

The Amphibians and Reptiles of Logan County, Illinois

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ABSTRACT

Logan County, Illinois historically has received limited herpetological field work and is poorly represented in large museum collections. To gain additional insight into the distribution and abundance of Logan County herpetofauna, I surveyed twelve sites at least twice throughout the 2001 field season. One species of salamander, nine species of anurans, three species of turtles, and four species of snakes were encountered. Eight were new county records and four were updated county records. An additional two species were updated by field observations but were not vouchered. Five species (one turtle and four snakes) that historically had been present were not found. Possible reasons they were not observed include difficulty with trapping methods, the secretive behavior of the species and/or rarity. Additional species that may occur in Logan County but were not found are listed.

INTRODUCTION

The conversion of prairie and the draining of wetlands for agriculture began in Illinois over a century ago and has permanently altered the Illinois landscape. At present, only 0.01% of the original tall grass prairie remains and only 3% of the wetlands remain, with only 0.016% of that classified as approaching pristine (Illinois Department of Energy and Natural Resources 1994). The quality of flowing water has deteriorated in Illinois, leading to state-wide extirpations of many species of fish (19%), amphibians and reptiles (34%), freshwater mussels (55%), and crayfish (22%) (Illinois Department of Energy and Natural Resources 1994). These conditions increase the need for species inventories, not only to document what is or is not currently present, but also to document the increase or decline of various species presence over time.

Our early understanding of the geographic distribution of Illinois amphibians and reptiles is largely due to the comprehensive work of Smith (1961). In the last decade, numerous contributions have updated and closed distributional gaps of Illinois herpetofauna at both regional (Tucker 1994, Wilson 1999, Markezich and Beckett 2001) and statewide (Redmer and Ballard 1995; Petzing et al. 1998, 2000) levels. Unfortunately, these contributions lacked data regarding species abundance, but this information often can be obtained through other sources (e.g., Ludwig et al. 1992, Anton 1999, Thurow 1999). Some

counties in Illinois historically have received limited organized field work. Frequently, the predominance of row crops in a county decreases its herpetological appeal, and access often is diminished due to private ownership of the land. As a consequence, little is known about the herpetofauna in some of these counties and many of the species probably occurring in them have not been documented. Logan County is a good example because roughly 94% of the county comprises privately owned cropland and grassland (Illinois Department of Natural Resources 1996), and has received little organized field work.

Logan County is in central Illinois and is bordered by Tazewell, Mason, Menard, Sangamon, Macon, DeWitt, and McLean counties (Figure 1). Few lakes are located within the county, but several small ponds are present. It is drained by five creeks: Deer, Kickapoo, Prairie, Salt, and Sugar. The dominant land use in Logan County is agriculture, as it is in most of central Illinois. It is estimated that 85% of the total acreage in Logan County was still prairie in 1820, but by 1980 no prairie remained and 80-89% of its wetland was lost (Illinois Department of Energy and Natural Resources 1994). At present, 80.2% of its total acreage is devoted to row crops and only 1.5% to wetland (Illinois Department of Natural Resources 1996). The number of acres of Logan County farmland receiving herbicide, insecticide, and commercial fertilizer has increased markedly in the last 30 years (Illinois Department of Energy and Natural Resources 1994) and these chemicals are known to have a variety of negative effects on amphibians and reptiles (Cowman and Mazanti 2000). Land conversion, extensive agricultural practices, and habitat loss are important links to amphibian declines (Vial and Saylor 1993). In such an agriculture-dominated habitat, animals with low vagilities (such as many amphibians and reptiles) face the threat of local extirpation due to loss of breeding habitat and other resources (Minton 1968, Thurow 1999).

Previous collection efforts in Logan County have documented six species of amphibians and eight species of reptiles (Phillips et al. 1999). Although these records are vouchered, many are over 30 years old. Some of these species may be rare or no longer present, and many unrecorded (new county records). I conducted the survey primarily during the 2001 field season with the objective to revise the species list and to provide insight into the distribution and abundance of the herpetofauna.

METHODS

Several localities were chosen initially by examining topographic maps for wooded areas, small ponds, and creeks. Once visited, the prospective value of these sites to harbor amphibians and reptiles was evaluated by observing the vegetation, ground cover, surrounding habitat, water source, availability of basking sites, etc. If a site appeared suitable, permission to census periodically was requested from the landowner. Some sites were located by chance during road surveys (i.e., observed a DOR specimen or heard a frog chorus while night-driving, etc.).

At the request of property owners, no drift fences were erected for pitfall or funnel traps; therefore, other surveying techniques were employed. Night-driving surveys were conducted to listen for anuran breeding choruses. Species were identified by their species specific calls and numerous specimens were caught by hand for verification. Chorus

sizes were estimated while walking through the chorus and were classified as small (1-15 individuals), medium (16-30 individuals) or large (30+ individuals). Salamanders were surveyed in suitable habitat (primarily ambystomids in temporary pools) by searching for egg masses. If egg masses were found, a visual encounter survey was conducted for adults along the periphery of the pool under appropriate cover objects (e.g., rotten logs). Little time was devoted to searching for plethodontid salamanders because their occurrence in the region was considered unlikely. Snakes were surveyed at suitable sites (e.g., grasslands, wooded areas, ponds) by inspection of potential basking areas, cover objects, and by the chance observation of a DOR specimen during road sampling. Turtles were surveyed by visually inspecting potential basking areas in ponds and creeks using binoculars. If turtles were observed, 2.5 ft. diameter nylon turtle traps baited with sardines were set to obtain voucher specimens of young turtles when possible. If adults were too large to preserve, photographic vouchers were taken. Specimens were preserved using standard methods (McDiarmid 1994) and deposited in the Illinois Natural History Survey (INHS) in Champaign.

All species found have been included in this report, but specimen catalog numbers are only provided for new and updated county records. Updated county records were defined as observation of a species that has not been documented in Logan County for at least twenty years, a standard adopted by Phillips et al. (1999). The status of Logan County specimens was determined by accessing museum collection records from the Chicago Academy of Sciences (CA), the Field Museum of Natural History (FMNH), the Illinois Natural History Survey (INHS), the Illinois State Museum (ISM), the Louisiana State University Museum of Zoology (LSUMZ), the University of Illinois Museum of Natural History (UIMNH), and the University of Michigan Museum of Zoology (UMMZ).

RESULTS

Twelve sites within or in close proximity to deciduous forest were surveyed at least twice (Table 1, sites 1-12) during the 2001 field season. Ten additional sites are considered incidental because they were either surveyed only once or are the result of a DOR observation (Table 1, sites 13-22). Locality data for all sites are given in Table 1. A total of one species of salamander, nine anuran species, three turtle species, and four snake species were found during this survey (Table 2). Eight new county records and four updated county records were documented. Two additional species were updated by field observations but were not vouchered. All six species of amphibians previously known to occur in Logan County were found (see Phillips et al. 1999), often at several localities. In addition, four species were new county records (*Ambystoma texanum*, *Pseudacris crucifer*, *P. triseriata*, and *Hyla versicolor/H. chrysoscelis complex*). Only three of the eight reptiles previously known to occur in Logan County were found (see Phillips et al. 1999). All three were snakes and contributed updated records. One-hundred thirteen trap hours were devoted to turtles. Three turtle species (*Chelydra serpentina*, *Chrysemys picta*, *Trachemys scripta*) and one snake (*Storeria dekayi*) were new county records. This survey elevates the known number of species in the county from fourteen to twenty-two. A revised species list for Logan County herpetofauna and all sites where they were found during this survey is provided in Table 2.

Abundance data were provided for use as a baseline for future amphibian and reptile surveys in Logan County. The seventeen amphibians and reptiles encountered during this survey were ranked according to their relative abundance in the county according to their presence at the twelve survey sites that were examined at least twice (sites 1-12 in Table 1). Species were considered rare/uncommon if they were found at only one locality, locally common if they were found at 2-4 localities, common if they were found at 5-7 localities, and abundant if they were found at eight or more localities.

SPECIES ACCOUNTS

Species Found During This Survey

AMPHIBIANS

Smallmouth salamander, *Ambystoma texanum*. New county record (INHS 17072). This medium-sized mole salamander breeds mainly in ephemeral lentic habitats from February to March in Illinois (Smith 1961) and tends to be an explosive breeder. It was locally common in Logan County. Four adults were observed at site 2 (two were vouchered), and numerous egg masses were observed at three sites (2, 3, and 6) dispersed throughout the county. All three sites were ephemeral pools that were dry by May. Because smallmouth salamander larvae are known to begin metamorphosis by late May in Illinois (Cagle 1942, Smith 1961, Parmelee 1993), many of the larvae may not have transformed before the pools dried.

American toad, *Bufo americanus*. This toad was abundant and widely distributed. Eight sites (1, 3, 4, 9-13) harbored large choruses from April to June and an adult was observed incidentally at site 15. All sites were permanent ponds bordered by deciduous forest.

Fowler's toad, *Bufo fowleri*. This toad appeared to be rare/uncommon in Logan County. From site 9 on 16 June, the distinct nasal call of two male Fowler's toads was heard approximately 0.9 km E of the intersection of Co. Rd. 1250E and Co. Rd. 2500N. No voucher specimen was taken due to the low number heard. Since the only known voucher specimen was collected in 1953 (INHS 7176) 9.6 km north of Lincoln, this field observation updates the record.

Northern cricket frog, *Acris crepitans*. This frog was abundant throughout the county from April to October. Eight sites (1, 3-5, 9-11, and 13) harbored large choruses and 26 individuals were observed along Sugar Creek at site 20 and 21 in October of 2000.

Gray treefrog complex, *Hyla versicolor* - *H. chrysoscelis*. New county record (INHS 17152). This complex was abundant throughout the county. Nine sites (1, 3, 4, 6, 9-13) harbored breeding choruses during April and May; some smaller choruses persisted into June. Six of these sites (1, 3, 9-12) harbored large choruses, two sites (4 and 13) harbored medium-sized choruses, and a few males were heard calling near site 6. The voucher specimen was taken from site 1. Most of these sites are permanent ponds, but sites 6 and 13 are ephemeral pools close to Kickapoo and Sugar creeks, respectively. Because the gray treefrogs in Illinois (*Hyla versicolor* and *H. chrysoscelis*) can not be

distinguished morphologically, call analyses or karyotyping must be performed to reliably decipher between them.

Spring peeper, *Pseudacris crucifer*. New county record (INHS 17074). This early breeding chorus frog was rare/uncommon in Logan County. Although elsewhere it often breeds in similar habitat at approximately the same time as the western chorus frog *Pseudacris triseriata* (Conant and Collins 1991, personal observation), I only heard one small chorus at site 2 in late March.

Western chorus frog, *Pseudacris triseriata*. New county record (INHS 17075). This early breeding chorus frog was abundant throughout the county. Eleven sites (1-8, 11-13) harbored large choruses from March to April in a variety of aquatic habitats ranging from temporary pools to permanent ponds; all breeding sites were surrounded by deciduous forest. The voucher was taken from site 2.

Plains leopard frog, *Rana blairi*. This species of leopard frog appeared to be locally common. It was found at two sites; site 11 (a permanent pond) harbored a medium-sized chorus in April and four specimens were observed on a trail along Salt Creek at site 8 in June.

Bullfrog, *Rana catesbeiana*. Updated county record (INHS 17076). This large ranid was common and widespread throughout the county. Seven sites (1, 3, 4, 9-11, 13) harbored sizeable breeding choruses in permanent ponds from April to June, and one male was DOR at site 22. The voucher specimen was from site 3. The last previous voucher specimen was collected in 1953 (INHS 7174) 9.6 km north of Lincoln.

Southern leopard frog, *Rana sphenoccephala*. This ranid appeared to be rare/uncommon in Logan County. Only one chorus was found at site 4. A single male was heard calling in late March and a large chorus was heard from April to May. This site is a permanent pond dominated by cattails (*Typha* sp.) at the west end. No voucher specimen was collected due to an agreement with the property owner. Since the only known voucher specimen was collected in 1908 (INHS 1149) from "Lincoln", this field observation updates the record.

REPTILES

The abundances of snakes were not estimated because so few were found.

Common snapping turtle, *Chelydra serpentina*. New county record (INHS Herpetological Slide 2001.01). Although this species is probably common throughout the county in suitable habitat (Smith 1961), it was found at only two sites. Therefore, it is considered locally common. Two large adults were trapped after 7 trap hours at site 1 on 22 April and released. A photographic voucher was taken due to their large size. Two other adults were trapped within 20 trap hours at site 11 and subsequently were released.

Painted turtle, *Chrysemys picta*. New county record (INHS 17150). This conspicuous turtle was locally common and often was observed basking on logs in permanent ponds and slow moving creeks. Four sites (3, 9-11) harbored this species. One specimen was vouchered at site 11 after 9.5 trap hours and another specimen was caught at site 9 after

19 trap hours. Four additional specimens were observed basking at site 10 and two at site 3.

Red-eared slider, *Trachemys scripta*. New county record (INHS 17351). Although this species appeared to be rare/uncommon, it may have been more common than this survey reveals due to favorable habitat and food sources in the area. Only site 8 was found to harbor this species. Two individuals were observed basking at site 8 on June 17 and three individuals were captured after 42.5 trap hours on 24 June. The youngest was vouchered.

Northern water snake, *Nerodia sipedon*. Updated county record (INHS 17151). One individual of this species was observed crossing Co. Rd. 1600 E at site 17 in April. It may be more prevalent than this survey reveals due to the presence of favorable habitat and food supply, and its tolerance of disturbed habitats. The last previous voucher specimen was collected in 1967 (FMNH 208229) 3.2 km north of Hartsburg.

Brown snake, *Storeria dekayi*. New county record (INHS 17153). Two DOR specimens were found within 5 km of each other in April. The voucher specimen was found 2.5 km north-northwest of Lawndale near water and deciduous forest at site 16, and the second was found 3.6 km southeast of Union amidst corn fields at site 14.

Common garter snake, *Thamnophis sirtalis*. Updated county record (INHS 17353). One DOR specimen was vouchered near site 18 on 13 September 2000. Another individual was found basking on an old pile of lumber at site 4 on 5 May 2001. The last previous voucher specimen was collected in 1957 (INHS 8748) 10.4 km east of Lincoln.

Plains garter snake, *Thamnophis radix*. Updated county record (INHS 17352). One DOR specimen was found near site 19 in June. The last previous voucher specimen was collected in 1976 (UMMZ 142860) north-northeast of Lincoln.

Species Not Found During This Survey But Present Historically

REPTILES

Spiny softshell, *Apalone spinifera*. The last known voucher specimen was collected in 1953 by W. L. Burger 9.6 km north of Lincoln (INHS 7172). This aquatic turtle prefers rivers but often is found in lakes and creeks where sand and mudbars are present. Favorable habitat may exist in Logan County, particularly at Rocky Ford Bridge along Salt Creek, but trapping was difficult due to the swift current. Only two specimens are known from Logan County (INHS 7171, 7172).

Prairie kingsnake, *Lampropeltis calligaster*. The last known voucher specimen was collected in 1956 by L. J. Stannard near Elkhart (INHS 8083). This medium-sized snake is a predator on rodents and often is found in developed habitat similar to that of the bullsnake. Three specimens are known from Logan County (CA 10978; INHS 3194, 8083).

Bullsnake, *Pituophis melanoleucus*. The last known voucher specimen was collected in 1957 by P. W. Smith near Lincoln (INHS 8512). This large snake occurs in a variety of

habitats, generally preferring open areas with sandy or loamy soil. It often inhabits clumps of vegetation and mammal burrows in search of rodents and is also common around granaries and vacant farm buildings. Three specimens are known from Logan County (INHS 8512; UIMNH 16631, 16632).

Graham's crayfish snake, *Regina grahami*. The only known voucher specimen was collected in 1959 by S. D. Lee, 13-16 km south of Lincoln (LSUMZ 8847). This medium-sized snake inhabits the margins of ponds and creeks. Despite apparently suitable habitat in Logan County, no specimen was found. Because a favorite food of this species is crayfish, it often hides in holes of muddy stream banks and crayfish chimneys, making them fairly elusive.

Massasauga, *Sistrurus catenatus*. The only known voucher specimen was collected in 1941 by D. Schoup near Broadwell (FMNH 38244). This state-endangered venomous snake (Illinois Endangered Species Protection Board 1999) prefers wet prairies but also occurs in dry woodlands. Since massasaugas utilize crayfish holes and underground cavities for shelter, they can be fairly elusive and overlooked in short-term surveys. Chris Phillips of the Illinois Natural History Survey currently is involved with a research project on massasaugas in Illinois and confirms that both the disappearance of habitat and human persecution are responsible for its rarity, and he believes that the massasauga has likely been extirpated from Logan County (personal communication).

Species Not Found During This Survey But Possibly Present

Several species that have not been found in Logan County occur in surrounding counties (see Figure 1). The species most likely to be encountered are listed here if appropriate habitats occur in Logan County.

AMPHIBIANS

Mudpuppy, *Necturus maculosus*. These neotenic salamanders are found in a wide variety of permanently aquatic habitats ranging from lagoons to rivers and are known to occur in Sangamon, Macon, and McLean counties. Smith (1961) noted that mudpuppies were probably abundant in suitable streams in every Illinois county.

Green frog, *Rana clamitans*. This species is common in ponds, lakes, and streams in northern Illinois but becomes more sporadic in the central region of the state (Smith 1961). It has been known in Tazewell, Mason, and Macon counties. On the evening of 23 June 2001, a small chorus of what is believed to be green frogs was heard amidst a large chorus of bullfrogs *Rana catesbeiana* at site 1. Due to the cool temperatures, the frogs were calling sporadically, making it difficult to locate them. All rapid frogs caught by hand to verify species identification were bullfrogs.

REPTILES

Ornate box turtle, *Terrapene ornata*. This turtle prefers treeless, sandy plains with scattered low brush but may enter woodlands along streams (Ernst et al. 1994). It frequently is found in the sand areas in central Illinois (Smith 1961) and has been collected in Tazewell, Mason, and Sangamon counties. At least two areas may harbor this species;

some sandy areas along Salt Creek are near woodland, and prairie-like habitat exists near site 13.

Racer, *Coluber constrictor*. This large snake has been found in all counties surrounding Logan County.

Fox snake, *Elaphe vulpina*. Historically found in Mason, DeWitt, and McLean counties, this snake is known to inhabit heavily farmed habitat (Smith 1961). This species is most likely to be found DOR because of its proclivity for roads.

Milk snake, *Lampropeltis triangulum*. This snake has been found historically in Tazewell, Menard, DeWitt, and McLean counties, where it frequently is found in forests, fields, and barns.

DISCUSSION

A total of one species of salamander, nine anurans, three turtles, and four snakes were found during this survey, elevating the known species list from fourteen to twenty-two amphibians and reptiles. Eight new county records and four updated county records were documented. Two additional species have been updated by field observations but not vouchered.

The four species of snakes and one species of turtle that were present historically in Logan County (but were not found during this survey) have not been vouchered for over 40 years. Although this may be an indication of their rarity or absence from the county, any conclusions regarding the status of these species is poorly based since this survey was conducted over only one field season and fewer than eight man-hours were spent conducting visual encounter surveys for snakes. Therefore, their absence from this survey can not rule out their existence within the county.

Several species have been found in surrounding counties, but never documented in Logan County despite apparently suitable habitat. Although other species not included in this list may possibly be present, this list was designed to indicate the species most likely to be found. Further fieldwork may reveal the presence of these and other species.

Eight sites that were examined harbored a diversity of herpetofauna: site 9 and 11 (eight species), sites 3 and 4 (seven species), sites 10 and 13 (five species), site 1 (four species), and site 8 (three species). All of these sites, with the exception of site 13, are small permanent ponds bordered by deciduous forest. The other sites (2, 6, 7, and 12) are ephemeral bodies of water and most were dry by May. Therefore, only a limited number of species could utilize these sites, particularly early breeding amphibians such as *Ambystoma texanum*, *Bufo americanus*, *Pseudacris crucifer*, and *P. triseriata*. No other species of amphibian or reptile were observed at these sites. The remaining survey sites could be classified as incidental sites (i.e., DOR specimens or aural location of chorus, etc.).

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Figure 1. Logan County and its surrounding counties.

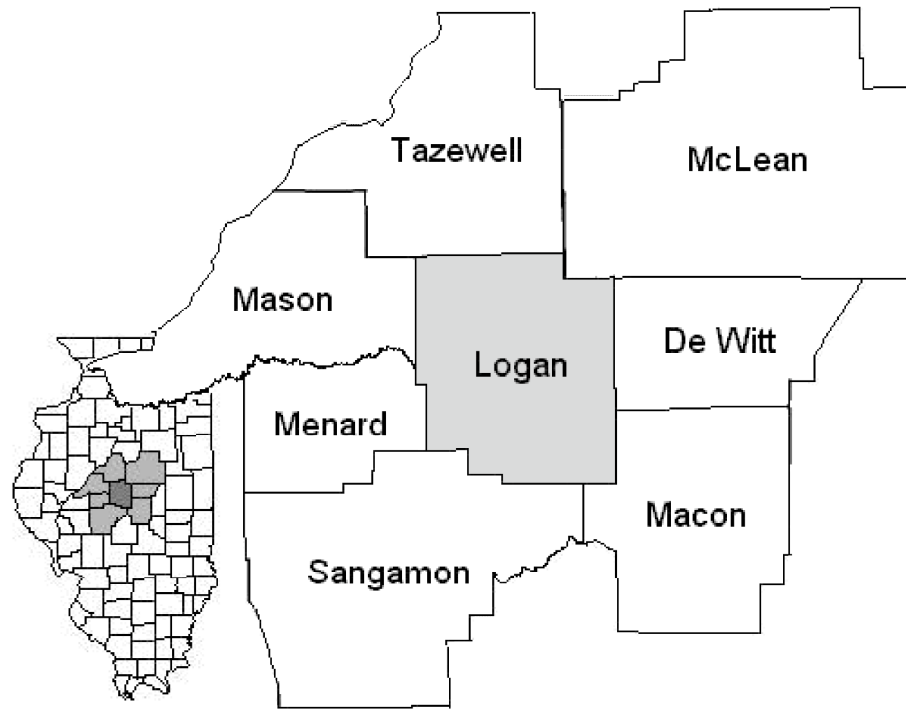


Table 1. Locality data for both major and incidental survey sites.

SITE NUMBER	SITE NAME	QUADRANGLE	LATITUDE/ LONGITUDE
1	Bellrose Pond	Armington	NW1/4 NW1/4 Sec. 21, T21N, R2W
2	Big Oak Hunting Paradise	Middletown	NW1/4 NE1/4 Sec. 16, T19N, R4W
3	Gates Pond	Armington	NW1/4 SW1/4 Sec. 8, T21N, R2W
4	Leith Pond	Middletown	NW1/4 SE1/4 Sec. 11, T19N, R4W
5	Lincoln University	Lincoln East	SE1/4 SE1/4 Sec. 6, T20N, R2W
6	Morrow Pond	Lincoln East	SW1/4 SW1/4 Sec. 5, T20N, R2W
7	Muck Pond	Broadwell	NW1/4 NE1/4 Sec. 7, T19N, R3W
8	Quarry Ponds	Broadwell	NE1/4 NE1/4 Sec. 7, T19N, R3W
9	Quisenberry Pond	Armington	NE1/4 NW1/4 Sec. 17, T21N, R2W
10	Sprague Pond	Armington	NW1/4 SW1/4 Sec. 8, T21N, R2W
11	Thompson Pond	Armington	SW1/4 SE1/4 Sec. 2, T21N, R2W
12	Vannoy Pond	Armington	NE1/4 NE1/4 Sec. 20, T21N, R2W
13	Bellrose Marsh	Armington	SW1/4 SW1/4 Sec. 16, T21N, R2W
14	Bellrose 2400N	Armington	SW1/4 SW1/4 Sec. 16, T21N, R2W
15	Elkhart Hill	Broadwell	NW1/4 SE1/4 Sec. 7, T18N, R3W
16	Lawndale	Lincoln East	SE1/4 SE1/4 Sec. 27, T21N, R2W
17	Mount Joy	Armington	NE1/4 NE1/4 Sec. 10, T21N, R2W
18	Pine Lake	Chestnut	NE1/4 SE1/4 Sec. 5, T18N, R1W
19	Rocky Ford	Lincoln West	NE1/4 SE1/4 Sec. 6, T19N, R3W
20	Sugar Creek Enterprises	Armington	SE1/4 NE1/4 Sec. 9, T21N, R2W
21	Weaver Bridge	Armington	NE1/4 NE1/4 Sec. 3, T21N, R2W
22	Weaver 1600E	Armington	SE1/4 NE1/4 Sec. 3, T21N, R2W

Table 2. Revised checklist and localities of herpetofauna in Logan County.

SPECIES	SITE(S)*
AMPHIBIANS	
<i>Ambystoma texanum</i>	2, 3, 6
<i>Bufo americanus</i>	1, 3, 4, 9, 10, 11, 12, 13, 15
<i>Bufo fowleri</i>	Near 9
<i>Pseudacris triseriata</i>	1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13
<i>Pseudacris crucifer</i>	2
<i>Acris crepitans</i>	1, 3, 4, 5, 9, 10, 11, 13, 20, 21
<i>Hyla versicolor</i>	1, 3, 4, 6, 9, 10, 11, 12, 13
<i>Rana sphenoccephala</i>	4
<i>Rana blairi</i>	11
<i>Rana catesbeiana</i>	1, 3, 4, 9, 10, 11, 13, 22
REPTILES	
<i>Lampropeltis calligaster</i>	n/a^
<i>Nerodia sipedon</i>	17
<i>Pituophis melanoleucus</i>	n/a
<i>Regina grahami</i>	n/a
<i>Sistrurus catenatus</i>	n/a
<i>Storeria dekayi</i>	14, 16
<i>Thamnophis sirtalis</i>	4, 18
<i>Thamnophis radix</i>	19
<i>Apalone spinifera</i>	n/a
<i>Chrysemys picta</i>	3, 9, 10, 11
<i>Trachemys scripta</i>	8
<i>Chelydra serpentina</i>	1, 11

Legend:

* Refer to Table 1 for locality information

^ n/a = historically found but not detected by this survey

