Missouri Herpetological Association

Newsletter
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INTRODUCTION

The Eighteenth Annual Meeting of the Missouri Herpetological Association was held 24-25 September 2005 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

19th Annual Meeting of the Missouri Herpetological Association

The 19th Annual Meeting of the Missouri Herpetological Association will be held on 30 September-1 October 2006 at the Reis Biological Station, Crawford 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

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: *Typhlotriton splaeus* (= *Eurycea splaeas*), *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

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 the 2005 meeting. Send ideas, suggestions, comments, and content to the Webmaster (webmaster@moherp.org).
Herpetology Residency Internship

The Missouri Department of Conservation is offering an internship to conduct and coordinate Hellbender recovery activities throughout the state. The position is open to graduate students currently enrolled or those who have completed a graduate degree within the past six months. The internship runs from June 2006 through May 2007. Application deadline is 3 February 2006. See the announcement on page 16 for complete details.

First Annual MHA Fieldtrip

A spring fieldtrip is planned for Saturday, May 20 to conduct a herpetofaunal survey of Saline Valley Conservation Area. Saline Valley CA is a 4783-acre area located near Tuscumbia in central Miller County. The area is home to a mixture of bottomland oak-hickory forest, dry dolomite forest and dolomite glades. Fens and numerous ponds are scattered on the area. Saline Creek and Little Saline Creek flow through Saline Valley on their way to the Osage River. Primitive camping is permitted on the area. MHA members, friends and willing by-standers are welcome. Additional information and maps will be sent electronically in April.
THE EFFECTS OF MINES ON AMPHIBIAN BIODIVERSITY

Jenna Tune and Anne M. Maglia
Department of Biology, University of Missouri, Rolla, MO

In this project, we examine the effects of mine drainage on amphibian development and population viability. Frog populations are in decline worldwide, and although the causes are debatable, habitat contamination is a primary suspect. Missouri, a leading producer of lead, is home to numerous endemic amphibians that may be affected by heavy metals and acid run-off from active and historic mines. In this study, we examine the effects of mine drainage on development, population viability, habitat use, and population fragmentation in frogs by: 1) identifying populations exposed to mine drainage; 2) assessing species richness, population density, and population viability via body size and mass calculations and population demographics; 3) identifying and categorizing malformations, abnormalities, infections, and diseases in affected populations; and 4) conducting FETAX (Frog Embryo Teratogenic Assays using Xenopus) with waters from affected sites.

OSTEOLOGY OF Acris crepitans blanchardi AND SKELETAL VARIATION AMONG HYLIDS.

Jessica M. Mueller and Anne M. Maglia
Department of Biology, University of Missouri, Rolla, MO

The osteology of frogs can be beneficial when comparing the phylogenetic history and relationships among populations. Acris crepitans blanchardi is a good specimen for doing such as it is a generalized North American hylid and is relatively common in Missouri. Knowing the osteology of this frog will enable us to understand the evolution of the species, provide normal baseline information for examination of malformations, and we’ll be able to compare patterns of variation within the subspecies, since they are so variable externally. Herein, we describe the skeletal morphology of the subspecies and document patterns of normal variation to compare to external variability and among populations. We then discuss the possible functional and phylogenetic implications of our findings.

BEHAVIORAL AND METABOLIC RESPONSES OF THE SOUTHERN RED-BACKED SALAMANDER (Plcthodon serratus) TO PREDATORY STIMULI: INFLUENCE OF BODY SIZE.

Nathan Windel and Alicia Mathis
Department of Biology, Missouri State University, Springfield, MO

In nature, visual cues are limited for southern red-backed salamanders (Plcthodon serratus), so chemoreception may be important for predator detection. I conducted experiments to examine the effect of chemical stimuli from predatory ringneck snakes on the foraging behavior and metabolic rates of P. serratus. Individuals were exposed to substrate cues from ringneck snakes, five-lined skinks (non-predator), and dechlorinated water. In the foraging study, I also examined the response to airborne cues.
Larger salamanders (SVL > 32 mm) foraged more than smaller salamanders, and salamanders showed reduced foraging in the presence of predatory substrate cues but not airborne cues. Metabolic rates for smaller salamanders showed greater increases in response to the snake exposure compared to larger individuals. In summary, salamanders reduce foraging in the presence of substrate predatory cues, which may reduce their chances of being detected. Lack of response to airborne cues may indicate that the chemical used in the detection of ringneck snakes is nonvolatile. The size-dependent metabolic responses may reflect a defense response versus a flee response. Large salamanders may be less inclined to flee because they are likely to be territory owners and loss of territories might have serious consequences. Large salamanders also may be less vulnerable to predation by gape-limited predators, like snakes.

LIFE HISTORY AND COLOR VARIANTS FROM WITHIN THE SAME MATRILINE IN *Eurycea tynerensis* (CAUDATA: PLETHODONTIDAE).

**Mark L. McKnight**¹ and **Nathaniel A. Nelson**²  
¹Department of Biology, Missouri State University, Springfield, MO  
²Fort Worth Zoo, Fort Worth, Texas

Until quite recently, there were believed to be two surface-dwelling species of multiribbed brook salamanders (i.e. the mostly metamorphic graybelly salamander *Eurycea multiplicata griseogaster*, and the strictly neotenic Oklahoma salamander *E. tynerensis*) living in the Missouri Ozarks. The current belief is that a single species (*E. tynerensis*) is resident in the Ozarks, and that this species is polymorphic for life-history mode from population to population. We present sequence data from the mitochondrial cytochrome-β gene that show that the two life-history modes and a formerly undescribed black-eyed color morph can all arise from the same mitochondrial defined matriline, and thus can all be found in the same population. While metamorphosis in these salamanders could be under either genetic or environmental control, we hypothesize that color pattern is under simple genetic control.

EASTERN COLLARED LIZARD (*Crotaphytus collaris*) RANGE EXPANSION PLAN: SUCCESS OR FAILURE

**Jeffrey T. Briggler**  
Missouri Department of Conservation, Jefferson City, MO

Collared lizards were historically known to be more widespread on glades in Missouri then their present occurrence. Due to reduced fire frequency and the resultant plant succession on glades, populations became isolated and local extirpation occurred. Increase emphasis on glade restoration has improved habitat, but lizards have not been able to recolonize some of these locations. Therefore, the Department of Conservation developed an eastern collared lizard range expansion plan in 1996. The plan main objective called for the establishment of populations to suitable, unoccupied glades within the historic range of this species in Missouri. To date, lizards have been introduced at six sites in the Ozarks. Another objective of the plan called for a follow-up population assessment to document survival and reproduction of lizards at these release sites. These assessment surveys were conducted in July (adults) and September (hatchlings) 2003. Surveys showed that collared lizard reintroductions were successful at four of the six locations where 108 lizards (55 adults and 53 hatchlings) were observed. The apparent failure of two of the reintroduction sites were most likely due to limited amount of rocky habitat at one site and limited management that allow a dense canopy cover to become established at the other site. Based upon population levels and habitat assessments, this reintroduction plan will be modified to further increase restoration potential of collared lizards on future restored glades.
THE EFFECT OF REPRODUCTIVE CONDITION ON THE THERMAL AND SPATIAL ECOLOGY OF THE FEMALE COTTONMOUTH (*Agkistrodon piscivorus*) IN SOUTHWEST MISSOURI

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Females of many temperate snake species are known to exhibit thermophilic behavior during gestation, resulting in differential habitat use of gravid and non-gravid individuals. I investigated the influence of thermoregulation on spatial patterns and habitat use of 16 female cottonmouths (*Agkistrodon piscivorus*) near the northwestern limit of the species’ range in southwest Missouri during late summer. All snakes exhibited similar body temperature profiles characterized by a warming period in late morning to a plateau maintained through mid-day, followed by a gradual decline from late afternoon into the evening. Preferred body temperatures measured in a laboratory thermal gradient were higher for gravid than non-gravid snakes. Physical models demonstrated that preferred temperatures were available to snakes in all habitat types but that habitat thermal quality differed as a function of variance in operative temperatures within habitat types. Gravid females were extremely sedentary and restricted all activity to patchy rocky outcroppings. These areas had the highest thermal quality of all available habitats, providing a thermal gradient that allowed snakes to maintain preferred body temperatures. As a result, gravid females maintained higher field body temperatures than non-gravid females which resided in forest habitats with lower and more variable environmental temperatures. My data on narrow preferences for thermally favorable habitats, combined with female-biased melanism in northern populations, suggest that exploitation of thermoregulatory opportunities is important to gravid *A. piscivorus* at the northern periphery of its range.

DEVELOPING AN EXPERIMENTAL METHOD TO DETERMINE IF THERE IS A NON-RANDOM PREFERENCE FOR EDGE HABITAT BY THE TIMBER RATTLE SNAKE (*Crotalus horridus*) AT TYSON RESEARCH CENTER

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With the ever-increasing habitat fragmentation, the importance of understanding and determining the habitat selection of animal populations increases. Alterations and destruction of the environment creates habitat ecotones, an ecotone being defined as the zone of transition between two adjacent ecosystems differentiated by an edge line. The ecotone may be quantified as the distance containing the edge line, know as the threshold, until a variable (i.e. temperature, vegetation, etc.) begins to level off; however, in many studies, the threshold distance was arbitrarily determined. The aim of this study is twofold: (1) to develop and test a far more accurate method to determine the threshold distances of ecotones and (2) investigate the extent of the non-random edge preference of the timber rattlesnake (*Crotalus horridus*) at Tyson Research Center. Results show a major variation threshold distance for different edge types (0-9 m) all of which were shorter than previously believed (>15 m). The GPS locations from one active season telemetry data for twelve timber rattlesnakes was used to determine if there is a non-random preference for edge habitat. Results show a significant preference for ecotone habitat by the timber rattlesnake. From this study, the natural history of the timber rattlesnake will gain much needed information for the conservation and preservation of this important snake specie.
REPRODUCTIVE BIOLOGY OF THE MASSASAUGA (Sistrurus catenatus) FROM SOUTH-CENTRAL ILLINOIS.

Robert D. Aldridge and Jason M. Cox
Department of Biology, Saint Louis University, St. Louis MO

This study was conducted at Carlyle Lake, Clinton County, Illinois. Preserved specimens examined for this study are housed in the Illinois Natural History Survey collection. Based on preserved snakes females initiate vitellogenesis in the summer/fall. Vitellogenic follicles reach 20 mm in length by late September. Follicles overwinter at this size and resume growth in the spring. Ovulation occurs later in the spring. Spermatogenesis begins June and peaks in August and September. The diameter of the seminiferous tubules is less than 200 µm in May and reaches a diameter of 300 µm in late July to early September. The sexual segment of the kidney parallels the diameter of the testis. Sexual segment tubules are lowest in the early part of the active season and peak in diameter and secretory activity in August through September. Mating and male-male combat occur primarily in the summer when the sexual segment of the kidney is hypertrophied. As in other species of snakes, the sexual segment of the kidney never regresses completely, indicating that testosterone levels are elevated throughout the year. Elevated plasma testosterone may be necessary for long term sperm storage in the vas deferens. This elevated testosterone may also account for the presence of reproductive behaviors sometimes observed in snakes.

LOW IMPACT ECOLOGICAL SURVEYS: BALANCING TAXONOMY AND CONSERVATION. THE LOMA ALTA CASE STUDY

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Ecuador has a wealth of protected areas covering almost half of its territory. Of these 20.54% are designated as Private Reserves, and 21.59% as Forests Protectorates. These reserves, managed by private institutions or communal councils, protect large areas of forests that would have been lost to agriculture and human settlements including corridors, buffer zones, isolated forest patches and some of the last remnants of coastal dry forest. However, the concepts and values of conservation and biodiversity embraced by these reserves sometimes run in conflict with traditional science, especially with taxonomists and herpetologists. It is common practice and scientific tradition in herpetology to collect specimens while conducting species surveys and inventories to obtain accurate species accounts as well as ecological, physiological, and taxonomical data from these specimens. The collection of specimens is regarded as unnecessary and detrimental to the health of the forest by many reserve managers and falls in stark contrast with local conservation policies. As a result of a lack of understanding and no compromise between scientists and private managers, many of these areas, which may harbor key species and populations, are left unstudied. We conducted a low-impact herpetofaunal survey in the Reserva Ecológica Comunal de Loma Alta, a transitional dry/pre-montane cloud forest that lies between the Chocó and Tumbes Ecoregion in the Chogón-Colonche mountains of Western Ecuador. By means of traditional sampling techniques, digital images and field measurements we recorded 293 individuals belonging to 34 species (16 anurans, 17 squamates) in 13 families. Within these, 3 represent new populations for endemic endangered anurans. Additionally, 4 anurans, 2 lizards and 4 snakes represent new localities with range extensions. Most notably, we found two undescribed populations of anurans, an Eleutherodactylus in the Unstrigatus group, with it’s closest relative found in subtropical and temperate forest in Northern Ecuador and a Hyla (Hypsiboas) from the albomarginata group, which might represent a geographically isolated and morphologically distinct population that closely resembles H. pellucens. Here we discuss the advantages and disadvantages of conducting a survey with minimal specimen collection and discuss the steps taken to determine the identity of these two species.
NEW HERPETOLOGICAL RECORDS FROM MISSOURI FOR 2005

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The following list represents new county records accumulated or brought to our attention since the publication of Johnson (2000), Daniel and Edmond (2000, 2001) and Daniel et al. (2002, 2003, 2004). 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: INHS- Illinois Natural History Survey, Champaign, IL; UMC- Dean E. Metter Memorial Collection, University of Missouri, Columbia, MO. Unless otherwise indicated, all distribution records are documented by post-metamorphic/hatching fluid preserved specimens.

We would like to extend our appreciation to S. Doherty, E. East, R. Gillespie, G. Gremaud, R. Krager, J. Lamer, B. Miller, D. Miller, B. Powell, C. Scott, A. Starostka and B. Williams for generously providing information or specimens included in this note. We would like to extend our special appreciation to P. Frese, who, despite his best efforts, failed to provide any new county records again this year.

**AMPHIBIA: CAUDATA**

**MARBLED SALAMANDER**

*Ambystoma opacum*

**Ozark Co.:** Caney Mountain Conservation Area (S9 T23N R13W); 15 April 2005; J. Briggler, R. Rimer (larva, UMC 7874).

**CAVE SALAMANDER**

*Eurycea lucifuga*

**Webster Co.:** unnamed cave on private farm (S18 T28N R17W); 26 February 2005; S. Ince, B. Ince, B. Edmond (UMC 7892).

**GROTTO SALAMANDER**

*Eurycea spelaea*

**Webster Co.:** unnamed cave on private farm (S18 T28N R17W); 26 February 2005; S. Ince, B. Ince, B. Edmond (UMC 7893).

**RED RIVER WATERDOG**

*Necturus ocellatus*

**Oregon Co.:** Eleven Point River, 0.8 mi. N Jct. Hurricane Creek (S34 T23N R2W); 1 September 2005; J. Briggler, G. Smith, P. Veatch, P. Allen (digital photo, UMC 840P).

**COMMON MUDPUPPY**

*Necturus maculosus*

**Warren Co.:** Missouri River, wing dam at structure 91.6 (S9 T45N R3W); 25 January 2005; A. Starostka (digital photo, UMC 740P).

**AMPHIBIA: ANURA**

**FOWLER’S TOAD**

*Bufo fowleri*

**Laclede Co.:** Gasconade River just W of Pulaski Co. (S1 T35N R14W); 20 July 2005; J. Briggler, K. Hedgpath (UMC 7879).

**SPRING PEEPER**

*Pseudacris crucifer*

**Christian Co.:** Busiek Conservation Area, Fork Valley E of Camp Creek (S15 T25N R21W); 26 March 2005; B. Edmond, S. Ince (UMC 7847-7848).

**Lawrence Co.:** MO 96, 0.7 mi. W Jct. MO 39 (S35 T29N R27W); 29 March 2005; B. Edmond (UMC 7895-7896).
PLAINS LEOPARD FROG  
*Rana blairi*  
*Caldwell Co.:* Bonanza Conservation Area (S32 T56N R27W); 2 June 2005; J. Briggler, L. Rizzo (UMC 7875).

BULLFROG  
*Rana catesbeiana*  
*Schuyler Co.:* Private Fen (S22 T67N R16W); 5 May 2005; J. Briggler, T. Smith, G. Gremaud (digital photo, UMC 839P).

*Sullivan Co.:* MO 5/6, 1.7 mi. N Jct. MO 6 (S21 T62N R20W); 16 May 2005; R. Daniel (digital photo, UMC 776P).

GREEN FROG  
*Rana clamitans*  
*Saline Co.:* Marshall Junction Conservation Area (S8 T48N R21W); 16 May 2005; R. Morrow, A. Mensch, B. Powell (UMC 7827).

SOUTHERN LEOPARD FROG  
*Rana sphenocephala*  
*Caldwell Co.:* Bonanza Conservation Area (S29 T56N R27W); 2 June 2005; J. Briggler, L. Rizzo (UMC 7876).


*Marion Co.:* Upper Mississippi Conservation Area, Mississippi River at Fabius Isl. (S34 T59N RSW); 30 August 2005; J. Lamer, C. Dolan (INHS 19664).

REPTILIA: LACERTILIA

BROADHEADED SKINK  
*Eumeces laticeps*  
*Barton Co.:* Prairie State Park (S17 T32N R33W); 2005; B. Miller (digital photo, UMC 736P).

*Osage Co.:* Painted Rock Conservation Area (S2 T42N R11W); 29 May 2005; D. Miller, T. Royall (digital photo, UMC 792P).

WESTERN SLENDER GLASS LIZARD  
*Ophisaurus attenuatus*  
*Chariton Co.:* (S3 T56N R18W); 5 July 2002; S. Doherty (color print, UMC 738P).

REPTILIA: SERPENTES

YELLOW-BELLIED RACER  
*Coluber constrictor*  
*Henry Co.:* Rt. Y X Tebo Creek (S13 T43N R24W); 23 October 2004; R. Daniel (color slide, UMC 793P).

TIMBER RATTLE SNAKE  
*Crotalus horridus*  

PRAIRIE RING-NECKED SNAKE  
*Diadophis punctatus*  
*Chariton Co.:* Marceline City Lake (S14 T56N R19W); 15 May 2005; R. Morrow, A. Mensch, B. Powell (digital photo, UMC 741P).

WESTERN RAT SNAKE  
*Elaphe obsoleta*  
*Clark Co.:* Wayland (S31 T65N R6W); 27 May 2005; E. East (digital photo, UMC 791P).


PRAIRIE KING SNAKE  
*Lampropeltis calligaster*  
*Douglas Co.:* MO 14, 1.2 mi. E of Sweden (S5 T25N R14W); 26 September 2005; J. Briggler, B. Heatherly (UMC 7880).


SPECKLED KING SNAKE  
*Lampropeltis getula*  
*Ripley Co.:* CR 160W-21, 0.1 mi. N Jct. US 160 (S5 T23N R1W); 22 April 2005; B. Edmond (UMC 7905).

NORTHERN WATERSNAKE  
*Nerodia sipedon*  
*Putnam Co.:* W Locust Creek at 170th Street (S29 T66N R20W); 19 July 2005; B. Williams (digital photo, UMC 823P).

ROUGH GREEN SNAKE  
*Opheodrys aestivus*  
*Saline Co.:* Marshall Junction Conservation Area (S18 T48N R21W); 3 April 2005; R. Daniel (UMC 7828).


DEKAY’S BROWNSNAKE  
*Storeria dekayi*  
*Grundy Co.:* NE 10th Ave, 0.7 mi. E Jct. Rt. V (S12 T61N R23W); 1 October 2005; R. Daniel (UMC 7869).

Livingston Co.: Rt. A X CR 516 (S36 T59N R25W); 14 October 2005; R. Daniel (UMC 7867).


Flat-headed Snake
*Tantilla gracilis*

Carter Co.: Peck Ranch Conservation Area (S4 T28N R2W); 3 May 2005; J. Briggler, R. Rimer (digital photo, UMC 832P).

Western Ribbon Snake
*Thamnophis proximus*


Lined Snake
*Trypodoclonion lineatum*

Adair Co.: Hooper Farm (S32 T64N R15W); 4 July 2005; E. Hooper (digital photo, UMC 814P).


Rough Earth Snake
*Virginia striatula*

Polt Co.: Sentinel Conservation Area (S15 T35N R22W); 7 May 2005; B. Edmond (UMC 7919).

Western Earth Snake
*Virginia valeriae*

Sullivan Co.: Locust Creek Conservation Area (S7 T62N R20W); 16 May 2005; R. Daniel (digital photo, UMC 775P).

**Reptilia: Testudines**

Common Snapping Turtle
*Chelydra serpentina*

Petts Co.: US 50, 0.8 mi. W Jct. MO 127 (S15 T46N R23W); 2 June 2005; J. Briggler (digital photo, UMC 841P).

St. Francois Co.: US 67, 0.2 mi. S St. Francis River (S29 T35N R6E); 20 May 2005; R. Daniel (digital photo, UMC 756P).

Stoddard Co.: Crowley Ridge Conservation Area (S29 T27N R10E); 21 May 2005; R. Daniel, B. Edmond (digital photo, UMC 770P).

Painted Turtle
*Chrysemys picta*

Oregon Co.: US 160, 0.5 mi. W Jct. Rt. JJ (S7 T24N R6W); 21 April 2005; B. Edmond (UMC 7823).

Ouachita Map Turtle
*Graptemys ouachitensis*

Marion Co.: Upper Mississippi Conservation Area, Mississippi River at Fabius Is. (S34 T59N R5W); 30 August 2005; J. Lamer, C. Dolan (digital photo, UMC 848P).

Three-Toed Box Turtle
*Terrapene carolina*

Oregon Co.: MO 19, Alton (S34 T24N R4W); 31 August 2005; J. Briggler (digital photo, UMC 833P); MO 19, 0.8 mi. N Jct. FS 3155 (McCormack Lake Rd.) (S 12 T25N R4W); 22 May 2005; B. Edmond (digital photo, UMC 861P).

Omnate Box Turtle
*Terrapene ornata*

Pulaski Co.: Fort Leonard Wood (S30 T34N R11W); 1 May 2002; K. Lohraff (digital photo, UMC 843P).

Red-Eared Slider
*Trachemys scripta*

Adair Co.: MO 6, 4.65 mi. E Jct. MO 149 (S30 T63N R16W); 16 May 2005; R. Daniel (digital photo, UMC 743P).

Douglas Co.: MO 181, 0.55 mi. S Bethany Church (S25/26 T25N R12W); 26 May 2005; J. Briggler, R. Rimer (digital photo, UMC 836P).

Linn Co.: Fountain Grove Conservation Area (S36 T57N R22W); 20 May 2005; J. Briggler (digital photo, UMC 834P).

Midland Smooth Softshell
*Apalone mutica*

Osage Co.: Gasconade River, 1.9 mi. S US 50 (S25 T43N R7W); 13 October 2005; J. Briggler, P. Pitts, B. McKeage (UMC 847P).
WESTERN SPINY SOFTSHELL
_Apalone spinifera_

_Sullivan Co._: Spring Creek at Ironbank Rd. (S26 T64N R18W); 6 July 2005; R. Daniel (UMC 7857).

**Literature Cited**


Natural History Notes

REPRODUCTIVE NOTES FOR REPTILES FROM CUIVRE RIVER STATE PARK

Bruce Schuette
Park Naturalist
Cuivre River State Park, Troy, MO 63379

During the summer of 2005, Cuivre River State Park (Lincoln Co., MO) maintenance worker Ronnie King found three gravid reptile females and one reptile nest. Here, I report on the specifics of those findings. Also included is a brief note on a clutch of ground skink eggs from 2004.

On 6 June, a female Common Snapping Turtle (Chelydra serpentina) was observed laying eggs in a nest dug seven meters from Big Sugar Creek. The nest was on a mowed earthen road bank at the edge of a picnic area, 1.5 to 2 meters above the elevation of the creek bank. On 8 August the nest site was excavated and 49 eggs were removed. The average diameter of the eggs was 26.6 mm. One egg hatched prematurely on the day of collection and that hatchling had a carapace length of 26 mm. On 22 and 23 August 46 eggs hatched. Hatchling carapace length averaged 29 mm (27 to 31 mm) and weighed either 8 g (n=5) or 9 g (n=41).

A gravid female Broad-headed Skink (Eumeces laticeps) was found under a pile of wood at the park shop area on 13 June. She measured 93 mm SVL, 164 mm TL (the tip of the tail was missing), and weighed 20.5 g after oviposition. On late 17 or early 18 June, she laid 18 eggs. Egg length averaged 15 mm (14 to 16 mm) with an average diameter of 10.5 mm (10 to 11 mm). Six of the eggs oozed fluid almost immediately and none of those hatched. Seven eggs hatched by 18 July. Hatchling SVL averaged 28.5 mm (26 to 31 mm) while TL averaged 63 mm (51 to 70 mm).

Two gravid female Black Rat Snakes (Elaphe obsoleta) were found in the park shop area on 27 June and 28 June. The first laid 10 eggs on 2 July. The female measured 129.5 cm SVL, 149.9 cm TL, and weighed 652 g before oviposition (496 g after). Average weight of the eggs was 15 g, average diameter for three of them was 24 mm, and the average length for all ten was 48.5 mm (46 to 51 mm). Seven of the eggs were clumped together in groups of three and four and all the eggs were deeply indented from the beginning. There was no sign of development and none hatched.

The second female measured 105.4 cm SVL, 127 cm TL, and weighed 496 g prior to oviposition (354 g after). She laid seven eggs on 10 July, one separate and six clumped. The clumped eggs averaged 18.6 g in weight, 49.5 mm in length (45 to 53 mm), and 24 mm in diameter (23 to 25 mm). Shortly after being laid, the single egg weighed 17 g, was 51 mm long and 25 mm in diameter. When this egg was measured on 26 August it weighed 24 g, was still 51 mm long, but was now 30 mm in diameter. On 3 September the individual egg hatched. The hatchling weighed 14 g, and was 305 mm in SVL and 365 mm in TL. All the other eggs hatched between 4 September and 8 September. These hatchlings averaged 314 mm SVL (303 to 320 mm), 371 mm TL (356 to 383 mm), and 16 g (15 to 17 g) in weight.

Additionally I would like to report on a clutch of Ground Skink (Scincella lateralis) eggs. Cassandra Kennedy collected a gravid female during June 2004 in southern Callaway County, ca. 11 miles southeast of Fulton. The female was 90 mm TL and 56 mm SVL. On 6 July she deposited four eggs. Two of the eggs hatched on 28 July.
NEW SIZE RECORDS FOR TWO SPECIES OF MISSOURI TURTLES

Richard E. Daniel
Division of Biological Sciences, University of Missouri, Columbia, MO 65211

The most recent compilation of Missouri maximum size records for amphibians and reptiles is presented in Edmond and Daniel (2001). Two records of turtles exceeding the previously reported size maxima, brought to my attention during 2005, are presented here.

On June 2, 2005 a female Terrapene carolina was collected in Arnold, Missouri in northeast Jefferson County by John, Luke and Nick Parlow. The turtle was taken to Powder Valley Conservation Nature Center where the naturalist obtained photographic documentation of the length. The carapace length of 18.9 cm exceeds both the previous state record of 15.5 cm and the size maxima for the T. c. triunguis of 17.9 cm given by Conant and Collins (1998). Digital photographs (UMC 812P) have been deposited in the Dean E. Metter Memorial Collection, University of Missouri-Columbia.

On May 27, 2002, Doug Yaeger and Nick Laposha salvaged a large Trachemys scripta shell (UMC 7826) from the Anthony and Beatrice Kendzora Conservation Area in Platte County, Missouri. The carapace length of 29.6 cm exceeds the previous state record of 29.2 cm and the maximum size for T.s. elegans of 28.9 cm reported in Conant and Collins (1998).

Literature Cited
ADDITIONS TO THE BIBLIOGRAPHY OF REFERENCES ON THE HERPETOFAUNA OF MISSOURI

Compiled by

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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). Readers are requested to notify the author of any additional references that should be included in future compilations.


**Literature Cited**

Missouri Department of Conservation
HERPETOLOGY RESIDENCY

LOCATION: Jefferson City, Missouri
WAGE: $12.05 per hour plus tuition reimbursement for up to six credit hours
INTERNSHIP PERIOD: June 2006 through May 2007; 40 hours per week
CLOSING DATE: Applications must be received in the Central Office at Jefferson City, Missouri by 5:00 pm on 3 February 2006.
INTERNSHIP NUMBER: 2006-227

PROGRAM DESCRIPTION: The Missouri Department of Conservation is committed to providing outstanding opportunities to students in the area of conservation. Objectives of the program (not in prioritized order): expose students to a variety of professional tasks and the MDC business culture, while offering compensation; mentor promising students in disciplines in which candidates are scarce; and attract students that might contribute to workforce diversity within MDC.

At the residency level, program emphasis is placed on providing graduate students with significant and meaningful professional experience. Residency opportunities may be based on graduate thesis, dissertation or specific project. Students with technical experience may also be hired for work loads similar to entry level professional positions. Positions may be project specific. Students are eligible for the program when they meet the below requirements.

REQUIREMENTS:

Enrolled in a graduate program or completion of a graduate degree within previous six months. Completion of a minimum 15 graduate credit hours.
Overall GPA of 3.0 or higher on 4.0 scale.
Completed application packet, including additional faculty recommendations.
Completion of residency report at end of project.
Bachelor’s degree in a related program.

DUTIES AND RESPONSIBILITIES:

The Herpetology Residency Intern will conduct and coordinate Hellbender recovery actions throughout Missouri. Duties include coordination and implementation of field surveys, assisting with data gathering needs, conducting data analysis, developing specific projects, and promoting outreach and education efforts for Hellbenders. This position will assist with other herpetology-related surveys and perform other duties as required. Considerable travel will be required.

QUALIFICATIONS:

Applicants must have obtained at least a Bachelor’s degree and must be enrolled in a graduate degree program at an accredited university. A working knowledge of herpetology and population biology or conservation biology is required. Technical experience with ArcGIS, statistical programs, and Microsoft Access is desirable. Applicant must be able to demonstrate their ability to coordinate, organize and evaluate data and the ability to communicate both orally and in writing.

SPECIAL ABILITY REQUIREMENTS:

Ability to swim and snorkel.
Ability to develop and sustain cooperative working relationships.
Ability to work outside in adverse weather conditions and perform tasks requiring strenuous physical activity.
Ability to demonstrate regular and predictable attendance.
Ability to obtain a current, valid driver license by the date of employment.
Ability to work Saturdays, Sundays and holidays when needed.
Ability to keep an accurate record of supplies, services and time reports.

CONDITIONS OF EMPLOYMENT:

This position has been determined to be nonexempt according to the Fair Labor Standards Act. Interns must agree to accept compensatory time off in lieu of cash payments in accordance with the Department’s Compensatory Time Off and Overtime policy. Smoking is prohibited in all owned, rented or leased Department of Conservation offices, buildings, and similar facilities, in Department aircraft, and in vehicles. The Department of Conservation will hire only United States citizens and aliens authorized to work in the United States. All new interns will be required to complete an "Employment Eligibility Verification" (Form I-9) and produce requested documentation after employment. Candidates must submit to a drug screen following offer of internship.

TO APPLY:

To apply for this position, return the internship application form by February 3, 2006.

Missouri Department of Conservation
Human Resources Division
P. O. Box 180
Jefferson City, Missouri 65102
(573) 751-4115
(573) 522-1787 fax

If you are a person with a disability and need accommodation, contact Human Resources Division at (573) 751-4115.

The Missouri Department of Conservation is an equal opportunity employer. For more information about this position, go to

http://www.mdc.mo.gov/about/jobs/internships/