ILLINOIS NATURAL HISTORY SURVEY
PRAIRIE RESEARCH INSTITUTE

A one-year project to update historic (> 10 yrs old) endangered and threatened invertebrate Element Occurrence Record information for Illinois Department of Natural Resources' (IDNR) Administrative Region 5

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INTRODUCTION

The objective of our report was to update invertebrate animal Element Occurrence Records (EORs) that are greater than 10 years old for IDNR Region 5. We conducted status assessments to update historic EORs for endangered and threatened invertebrates, which include amphipods, crayfishes, and freshwater mussels. This report summarizes the surveys done for those groups.

Freshwater Mussels

IDNR's Region 5, which includes the Wabash River, historically supported a diverse and abundant mussel fauna. Nearly 75 species of freshwater mussels have been recorded from this region historically, but about 30 have been found alive since 1970 (Cummings and Mayer 1997; Fisher 2006; Tiemann et al. 2007). This represents a 55% reduction in species richness. Physical and biological changes as a result of anthropogenic activities are the suspected cause for declines in aquatic species richness in the Wabash River system (Simon 2006).

In August 2011, we sampled the 22 EOR freshwater mussel sites in the Wabash River, and in September 2012 we sampled the 4 Little Wabash River EORs (Table 1). The water levels were low and provided good conditions for sampling. Nearly every site was sampled for at least 4 person-hours (Table 1). Freshwater mussels were classified as live, dead (valves with tissue present or shiny nacre and intact periostracum), or relict (valves with chalky nacre and worn periostracum) based on condition of best specimen found (Table 1). Voucher specimens of each species from each site were retained and select specimens were deposited into the INHS Mollusk Collection, Champaign. Of the 22 EOR freshwater mussel sites in the Wabash River, we were only able to reconfirm 7 records (Table 1).

- *Cyclonaias tubercula* (Figure 1a) is found in medium to large rivers in gravel or mixed sand and gravel (Cummings and Mayer 1992). It is widespread but uncommon in most of the Midwest (Cummings and Mayer 1992). Fisher (2006) suggested that it is no longer reproducing in the Wabash River mainstem and was therefore a functionally extirpated species in the Wabash River. Cummings et al. (1988) stated that it has undergone a "severe reduction in range." Within Illinois, it is sporadically found in the Kankakee, Vermilion of the Wabash, and Ohio rivers (Cummings and Mayer 1997). We failed to find *C. tubercula* at the one EOR site in the Wabash River (Table 1).
- *Cyprogenia stegaria* (Figure 1b) is found in medium to large rivers in gravel riffles (Cummings and Mayer 1992). It was historically known to inhabit the Ohio River and the Wabash River drainage in Illinois (Cummings and Mayer 1997; Tiemann et al. 2007), and was thought to occur in isolated populations in the Wabash River (Cummings et al. 1987; Cummings et al. 1988). However, it's doubtful that a reproducing population still exists in the Wabash River and is therefore considered a functionally extirpated species in the mainstem (Cummings and Mayer 1997; Fisher 2006). We failed to find *C. stegaria* at the one EOR site in the Wabash River (Table 1).
- *Elliptio crassidens* (Figure 1c) is found in large rivers in mud, sand, or fine gravel (Cummings and Mayer 1992). It is widespread but relatively rare in the Midwest, and within Illinois is sporadically found in the Wabash and Ohio rivers (Cummings and Mayer 1992; Cummings and Mayer 1997). It was never abundant in the Wabash River (Cummings et al. 1987; Cummings et al. 1988) and might be a functionally extirpated

species in the Wabash River because it is not reproducing in the mainsteam (Fisher 2006). We found *E. crassidens* at 1 of the 5 EOR site in the Wabash River (Table 1).

- *Fusconaia ebena* (Figure 1d) was historically distributed in the sandy-gravel areas of larger streams in Illinois (Cummings and Mayer 1992). Within Illinois, it currently is known from the Illinois, Mississippi, Little Wabash, Wabash, and Ohio rivers (Cummings and Mayer 1997; Tiemann et al. 2007). Cummings et al. (1987) suggested it was rare in the Wabash River, and Fisher (2006) suggested that it probably does not have reproducing populations in the mainsteam and is therefore a functionally extirpated species here. We failed to find *F. ebena* at the 6 EOR sites in the Wabash River (Table 1).
- *Plethobasus cyphyus* (Figure 1e) is found in large streams in gravelly areas (Cummings and Mayer 1992). It is rare throughout its range, and is no longer believed to be reproducing in the Wabash River mainstem (Cummings and Mayer 1997; Fisher 2006). Within Illinois it is currently known from the Kankakee and Mississippi rivers (Cummings and Mayer 1997). We failed to find *P. cyphyus* at the one EOR site in the Wabash River (Table 1).
- *Potamilus capax* (Figure 1f) is found in large rivers in slow-flowing water in mud or sand (Cummings and Mayer 1992). Within Illinois, it currently is known from the Saline, Little Wabash, Wabash, and Ohio rivers (data from INHS Mollusk Collection, Champaign). It appears to have a stable population in the lower Wabash River (Cummings and Mayer 1993; Fisher 2006). *Potamilus capax* was found at 6 of the 8 EOR sites (Table 1). It is one of the most common species downstream of Mt Carmel, IL, and it might be expanding its range upstream. Cummings et al. (1988) stated that *P. capax* is "apparently confined in the Wabash River to the area below Grand Chains" (= Maunie, IL) yet it has been found as far upstream as Catfish Bend near Allendale, IL, which is about 50 river miles upstream (data from INHS Mollusk Collection, Champaign). During our 2011 survey in the lower portions of the Wabash River, many *P. capax* were observed dead (some with soft-parts still present) on exposed sand bars.

Of the 4 EOR from the Little Wabash River, we were only able to reconfirm 1 record (Table 1).

- *Elliptio dilatata* (Figure 1g) is found in small to large in gravel (Cummings and Mayer 1992). It is widespread but sporadic in most of the Midwest (Cummings and Mayer 1992), and within the Little Wabash, it is rare (Cummings and Mayer 1997). Tiemann et al. (2008) suggested that the species in imperiled in the basin because it has experienced a range reduction in during the last 100 years. We failed to find *E. dilatata* at the two EORs site in the Little Wabash River (Table 1).
- *Potamilus capax* (Figure 1f) is found in large rivers in slow-flowing water in mud or sand (Cummings and Mayer 1992). Within Illinois, it currently is known from the Saline, Little Wabash, Wabash, and Ohio rivers (data from INHS Mollusk Collection, Champaign). The species has only recently expanded its range into the Little Wabash (Tiemann et al. 2007), and is present in low numbers (Tiemann et al. 2008). We failed to find *P. capax* at the two EORs site in the Little Wabash River (Table 1).
- *Toxolasma lividus* (Figure 1h) is found in gravelly areas of medium-sized streams (Cummings and Mayer 1992). Historically in Illinois, the species was found thought the Wabash and Ohio river basins, but now is only found in big Grand Pierre Creek and the Little Wabash and Vermilion rivers. We found *T. lividus* at 1 EOR site (Table 1).

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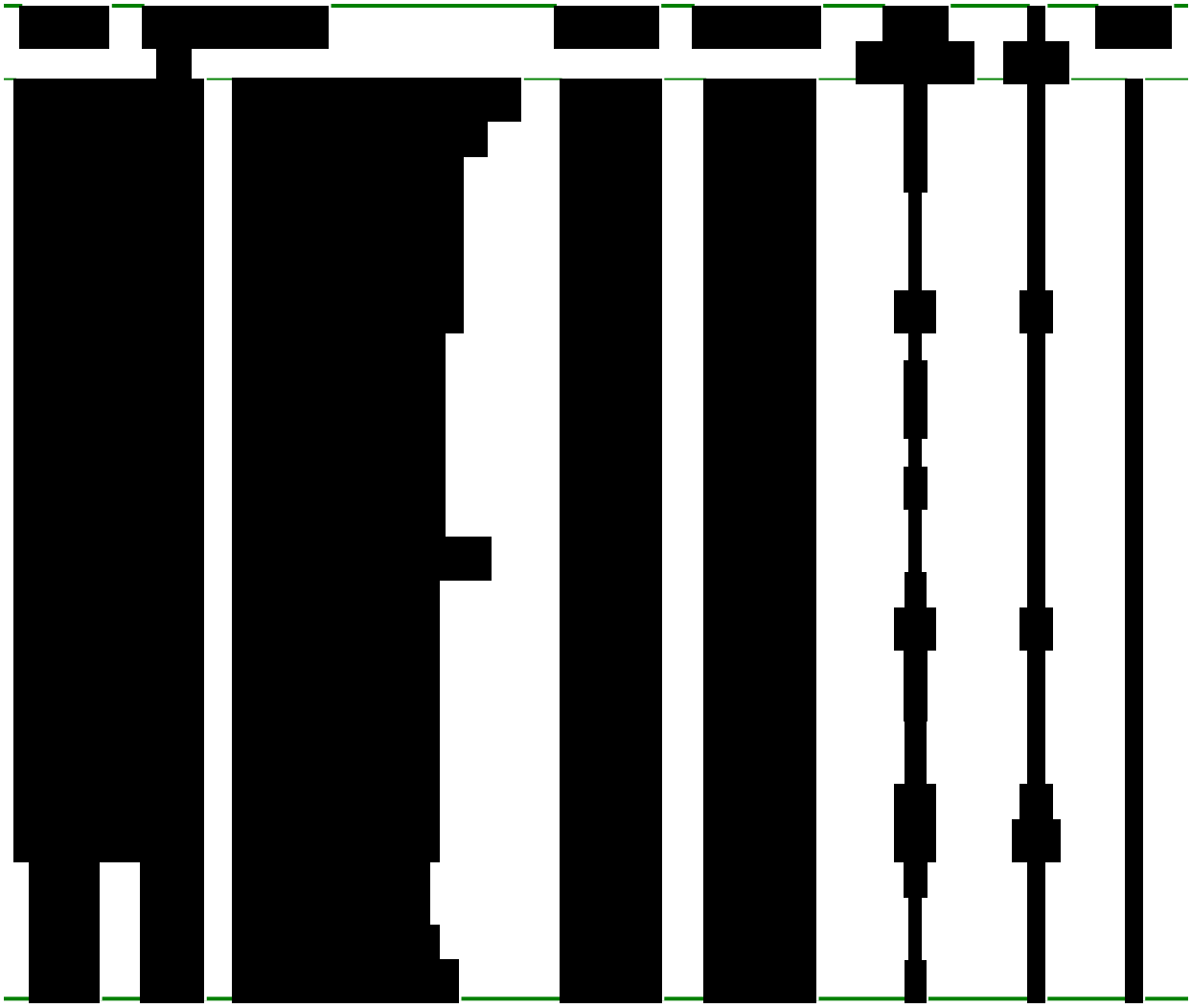

Amphipods

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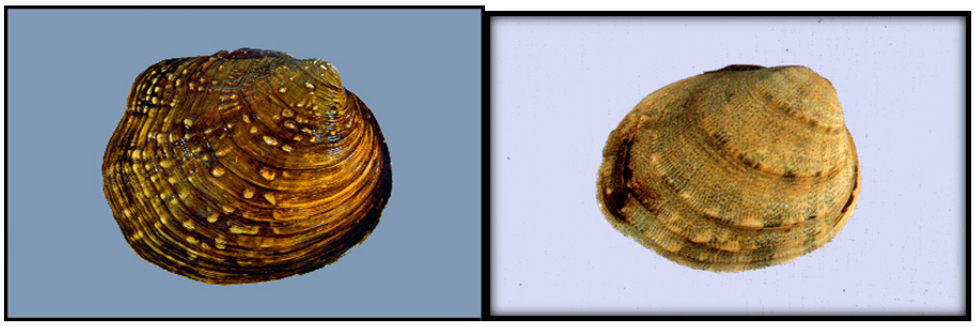
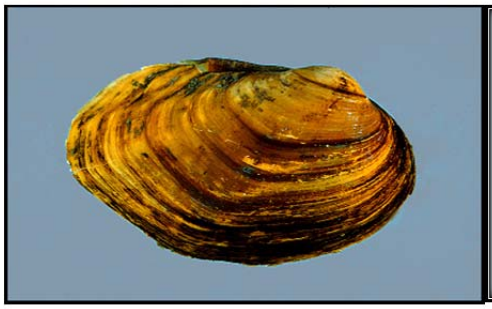


a) *Cyclonaias tubercula*

b) *Cyprogenia stegaria*

c) *Elliptio crassidens*

d) *Fusconaia ebena*



e) *Plethobasus cyphyus*

f) *Potamilus capax*

g) *Elliptio dilatata*

h) *Toxolasma lividus*

Figure 1 – Freshwater mussels known from IDNR Region 5 (from Cummings and Mayer 1992).

Figure 2 – Spring and mostly dry spring run at site sjt11-060, near Simmons Creek, Pope County, Illinois, 26 August 2011.

Figure 3 – Spring head at site sjt11-060, near Simmons Creek, Pope County, Illinois, 26 August 2011.

Figure 4 – Springtail (Collembola: Tomoceridae: probably *Pogonongnathellus flavescens*) from moss on rocks in spring head at site sjt11-060, near Simmons Creek, Pope County, Illinois, 26 August 2011.

Figure 5 – *Lirceus* sp. (Isopoda: Asellidae) from moss on rocks in spring head at site sjt11-060, near Simmons Creek, Pope County, Illinois, 26 August 2011.

Figure 6 – Dry, intermittent spring run at Site sjt11-061, near Simmons Creek, Pope County, Illinois, 26 August 2011.

Figure 7 – Springhead at site sjt11-062, near Simmons Creek, Pope County, Illinois, 26 August 2011.

Figure 8 – Looking upstream along dry spring run to springhead of intermittent spring at Site sjt11-062, near Simmons Creek, Pope County, Illinois, 26 August 2011.

Figure 9 – Entrance area of Firestone Creek Cave (Johnson County, Illinois), 27 August 2011. Researcher is standing above main entrance. Rebar cages are, according to landowner, intended to keep livestock and people from accidentally falling into the cave. These covers are movable and not locked.

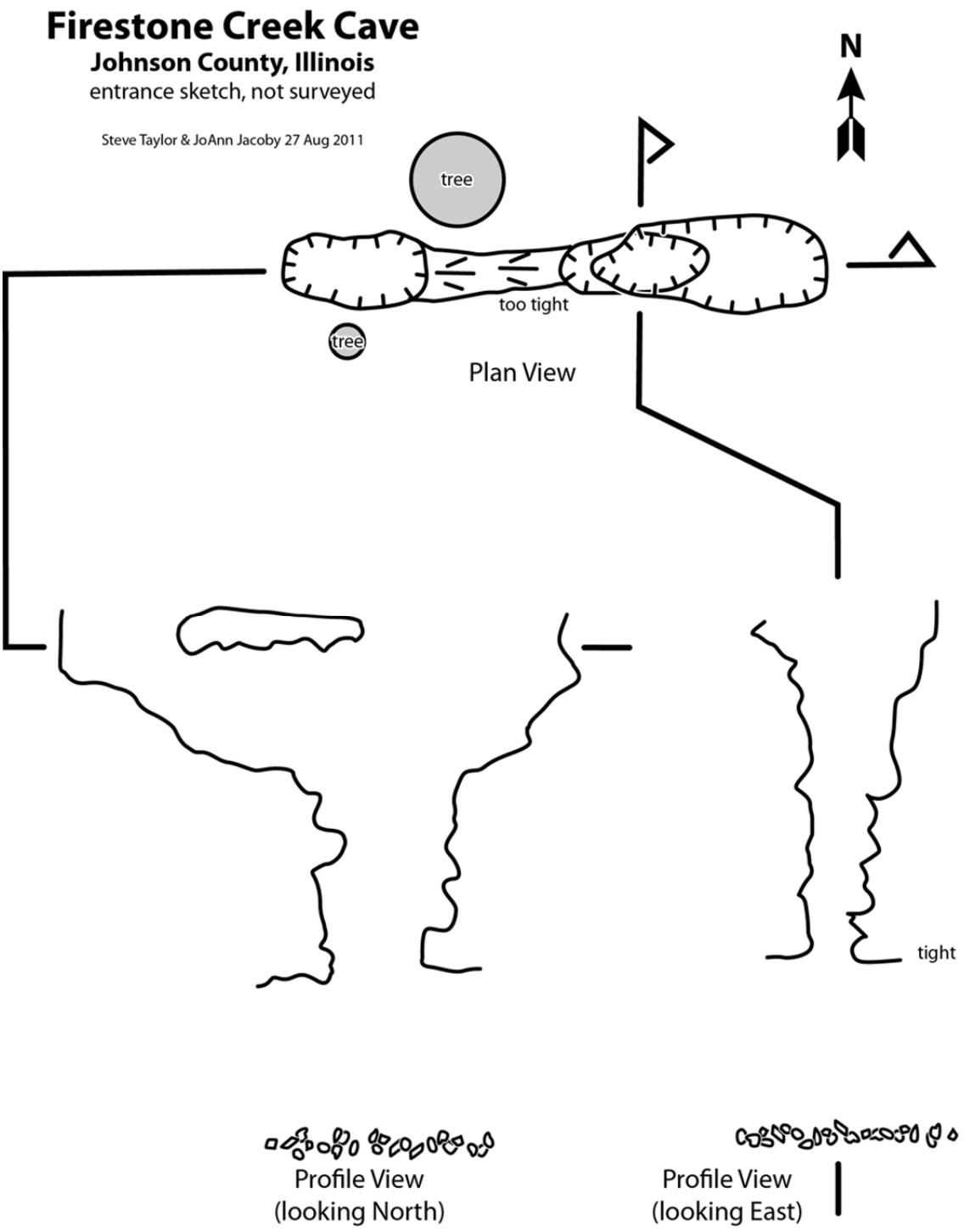


Figure 10 – Field sketch of entrance portion of Firestone Creek Cave (Johnson County, Illinois).

Figure 11 – Spring at Grantsburg Swamp, Johnson County, Illinois, 27 August 20111. Springhead is located under and around large stones at center of image. Green area in foreground and where researcher is standing is normally completely submerged, causing the swamp to back up into the springhead.

Figure 12 – C*aecidotea* sp. (Isopoda: Asellidae) from the spring at Grantsburg Swamp, Johnson County, Illinois, 27 August 2011.

Figure 13 – Bedrock wall of Cave Spring Cave, Union County, with seeping water and organic debris. White line points to small (ca. 4 cm diameter) pool on bedrock wall ledge where Crangonyx sp. (Figure 14) was collected on 8 August 2012.

Figure 14 – *Crangonyx* sp. from Cave Spring Cave, Union County, Illinois (8 August 2012). Scale bar is 1 millimeter. Note the well-developed eye.

Figure 15 – Isolated, sediment bottom pool in otherwise dry stream bed in Equality Cave, Saline County, Illinois (7 August 2012). This is where *Crangonyx packardi* (Figure 16) was collected using a plastic turkey baster and an aquarium net.

Figure 16 – *Crangonyx packardi* from Equality Cave, Saline County, Illinois (7 August 2012). Scale bar is 1 millimeter. Not the apparent absence of eyes, and relatively slender antennae in comparison to the eyed species of *Crangonyx* shown in Figure 14.

Figure 17 – *Bactrurus mucronatus* from Equality Cave, Saline County, Illinois (7 August 2012). Note the absence of eyes and the well-developed posterior process that is diagnostic for this species in Illinois. Scale bar is 1 millimeter.

Figure 18 – Shrimp crayfish *Orconectes lancifer*.