

# A Survey of Aquatic Turtles at Kickapoo State Park and Middle Fork State Fish and Wildlife Area (MFSFWA)

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## ABSTRACT

Aquatic turtles were trapped from 10 ponds in Kickapoo State Park and Middle Fork State Fish and Wildlife Area (MFSFWA), Vermilion Co., Illinois. A total of 2979 trap hours yielded 90 individual turtles of 4 species: 1 spiny softshell (*Apalone spinifera*), 12 common snapping (*Chelydra serpentina*), 39 painted (*Chrysemys picta*), and 38 slider (*Trachemys scripta*) turtles. Visual surveys were also conducted but did not yield any additional species.

Keywords. Kickapoo State Park, Middle Fork State Fish and Wildlife Area, turtles, survey

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## INTRODUCTION

Aquatic turtle surveys are necessary to determine what species inhabit an area, identify species community composition, understand the impacts of anthropogenic activities on turtle populations and communities, and guide wildlife management efforts. Currently, one-third of the 15 aquatic turtle species in Illinois are listed as either state threatened or endangered (Phillips et al. 1999). There have been numerous aquatic turtle surveys published on Illinois species, but none have provided data specifically on turtles present in eastern Illinois (Table 1).

## STUDY AREAS

We conducted an aquatic turtle survey at Kickapoo State Park and the Middle Fork State Fish and Wildlife Area (MFSFWA) located in Vermilion Co., in east-central Illinois. Kickapoo State Park encompasses 2,842 acres and includes 22 deep-water ponds totaling 221 acres with ponds ranging in size from 0.2 – 57 acres (IDNR website). The Middle Fork State Fish and Wildlife Area consists of 2,700 acres of grass, forest, cropland, and marsh, and is connected to Kickapoo State Park by the Middle Fork River, approximately

10 miles downstream (IDNR website). Our objective was to survey the ponds and marsh in the park and wildlife area, respectively, to document the resident turtle species.

## MATERIALS AND METHODS

Turtles were trapped using baited hoop traps from 6 June to 22 September 2005 at Kickapoo State Park and from 6–12 June 2006 at MFSFWA. Traps were checked daily to prevent accidental drowning. Spot visual searches (not timed) were also performed daily at each site to locate any basking turtles. Timed visual encounter surveys were conducted from 15 April to 12 June 2006 at MFSFWA where researchers would walk the perimeter of the marsh and search the vegetation for turtles.

Captured turtles were measured for straight-line plastron length (PL) and carapace length (CL) to the nearest mm, weighed to the nearest g., and marked with a unique notch on their marginal scutes (Cagle 1939). The sex of each turtle was determined using secondary sexual characters such as elongated foreclaws and preanal tail lengths (Ernst et al. 1994). The reproductive stage was determined using PL (Ernst et al. 1994).

## RESULTS

In Kickapoo State Park, turtles were trapped from 9 ponds totaling 2191 trap hours of effort (Table 2). A total of 81 individual turtles were captured including: 1 spiny softshell (*Apalone spinifera*), 8 common snapping (*Chelydra serpentina*), 34 painted (*Chrysemys picta*), and 38 slider (*Trachemys scripta*) turtles (Tables 2 & 3). One *T. scripta* and one *C. picta* were recaptured, but not included in any tables or calculations. Only *C. serpentina*, *C. picta*, and *T. scripta* were seen using spot searches.

At MFSFWA, a total of 788 trap hours at the Main Marsh yielded 9 turtles: 4 *C. serpentina*, and 5 *C. picta* (Tables 2 & 3). A total of 215 minutes of timed visual encounter surveys as well as spot surveys yielded only *C. serpentina* and *C. picta*.

## DISCUSSION

Eight species of aquatic turtles have been reported present in Vermilion Co., Illinois (Phillips et al. 1999). Our survey found only half of these species. Although not encountered, it is possible that the common musk turtle (*Sternotherus odoratus*), and the Blanding's turtle (*Emydoidea blandingii*), a state threatened species, may also utilize these sites. *Emydoidea blandingii* was first observed at MFSFWA in 1990, but has not been seen since 1996. Due to the interconnectedness and breadth of possible habitats in the area, a small population of Blanding's turtles could still persist. It is unlikely that common map turtles (*Graptemys geographica*) and smooth softshells (*Apalone mutica*), species that prefer rivers and large lakes (Phillips et al. 1999), would inhabit these ponds.

*Chrysemys picta* and *T. scripta* had the highest relative abundance (Table 1) of all turtle species captured, and are often reported as the most abundant turtles in suitable ponds within their range (Ernst et al. 1994; Dreslik et al. 2005; Ernst 1971). The abundances of *T. scripta* and *C. picta* in our study were lower and higher, respectively, than most other studies conducted in southern and western Illinois (Table 1). Generally, populations of *C.*

*picta* dominate in northern Illinois, and *T. scripta* in southern Illinois (Phillips et al. 1999; Reehl et al. 2006; Dreslik et al. 2005, Dreslik and Phillips 2005). However, it appears that in some areas within eastern and western Illinois, these species coexist at similar population levels (Moll 1977, this study). These species may be competitors where they co-occur (Cagle 1942; Cagle and Chaney 1950; Ernst 1971; Moll and Legler 1971), but, it is unknown if *T. scripta* ever directly excludes *C. picta*. It is possible that some species sorting exists among the ponds in Kickapoo State Park (Table 2) where each pond may be dominated by either *C. picta* or *T. scripta*. More data would be needed to draw any conclusions. The ponds at Kickapoo State Park may offer a unique opportunity to study competition between these species in an area where they naturally co-exist.

The relative abundance of *C. serpentina* in our study was both similar and higher (Table 1) than other studies. This species appears common at the sites surveyed in this study because it took only half the number of trap hours to capture one *C. serpentina* at Kickapoo State Park and MFSFWA compared to a large-scale survey of 57 sites conducted throughout central and southern Illinois during the same time period (Readel et al, 2008). Harvest (Congdon et al. 1994) and road mortality (Haxton 2000) could result in population declines for this species, but probably have minimal impacts on this species at our study sites because of reduced speed limits in the area and the prohibited use of fish and turtle traps and trot lines.

*Apalone spinifera* had the lowest turtle species composition and represented only 1% of all turtles captured at our sites. This species relative abundance is comparable, however, to most other studies conducted in Illinois (Table 1) but the number of trap hours taken to capture one *A. spinifera* was double the average from 57 sites in central and southern Illinois (Readel et al. 2008).

Numerous studies suggest that multiple methods should be employed when sampling turtle communities in order to reduce trap bias (Ream and Ream 1966; Dreslik et al. 2005; Reehl et al. 2006). This study utilized only baited hoop traps, a method that resulted in the underestimation of both *C. picta* and *S. odoratus* abundance in another study (Reehl et al. 2006). Additionally, different trapping methods can result in different sex ratios and size structures in turtle populations (Ream and Ream 1966). Trap biases could compromise results of studies using raw trap data (Reehl et al. 2006; Dreslik et al. 2005; Ream and Ream 1966, this study).

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## LITERATURE CITED

- Cagle, F. R. 1939. A system of marking turtles for future identification. *Copeia* 1939:170-173.
- Cagle, F. R. 1942. Turtle populations in southern Illinois. *Copeia* 1942:155-162.
- Cagle, F. R., and A. H. Chaney. 1950. Turtle populations in Louisiana. *Amer. Midl. Nat.* 43:383-388.
- Congdon, J. D., A. E. Dunham, and R. C. VanLobenSels. 1994. Demographics of common snapping turtles (*Chelydra serpentina*): implications for conservation and management of long-lived organisms. *Am. Zool.* 34:397-408.
- Dreslik, M. J., and C. A. Phillips. 2005. Turtle communities in the upper Midwest, USA. *J. Fresh. Ecol.* 20:149-164.
- Dreslik, M. J., A. R. Kuhns, and C. A. Phillips. 2005. Structure and composition of a southern Illinois freshwater turtle assemblage. *Northeastern Nat.* 12: 173-186.
- Ernst, C. H. 1971. Population dynamics and activity cycles of *Chrysemys picta* in southeastern Pennsylvania. *J. Herpetol.* 5:151-160.
- Ernst, C. H., J. E. Lovich, R. W. Barbour. 1994. *Turtles of the United States and Canada*. Smithsonian Institution Press, Washington, D.C.
- Haxton, T. 2000. Road mortality of snapping turtles, *Chelydra serpentina*, in central Ontario during their nesting period. *Can. Field-Nat.* 114:106-110.
- IDNR website. <http://dnr.state.il.us/>. Accessed 5 June 2007.
- Moll, D. L. 1977. Ecological investigations of turtles in a polluted ecosystem: the central Illinois river and adjacent flood plain lakes. Ph.D thesis, Illinois State University, Bloomington, Illinois, USA.
- Moll, E. O., and J. M. Legler. 1971. The life history of a neotropical slider turtle, *Pseudemys scripta* (Schoepff), in Panama. *Bull. L. A. County Mus. Nat. Hist.* 11:1-102.
- Phillips, C. A., R. A. Brandon, and E. O. Moll. 1999. Field guide to amphibians and reptiles of Illinois. Illinois Natural History Survey Manual 8. xiv + 282 pp.
- Readel, A. M., C. A. Phillips, and M. J. Wetzel. 2008. Leech parasitism in a turtle assemblage: effects of host and environmental characteristics. *Copeia* 1: 227-233.
- Ream, C., and R. Ream. 1966. The influence of sampling methods on the estimation of population structure in Painted Turtles. *Am. Midl. Nat.* 75:325-338.
- Reehl, M., J. Thompson, and J. K. Tucker. 2006. A three year survey of aquatic turtles in a river-side pond. *Trans. Illinois Acad. Sci.* 99: 145-152.

Table 1. The relative abundance (%) of each turtle species captured for multiple aquatic turtle studies throughout Illinois.

<i>Apalone spinifera</i>	<i>Chelydra serpentina</i>	<i>Chrysemys picta</i>	<i>Trachemys scripta</i>	No. Turtles (Ponds)	Region	Study
1.1 (0.06 - 5.9)	13.3 (7.6 - 22.1)	42.2 (33.2 - 53.9)	43.3 (32.2 - 52.8)	90 (10)	Eastern	This study
4.6	13.2	21.0	55.2	433 (57)	Eastern & Southern	Readel et al. 2008
1.3	8.6	0.4	66.7	1082 (1)	Southern	Dreslik et al. 2005
1.8	2.1	10.1	74.9	2346 (6)	Southern	Cagle 1942
0.2	3.3	19.5	67.5	400 (1)	Western	Reehl et al. 2006
7.0	2.1	36.2	35.5	1091 (4)	Western	Moll 1977

Table 2. Trap sites, trap hours, and the number of each turtle species captured at Kickapoo State Park and Middle Fork State Fish and Wildlife Area (MFSFWA) from 6 June to 22 September 2005 in Vermilion Co., Illinois.

Site	Trap Hours	<i>Apalone spinifera</i>	<i>Chelydra serpentina</i>	<i>Chrysemys picta</i>	<i>Trachemys scripta</i>	Total No. Captured
<b>Kickapoo State Park</b>						
High Lake	472.8	–	2	6	11	19
Inland Sea	189.0	1	–	1	4	6
Little Deep Pond	100.0	–	–	–	–	0
Little Hook Lake	573.5	–	3	11	3	17
Peelman Pond	596.0	–	1	5	16	22
Possum Pond	140.0	–	–	10	4	14
Silt Basin	24.0	–	–	–	–	0
Sportsmans Lake	72.3	–	–	1	–	1
Unnamed Slough	23.5	–	2	–	–	2
<b>Total</b>	<b>2191.0</b>	<b>1</b>	<b>8</b>	<b>34</b>	<b>38</b>	<b>81</b>
<b>MFSFWA</b>						
Main Marsh	788.0	–	4	5	–	9
<b>Total</b>	<b>788.0</b>	<b>0</b>	<b>4</b>	<b>5</b>	<b>0</b>	<b>9</b>
<b>Grand Total</b>	<b>2979.0</b>	<b>1</b>	<b>12</b>	<b>39</b>	<b>38</b>	<b>90</b>

Table 3. Sex, stage, and morphometrics for each turtle species captured at Kickapoo State Park and Middle Fork State Fish and Wildlife Area (MFSFWA) in Vermilion Co., Illinois.

Species	Total Captured	Sex (M.F.U)	Stage (Mat.Immat.)	Average Weight (g) $\pm$ SE	Average CL $\pm$ SE	Average PL $\pm$ SE
<b>Kickapoo State Park</b>						
<i>Apalone spinifera</i>	1	0.1.0	1.0	970	215	160
<i>Chelydra serpentina</i>	8	0.1.7	2.6	N/A	179 $\pm$ 25	118 $\pm$ 16
<i>Chrysemys picta</i>	34	23.8.3	28.6	273 $\pm$ 25	127 $\pm$ 4	117 $\pm$ 4
<i>Trachemys scripta</i>	38	11.19.8	20.18	681 $\pm$ 107	153 $\pm$ 10	143 $\pm$ 9
<b>MFSFWA</b>						
<i>Chelydra serpentina</i>	4	2.2.0	4.0	N/A	272 $\pm$ 30	202 $\pm$ 17
<i>Chrysemys picta</i>	5	1.4.0	5.0	567 $\pm$ 59	162 $\pm$ 6	151 $\pm$ 7