Herpetofaunal Survey of Illinois Audubon Society Lusk Creek Tract, with Emphasis on State-listed Species

Report by:

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Abstract

The composition of the amphibian and reptile fauna of the Illinois Audubon Society's Lusk Creek Tract was evaluated between August 2009 and June 2010. Survey effort focused on three rare species: mudpuppy (*Necturus maculosus*), timber rattlesnake (*Crotalus horridus*), and smooth softshell turtle (*Apalone mutica*). Sampling techniques included visual encounter surveys, coverboard sampling, and aquatic trapping. A total of 24 herpetofaunal species (11 amphibian and 13 reptile) were detected during 14 field days. The most commonly detected species include longtail salamander (*Eurycea longicauda*), slimy salamander [*Plethodon glutinosus*]), American toad (*Bufo americanus*], bullfrog (*Rana catesbeiana*), green frog (*Rana clamitans*), red-eared slider (*Trachemys scripta*), snapping turtle (*Chelydra serpentina*), ground skink (*Scincella lateralis*], fence lizard (*Sceloporus undulatus*), ringneck snake (*Diadophis punctatus*), and northern water snake (*Nerodia sipedon*). None of the targeted, state-listed herpetofaunal species were encountered. However, three spawning aggregations of the state-threatened least brook lamprey (*Lampetra aepyptera*) were observed.

Introduction

In April 2007, the Illinois Audubon Society purchased a 57-acre tract in Pope County, Illinois (T11S, R6E, E ½ of NW ¼ of Section 27; Figure 1). Because the property is an in-holding within the Lusk Creek Wilderness Area, Shawnee National Forest, its purchase by a conservation organization presents an opportunity to protect and manage the site consistent with wilderness values. The tract contains a variety of habitats including rocky intermittent streams, Lusk Creek (shallow, rock-bottomed portions and deep, sand-silt bottomed portions), sandstone bluffs, forested (oak-hickory-sugar maple) talus slopes, grass-shrub fields, riparian canebrakes, and sandstone prickly-pear glades. The tract provides potential habitat for a variety of amphibians and reptiles, including several state-listed species. Listed species potentially occurring on-site include: mudpuppy (*Necturus maculosus*), timber rattlesnake (*Crotalus horridus*), and smooth softshell turtle (*Apalone mutica*). The uplands, particularly the forested talus slopes and bluffs provide potential hibernacula, foraging habitat, and birthing sites for timber rattlesnakes. Lusk Creek provides potentially suitable habitat for mudpuppies and smooth softshell turtles.

The specific objectives of this project include: 1) determine the composition of the amphibian and reptile community occupying the Illinois Audubon Society's Lusk Creek Tract, and 2) determine which, if any, state-listed amphibian or reptile species occupy the tract.

Survey Dates and Methodology

Prior to initiation of field work, I acquired a list of the 59 amphibian and reptile

species known to occur in Pope County from the Illinois Natural History Survey website (accessed 20 August 2009). I obtained two additional Pope County species records by examining the Geographic Distribution section in the 1999-2009 issues of Herpetological Review. I also reviewed Thompson's list of vertebrates he observed near Lusk Creek during the summer of 1967 (Thompson 1972). Presently, a total of 61 amphibian and reptile species are documented from Pope County (59.8% of the 102 herpetofaunal species known to occur in Illinois). However, due to the relatively small size of the tract and limited number of habitat types, all 61 species of amphibians and reptiles known from Pope County would not be expected to occur on-site. I made nine visits to the tract on the following dates: 23 August 2009, 12-13 September 2009, 20-21 October 2009, 31 March-1 April 2010, 13 April 2010, 25 April 2010, 15-16 May 2010, 26 May 2010, and 8-9 June 2010.

Visual Encounter Surveys: I conducted visual encounter surveys by visually scanning terrestrial and aquatic habits (with the aid of binoculars for distance viewing, and a flashlight for investigating crevices in bedrock and gaps between embedded rocks and soil), as well as by examination of the undersurface of natural objects such as rocks and logs, and artificial cover objects. I conducted undersurface examination of natural cover objects both terrestrially and aquatically. I replaced displaced cover objects.

On 20 October 2009, I placed eight artificial cover objects (i.e., coverboards) at the western edge of the west field near the entrance gate. I placed coverboards 10 m apart and arranged them, north-south, as follows: sheet of corrugated roofing tin (0.65 m x 2.45 m), sheet of corrugated roofing tin, plywood board (1.9 cm-thick, 0.25 m x 1.6 m), sheet of corrugated roofing tin, plywood board (0.6 cm-thick, 0.5 m x 1.2 m), sheet of corrugated roofing tin, wood board (2.5 cm thick, 0.3 m x 2.2 m), and plywood board (0.6 cm thick, 0.45 m x 1.2 m). The northern-most coverboard was located at 37°32'18.8"N, 88°32'17"W and the southern-most at 37°32'16.5"N, 88°32'17"W.

I documented each species photographically when feasible (Appendix I). I released all amphibians and reptiles following capture. Species were identified visually or, in the case of some frog species, aurally. I tallied all individuals observed or heard, except for anuran larvae which were often too abundant to realistically count (e.g., toad tadpoles). In cases of brief sightings (e.g., salamander or lizard eluding capture or frog leaping into water), identification was made to genus (i.e., *Apalone* sp., *Eurycea* sp., *Eumeces* sp. and *Rana* sp.). *Apalone* sp. was either smooth softshell turtle (*Apalone mutica*) or spiny softshell turtle (*Apalone spinifera*), *Eurycea* sp. was either two-lined salamander (*Eurycea cirrigera*) or longtail salamander (*Eurycea longicauda*), *Eumeces* sp. was either five-lined skink (*Eumeces fasciatus*) or broadhead skink (*Eumeces laticeps*), whereas *Rana* sp. could have been bullfrog (*Rana catesbeiana*), green frog (*Rana clamitans*), or southern leopard frog (*Rana sphenocephala*).

On 25 May 2010, nine students from the Southern Illinois University herpetology class helped me survey Lusk Creek for mudpuppies. Lusk Creek was relatively high and swift-flowing, providing ideal conditions for kick sampling. Holding fine-mesh d-frame dipnets or a 1 m x 1 m fine-mesh kick net downstream of large rocks or riffles, we kicked through riffle-rocks towards the nets or lifted large rocks and stirred the area beneath. Displaced animals were swept by the current into the nets.

Trapping: I surveyed Lusk Creek for turtles and mudpuppies using two different trap types. I surveyed for mudpuppies using baited, 43 cm x 23 cm rectangular, 3-mm nylon mesh minnow traps having 5-cm diameter interior funnel openings at each end. I baited each trap with canned sardines packed in water. I set eight traps in pools one day and removed them the next. Traps were completely submerged in September and October when snake activity was low. In May, submerged traps were set only in deep pools to reduce the likelihood of capturing snakes. In June, the upper ¼ of all traps remained above the water surface. I employed eight traps on the following dates: 12-13 September 2009, 20-21 October 2009, 15-16 May 2010, and 8-9 June 2010 (four times overnight = 32 trap-nights).

I trapped for turtles in deep pools using a baited 2.54-cm mesh, 76.2-cm diameter, single-throated hoop net and a baited 2.54-cm mesh, 55.9-cm diameter, double-throated hoop net. I baited hoop nets with whole fish or sections of large fish. I set hoop nets such that captured turtles had access to air. I set two traps in pools one day and removed them the next. I employed traps on the following dates: 12-13 September 2009, 15-16 May 2010, and 8-9 June 2010 (three times overnight = 6 trap-nights).

Results and Discussion

I detected 322 individuals of 11 amphibian and 13 reptile species on-site (Table 1), and two additional species in the vicinity of the property. The species observed nearby (wood frog [*Rana sylvatica*] and eastern garter snake [*Thamnophis sirtalis*]) may also occur on the Audubon tract. I detected all species occurring on the Audubon property visually except spring peeper (*Pseudacris crucifer*) and gray treefrog (*Hyla chrysoscelis*). I detected spring peepers by call only and gray treefrogs by call and the presence of egg masses. The number of amphibian species inhabiting the Lusk Creek tract is likely limited by the paucity of lentic (non-flowing) aquatic breeding sites (e.g., ponds). The only lentic aquatic habitats available for breeding are backwater pools in Lusk Creek, pools in the intermittent streams, and temporary pools on the glades. All of these pools, however, are subject to transformation to swift-flowing waters following rain events.

The herpetofaunal species observed are typical of habitats occurring on the Lusk Creek Tract. The most commonly observed species per taxonomic group include

two salamanders (longtail salamander and slimy salamander [*Plethodon glutinosus*]), three anurans (American toad [*Bufo americanus*], bullfrog, and green frog), two turtles (red-ear [*Trachemys scripta*] and snapping [*Chelydra serpentina*]), two lizards (ground skink [*Scincella lateralis*] and fence lizard [*Sceloporus undulatus*]), and two snakes (ringneck [*Diadophis punctatus*]), and northern water [*Nerodia sipedon*]); Table1). Frequent observations of these species does not necessarily translate to greater abundance than other, less frequently-observed species. Their perceived abundance may reflect greater detectability rather than greater population size.

Thompson (1972) surveyed vertebrates of upper Lusk Creek and its environs during a summer (June 15-September 15) 1967 survey. His survey area encompassed approximately ¼ mile on either side of Lusk Creek upstream from Eddyville Road (Thompson 1972). Thompson (1972) observed 13 species of amphibians and 14 species of reptiles (Table 2). Although our species lists have considerable overlap, we each detected species that the other did not (Table 2). When including species I observed both on and off the Lusk Creek tract, my amphibian list is nearly identical to that of Thompson (1972). The single exception is the spadefoot toad (*Scaphiopus holbrookii*), which Thompson (1972) observed at only one location. Breeding habitat for spadefoot toads does not occur on the Lusk Creek tract.

Thompson (1972) observed two species of lizard, and four species of snake that I did not (Table 2). I encountered one species of turtle and four species of snake that Thompson (1972) did not observe (Table 2). My survey area was just a fraction of that of Thompson's (1972) which may have limited opportunities to observe some of the species detected by Thompson.

Previous Pope County reports for the three focus species of this survey include the following. On 15 February 2006, Diane Shasteen collected a juvenile mudpuppy in Lusk Creek, downstream of the Audubon property. This was the first scientific report of the mudpuppy for Pope County (Shasteen 2006). The mudpuppy was captured during shallow-water sampling for larval and adult least brook lampreys (*Lampetra aepyptera*; Brooks Burr, personal communication 2009). Smith (1961) included a 1937 literature record for a smooth softshell turtle observed at Golconda. Because Lusk Creek joins the Ohio River at Golconda, the turtle may have been taken in either stream. Mike Maynard, the previous owner of the Audubon tract, observed an adult timber rattlesnake on the property near his cabin (personal communication 2009).

Mudpuppies may be rare in upper Lusk Creek. Thompson (1972) did not encounter any and, despite extensive sampling of suitable habitat, Shasteen encountered only one (Brooks Burr, personal communication 2009). Mudpuppies are, however, commonly encountered in the Ohio River near Metropolis, Illinois (Jeffrey Stewart, personal communication 2010). Mudpuppies may prefer deeper water than occurs in upper Lusk Creek and might inhabit the

deeper portions of Lusk Creek downstream of Eddyville Road.

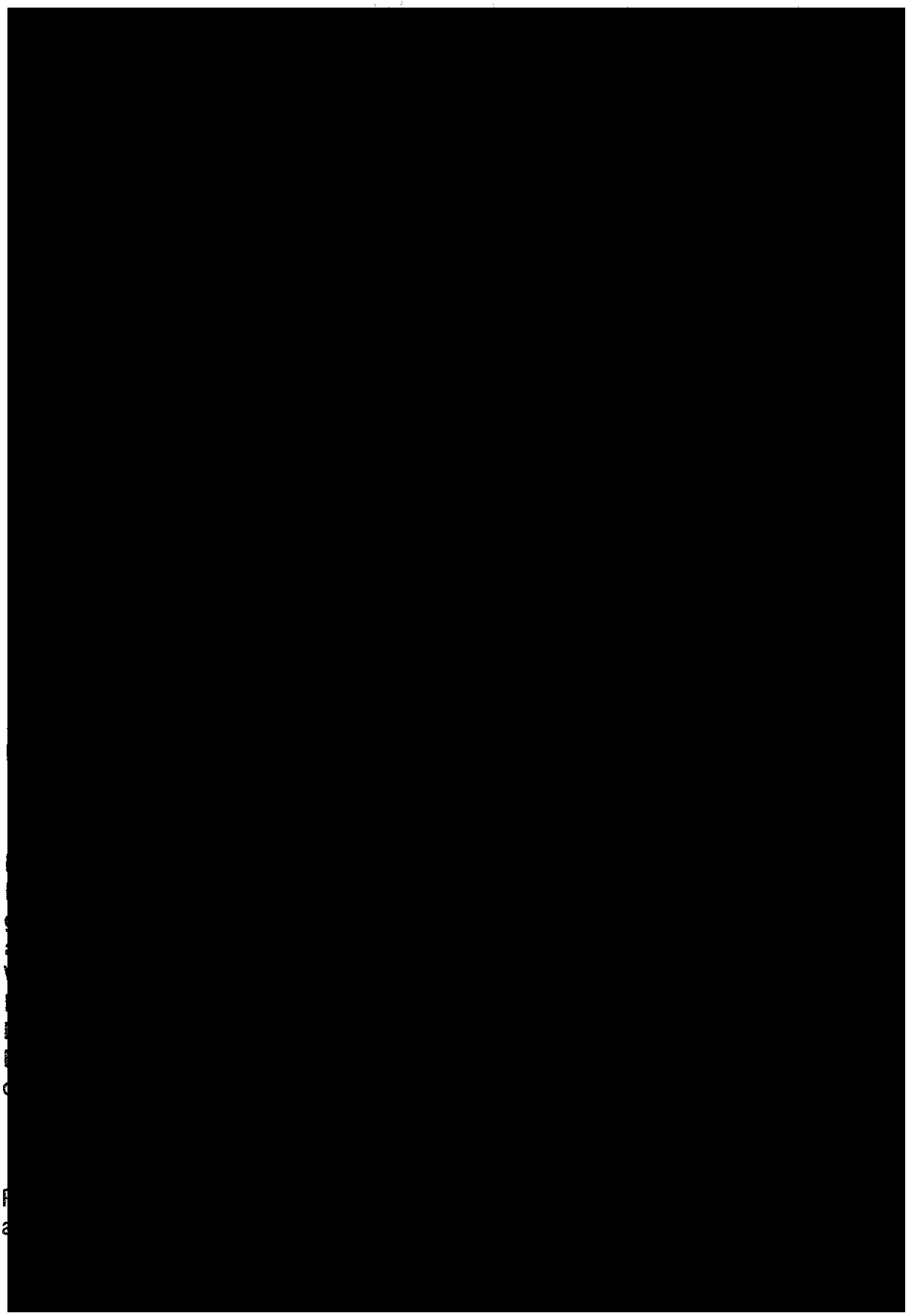

Figure 1. Location of the Illinois Audubon Society Lusk Creek Tract within the Shawnee National Forest.

Table 1. Number of observations for each taxon encountered on Illinois Audubon Society Lusk Creek Tract, August 2009-June 2010.

Species	Number
Salamanders	
Eurycea cirrigera (two-lined salamander)	2
Eurycea longicauda (longtail salamander)	11
Eurycea sp.	1
Plethodon glutinosus (slimy salamander)	13
Frogs	
Acris crepitans (cricket frog)	8
Bufo americanus (American toad)	70
Bufo fowleri (Fowler's toad)	5
Hyla chrysoscelis (gray treefrog)	4[a]
Pseudacris crucifer (spring peeper)	3[b]
Rana catesbeiana (bullfrog)	23
Rana clamitans (green frog)	16
Rana sphenocephala (southern leopard frog)	2
Rana sp.	70
Turtles	
Apalone spinifera (spiny softshell turtle)	1
Apalone sp.	2
Chelydra serpentina (snapping turtle)	6
Terrapene carolina (eastern box turtle)	4
Trachemys scripta (red-eared slider)	7
Lizards	
Eumeces fasciatus (five-lined skink)	1
Eumeces sp.	5
Sceloporus undulatus (fence lizard)	16
Scincella lateralis (ground skink)	15
Snakes	
Carphophis amoenus (worm snake)	6
Diadophis punctatus (ringneck snake)	15
Lampropeltis getula (common kingsnake)	3
Nerodia sipedon (northern water snake)	11
Storeria occipitomaculata (redbelly snake)	1
Virginia valeriae (smooth earth snake)	1
Total	322

[a] documented by calls and eggs only; [b] documented by calls only

Table 2. Comparison of herpetofaunal species observed by Thompson (1972) in summer 1967 with those observed during August 2009-June 2010.

Species	2009-2010 survey	Thompson 1972
Salamanders		
Eurycea cirrigera (two-lined salamander)	X	X
Eurycea longicauda (longtail salamander)	X	X
Plethodon glutinosus (slimy salamander)	X	X
Frogs		
Acris crepitans (cricket frog)	X	X
Bufo americanus (American toad)	X	X
Bufo fowleri (Fowler's toad)	X	X
Hyla chrysoscelis (gray treefrog)	X	X
Pseudacris crucifer (spring peeper)	X	X
Rana catesbeiana (bullfrog)	X	X
Rana clamitans (green frog)	X	X
Rana sphenocephala (southern leopard frog)	X	X
Rana sylvatica (wood frog)		X
Scaphiopus holbrookii (spadefoot)		X
Turtles		
Apalone spinifera (spiny softshell turtle)	X	X
Chelydra serpentina (snapping turtle)	X	X
Terrapene carolina (eastern box turtle)	X	X
Trachemys scripta (red-eared slider)	X	
Lizards		
Cnemidophorus sexlineatus (six-lined racerunner)		X
Eumeces fasciatus (five-lined skink)	X	X
Eumeces laticeps (broadhead skink)		X
Sceloporus undulatus (fence lizard)	X	X
Scincella lateralis (ground skink)	X	X
Snakes		
Agkistrodon contortrix (copperhead)		X
Coluber constrictor (racer)		X
Carphophis amoenus (worm snake)	X	
Diadophis punctatus (ringneck snake)	X	
Elaphe obsoleta (rat snake)		X
Lampropeltis getula (common kingsnake)	X	X
Nerodia sipedon (northern water snake)	X	
Storeria occipitomaculata (redbelly snake)	X	
Thamnophis sirtalis (eastern garter snake)		X
Virginia valeriae (smooth earth snake)	X	X
n =	24	27

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Herpetofauna of Illinois Audubon Society's Lusk Creek Tract, Pope County, Illinois, with Comparisons to Thompson (1972)

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Abstract

I evaluated the composition of the amphibian and reptile fauna of Illinois Audubon Society's Lusk Creek Tract in southeastern Illinois using terrestrial and aquatic visual encounter surveys, coverboard sampling, and aquatic trapping. I made a total of 322 observations of 24 species of herpetofauna (11 amphibians and 13 reptiles) during 14 field days between August 2009 and June 2010. I encountered anurans most frequently (8 species, 201 observations), followed by snakes (6 species, 37 observations), turtles (4 species, 20 observations), lizards (3 species, 37 observations), and salamanders (3 species, 27 observations). A previous vertebrate survey of upper Lusk Creek (Thompson, 1972) yielded 27 herpetofaunal species, 21 of which I also observed during my survey.

Introduction

In April 2007, the Illinois Audubon Society (IAS) purchased a 23-hectare tract in Pope County, southeastern Illinois (T11S, R6E, E ½ of NW ¼ of Section 27). Because the property is an in-holding within the Lusk Creek Wilderness Area, Shawnee National Forest, its purchase by a conservation organization presents an opportunity to protect and manage the site consistent with wilderness values. The tract contains a variety of habitats including rocky intermittent streams, a perennial stream (Lusk Creek; shallow, rock-bottomed portions and deep, sand/silt-bottomed portions), sandstone bluffs and glades, forested (oak [*Quercus* spp.]–hickory [*Carya* spp.]–sugar maple [*Acer saccharum*]) rocky slopes, grass–shrub fields, and riparian canebrakes (*Arundinaria gigantea*).

From 15 June through 15 September 1967, Thompson (1972) conducted a survey of vertebrates inhabiting the Lusk Creek corridor from Eddyville Road upstream to the vicinity of Little Bear Branch (a distance of approximately 10.7 stream-km). His survey area included 0.4 km on either side of Lusk Creek. Thompson's 1967 survey was part of a flurry of scientific investigations conducted in the upper Lusk Creek corridor by Southern Illinois University at Carbondale (SIUC) faculty and students in the mid-1960s (Ashby, 1969). At that time, the integrity of the Lusk Creek ecosystem was threatened by a proposed dam on Lusk Creek approximately 7.25 km SSE of Eddyville (Ashby, 1968). The dam would have created an impoundment approximately 983 ha in extent (Ashby, 1969). The northern end of Thompson's (1972) survey area was near the upstream end of the predicted high water level of the impoundment, approximately 3.5 stream-km downstream of the IAS property.

Herpetofaunal survey and collection methods employed by Thompson (1972) include: 1) search (including turning logs and rocks) and seize by hand or tongs, 2) stunning by shooting with a large rubber band (lizards), 3) shooting with dust shot from a .22 -caliber pistol, and 4) trotline fishing (turtles). Thompson (1972) documented 27 species of herpetofauna (13 amphibians and 14 reptiles) in the vicinity of upper Lusk Creek. The objectives of my survey included: 1) determine the composition of the amphibian and reptile community occupying the IAS Lusk Creek tract, and 2) compare my observations with those made by Thompson (1972). Taxonomic nomenclature follows Phillips et al. (1999).

Survey Methods and Data Treatment

Prior to initiation of field work, I acquired a list of 59 species of amphibians and reptiles known to occur in Pope County from the Illinois Natural History Survey website (www.inhs.uiuc.edu accessed 20 August 2009). I obtained two additional Pope County species records by examining the Geographic Distribution section in the 1999–2009 issues of *Herpetological Review* (Regester et al., 2002; Shasteen, 2006). Presently, a total of 61 species of amphibians and reptiles is documented from Pope County (59.8% of the 102 herpetofaunal species known to occur in Illinois). However, due to the relatively small size of the IAS tract and limited number of habitat types, I would not expect all 61 species to occur on site. I made nine visits to the tract on the following dates: 23 August 2009; 12–13 September 2009; 20–21 October 2009; 31 March–1 April 2010; 13 April 2010; 25 April 2010; 15–16 May 2010; 26 May 2010; 8–9 June 2010.

Visual Encounter Surveys: I conducted visual encounter surveys by visually scanning terrestrial and aquatic habits (with the aid of binoculars for distance viewing and a flashlight for investigating crevices in bedrock and gaps between embedded rocks and soil), as well as by examination of the undersurface of rocks and logs, and artificial cover objects. I conducted undersurface examination of natural cover objects both terrestrially and aquatically. I replaced displaced cover objects.

On 20 October 2009, I placed eight artificial cover objects (i.e., coverboards) in a grass-dominated field within 5 m of forest edge. I placed coverboards 10 m apart and arranged them, north–south, as follows: 1) sheet of corrugated roofing tin (0.65 m × 2.45 m); 2) sheet of corrugated roofing tin; 3) plywood board (1.9 cm thick, 0.25 m × 1.6 m); 4) sheet of corrugated roofing tin; 5) plywood board (0.6 cm thick, 0.5 m × 1.2 m); 6) sheet of corrugated roofing tin; 7) wood board (2.5 cm thick, 0.3 m × 2.2 m); 8) plywood board (0.6 cm thick, 0.45 m × 1.2 m).

I released all amphibians and reptiles following capture. I identified species visually or, in the case of some frog species,

aurally. I tallied all individuals observed or heard, except for anuran larvae which were often too abundant to realistically count (e.g., *Bufo* tadpoles). In cases of brief sightings (e.g., salamander or lizard eluding capture or frog leaping into water), I recorded genus (i.e., *Apalone* sp., *Eurycea* sp., *Eumeces* sp., and *Rana* sp.). *Apalone* sp. was either smooth softshell turtle (*Apalone mutica*) or spiny softshell turtle (*Apalone spinifera*), *Eurycea* sp. was either two-lined salamander (*Eurycea cirrigera*) or longtail salamander (*Eurycea longicauda*), *Eumeces* sp. was either five-lined skink (*Eumeces fasciatus*) or broadhead skink (*Eumeces laticeps*), whereas *Rana* sp. could have been bullfrog (*Rana catesbeiana*), green frog (*Rana clamitans*), or southern leopard frog (*Rana sphenocephala*).

On 25 May 2010, nine students from the SIUC herpetology class helped me survey Lusk Creek for mudpuppies (*Necturus maculosus*). Lusk Creek was relatively high and swift flowing, providing ideal conditions for kick sampling. Holding fine-mesh d-frame dipnets or a 1 m × 1 m fine-mesh kick net downstream of large rocks or riffles, we kicked through riffle-rocks towards the nets or lifted large rocks and stirred the area beneath. Displaced animals were swept by the current into the nets.

Trapping: I surveyed Lusk Creek for turtles and mudpuppies using two different trap types. I surveyed for mudpuppies using baited, 43 cm × 23 cm rectangular, 3-mm nylon mesh minnow traps having 5-cm diameter interior funnel openings at each end. I baited each trap with canned sardines which I placed into film canisters drilled with holes. I set eight traps in pools one day and removed them the next. Traps were completely submerged in September and October 2009 when snake activity was low. In May 2010, submerged traps were set only in deep pools to reduce the likelihood of capturing snakes. In June 2010, the upper ¼ of all traps remained above the water surface. I employed eight traps on the following dates: 12–13 September 2009; 20–21 October 2009; 15–16 May 2010; 8–9 June 2010 (four times overnight for a total of 32 trap-nights).

I trapped for turtles in deep pools using a baited 2.54-cm mesh, 76.2-cm diameter, single-throated hoop net and a baited 2.54-cm mesh, 55.9-cm diameter, double-throated hoop net. I baited hoop nets with whole fish or sections of large fish tied to the rearmost hoop. The top of the back end of each hoop net was above the water surface so captured turtles had access to air. I set the two nets in pools one day and removed them the next. I employed traps on the following dates: 12–13 September 2009; 15–16 May 2010; 8–9 June 2010 (three times overnight for a total of 6 trap-nights).

Comparison with Thompson (1972): Thompson (1972) did not provide (except for five species) the number of individuals of each species he observed. Instead, he assigned each a descriptor of relative abundance: "common," "uncommon," or "rare." He did not, however, describe what criteria he used to assign these designations. He also noted the distribution of each species as 1) "generally distributed" (defined as "occurring throughout, in most habitats") or 2) "locally distributed" ("occurring in only select spots or habitats"). Given the relatively small size of my survey area, I do not describe distribution. Because the frequency of observations of amphibians and reptiles is influenced by factors such as time of year, weather, breeding biology, and survey method, I did not attempt to assign an abundance rank to the species I observed. Rather, I provide number of observations of each species in tabular form, along with Thompson's (1972) abundance and distribution designations. Because I did not capture and mark individuals, I may have counted some individuals more than once.

Results and Discussion

I made 322 observations of 11 species of amphibians and 13 species of reptiles on-site (Table 1), and detected two additional species in the vicinity. The species observed nearby (wood frog [*Rana sylvatica*] and eastern garter snake [*Thamnophis sirtalis*]) may also occur on the Audubon tract. I detected all species occurring on the Audubon property visually except spring peeper (*Pseudacris crucifer*) and gray treefrog (*Hyla chrysoscelis*). I detected spring peepers by call only and gray treefrogs by call and the presence of egg masses. The number of amphibian species inhabiting the Lusk Creek tract is likely limited by the paucity of lentic (nonflowing) aquatic breeding sites (e.g., ponds). The only lentic aquatic habitats available for breeding are backwater pools in Lusk Creek, pools in the intermittent streams, and temporary pools on the glades. All of these pools, however, are subject to transformation to swift-flowing waters following rain events.

The species of amphibians and reptiles observed are typical of habitats occurring on the Lusk Creek tract. The species most commonly observed (≥ 11 observations) include American toad (*Bufo americanus*), bullfrog, green frog, longtail salamander, slimy salamander (*Plethodon glutinosus*), fence lizard (*Sceloporus undulatus*), ground skink (*Scincella lateralis*), ringneck snake (*Diadophis punctatus*), and northern water snake (*Nerodia sipedon*) (Table 1). Frequent observations of these species do not necessarily translate to greater abundance than other, less frequently observed species. Their perceived abundance may reflect greater detectability rather than greater population size.

Thompson (1972) observed 13 species of amphibians and 14 species of reptiles (Table 1). Although our species lists overlap considerably, we each detected species that the other did not (Table 1). When including species I observed both on and off the Lusk Creek tract, my amphibian list is nearly identical to that of Thompson (1972). The single exception is the spadefoot toad (*Scaphiopus holbrookii*). Thompson captured a single spadefoot in a snap-trap set for small mammals (Thompson et al., 1968).

Thompson (1972) observed two species of lizards and four species of snakes that I did not encounter (Table 1). Thompson (1972) described the six-lined racerunner (*Cnemidophorus sexlineatus*) as "locally common along gravel roads and other dry stony regions" and the broadhead skink as "locally rare around dead trees, wood piles, etc." Given their localized distribution, it is possible that neither of these species occurs on the Audubon tract. On the other hand, one or more of the unidentified *Eumeces* I observed could have been broadhead skinks. Copperheads (*Agkistrodon contortrix*) were described by Thompson (1972) as "generally common along rocky outcrops." He deemed racers (*Coluber constrictor*) and eastern garter snakes to be "generally uncommon throughout." Thompson (1972) observed a single rat snake (*Elaphe obsoleta*). I am perplexed by my lack of copperhead sightings as the habitat I searched appears ideal. I did see one eastern garter snake nearby, off-site. Racers and rat snakes have large home ranges (Carfagno and Weatherhead, 2008), so the chance of encountering

Table 1. Number of observations of amphibians and reptiles made during a 23 August 2009 through 9 June 2010 survey of IAS Lusk Creek tract and during a 15 June through 15 September 1967 survey along upper Lusk Creek by Thompson (1972). Taxonomy follows Phillips et al. (1999). See text for explanation of Thompson's (1972) abundance and distribution categories.

Species	2009–2010 survey	Thompson (1972)
Salamanders		
Eurycea cirrigera (two-lined salamander)	2	LC
Eurycea longicauda (longtail salamander)	11	LC
Eurycea sp.	1	
Plethodon glutinosus (slimy salamander)	13	GC
Frogs		
Acris crepitans (cricket frog)	8	GC
Bufo americanus (American toad)	70	LU
Bufo fowleri (Fowler's toad)	5	GC
Hyla chrysoscelis (gray treefrog)	4	LU (1)
Pseudacris crucifer (spring peeper)	3	LU (1)
Rana catesbeiana (bullfrog)	23	GC
Rana clamitans (green frog)	16	GC
Rana sphenocephala (southern leopard frog)	2	GC
Rana sylvatica (wood frog)		LU
Rana sp.	70	
Scaphiopus holbrookii (spadefoot)		LR (1)
Turtles		
Apalone spinifera (spiny softshell turtle)	1	GC
Apalone sp.	2	
Chelydra serpentina (snapping turtle)	6	GC
Terrapene carolina (eastern box turtle)	4	GC
Trachemys scripta (red-eared slider)	7	
Lizards		
Cnemidophorus sexlineatus (six-lined racerunner)		LC
Eumeces fasciatus (five-lined skink)	1	LC
Eumeces laticeps (broadhead skink)		LR
Eumeces sp.	5	
Sceloporus undulatus (fence lizard)	16	GC
Scincella lateralis (ground skink)	15	GC
Snakes		
Agkistrodon contortrix (copperhead)		GC
Coluber constrictor (racer)		GU
Carphophis amoenus (worm snake)	6	
Diadophis punctatus (ringneck snake)	15	
Elaphe obsoleta (rat snake)		1
Lampropeltis getula (common kingsnake)	3	1
Nerodia sipedon (northern water snake)	11	
Storeria occipitomaculata (redbelly snake)	1	
Thamnophis sirtalis (eastern garter snake)		GU
Virginia valeriae (smooth earth snake)	1	GC
Total species	24	27
Total individuals	322	

either species on the relatively small Audubon tract during a short-term survey may be small. Suitable habitat for both species occurs on the Audubon property so both may inhabit the tract in small numbers.

I encountered one species of turtle and four species of snakes that Thompson (1972) did not observe (Table 1). Due to their habit of basking frequently, the presence of red-ear turtles (*Trachemys scripta*) is usually readily determined. For example, most (57%) of my red-ear turtle observations were of basking or swimming individuals. I frequently encountered worm snakes (*Carphophis amoenus*) and ringneck snakes beneath rocks, and northern water snakes in Lusk Creek. Given that Thompson (1972) lifted rocks and logs, and surveyed for turtles and fishes in Lusk Creek, it is surprising that he did not observe these three species of snakes or red-ear turtles. Worm snakes and ringneck snakes move to moist microhabitats, including deeper into the soil, as the soil dries during the warmer months (Orr, 2006; Smith, 1961). In Illinois, soil moisture typically decreases from spring through summer (Hollinger and Isard, 1994). Thus, it is plausible that these two species were deep underground during the summer of 1967. Redbelly snakes (*Storeria occipitomaculata*) may also have been underground and unattainable during summer of 1967. I observed only one redbelly snake, swept up with debris on an old cabin floor by former landowner, Mike Maynard.

My survey and that of Thompson (1972) each have biases that likely affected what species, and how many individuals of each species, we encountered. Because Thompson's (1972) survey was restricted to the summer months, he did not encounter spring-breeding anurans during their breeding season. Spring-breeding amphibians often congregate at breeding sites in large numbers for a relatively brief period. This, I believe, explains why the species I encountered most frequently (American toad) was described by Thompson (1972) as "locally uncommon." Although I infrequently encountered American toads in the uplands (5.7% of observations), I counted 66 adults at breeding pools on a glade and in Lusk Creek on 1 and 13 April 2010, respectively. Thompson (1972) may also have been distracted by his responsibilities to survey other vertebrate groups, limiting his survey effort for amphibians and reptiles. The principal limitation of my survey was geographic; I surveyed a relatively small area. Both surveys would have benefited from longer survey periods (including multiple years) and the use of additional survey techniques.

Two species, one previously observed on-site (timber rattlesnake [*Crotalus horridus*]; Mike Maynard, personal communication, 2009) and the other observed downstream in Lusk Creek (mudpuppy; Shasteen, 2006), were not encountered by Thompson (1972) or myself. Both species are listed as state-threatened in Illinois, and both can take considerable effort to detect. Timber rattlesnakes (and the other aforementioned large snake species) are likely transitory inhabitants of the Audubon property. The sandstone glades and blufftops appear to provide suitable basking areas for gravid female timber rattlesnakes. Mudpuppies may not be common in upper Lusk Creek. Shasteen (2006) encountered only one individual during many hours of least brook lamprey (*Lampetra aepyptera*) surveys (Brooks Burr, personal communication, 2009).

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