2007 will be held in Saint Clair County with a focus on searching for historical populations of the Ground Snake (*Sonora semiannulata*).

Photos from both field trips can be found on the "Events" page of the Association's web site (<http://www.moherp.org/>).

### **Spring 2006 Field Trip: Saline Valley Conservation Area**

The spring field trip was held Sat 20 May 2006. A herpetofaunal survey of the Saline Valley Conservation Area, located near Eldon in Miller County, was conducted over the course of the weekend. Habitats searched included ponds, streams, wooded hillsides, fens, glades, and old homesteads.

Nine members caught more than 200 individual reptiles and amphibians, representing a total of 24 species (see Table 1). Most collecting activity occurred on Sat 20 May 2006, but a few species were observed or caught the previous evening (Fri 19 May 2006) by members that arrived to camp.

Temperatures on Friday exceeded 90°F but it was cloudy and cooler on Saturday, enabling the group to use the entire day for productive collecting. Warm temperatures on Friday night and a brief rain on Saturday encouraged calling males in several anuran species. Several presumably common species for the area were not observed at all.



**Table 1.** List of species captured or observed at Saline Valley Conservation Area on 19-20 May 2006.

<b>Species</b>	<b>Common Name</b>	<b>NUMBER</b>
<b>Salamanders (Caudata)</b>		
<i>Ambystoma maculatum</i>	Spotted Salamander	2 (larvae)
<i>Eurycea longicauda</i>	Dark-sided Salamander	2
<i>Plethodon albagula</i>	Western Slimy Salamander	24
<b>Frogs (Anura)</b>		
<i>Bufo americanus</i>	American Toad	9
<i>Acris crepitans</i>	Blanchard's Cricket Frog	62
<i>Hyla chrysoscelis</i>	Cope's Gray Treefrog	1 (calling male)
<i>Hyla versicolor</i>	Gray Treefrog	14 (calling males)
<i>Rana catesbeiana</i>	Bullfrog	5
<i>Rana clamitans</i>	Green Frog	28
<i>Rana palustris</i>	Pickerel Frog	1
<i>Rana sphenoccephala</i>	Southern Leopard Frog	40
<i>Gastrophryne carolinensis</i>	Eastern Narrow-mouthed Toad	2
<b>Turtles (Testudinata)</b>		
<i>Terrapene carolina</i>	Three-toed Box Turtle	18
<b>Lizards (Lacertilia)</b>		
<i>Sceloporus consobrinus</i>	Eastern Fence Lizard	2
<i>Scincella lateralis</i>	Ground Skink	9
<b>Snakes (Serpentes)</b>		
<i>Carphophis vermis</i>	Western Worm Snake	2
<i>Coluber constrictor</i>	Eastern Yellow-bellied Racer	2
<i>Diadophis punctatus</i>	Prairie Ringneck Snake	14
<i>Lampropeltis getula</i>	Speckled Kingsnake	1
<i>Lampropeltis triangulum</i>	Red Milksnake	2
<i>Nerodia sipedon</i>	Northern Water Snake	2
<i>Storeria dekayi</i>	Midland Brown Snake	2
<i>Storeria occipitomaculata</i>	Northern Redbelly Snake	1
<i>Agkistrodon contortrix</i>	Copperhead	3

#### **Fall 2006 Field Trip: Woodson K. Woods Conservation Area**

The fall field trip was held on Sun 1 Oct 2006. The Sunday morning field trip was part of the 19th Annual Meeting. A quick herpetofaunal survey was conducted on the Woodson K. Woods Conservation Area, located near Steelville in Crawford County. Habitats searched included ponds, old fields, streams, and wooded hillsides.

Thirteen members, representing five institutions, caught 87 individual amphibians and reptiles in about two collecting hours. Fifteen species were represented (see Table 2).

Temperatures on Sunday were pleasant the entire morning. Several presumably common species for the area were not observed at all and the very dry summer and fall probably affected the number of animals observed.

**Table 2.** List of species captured or observed at Woodson K. Woods Conservation Area on 1 Oct 2006.

<b>Species</b>	<b>Common Name</b>	<b>NUMBER</b>
<b>Salamanders (Caudata)</b>		
<i>Notophthalmus viridescens</i>	Central Newt	3 (1 adult, 2 efts)
<i>Plethodon albagula</i>	Western Slimy Salamander	42
<i>Plethodon serratus</i>	Redback Salamander	2
<b>Frogs (Anura)</b>		
<i>Bufo americanus</i>	American Toad	1
<i>Acris crepitans</i>	Cricket Frog	2
<i>Rana clamitans</i>	Green Frog	21 (6 adults, 15 tadpoles)
<i>Rana sphenoccephala</i>	Southern Leopard Frog	3 (tadpoles)
<b>Turtles (Testudinata)</b>		
<i>Terrapene carolina</i>	Three-toed Box Turtle	3
<b>Lizards (Lacertilia)</b>		
<i>Scincella lateralis</i>	Ground Skink	1
<i>Eumeces fasciatus</i>	Five-Lined Skink	1
<i>Ophisaurus attenuatus</i>	Western Slender Glass Lizard	1
<b>Snakes (Serpentes)</b>		
<i>Coluber constrictor</i>	Racer	1 (shed skin)
<i>Elaphe obsoleta</i>	Black Ratsnake	4
<i>Lampropeltis triangulum</i>	Red Milksnake	1
<i>Storeria occipitomaculata</i>	Redbelly Snake	1

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

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The following is a list of references dealing with the biology of amphibians and reptiles from Missouri that have been brought to my attention since the publication of Johnson (2000), Powell and Daniel (2000), and Daniel (2001, 2002, 2003, 2004, 2005). Readers are requested to notify the author of any additional references that should be included in future compilations.

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