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

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

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.

HERPETOFAUNAL SURVEYS ..................................................................................................................... 14

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

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
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 southermost 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.

5
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 bishopei, 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 bishopei, 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. Populations 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

SMALLMOUTH SALAMANDER
Ambystoma texanum

EASTERN TIGER SALAMANDER
Ambystoma tigrinum tigrinum

THREE-TOED AMPHIUMA
Amphiuma tridactylum

DARK-SIDED SALAMANDER
Eurycea longicauda melanopleura

RED RIVER MUDPUPPY
Necturus louisianensis

WESTERN LESSER SIREN
Siren intermedia nettingi
PIKE CO: Ted Shanks Conservation Area (CSC).

Amphibia: Anura

FOWLER’S TOAD
Bufo woodhousii fowleri

EASTERN NARROWMOUTH TOAD
Gastrophryne carolinensis

GREEN TREEFROG
Hyla cinerea

NORTHERN SPRING PEEPER
Pseudacris crucifer crucifer

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).

GREEN FROG
Rana clamitans

EASTERN SPADEFOOT
Scaphiopus holbrookii holbrookii

Reptilia: Testudines

EASTERN SPINY SOFTSHELL
Apalone spinifer spinifer
PIKE CO: Ted Shanks Conservation Area (CSC).

COMMON SNAPPING TURTLE
Chelydra serpentina serpentina

WESTERN PAINTED TURTLE
Chrysemys picta bellii

SOUTHERN PAINTED TURTLE
Chrysemys picta picta
Chrysemys picta dorsalis

COOTER
Pseudemys concinna

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

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).


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

FIVE-LINED SKINK
Eumeces fasciatus

NORTHERN FENCE LIZARD
Sceloporus undulatus hyacinthinus

GROUND SKINK
Scincella lateralis

Reptilia: Squamata: Serpentes
WESTERN COTTONMOUTH
Agkistrodon piscivorus leucostoma

WESTERN WORM SNAKE
Carphophis amoenum vernis

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

TIMBER RATTLESNAKE
Crotalus horridus

GREAT PLAINS RAT SNAKE
Elaphe guttata emoryi

BLACK RAT SNAKE
Elaphe obsoleta obsoleta
PRAIRIE KING SNAKE
* Lampropeltis calligaster calligaster *

SPECKLED KING SNAKE
* Lampropeltis getula holbrooki *

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 *

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 *

NORTHERN LINED SNAKE
* Tropidoconion 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
Department of Biology, Culver-Stockton College, Canton MO 63435

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.

Literature Cited


SIZE RECORD FOR THE DIAMONDBACK WATER SNAKE,
Nerodia rhombifer

Christopher D. Schulse
Department of Biology, Culver-Stockton College, Canton MO 63435

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

**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

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>HABITAT*</th>
<th>A</th>
<th>M</th>
<th>F</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amphibia</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Caudata</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambystoma texanum</td>
<td>ob r r</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambystoma t. tigrinum</td>
<td>ob r</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Siren intermedia nettingi**</td>
<td>ob</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anura</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bufo a. americanus</td>
<td>cb ub o</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bufo woodhousii fowleri</td>
<td>cb cb o</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acris crepitans Blanchardi**</td>
<td>ab cb</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudacris c. crucifer**</td>
<td>ab cb</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudacris t. triseriata</td>
<td>ab cb</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rana blairi**</td>
<td>u</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rana catesbeiana</td>
<td>c c</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rana clamitans**</td>
<td>o r</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rana sphenoecephala</td>
<td>c a</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyla chrysoscelis / versicolor**</td>
<td>r r c</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reptilia</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Testudines</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chrysemys picta bellii</td>
<td>a c</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chelydra s. serpentina**</td>
<td>o o</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terrapene o. ornata**</td>
<td>r</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trachemys scripta elegans**</td>
<td>a c</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apalone s. spinifer**</td>
<td>o o</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Squamata</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eumeces fasciatus**</td>
<td>o</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carphophis amoenaus vermis**</td>
<td>r r</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coluber constrictor</td>
<td>o</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flaviventris</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diadophis punctatus arnyi</td>
<td>u</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>HABITAT*</th>
<th>A</th>
<th>M</th>
<th>F</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elaphe o. obsoleta</td>
<td>u</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lampropeltis c. calligaster</td>
<td>u</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nerodia r. rhombifer</td>
<td>u</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nerodia s. sipedon**</td>
<td>c c</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regina grahamii**</td>
<td>o</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storeria dekayi wrightorum</td>
<td>r</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thamnophis p. proximus**</td>
<td>c</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thamnophis s. sirtalis**</td>
<td>c</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thamnophis sirtalis parietalis**</td>
<td>r</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crotalus horridus</td>
<td>r</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Key:**

a abundant or certain to be seen  
ab abundant when breeding  
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

**Key to habitats (•):**

A aquatic  
M marsh  
F forest  
O outcrop

**•** denotes new Pike County record  
(according to Johnson, 1987).
### 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 sphenoecephala*

* 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

Compiled by

Robert Powell
Department of Natural Sciences, Avila College, Kansas City MO 64145

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.


Literature Cited