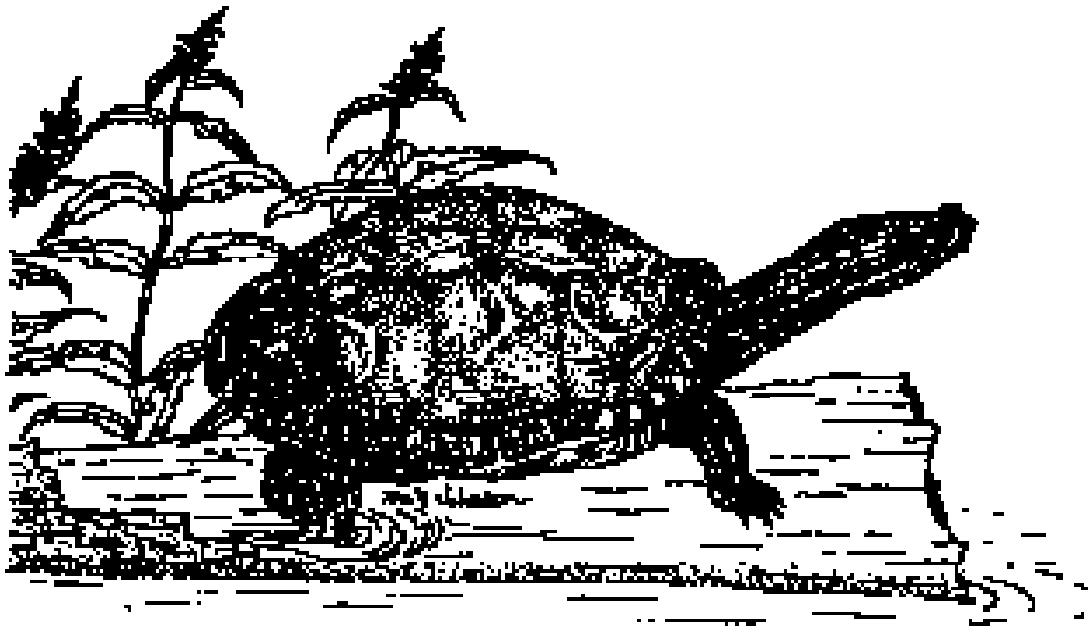


**Missouri
Herpetological
Association**



Newsletter

Number 8

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**MISSOURI HERPETOLOGICAL ASSOCIATION NEWSLETTER NO. 8
CONTENTS**

INTRODUCTION 2

ANNOUNCEMENT OF THE NINTH ANNUAL MHA MEETING 2

ABSTRACTS OF PAPER PRESENTED AT THE EIGHTH ANNUAL MHA MEETING 3

Life history, evolution, and adaptive radiation of hemidactyliine salamanders (Caudata: Plethodontidae: Hemidactyliini). **T.J. Ryan.**

Pheromone communication in the Northern Water Snake, *Nerodia sipedon*.
R.D. Aldridge and A.A. Reeves.

Seasonal patterns of feedings and coelomic fat mass in the Diamondback Water Snake (*Nerodia rhombifer*) in Veracruz, México. **R.D. Aldridge and K. Williams.**

A herpetofaunal survey of Ted Shanks Conservation Area. **J. Graves and J.M. Jones.**

Herps are where the habitat is: Ted Shanks Conservation Area. **J.M. Jones.**

Amphibian and reptile surveys of Fort Leonard Wood, Pulaski County, Missouri.
S. Sanborn and J. Sternberg.

Ecological interactions of vegetation and plethodontid salamanders for Missouri Ozark forests.
L.A. Herbeck and D.R. Larsen.

Herpetofaunal communities on the Missouri Ozark Forest Ecosystem Project (MOFEP): consistency among communities in pretreatment years? **R. B. Renken.**

Herpetofaunal sampling using the LCTA Method at Lake Wappapello, Butler County, Missouri. **R.L. Essner, Jr., A.J. Henderschott, and J.S. Scheibe.**

Habitat analysis of the Ozark Hellbender, *Cryptobranchus alleganiensis bishopi*, in Missouri.
T.M. Fobes and R.F. Wilkinson, Jr.

The occurrence, habitat use, and breeding status of an aquatic salamander, *Amphiuma tridactylum*, in southeastern Missouri. **C.A. Cunningham and S. Trautwein.**

Effects of female mate choice on offspring fitness in the Gray Treefrog (*Hyla versicolor*).
A.M. Welch and R.D. Semlitsch.

The effects of hybridization on larval performance in *Rana blairi* and *R. sphenoccephala* (Anura: Ranidae). **M.J. Parris, R.D. Semlitsch, and R.D. Sage.**

NEW RECORDS OF AMPHIBIANS AND REPTILES IN MISSOURI FOR 1995
R. Powell, T.R. Johnson, and D.D. Smith 9

NOTES 13

Range extension of the Western Lesser Siren, *Siren intermedia nettingi*. **D.D. Dunn.**

Size record for the Diamondback Water Snake, *Nerodia rhombifer*. **C.D. Shulse.**

HERPETOFAUNAL SURVEYS 14

Amphibians and reptiles of Ted Shanks Conservation Area, Pike County, Missouri.
J. Graves and J.M. Jones.

LCTA WETS Site, Wappapello, Butler County, Missouri. **R.L. Essner, Jr.,
A.J. Henderschott, and J.S. Scheibe.**

ADDITIONS TO THE BIBLIOGRAPHY OF AMPHIBIANS AND REPTILES IN MISSOURI
R. Powell 16

Cover art by Tom R. Johnson: a Western Chicken Turtle (*Deirochelys reticularia miaria*). This species was recently rediscovered in Missouri after 33 years (see Buhlmann and Johnson 1995).

INTRODUCTION

The Eighth Annual Meeting of the **Missouri Herpetological Association** took place on 23-24 September 1995 at the Reis Biological Station near Steelville in Crawford County, Missouri. This organization is designed to provide herpetologists in Missouri and surrounding states with an opportunity to meet and exchange ideas regarding current efforts in research and other professional activities. High on the list of priorities is to provide students, involved in research at either the graduate or undergraduate level, (1) the chance to interact with senior herpetologists, and (2) an outlet to present, in a semi-formal setting, the results of their labors.

This Newsletter is the result of a decision made at the inaugural meeting to provide a means of publicly acknowledging papers presented at this and subsequent Annual Meetings. Further, the Newsletter will inform the herpetological community of new distributional and size records of Missouri's herpetofauna and serve to provide an outlet for the publication of short notes dealing with the state's amphibians and reptiles.

At this time the Association would again like to acknowledge the contribution of Dr. Nevin Aspinwall, of the Reis Biological Station, for allowing us the use of the Station's excellent facilities.

ANNOUNCEMENT

9th Annual Meeting of the Missouri Herpetological Association

BENNETT SPRINGS STATE PARK

The 9th Annual Meeting of the **Missouri Herpetological Association** will be held on 28-29 September 1996. Tentative plans are to meet at Bennett Springs State Park, Lebanon, Missouri. Eight cabins have been reserved. The evening meal on Saturday, after the paper session, will be in the Park's restaurant and we can order off the menu. There will be no charge for the use of the meeting room.

COST: Each cabin will sleep 6-8 people (one queen and two twin beds plus a fold-out sofa and the floor. Each cabin also has a small kitchen. Cost per cabin is \$88. Camping is also available in the Park.

A "call for papers" and registration packet will be sent in mid-July. Any questions or comments on plans to meet at Bennett Springs can be addressed to Tom R. Johnson (see below). If no major complaints are heard about meeting at Bennett Springs, these plans will stand.

For more information please contact Tom R. Johnson:

Phone: (314) 751-4115 ext. 201
Email: johnst@mail.conservation.state.mo
Address: Missouri Department of Conservation
P.O. Box 180
Jefferson City, MO 65102-0180

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

23-24 September 1995

**LIFE HISTORY, EVOLUTION, AND ADAPTIVE RADIATION OF
HEMIDACTYLIINE SALAMANDERS
(CAUDATA: PLETHODONTIDAE: HEMIDACTYLIINI)**

Travis J. Ryan

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

Hemidactyliine salamanders exhibit wide variation in life history traits, particularly in the age at metamorphosis and age at maturity. Heterochronic changes in the relative timing of these events may have not only promoted the variation observed, but allowed the salamanders of the tribe Hemidactyliini to expand their geographical and ecological distributions. Ancestral hemidactyliines exhibited a biphasic life cycle, characterized by a lengthy larval period in montane streams, followed by a semiaquatic adult phase. A shift in the timing of metamorphosis, through the acceleration of somatic tissue development, has decreased the larval period and allowed for the colonization of lentic larval habitats. This change in habitat permitted members of the tribe to move out of the mountains into surrounding lowlands (e.g., the Atlantic and Gulf coastal plains and the interior highlands). The elimination of the postlarval phase of the life cycle, through the processes of progenesis and neoteny, has enabled hemidactyliines to inhabit areas of extremely low productivity, such as the xeric Edwards Plateau of Texas, Ozark Mountains of the interior highlands, and limestone caves of eastern North America. Thus, these heterochronic changes have allowed for a considerable expansion of the geographic range of this tribe. Hypermorphosis, the retardation of the development of reproductive tissues, may be an important mechanism in the adaptation of one hemidactyliine species. These heterochronic changes may be useful as a hypothesis to explain the extensive life history variation and adaptive radiation of these primitive plethodontid salamanders.

PHEROMONE COMMUNICATION IN THE NORTHERN WATER SNAKE, *Nerodia sipedon*

Robert D. Aldridge and Amber A. Reeves

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

Vertebrates communicate with one another using a variety of the senses, with olfaction being one of the most important. The chemicals that animals use to communicate with members of their own species are called pheromones. These chemicals evoke behavioral, developmental, or reproductive responses within species. This study focuses on the use of pheromones as sex attractants between male and female water snakes of the genus *Nerodia*. Our hypothesis is that the pheromones are produced continuously during vitellogenesis and are released through the skin during shedding, initiating the events leading to mating. Our preliminary data suggest that this hypothesis is correct. We have found that the plasma pheromones affect behaviors of both

males and females. Males respond to the pheromone by exhibiting courtship behaviors, including multiple tongue flicks and mate searching behaviors. Females respond by becoming extremely docile. The females' unexpected behavior may cause her to become receptive and perhaps tolerant of the males courting her. The results of this study may have important applications for the biological control of the brown tree snake (*Boiga irregularis*). This species, which was introduced onto Guam, is responsible for the extinction from the wild of several endemic birds and lizards.

SEASONAL PATTERNS OF FEEDING AND COELOMIC FAT MASS IN THE DIAMONDBACK WATER SNAKE (*Nerodia rhombifer*) IN VERACRUZ, MÉXICO

Robert D. Aldridge and Kim A. Williams

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

Snakes were collected on the Papaloapan river, nearby lagoons and as road kills, near Tlacotalpan, Veracruz, México. The mean annual temperature is 24.8°C, with a low of 21.8°C in January and a high of 28.4°C in August. Rainfall is seasonal, with 89% of the annual average of 1841 mm occurring in June–October. The elevation is < 10 m above sea level. Data were obtained from preserved specimens of the Diamondback Water Snake (*Nerodia rhombifer*). Feeding frequency was determined by stomach content analysis of preserved snakes. The diet consisted primarily of fish (8 species in 7 families). Of the adults examined, 21% of the 100 males and 22% of the females contained food. Feeding frequency did not differ in the wet and dry seasons. Coelomic fat mass was compared by months in both adult males and females. In both sexes fat body mass was higher in February, March, and April. The variation in mass of the fat bodies was greater in females than in males. Study was conducted under Permit No. 303300, La Secretaría de Relaciones Exteriores, to RDA.

A HERPETOFAUNAL SURVEY OF TED SHANKS CONSERVATION AREA

Jennifer Graves and J. Michael Jones

Department of Biology, Culver-Stockton College, Canton MO 63435

Ted Shanks Conservation Area is located 18 mi S of Hannibal, Pike Co., Missouri. Most of the 6.600 acre area is within the Mississippi River floodplain. The Area is bounded on the east by the Mississippi River, by the Salt River on the southwest, and by river bluffs on the northwest. Changes in the hardwoods have been observed following the 1993 flood. Although this artificial wetland is relatively natural, adjacent areas are being changed by agricultural activities. Collecting trips to Ted Shanks Conservation Area were made on 79 separate occasions between 21 February and 26 July 1995. Collecting methods included seines, drift fences, turtle traps, and 2-liter funnel traps in addition to extensive hand collecting. The funnel traps were especially effective in collecting breeding amphibians. No rare or endangered species were found. A total of 13 amphibian species was collected and dates of calling were recorded; six of these species were collected in the Area for the first time. A total of 18 species of reptiles was collected, 10 of which were new to the Area. A Missouri state size record Diamondback Water Snake (130 cm) was taken. Recommendations resulting from this study include: (1) maintain winter water levels to facilitate hibernation; (2) insure the water supply of upland ponds which are not part of the management areas; (3) control or contain the lotus, which is not native

to the region; (4) acquire and include in the Area the steep bluffs west of the railroad tracks; and (5) continue maintenance of the southernmost portion of the Area as a less-developed site with no roads.

HERPS ARE WHERE THE HABITAT IS: TED SHANKS CONSERVATION AREA

J. Michael Jones

Department of Biology, Culver-Stockton College, Canton MO 63435

No abstract available.

AMPHIBIAN AND REPTILE SURVEYS OF FORT LEONARD WOOD, PULASKI COUNTY, MISSOURI

Sharon M. Sanborn and Janet Sternberg

Missouri Department of Conservation, Jefferson City MO 65102

Surveys of amphibians and reptiles were conducted between 27 March and 22 September within Fort Leonard Wood boundaries in Pulaski County, Missouri. We located 50 of the 67 species of possible occurrence using a variety of survey methods during 80 field days. Special habitat searches were conducted in areas meeting suitable habitat requirements of the federal and state listed species of possible occurrence at Fort Leonard Wood. Two state watch-listed (WL) species were located: *Ambystoma annulatum* (Ringed Salamander) and *Typhlotriton spelaeus* (Grotto Salamander). Use of other methods resulted in the collection of eight voucher specimens for new Pulaski County records: *Ambystoma opacum* (Marbled Salamander), *Ambystoma tigrinum* (Eastern Tiger Salamander), *Trachemys scripta* (Red-eared slider), *Eumeces laticeps* (Broadhead Skink), *Heterodon platyrhinos* (Eastern Hognose Snake), *Opheodrys aestivus* (Rough Green Snake), and *Virginia valeriae* (Western Earth Snake).

ECOLOGICAL INTERACTIONS OF VEGETATION AND PLETHODONTID SALAMANDERS IN MISSOURI OZARK FORESTS

Laura A. Herbeck and David R. Larson

School of Natural Resources, University of Missouri, Columbia MO 65211

Long term experiments are needed to detect change, both natural and human induced, in forest communities. However, results from these experiments from which management recommendations can be made will not be available for years and sometimes decades. Computers and innovative thinking have allowed us to predict forest community responses to management decisions. Long term experiments provide the opportunity to test the predictive capability of computer models.

During the summer of 1995 we initiated a project to determine the overstory, understory, plethodontid salamander relationships which occur within three distinct successional forest stages. Successional stages consisted of old-growth, second growth (70–80 years), and clearcuts (< 5 years). Old-growth relationships were examined at Big Springs Pines Natural Area and second growth and clearcuts were examined on Missouri Department of Conservation lands adjacent to MOFEP compartments. Relationships developed in this project will be tested over time on MOFEP, as similar successional conditions are realized.

Herein we discuss the structural and compositional differences of old-growth, second growth, and newly regenerated forests. First year findings of this experiment will be presented and future initiatives outlined. Preliminary analyses suggest strong relationships between the presence of salamanders and successional forest stage.

**HERPETOFAUNAL COMMUNITIES ON
THE MISSOURI OZARK FOREST ECOSYSTEM PROJECT (MOFEP):
CONSISTENCY AMONG COMMUNITIES IN PRETREATMENT YEARS?**

Rochelle B. Renken

Missouri Department of Conservation, Columbia MO 65201

The objectives of the herpetological research in the Missouri Ozark Forest Ecosystem Project (MOFEP) are to: (1) determine the landscape scale effects of forest management on the species composition and relative abundance of herpetofaunal communities, (2) examine which forest habitat characteristics and environmental variables are related to the relative abundances of selected species, and (3) determine the effects of even-aged forest management on herpetofaunal communities within and at 50 m and 200 m from clearcuts. Pretreatment sampling began in 1992 and continued through 1995. Posttreatment sampling will occur during 1997–2000 following cutting in 1996. Herpetofaunal communities were sampled using Jones' arrays consisting of drift fences and associated funnel traps. Sampling occurs from 1 March through 30 June and 1 September through 31 October of each sampling year. During 1992–1994, 43 species of amphibians and reptiles and approximately 17,000 captures were recorded on the nine MOFEP study sites. Captures of salamanders, lizards, and snakes were relatively consistent within treatments and among years. Captures of frogs/toads were inconsistent within treatments and among years. Overall analysis plans were discussed.

**HERPETOFAUNAL SAMPLING USING THE LCTA METHOD AT
LAKE WAPPAPELLO, BUTLER COUNTY, MISSOURI**

Richard L. Essner, Jr., Arron J. Hendershott, and John S. Scheibe

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

A herpetofaunal survey was conducted at Lake Wappapello in southeastern Missouri using the LCTA plot inventory method. The trapping array included pitfall traps, terrestrial funnel traps, and aquatic funnel traps. During the summers of 1994 and 1995, 14 species of amphibians and 24 species of reptiles were recorded. Results of the survey and associated problems will be discussed.

**HABITAT ANALYSIS OF THE OZARK HELLBENDER,
Cryptobranchus alleganiensis bishopi, IN MISSOURI**

Timothy M. Fobes and Robert F. Wilkinson, Jr.

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

The habitat of the Ozark Hellbender, *Cryptobranchus alleganiensis bishopi*, was investigated in the Northfork of the White River, Ozark County, Missouri. Microhabitat variables of water depth, current velocity, substrate, and embeddedness were measured. A principal components analysis demonstrated all microhabitat variables were important to hellbenders. Sites with hellbender populations had available cover rocks at significantly greater depths, larger substrates,

and less embeddedness. Sites with hellbender populations also had significantly more cover rocks and available microhabitat. A high correlation existed between more cover rocks and available microhabitat. A high correlation between hellbender abundance and available microhabitat suggested that habitat limited population size. Hellbenders selected cover rocks within sites at significantly greater water depths, faster current velocity, and lower embeddedness.

**THE OCCURRENCE, HABITAT USE, AND BREEDING STATUS
OF AN AQUATIC SALAMANDER, *Amphiuma tridactylum*,
IN SOUTHEASTERN MISSOURI**

Carol A. Cunningham and S. Trautwein

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

From April 1994 to August 1995, 27 animals were trapped at Otter Slough Conservation Area and Wilhelmina State Forest using 36" funnel traps made of 1/4" hardware cloth. Trapped individuals were marked by fishtags, hot branding, silver nitrate, and/or PIT tags. Mass, total length, snout-vent length, and sex were recorded before release. Although sexual dimorphism has not previously been reported in this species in Missouri, the data suggest an intersexual difference in the relationship between mass and length, and males are significantly heavier. Analysis of water temperatures shows that temperature is not a predictor of trapping success, nor is it a predictor of mass of animals trapped at any given temperature. Population estimates are unavailable due to the low number of recaptures. Breeding females were not found.

**EFFECTS OF FEMALE MATE CHOICE ON OFFSPRING FITNESS IN THE GRAY
TREEFROG (*Hyla versicolor*)**

Allison M. Welch and Raymond D. Semlitsch

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

Female gray treefrogs (*Hyla versicolor*) exhibit strong preferences, in laboratory experiments, for male advertisement calls of long duration. Although males do not provide resources or parental care, females may benefit indirectly by selecting mates with genes that increase the fitness of their offspring. Because long calls and larval growth are both energetically demanding, genes that allow males to produce long calls may also afford tadpoles improved growth or survival. Thus, we hypothesized that offspring of *H. versicolor* males with long calls would have higher larval fitness than offspring of males with short calls. Eggs from each of nine females were artificially fertilized with sperm suspensions from one short-calling male and one long-calling male to create 18 half sib families. Upon hatching, fifteen tadpoles from each family were assigned to each of two food levels and raised in individual containers in the lab. Tadpoles in high food treatments metamorphosed significantly earlier and weighed significantly more at day 30 and at metamorphosis than tadpoles in low food treatments. Analysis of variance for mass at day 30 revealed a mildly significant father x food interaction: at high food, mass of tadpoles from long- and short-calling fathers did not differ, but under low food conditions, offspring of long-calling fathers were heavier than those of short-calling fathers. Multivariate analysis of variance indicated a significant maternal effect on overall tadpole performance. We are currently raising metamorphs to maturity in order to assess call duration of

male offspring and call preferences of female offspring to test the effects of paternal call duration on offspring reproductive success.

**THE EFFECTS OF HYBRIDIZATION ON LARVAL PERFORMANCE
IN *Rana blairi* and *R. sphenocephala* (ANURA: RANIDAE)**

Matthew J. Parris, Raymond D. Semlitsch, and Richard D. Sage

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

Two species of leopard frogs, *Rana blairi* and *R. sphenocephala*, occur in a narrow zone of sympatry in central Missouri. Protein gel electrophoresis shows that the natural level of introgression between these two species is four percent. The role of premating isolating mechanisms in this system is ambiguous, due to the lack of quality natural history data for both species. Selection against hybridization operating at the postzygotic level predicts that interspecific hybrids should have lower fitness levels relative to the conspecifics. Using artificial crossing techniques, control, interspecific, and backcross progeny between *R. blairi* and *R. sphenocephala* were obtained in the laboratory. Larvae were separated by genotype and randomly assigned to an array of 56 identical artificial mesocosms at a high or low density. Each genotype at both densities was replicated from three to five times. Froglets were collected at metamorphosis and weighed following tail resorption. The effect of cross type and density on four larval responses was analyzed: survival, metamorphosis, length of larval period, and froglet mass at tail resorption. Multivariate analysis of variance indicated both a significant cross type and density effect on all responses, but no significant interaction. Univariate ANOVA indicated a significant density effect on all four responses; cross type was significant in terms of proportion reaching metamorphosis and larval period length. Both F₁ and F₁ backcross larvae exhibited performance levels intermediate between pure *R. blairi* and *R. sphenocephala*. The absence of hybrid inferiority suggests that hybrids are not necessarily at a selective disadvantage.

NEW RECORDS OF AMPHIBIANS AND REPTILES IN MISSOURI FOR 1995

Robert Powell,¹ Tom R. Johnson,² and Donald D. Smith³

¹ Avila College, Kansas City MO 64145

² Missouri Department of Conservation, Jefferson City MO 65102

³ University of Kansas Medical Center, Kansas City KS 66103

The new county or maximum size records listed below are those accumulated or brought to our attention since previous updates (Johnson and Powell 1988, Powell et al. 1989, 1990, 1991, 1992, 1993a, 1993b, 1994a, 1994b) of records listed in Johnson (1987). Publication of this list allows us to express appreciation to the many individuals who contributed specimens or information. Further, recipients of this list have the opportunity to update range maps and listings of size maxima. Finally, these new records represent information that extends our knowledge of these animals in Missouri.

The specimens listed represent the first records for the given county based on preserved, catalogued voucher specimens (unless indicated as observations only). Size records require the deposition of the specimen in an institutional collection. All specimens must be taken under the auspices of a valid state permit.

All new records listed here are presented in the standardized format of Collins (1989, 1990): common and scientific name, county, specific locality (when available or unless withheld for rare and endangered species), date of collection (when available), collector(s), and place of deposition and catalog number (if available or applicable). If the record was published elsewhere, the citation is given. New size maxima are presented in accordance with criteria established by Powell et al. (1982) and are expressed in both metric and English units, but the metric value is the precise measure (the English equivalent is only an approximation).

The following acronyms apply to institutional collections in which specimens are deposited: BWMC — Bobby Witcher Memorial Collection, Avila College, Kansas City MO; CSC — Ted Shanks Conservation Area Collection, Culver-Stockton College, Canton MO; KU — Natural History Museum, University of Kansas, Lawrence KS; MDC — Missouri Department of Conservation, Jefferson City MO; SEMSU — Southeast Missouri State University, Cape Girardeau MO.

NEW COUNTY RECORDS

Amphibia: Caudata

MARBLED SALAMANDER

Ambystoma opacum

PULASKI CO: Fort Leonard Wood base road 25 S20 T35N R10W, 17 April 1995, S. Sanborn (KU cat. no. pending).

SMALLMOUTH SALAMANDER

Ambystoma texanum

ST. FRANCOIS CO: Hillsboro Rd 500' N Adar Run Rd jct with HW E S4 T36N R5E, 19 May 1995, J. Powell (KU cat. no. pending).

EASTERN TIGER SALAMANDER

Ambystoma tigrinum tigrinum

PULASKI CO: Fort Leonard Wood S33 T35N R11W, 19 September 1995, S. Sanborn (KU cat. no. pending).

THREE-TOED AMPHIUMA

Amphiuma tridactylum

CAPE GIRARDEAU CO: T31/32N R12E, 3 April 1970, R.A. Rowlett (SEMSU 57).

DARK-SIDED SALAMANDER

Eurycea longicauda melanopleura

CAPE GIRARDEAU CO: Trail of Tears State Park S23 T32N R14E, 12 July 1994, R. Essner (SEMSU 183). **ST. CHARLES CO:** Weldon Springs Conservation Area S5-6 T45N R3E, 12 May 1995, S. Stumme and E. Danielson (KU cat. no. pending).

RED RIVER MUDPUPPY

Necturus louisianensis

CAPE GIRARDEAU CO: Bollinger Mill State Historic Site S14 T31N R11E, J. Sharp, Kaszubski, Whitmar (SEMSU 160).

WESTERN LESSER SIREN

Siren intermedia nettingi

PIKE CO: Ted Shanks Conservation Area (CSC).

Amphibia: Anura

FOWLER'S TOAD

Bufo woodhousii fowleri

NEW MADRID CO: 4 km W jct HW P & WW S35 T23N R14E, 15 July 1995, J. Schulte and C. Cunningham (SEMSU 361). **PERRY CO:** Yount on gravel bar of Whitewater River S33 T34N R9E, 16 July 1995, J. Schulte and C. Cunningham (SEMSU 366).

EASTERN NARROWMOUTH TOAD

Gastrophryne carolinensis

JEFFERSON CO: Festus S6 T40N R6E, 22 July 1994, B. Wright (SEMSU 194).

GREEN TREEFROG

Hyla cinerea

MADISON CO: Belmar Slough (old channel of St. Francis River) near HW 447 S27 T31N R5E, 13 July 1994, D. Rowan and A. Brant (photograph on file at MDC). **SCOTT CO:** HW N 4.6 km S HW E S25-30 T16S R14/15E DOR, 2 August 1995, J. Schulte and C. Cunningham (SEMSU 375); Commerce S24 T28N R14E, 20 March 1995, A.J. Hendershott (SEMSU 396).

NORTHERN SPRING PEEPER

Pseudacris crucifer crucifer

BUTLER CO: WETS LCTA site S15 T25N R7E, 18 August 1994, R. Essner (SEMSU 243). **PERRY CO:** HW O near Biehle S25 T33N R10E, 2 September 1995, R. Essner (SEMSU 402). **PIKE CO:** Ted Shanks Conservation Area (CSC). **ST. CLAIR CO:** 6 mi E Osceola, 28 July 1994, L. Ireland (KU cat. no. pending).

WESTERN CHORUS FROG

Pseudacris triseriata

CAPE GIRARDEAU CO: Kelso Sanctuary S22 T31N R14E, 5 March 1969 (SEMSU 24).

PLAINS LEOPARD FROG

Rana blairi

PIKE CO: Ted Shanks Conservation Area (CSC). **SCOTT CO:** HW N 4.6 km S HW E S25-30 T16S R14/15E DOR, 2 August 1995, J. Schulte and C. Cunningham (SEMSU 376).

BULLFROG

Rana catesbeiana

DUNKLIN CO: Wilhelmina State Forest in oxbow of St. Francis River S21 T22N R8E, 2 July 1995, J. Schulte and C. Cunningham (SEMSU 353).

GREEN FROG

Rana clamitans

PERRY CO: 0.8 km E Yount in dry tributary of Whitewater River S34 T34N R9E, 16 July 1995, J. Schulte and C. Cunningham (SEMSU 368); HW O near Biehle S25 T33N R10E, 2 September 1995, R. Essner (SEMSU 403). **PIKE CO:** Ted Shanks Conservation Area (CSC).

SOUTHERN LEOPARD FROG

Rana sphenocephala

PERRY CO: Yount on gravel bar of Whitewater River S33 T34N R9E, 16 July 1995, J. Schulte and C. Cunningham (SEMSU 370).

EASTERN SPADEFOOT

Scaphiopus holbrookii holbrookii

BOLLINGER CO: S23 T33N R9E, 19 April 1970, R.A. Rowlett (SEMSU 13).

Reptilia: Testudines

EASTERN SPINY SOFTSHELL

Apalone spinifer spinifer

PIKE CO: Ted Shanks Conservation Area (CSC).

COMMON SNAPPING TURTLE

Chelydra serpentina serpentina

CAPE GIRARDEAU CO: Burfordville S14 T31N R11E, 15 September 1995, A.J. Hendershott (SEMSU 407). **COLE CO:** Scott Station Rd 5 mi NW Jefferson City S32 T45N R12W DOR, R. Krager (KU cat. no. pending). **PERRY CO:** Perryville S19 T35N R10E, 16 September 1995, R. Essner (SEMSU 406). **PIKE CO:** Ted Shanks Conservation Area (CSC).

WESTERN PAINTED TURTLE

Chrysemys picta bellii

COLE CO: Elston Rd 5 mi NW Jefferson City S30 T45N R12W, 24 June 1995, R. Krager (KU cat. no. pending).

SOUTHERN PAINTED TURTLE

Chrysemys picta dorsalis

CAPE GIRARDEAU CO: Cape Girardeau S32 T31N R14E, R.A. Rowlett (SEMSU 116).

COOTER

Pseudemys concinna

PERRY CO: HW O near Biehle S25 T33N R10E, 2 September 1995, R. Essner (SEMSU 401).

COMMON MUSK TURTLE

Sternotherus odoratus

SCOTT CO: HW 74/77 0.2 km S Cape Girardeau Co line S 12 T29N R12E DOR, 2 August 1995, J. Schulte and C. Cunningham (SEMSU 374).

THREE-TOED BOX TURTLE

Terrapene carolina triunguis

DUNKLIN CO: HW H & J S8-9 T22N R9E DOR, 12 August 1995, J. Schulte and C. Cunningham (SEMSU 381)

ORNATE BOX TURTLE

Terrapene ornata ornata

PIKE CO: Ted Shanks Conservation Area (CSC).

RED-EARED SLIDER

Trachemys scripta elegans

PIKE CO: Ted Shanks Conservation Area (CSC).
PULASKI CO: Fort Leonard Wood in Big Piney River backwater S19 T35N R10W, 6 August 1995, S. Sanborn and K. Ricke (KU cat. no. pending).
SCOTT CO: HW 74/77 0.2 km S Cape Girardeau Co line S 12 T29N R12E DOR, 2 August 1995, J. Schulte and C. Cunningham (SEMSU 373).

Reptilia: Squamata: Sauria

SOUTHERN COAL SKINK

Eumeces anthracinus pluvialis

BUTLER CO: WETS LCTA site S15 T26N R7E, 7 August 1994, R. Essner (SEMSU 217).

FIVE-LINED SKINK

Eumeces fasciatus

CAPE GIRARDEAU CO: HW B 2.4 km N HW BB S36 T33N R11E DOR, J. Schulte and C. Cunningham (SEMSU 365); Bollinger Mill State Historic Site S14 T31N R11E, 17 May 1995, A.J. Hendershott (SEMSU 386). **NEW MADRID CO:** HW 62 8.8 km W HW 61 S12 T22N R12E, 12 August 1995, J. Schulte and C. Cunningham (SEMSU 382). **PIKE CO:** Ted Shanks Conservation Area (CSC).

NORTHERN FENCE LIZARD

Sceloporus undulatus hyacinthinus

PERRY CO: HW O near Biehle S25 T33N R10E, 2

September 1995, R. Essner (SEMSU 408).

GROUND SKINK

Scincella lateralis

CARROLL CO: Bunch Hollow Conservation Area S16 T55N R24W, 27 June 1995, D. Figg, H. Loring, and D. Browning (KU cat. no. pending).

MONITEAU CO: S28 T46N R14W, 15 April 1995, T.R. Johnson and R. Krager (KU cat. no. pending).

Reptilia: Squamata: Serpentes

WESTERN COTTONMOUTH

Agkistrodon piscivorus leucostoma

ST. LOUIS CO: Jefferson Barracks Park and National Cemetery along bank of Mississippi River S30 T44N R7E, 19 April 1995, S. Wilson (KU cat. no. pending).

WESTERN WORM SNAKE

Carphophis amoenus vermis

CAPE GIRARDEAU CO: Bollinger Mill State Historic Site S14 T31N R11E, 22 March 1995, A.J. Hendershott (SEMSU 295). **OSAGE CO:** 1 mi N Meta S4 T41N R11W, 21 May 1995, R. Krager (KU cat. no. pending). **PIKE CO:** Ted Shanks Conservation Area (CSC).

EASTERN YELLOWBELLY RACER

Coluber constrictor flaviventris

MADISON CO: HW 212 just N HW 72 S10 T33N R7E DOR, 9 April 1995, D. Rowan (KU cat. no. pending).

SOUTHERN BLACK RACER

Coluber constrictor priapus

BOLLINGER CO: North Patton S23 T33N R9E, 5 May 1995, A.J. Hendershott (SEMSU 103). **CAPE GIRARDEAU CO:** Cape Girardeau Sprigg St S32 T31N R14E, 22 March 1995, C. Corbin (SEMSU 239).

TIMBER RATTLESNAKE

Crotalus horridus

CAPE GIRARDEAU CO: KFVS tower S21 T32N R14E, 29 April 1982, D. Hargraves (SEMSU 147).

GREAT PLAINS RAT SNAKE

Elaphe guttata emoryi

ST. CLAIR CO: 6 mi E Osceola, 28 July 1994, L. Ireland (photograph on file at MDC).

BLACK RAT SNAKE

Elaphe obsoleta obsoleta

NEW MADRID CO: HW 62 8.8 km W HW 61 S12 T22N R12E, 12 August 1995, J. Schulte and C. Cunningham (SEMSU 382).

PRAIRIE KINGSNAKE

Lampropeltis calligaster calligaster

CAPE GIRARDEAU CO: Bollinger Mill State Historic Site S14 T31N R11E, 14 November 1993, A.J. Hendershott (SEMSU 178). **SCOTT CO:** Blodgett HW U S11 T27N R13E, 19 April 1970, R.A. Rowlett (SEMSU 141).

SPECKLED KINGSNAKE

Lampropeltis getula holbrooki

CAPE GIRARDEAU CO: Burfordville S14 T31N R11E, 30 July 1994, A.J. Hendershott (SEMSU 397). **SCOTT CO:** Commerce S24 T28N R14E, 22 March 1995, A.J. Hendershott (SEMSU 384).

RED MILK SNAKE

Lampropeltis triangulum sypila

CAPE GIRARDEAU CO: SEMO campus Cape Girardeau S32 T31N R14E, 9 June 1976 (SEMSU 156). **PERRY CO:** 0.8 km E Yount S34 T34N R9E, 16 July 1995, J. Schulte and C. Cunningham (SEMSU 367).

YELLOWBELLY WATER SNAKE

Nerodia erythrogaster flavigaster

CAPE GIRARDEAU CO: Kelso Sanctuary S22 T31N R14E, summer 1994 (SEMSU 290).

NORTHERN WATER SNAKE

Nerodia sipedon sipedon

CAPE GIRARDEAU CO: Egypt Mills Creek T31/32N R14E, 21 July 1969, Dr. Byrd (SEMSU 149). **PIKE CO:** Ted Shanks Conservation Area (CSC).

GRAHAM'S CRAYFISH SNAKE

Regina grahamii

PIKE CO: Ted Shanks Conservation Area (CSC).

MIDLAND BROWN SNAKE

Storeria dekayi wrightorum

COLE CO: 6 mi NW Jefferson City S25 T45N R13W, 9 June 1995, R. Krager (KU cat. no. pending).

WESTERN RIBBON SNAKE

Thamnophis proximus proximus

PIKE CO: Ted Shanks Conservation Area (CSC).

RED-SIDED GARTER SNAKE

Thamnophis sirtalis parietalis

PIKE CO: Ted Shanks Conservation Area (CSC).

EASTERN GARTER SNAKE

Thamnophis sirtalis sirtalis

CAPE GIRARDEAU CO: Cape Girardeau S32 T31N R14E, September 1994, J. Scheibe (SEMSU 297). **NEW MADRID CO:** adjacent to hardwood swamp 4 km W jct HW P & WW S35 T23N R14E, 15 July 1995, J. Schulte and C. Cunningham (SEMSU 360). **PIKE CO:** Ted Shanks Conservation Area (CSC).

NORTHERN LINED SNAKE

Tropidoclonion lineatum lineatum

CLARK CO: 2 mi NNW St. Patrick S2 T63N R7W, 16 July 1995, C. and T. Weiss (KU cat. no. pending).

ROUGH EARTH SNAKE

Virginia striatula

OSAGE CO: 1 mi NE Meta S4 T41N R11W, 21 May 1995, R. Krager (KU cat. no. pending).

WESTERN EARTH SNAKE

Virginia valeriae elegans

PETTIS CO: near Muddy Creek 18 mi NE Sedalia S13 T47N R20W, 22 May 1995, R. Krager (KU cat. no. pending).

NEW MAXIMUM SIZE RECORDS

Amphibia: Caudata

SOUTHERN REDBACK SALAMANDER

Plethodon serratus

CAPE GIRARDEAU CO: S32 T31N R14E, R. Essner (SEMSU 289). SVL = 55.2 mm (2.2 in), TL = 107.3 mm (4.2 in).

Reptilia: Squamata: Serpentes

DIAMONDBACK WATER SNAKE

Nerodia rhombifer rhombifer

PIKE CO: Ted Shanks Conservation Area, 5 May 1995, C.D. Shulse (CSC). TL = 1300 mm (51.2 in).

NOTES

RANGE EXTENSION OF THE WESTERN LESSER SIREN, *Siren intermedia nettingi*

Dusty D. Dunn

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Johnson (1987) indicated that the Western Lesser Siren is found primarily in the southeastern corner of Missouri. Its range extends north along the Mississippi River, ending in Pike County, Missouri, and in Illinois along the Illinois River (Smith 1961).

On 17 April 1995, a Lesser Siren was found within the Ted Shanks Conservation Area 18 mi S Hannibal, Pike County, Missouri. The specimen was collected in a tadpole trap placed in a pond approximately 1.5 mi SE of the visitors' center. The trap was on the bottom of this shallow pond and surrounded by emergent vegetation. Total length of the animal was 17 cm. The dorsum was dark gray with a lighter venter. External gills were prominent. The Siren was maintained in the laboratory at Culver-Stockton College for approximately three weeks and apparently ate small tadpoles. The specimen was subsequently released. Several additional sirens were collected later at two different sites at Ted Shanks Conservation Area.

This study was supported by a grant from the Missouri Department of Conservation to J.M. Jones and C.D. Shulse.

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Smith, P.S. 1961. The Amphibians and Reptiles of Illinois. Dept. Reg. Educ., Nat. Surv. Div., Urbana, Illinois.

SIZE RECORD FOR THE DIAMONDBACK WATER SNAKE, *Nerodia rhombifer*

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On 5 May 1995 a large Diamondback Water Snake (*Nerodia rhombifer rhombifer*) was captured at Ted Shanks Conservation Area, Pike County, Missouri. The specimen measured 130 cm TL and represents a new size record for Missouri; the previous record was 127 cm (Johnson 1987). Although Anderson (1965) cited a 137 cm snake, the specimen is not available. The Pike County snake was preserved as part of the Ted Shanks Conservation Area collection at Culver Stockton College. This individual was collected as part of a study supported by the Missouri Department of Conservation.

Literature Cited

- Anderson, P. 1965. The Reptiles of Missouri. Univ. Missouri Press, Columbia.
Johnson, T.R. 1987. The Amphibians and Reptiles of Missouri. Missouri Dept. Conserv., Jefferson City.

HERPETOFAUNAL SURVEYS

AMPHIBIANS AND REPTILES OF TED SHANKS CONSERVATION AREA,
PIKE COUNTY, MISSOURI

Jennifer Graves and J. Michael Jones

Department of Biology, Culver-Stockton College, Canton MO 63435

SPECIES	HABITAT*				SPECIES	HABITAT*			
	A	M	F	O		A	M	F	O
Amphibia					<i>Elaphe o. obsoleta</i>				u
Caudata					<i>Lampropeltis c. calligaster</i>			u	
<i>Ambystoma texanum</i>	ob	r	r		<i>Nerodia r. rhombifer</i>	u	u		
<i>Ambystoma t. tigrinum</i>	ob	r			<i>Nerodia s. sipedon**</i>	c	c		
<i>Siren intermedia nettingi**</i>	ob				<i>Regina grahamii**</i>				o
Anura					<i>Storeria dekayi wrightorum</i>			r	
<i>Bufo a. americanus</i>	cb	ub	o		<i>Thamnophis p. proximus**</i>			c	
<i>Bufo woodhousii fowleri</i>	cb	cb	o		<i>Thamnophis s. sirtalis**</i>			c	
<i>Acris crepitans blanchardi**</i>			ab	cb	<i>Thamnophis sirtalis</i>				r
<i>Pseudacris c. crucifer**</i>			ab	cb	<i>parietalis**</i>				
<i>Pseudacris t. triseriata</i>	ab	cb			<i>Crotalus horridus</i>			r	
<i>Rana blairi**</i>	u								
<i>Rana catesbeiana</i>	c	c			Key:				
<i>Rana clamitans**</i>	o	r			a	abundant or certain to be seen			
<i>Rana sphenoccephala</i>	c	a			ab	abundant when breeding			
<i>Hyla chrysoscelis / versicolor**</i>	r	r	c		c	common or should be seen			
					cb	common when breeding			
					u	uncommon or might be seen			
					ub	uncommon when breeding			
					o	occasional or seen but few times			
					ob	occasional when breeding			
					r	rare or unlikely to be seen			
Reptilia									
Testudines					Key to habitats (*):				
<i>Chrysemys picta bellii</i>	a	c			A	aquatic			
<i>Chelydra s. serpentina**</i>	o	o			M	marsh			
<i>Terrapene o. ornata**</i>			r		F	forest			
<i>Trachemys scripta elegans**</i>	a	c			O	outcrop			
<i>Apalone s. spinifer**</i>	o	o							
Squamata					**	denotes new Pike County record (according to Johnson, 1987).			
<i>Eumeces fasciatus**</i>				o					
<i>Carphophis amoenus vermis**</i>			r	r					
<i>Coluber constrictor flaviventris</i>				o					
<i>Diadophis punctatus arnyi</i>				u					

LCTA WETS SITE, WAPPAPELLO, BUTLER COUNTY, MISSOURI

R.L. Essner, Jr., A.J. Henderschott, and J.S. Scheibe

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AMPHIBIA

Caudata

*Ambystoma maculatum**
*Ambystoma opacum**
*Ambystoma talpoideum**
Plethodon albagula

Anura

*Bufo americanus**
*Bufo woodhousii**
*Acris crepitans**
*Hyla cinerea**
*Hyla chrysoscelis / versicolor***
*Pseudacris crucifer***
*Gastrophryne carolinensis**
*Rana catesbeiana**
*Rana clamitans**
*Rana sphenoccephala**

* Voucher specimen taken

** Butler County record

REPTILIA

Testudines

*Chrysemys picta**
Pseudemys concinna
*Terrapene carolina**
Trachemys scripta
*Sternotherus odoratus**

Squamata

Sceloporus undulatus
*Eumeces anthracinus***
Eumeces fasciatus
Eumeces laticeps
Scincella lateralis
Cnemidophorus sexlineatus

*Carphophis amoenus**
*Diadophis punctatus**
*Elaphe obsoleta**
*Heterodon platyrhinos**
*Lampropeltis getula**
Nerodia erythrogaster
Nerodia sipedon
*Thamnophis sirtalis**
*Virginia valeriae***
*Agkistrodon contortrix**
Agkistrodon piscivorus
Crotalus horridus

ADDITIONS TO THE BIBLIOGRAPHY OF AMPHIBIANS AND REPTILES IN MISSOURI

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Following is a list of references addressing the biology of amphibians and reptiles in Missouri which have been brought to my attention since the publication of Powell (1991, 1992, 1993, 1994) and Johnson (1987). Readers are requested to notify the author of any additional publications that should be included in future lists.

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