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Survey for *Macrochelys temminckii* in Southern Illinois: Implications for Recovery Actions

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ABSTRACT

Moll's (1988) report to the Illinois Endangered Species Protection Board recommended attempts to locate viable populations of alligator snapping turtles (*Macrochelys temminckii*) before considering management actions. We surveyed 18 sites in southern Illinois and captured 2,671 turtles, none of which were *M. temminckii*. No verifiable records were obtained from our solicitation of observations in two regulatory publications of the Illinois Department of Natural Resources. Our findings are supported by other chelonian studies and a lack of documented records of *M. temminckii* in Illinois during the past quarter century. We conclude recovery of this species is unlikely in Illinois without direct management such as translocation or release of captive-raised individuals.

INTRODUCTION

Alligator snapping turtles (*Macrochelys temminckii*) occur in river systems that drain into the Gulf of Mexico (Ernst et al. 1994). They are distributed widely and locally abundant at the core of their range in Louisiana (Boundy 2003, Boundy and Kennedy 2006), Arkansas (Wagner et al. 1996), Mississippi, southern Alabama (Mount 1975), southwestern Georgia (Jensen and Birkhead 2003) and northwestern Florida (Pritchard 1992). Surveys in Oklahoma (Riedle et al. 2005), Kansas (Shipman et al. 1995) and Missouri (Shipman and Riedle 2008) suggest a reduction of the species' historical range at its northern limits, where alligator snapping turtles are considered absent or limited to remnant populations.

Garman (1892), Cahn (1937), Parmalee (1955) and Smith (1961) noted the species' rarity in Illinois, but considered it endemic to the southern part of the state. Records of its occurrence in Illinois are sparse, with the most recent from 1959, 1960 (Galbreath 1961) and 1984 (Morris and Sweet 1985). Moll's (1988) attempts to determine the species' status by interviewing commercial fishermen along the Wabash, Ohio and Mississippi rivers produced no new records, although 11 of the interviewees recalled seeing specimens in their lifetimes.

Moll (1988) considered his findings inconclusive. Therefore, he recommended that no management actions should take place until surveys occurred in locations most likely to

harbor viable populations. We completed this task prior to implementation of Kath's (2005) recovery plan for the species.

METHODS

Selection of Sites

Moll (1988) identified Mississippi River drainages from Cairo to Grand Tower as the best locations for surveys. Dreslik et al. (1998) believed viable populations might exist in Mississippi River drainages between the Big Muddy and Ohio rivers. Recent (post-1990) records from Indiana (Lodato et al. 1992) and northern Kentucky (Kentucky Natural Heritage Program, Element Occurrence Records, accessed 15 July 2010) add drainages of the Ohio and lower Wabash rivers as possibilities. Targeted surveys failed to detect the species in Indiana (S. Klueh, Indiana Department of Natural Resources, personal communication), so we confined our efforts to drainages of the Mississippi River from Grand Tower, Illinois to the confluence of the Ohio River and drainages of the Ohio River from its confluence with the Mississippi River to Rosiclare, Illinois. Within this area, we chose sites with past records of occurrence and those with suitable habitat based on Kath's (2005) recovery plan or recommendations of biologists familiar with the region (Fig. 1).

Capture Methods

We trapped from April through September, 2005 through 2010, using commercial hoop nets (Memphis Net and Twine Company, Inc., Memphis, Tennessee, USA). Each had a single throat, 3 hoops and 3.81-cm mesh. We baited nets daily with 0.5–1.0 kg of fresh frozen fish. Locations of sets were determined with a hand-held global positioning system (eTrex, Garmin International, Inc., Olathe, KS, USA).

We trapped diverse habitats including streams, rivers, lakes, ponds, swamps and wetlands. Faced with varying depths of water, we chose net sizes best suited to individual conditions so that throats were submerged yet turtles could breathe when captured. Most sets (72%) were made with nets 0.9144-m in diameter, while some employed nets 0.6096-m (18%) or 1.2192-m (10%) in diameter. We checked nets daily and recorded numbers of each species captured. We did not mark individual turtles because our typical protocol of trapping a site for 2–3 nights precluded use of marks to derive robust estimates of abundance. Three authors (RDB, DAW, JAK) captured alligator snapping turtles successfully in Louisiana using methods employed in Illinois, and the fourth was trained by Dr. Paul Shipman, who had conducted surveys in other states.

Observations from Sportsmen

We solicited observations of alligator snapping turtles in two of the Illinois Department of Natural Resources' most widely disseminated publications. Requests occurred in the Digest of Fishing Regulations from 2007 through 2010, and the Digest of Hunting and Trapping Regulations for 2006–07 through 2010–11. Combined annual publication was 775,000–800,000 copies, with online availability at the Department's website.

RESULTS

We expended 377 net nights of effort at 18 sites (Table 1) and recorded 2,671 captures of nine species of turtles (Table 2). No alligator snapping turtles were encountered. We received dozens of reports of alligator snapping turtles from sportsmen and the general public. All except two were discounted as false identifications after further investigation. One report, accompanied by a photograph, was from the Milan Bottoms in Rock Island County. Another, also accompanied by a photograph, originated from Gallatin County.

DISCUSSION

Two observations submitted by the public were the only evidence of *M. temminckii*'s current existence in Illinois. We discounted the specimen reported from Rock Island County because experts (Moll 1988, Dreslik et al. 1998) consider all records originating north of St. Louis, MO as suspect and possibly resulting from releases. We made several attempts to obtain more information about the report from Gallatin County, but the individual who submitted it electronically did not respond to our queries. We do not consider the report from Gallatin County indicative of a viable population because it was isolated and unconfirmed. Alligator snapping turtles are vulnerable to recreational fishing gear (Shipman 1993) allowed in Illinois (i.e., trotlines), so incidental captures are likely sources of observations of this otherwise cryptic species. As Cahn (1937:38) stated, "…such a large animal is more than likely to attract attention if present in any numbers."

Alligator snapping turtles are not difficult to detect where viable populations occur. Surveys using methods similar to ours at similar geographic scales in Oklahoma (Riedle et al. 2005), Missouri (Shipman and Riedle 2008), Louisiana (Boundy and Kennedy 2006), Georgia (Jensen and Birkhead 2003) and Arkansas (Wagner et al. 1996) yielded capture rates of 5.7–23.3 alligator snapping turtles per 100 net nights. Studies of local populations have yielded capture rates as great as 34.9 per 100 net nights (Riedle et al. 2008a). Riedle et al. (2005) considered capture rates of ≥12 alligator snapping turtles per 100 net nights as indicative of viable populations at sites sampled in Oklahoma.

Our findings are supported by other studies in or near Illinois. Scott Ballard of the Illinois Department of Natural Resources sampled for *M. temminckii* in the Mississippi River (Union and Alexander counties), Clear Creek (Alexander County), Heron Pond-Little Black Slough (Johnson County), Loon Lake (Massac County) and Brushy Lake (Massac County); he captured no alligator snapping turtles in 176 net nights of effort (S. Ballard, personal communication). Barko et al. (2004) sampled the Mississippi River from the confluence of the Missouri River (near St. Louis, MO) to the confluence of the Ohio River (near Cairo, IL) to assess commercial fishing gear as a cause of mortality of turtles; they captured no *M. temminckii* in 2,704 net nights of effort. Other relevant studies from Illinois include Readel and Phillips (2008), Palis (2007), Dreslik et al. (2005), Burbrink et al. (1998), Pierce (1992), Klimstra and Hutchison (1965), Minton and Minton (1948) and Cagle (1942); none encountered *M. temminckii*.

The alligator snapping turtle was listed as a state endangered species in Illinois during 1994. Given that recovery is the ultimate goal of listing (520 Illinois Compiled Statutes 10/11), the most salient question is not whether *M. temminckii* exists in Illinois, but

whether it exists in sufficient numbers to fuel a natural recovery. Our findings answer the latter question, especially when considered in the context of other studies. The nearest known viable populations occur in extreme southeastern Missouri (Shipman and Riedle 2008). Therefore, recovery is unlikely in Illinois without supplementing populations as proposed by Kath (2005). Similar programs have been implemented by state agencies in Tennessee (Alan Peterson, Tennessee Wildlife Resources Agency, personal communication) and Oklahoma (Riedle et al. 2008b).

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Table 1. Locations sampled for the presence of *Macrochelys temminckii* in southern Illinois, 2005–2010.

Site	County	Effort (net nights)
Cypress Creek National Wildlife Refuge (Old Channel Unit)	Alexander/Pulaski	17
Horseshoe Lake State Fish & Wildlife Area	Alexander	45
Mill Creek	Alexander/Pulaski	6
Mississippi River	Alexander	26
Big Creek	Hardin	5
Mud Creek	Hardin	4
Big Muddy River	Jackson/Union	34
Tower Island Chute	Jackson/Perry (MO)	21
Mermet Lake State Fish & Wildlife Area	Massac	24
Bay Creek	Pope	18
Big Grand Pierre Creek	Pope	18
Lusk Creek	Pope	37
Sugar Creek	Pope	12
Cache River State Natural Area	Pulaski/Johnson	24
Dutch Creek	Union	24
LaRue Swamp	Union	18
Clear Creek	Union	15
Union County State Fish & Wildlife Area	Union	9
Total effort		377

Table 2. Captures of freshwater turtles during a survey for *Macrochelys temminckii* in southern Illinois, 2005–2010.

	No. captures by species								
Site	*Chelydra serpentina*	*Sternotherus odoratus*	*Chrysemys picta*	*Trachemys scripta*	*Graptemys pseudogeographica*	*Graptemys ouachitensis*	*Graptemys geographica*	*Apalone mutica*	*Apalone spinifera*
Cypress Creek NWR	15	3	2	150	0	0	0	0	1
Horseshoe Lake SFWA	39	1	4	245	0	0	0	0	7
Mill Creek	2	0	0	37	0	0	0	0	1
Mississippi River	25	0	0	357	226	14	0	0	0
Big Creek	4	0	0	11	0	0	0	0	6
Mud Creek	3	2	0	9	0	0	0	0	0
Big Muddy River	23	0	0	519	13	4	1	1	1
Tower Island Chute	0	1	0	164	11	0	0	0	6
Mermet Lake SFWA	36	0	9	137	0	0	0	0	1
Bay Creek	15	0	1	113	0	0	0	0	0
Big Grand Pierre Creek	5	0	0	6	0	0	3	0	1
Lusk Creek	19	4	0	9	0	0	0	0	6
Sugar Creek	3	2	0	23	0	0	0	0	2
Cache River SNA	14	0	2	46	0	0	0	0	1
Dutch Creek	10	0	0	15	0	0	0	0	20
LaRue Swamp	5	6	0	14	0	0	0	0	0
Clear Creek	4	0	0	62	1	0	0	0	12
Union County SFWA	21	2	0	129	0	0	0	0	4
Total	243	21	18	2046	251	18	4	1	69

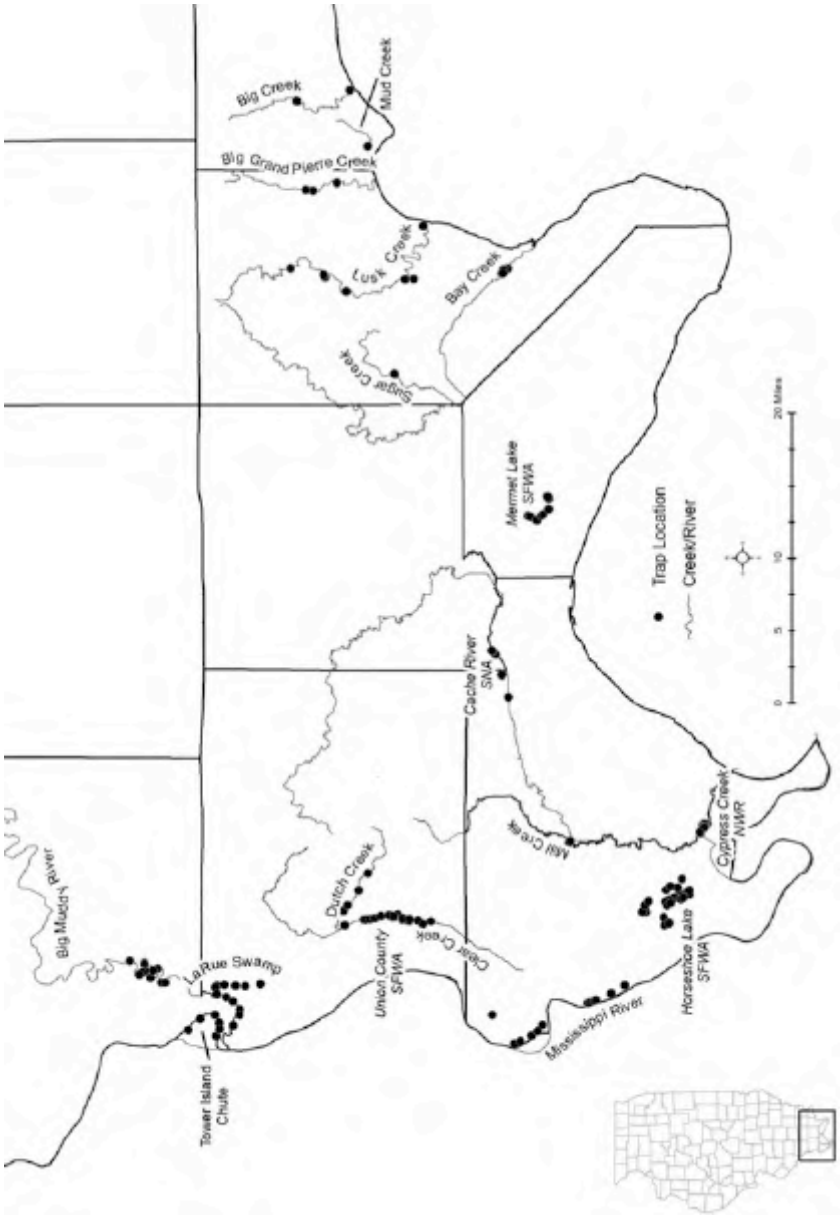

Figure 1. Locations sampled for the presence of *Macrochelys temminckii* in southern Illinois during 2005–2010.