ILLINOIS NATURAL HISTORY SURVEY
PRAIRIE RESEARCH INSTITUTE

Freshwater snail surveys of wetlands in northern Illinois

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Prepared for Illinois Department of Natural Resources,
Wildlife Preservation Fund
Grant Agreement Number 13-032W
Project duration: 31 July 2012 – 31 December 2013

Illinois Natural History Survey Technical Report 2014 (07)
20 February 2014

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Abstract – Northern Illinois wetlands were sampled for freshwater snails to obtain baseline data on the distribution of the assemblage. Twenty-six sites were sampled in the region during 2012 and 2013. Thirteen species were collected as live or fresh-dead shells, three species were found only as relict shells, and 16 species known from natural history museums were not encountered during the 2012-2013 surveys. The species composition, including extant and rare species, is similar to those reported in surrounding states.

Introduction

Freshwater gastropods (snails) are an important and diverse component of aquatic ecosystems worldwide (Johnson et al. 2013). Gastropods have diversified into every conceivable natural aquatic habitat including aquifers, springs, creeks, rivers, lakes and wetlands and are routinely found in ephemeral and man-made water bodies. Most graze on periphytic or epiphytic algae and biofilms, while some are suspension or deposit feeders. Gastropods often dominate stream benthos in both mass and numbers often exceeding 50% of the invertebrate benthic biomass and are the principal grazers in many aquatic habitats. As such, gastropods have a profound impact on algal primary productivity playing a pivotal role in nutrient cycling. Gastropods were important dietary components of several animals, including fishes (e.g., Redear Sunfish, River Redhorse) and turtles (e.g., Stinkpot).

Freshwater snails are among the most rapidly declining groups of organisms on Earth (Lydeard et al., 2004; Johnson et al. 2013). Of the approximate 700 species of freshwater snails native to North America, nearly three-quarters are extinct, federally–listed, or are in need of conservation status (Johnson et al. 2013). Factors responsible for the decline in freshwater mollusks include anthropogenic disturbances to stream habitats (e.g., habitat destruction and environmental contamination) and competition with exotic (non-native) species.

Northeastern Illinois has numerous wetlands as a result of the glacial history of the area (Suloway and Hubbell 1994). A variety of wetland types, such as marshes, sedge meadows, fens, and bogs, support a unique and sometimes rare flora and fauna, including freshwater snails. Baker (1902, 1906) was the last investigate the distribution and status of freshwater snails in Illinois. Current data are needed by the Illinois Endangered Species Protection Board to determine the state status of several snail species and by natural resource agencies to make management decisions and provide plans to protect rare gastropods in Illinois. The objective of this study was to sample in wetlands of northern Illinois to collect baseline distribution data on freshwater gastropods in the area.

Methods

Freshwater snails were collected in at 26 lentic sites northern Illinois during 2012 and 2013 (Table 1; Figure 1). Selected sites included areas with historical collections (data taken from the following mollusk collections[1]: Chicago Academy of Science [CAS]; Field Museum of Natural History, Chicago [FMNH]; Florida Museum of Natural History, Gainesville [UF]; the combined Illinois Natural History Survey [INHS] and University of Illinois Museum of Natural History, Champaign [UIMNH]; and University of Michigan Museum of Zoology, Ann Arbor [UMMZ]) and areas that looked suitable for freshwater snails (e.g., wetlands, ponds, ditches, and streams with dense vegetation and no flow). Freshwater snails were collected for one person-hour with a dipnet by sweeping the vegetation and substrate and by picking snails off rocks and logs (figures 2 and 3). Areas of the shoreline also were visually searched for the presence of fresh dead and relict shells. Voucher specimens of all species from each site were deposited in the INHS Mollusk Collection, Champaign.

Results

A total of 13 species of freshwater snails were collected as live or fresh-dead during 2012 and 2013 (Table 2; Appendix 1). An additional 3 species were found as relict shell (Table 2; Appendix 1). The number of extant (live and fresh-dead) native species varied from 0 to 6 per site, whereas the total number of species, including exotic, varied from 1 to 8 per site (Table 1). A review of natural history museum records revealed an additional 16 species known from northern Illinois wetlands, increasing the total of freshwater snails species known from this region to 32 (Table 2; Appendix 1). Of these 16 addition species housed in museums, 6 are considered extant because they have been collected as live or fresh-dead since 2000 (Table 2; Appendix 1). It should be noted that Lake Michigan records were excluded from this report. Also not included are data for *Campeloma decisum* (Viviparidae), *Elimia livescens* (Pleuroceridae), and *Pleurocera acuta* (Pleuroceridae); these three species typically inhabit lotic systems (Baker 1902, 1906, 1928) and are considered extant in streams throughout northern Illinois (INHS Mollusk Collection database, Champaign).

[1]Records were excluded if they could not be confirmed. Also, not all lots have been examined at a given institution.

Discussion

Freshwater snails have received little attention in Illinois during the past century, and there is a paucity of data for snails inhabiting northern Illinois wetlands. With at least 32 species occurring in the region, northern Illinois wetlands supported nearly half the state's 80 freshwater snail species (Cummings 191; Johnson et al. 2013). However, northern Illinois, once home to a vast amount of the state's wetland acreage, now only contains the remaining 22 percent (Suloway and Hubbell 1994), and this reduction in wetlands not only affects plants, but also freshwater snails (Johnson et al. 2013).

The majority of the extant species encountered were similar to other states, as was the list of taxa considered rare (Stewart 2006; Pyron et al. 2008). There are a few species (e.g., *Lymnaea stagnalis* and *Aplexa elongata*) whose southern distribution historically stopped in northern Illinois (Burch 1989; Johnson et al. 2013), and we failed to find evidence that they are still extant in the state (data in Appendix). Some of these species are considered extirpated or very rare in Iowa, Indiana, and southern Wisconsin (Baker 1928; Goodrich and van der Schalie 1944; Jass 2004; Stewart 2006; Pyron et al. 2008). More targeted surveys should shed light on the state status of these species.

There are two limitations of the study. The first is under-sampling. There are thousands of acres of wetland habitats in northern Illinois (Suloway and Hubbell 1994), and only a minute fraction of those habitats were sampled during the 2012-2013 surveys. It is highly likely that a few species (either those not reported in Table 1 or those not considered extant) might have been missed. One example is the Coldwater Pondsnail *Stagnicola woodruffi* (Baker, 1901), which has been reported from Lake Michigan (INHS Mollusk Collection data, Champaign) and is listed as threatened by Johnson et al. (2013). Not only do very few records exist for this species to allow for a more targeted survey, but also the species is found in areas not easily sampled.

The second limitation of the study is the uncertainty of species identification. Snail shells are ecophenotypically plastic, and very few dichotomous keys exist for freshwater snails. These two factors couple together has resulted in taxonomic uncertainty and hinders identification. An example of this issue is the lymnaeid group. All *Galba* (= *Fossaria*) species were lumped by Stewart (2006) in Iowa and Pyron et al. (2008) in Indiana because "taxonomy of the genus *Fossaria* is in a confused state, with species distinguished by minor differences in shell attributes that might be exophenotypic in origin" (Stewart 2006). For this report, specimens collected were compared with reference specimens in the INHS-UIMNH Mollusk Collection.

Numerous authors have stated conservation of freshwater snails should be considered as important as conservation of other aquatic organisms, if only for preservation of diversity (Lydeard et al. 2004; Pyron et al. 2008; Johnson et al. 2013). First step toward conservation is an accurate inventory, but efforts towards this have lagged behind inventories of vertebrates, especially those considered popular with numerous funding sources (e.g., fishes, birds, and mammals). Because of limited funding, only 26 wetlands were sampled during the 2012-2013 surveys, which barely "scratched the surface" of those potential areas known to harbor freshwater snails found in northern Illinois wetlands. Additional surveys and utilizing different sampling methods (e.g., ponar grabs or dredging) would provide a more accurate inventory of freshwater snails, and would better address taxonomic, ecological, and conservation status issues pertaining to the group.

Acknowledgements

This project was funded in part by a grant from the Illinois Department of Natural Resources' Wildlife Preservation Fund (#13-032W) and the Illinois Department of Transportation, Springfield. B.D. Cheek (INHS), K.S. Cummings (INHS), M.J. Dreslik (INHS), S. Baker-Wylie (INHS), S.A. Douglass (INHS), M. Grobelny (INHS), A.C. Haskett (INHS), S.M. Jaworski (INHS), E. Kessler (INHS), A.R. Kuhns, C.A. Phillips, A.P. Stodola (INHS) assisted in field collections and lab preparation. C.A. Mayer (INHS) assisted in data management. D. Foighil (UMMZ), J. Gerber (FMNH), D. Roberts (CAS), and J. Slapcinsky (UF) generously provided access to specimens and data under their care. F. Veraldi (U.S. Army Corps of Engineers) offered historical information on wetlands in the region.

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Table 1. List of 2012-2013 sampling locations (N = 26) with date sampled, number of extant native species collected (live or fresh-dead), and total number of species collected, including relict and exotic (non-native) species. All sites sampled for one person-hour.

Water body	County	Common Location	Latitude / Longitude	Date	Extant	Total
Wetland	Lake	Winthrop Harbor, Spring Bluff Nature Preserve	42.49102, -87.80796	30 April 2013	6	8
Wetland	Lake	1 mi SE Russell, off 9th St.	42.47944, -87.89976	30 April 2013	5	7
Pond	Lake	3.5 mi N Lindenhurst, Raven Glen Forest Preserve	42.45985, -88.01688	30 April 2013	3	4
Dead River	Lake	Zion, Bull Creek confluence, Illinois Beach State Park	42.42630, -87.81601	30 April 2013	2	3
Volo Bog	Lake	2 mi NNW Volo, Volo Bog State Nature Preserve	42.35256, -88.18890	26 June 2013	4	4
Ditch	Lake	4 mi NW Libertyville, off Buckley Rd.	42.32248, -88.01759	2 July 2012	2	2
Pond	Lake	1.7 mi E Wauconda, Lakewood Forest Preserve	42.26080, -88.10672	27 June 2013	3	3
Wetland	Lake	0.4 mi SW Diamond Lake	42.24027, -88.01620	26 June 2013	2	4
Pond	Lake	1.8 mi NW Long Grove, Heron Creek Forest Preserve	42.19478, -88.02463	27 June 2013	2	2
Pond	Lake	1.7 mi SSW Lake Zurich, Cuba Marsh Forest Preserve	42.17242, -88.10143	27 June 2013	5	5
Wetland	McHenry	1 mi S Richmond, S of Hill Rd.	42.46396, -88.29972	15 Sept 2013	1	1
Wetland	McHenry	3.5 mi S Richmond, Glacial Park	42.42553, -88.31387	9 July 2013	1	6
Nippersink Creek	McHenry	0.5 mi N Pistakee, Nippersink Canoe Base County Park	42.41873, -88.20680	9 July 2013	2	4
Ditch	McHenry	Wonder Lake, jct. Wonder Lake Rd. & Wooded Shore Dr.	42.37291, -88.34561	13 Sept 2013	3	3
Lily Lake	McHenry	Lakemoor	42.32832, -88.20265	10 July 2013	0	2
Lake Defiance	McHenry	1.5 mi WSW Lakemoor, Moraine Hills State Park	42.32173, -88.22656	10 July 2013	0	3
Wetland	McHenry	1 mi SW Lakemoor, Moraine Hills State Park	42.31994, -88.21534	10 July 2013	1	1
Lake Killarney	McHenry	Silver Lake	42.23568, -88.25949	9 July 2013	3	4
Wetland	Cook	2.1 mi SSE Barrington Hills, Crabtree Nature Preserve	42.11162, -88.16196	10 July 2013	3	3
Poplar Creek	Cook	3.5 mi N Bartlett, Rt. 58 bridge	42.04544, -88.19507	28 Aug 2012	0	1
Wolf Lake	Cook	Hegewisch, Wm. W. Powers Conservation Area	41.66929, -87.53475	1 May 2013	1	2
Ditch	Kane	3.9 mi NE Hampshire, I-90 bridge	42.13271, -88.46841	5 June 2012	0	2
Ditch	Kane	3 mi SSW Huntley, I-90 bridge	42.13108, -88.46021	5 June 2012	2	2
Tyler Creek	Kane	6 mi E Hampshire, Rt. 72 bridge	42.09413, -88.41348	9 July 2013	4	4
Wetland	Will	1.9 mi WSW Lemont, Romeoville Prairie Co. Forest Pres.	41.66783, -88.03728	24 June 2013	2	3
Wetland	Will	1.9 mi W Lemont, Keepataw County Forest Preserve	41.67201, -88.03770	24 June 2013	0	1

Table 2. List of freshwater snails found in northern Illinois. Information about species distribution can be found in the appendix. Species in **bold** were found either as live or fresh-dead during the 2012-2013 surveys and are considered extant in the region. Species marked with an asterisk (*) were not found during the 2012-2013 surveys, but a specimen resides in a natural history museum listed in the methods section. Special status includes Exotic (non-native) species. Nomenclature follows Johnson et al. (2013).

Family Lymnaeidae
- *Acella haldemani* (Binney, 1867) – Spindle Lymnaea*
- ***Galba dalli* (Baker, 1907) – Dusky Fossaria**
- ***Galba exigua* (Lea, 1841) – Graceful Fossaria**
- ***Galba modicella* (Say, 1825) – Rock Fossaria***
- ***Galba obrussa* (Say, 1825) – Golden Fossaria**
- *Galba parva* (Lea, 1841) – Pygmy Fossaria*
- *Lymnaea stagnalis* Linnaeus, 1758 – Swamp Lymnaea*
- ***Pseudosuccinea columella* (Say, 1817) – Mimic Lymnaea**
- *Stagnicola caperatus* (Say, 1829) – Wrinkled Marshsnail*
- ***Stagnicola elodes* (Say, 1821) – Marsh Pondsnail**

Family Physidae
- *Aplexa elongata* (Say, 1821) – Lance Aplexa
- ***Physella gyrina* (Say, 1821) – Tadpole Physa**
- ***Physella heterostropha* (Say, 1817) – Pewter Physa***
- ***Physella integra* (Haldeman, 1841) – Ashy Physa**
- ***Physella virgata* (Gould, 1855) – Protean Physa**

Family Planorbidae
- ***Gyraulus deflectus* (Say, 1824) – Flexed Gyro**
- *Gyraulus parvus* (Say, 1817) – Ash Gyro*
- ***Helisoma anceps* (Menke, 1830) – Two-ridge Rams-horn**
- *Planorbella campanulata* (Say, 1821) – Bellmouth Ramshorn*
- ***Planorbella trivolvis* (Say, 1817) – Marsh Ramshorn**
- ***Planorbula armigera* (Say, 1821) – Thicklip Ramshorn**
- ***Promenetus exacuous* (Say, 1821) – Sharp Sprite***

Family Viviparidae
- ***Bellamya chinensis* (Reeve, 1863) – Chinese Mysterysnail (Exotic)**
- ***Viviparus georgianus* (Lea, 1834) – Banded Mysterysnail***

Family Amnicolidae
- *Amnicola limosa* (Say, 1817) – Mud Amnicola
- *Lyogyrus pilsbryi* (Walker, 1906) – Lake Duskysnail*

Family Hydrobiidae
- ***Cincinnatia integra* (Say, 1821) – Midland Siltsnail***
- *Fontigens nickliniana* (Lea, 1839) – Watercress Snail*

Family Lithoglyphidae
- *Somatogyrus depressus* (Tyron, 1862) – Sandbar Pebblesnail*

Family Pomatiopsidae
- ***Pomatiopsis cincinnatiensis* (Lea, 1840) – Brown Walker***

Family Valvatidae
- *Valvata bicarinata* Lea, 1841 – Two-ridge Valvata*
- *Valvata tricarinata* (Say, 1817) – Threeridge Valvata

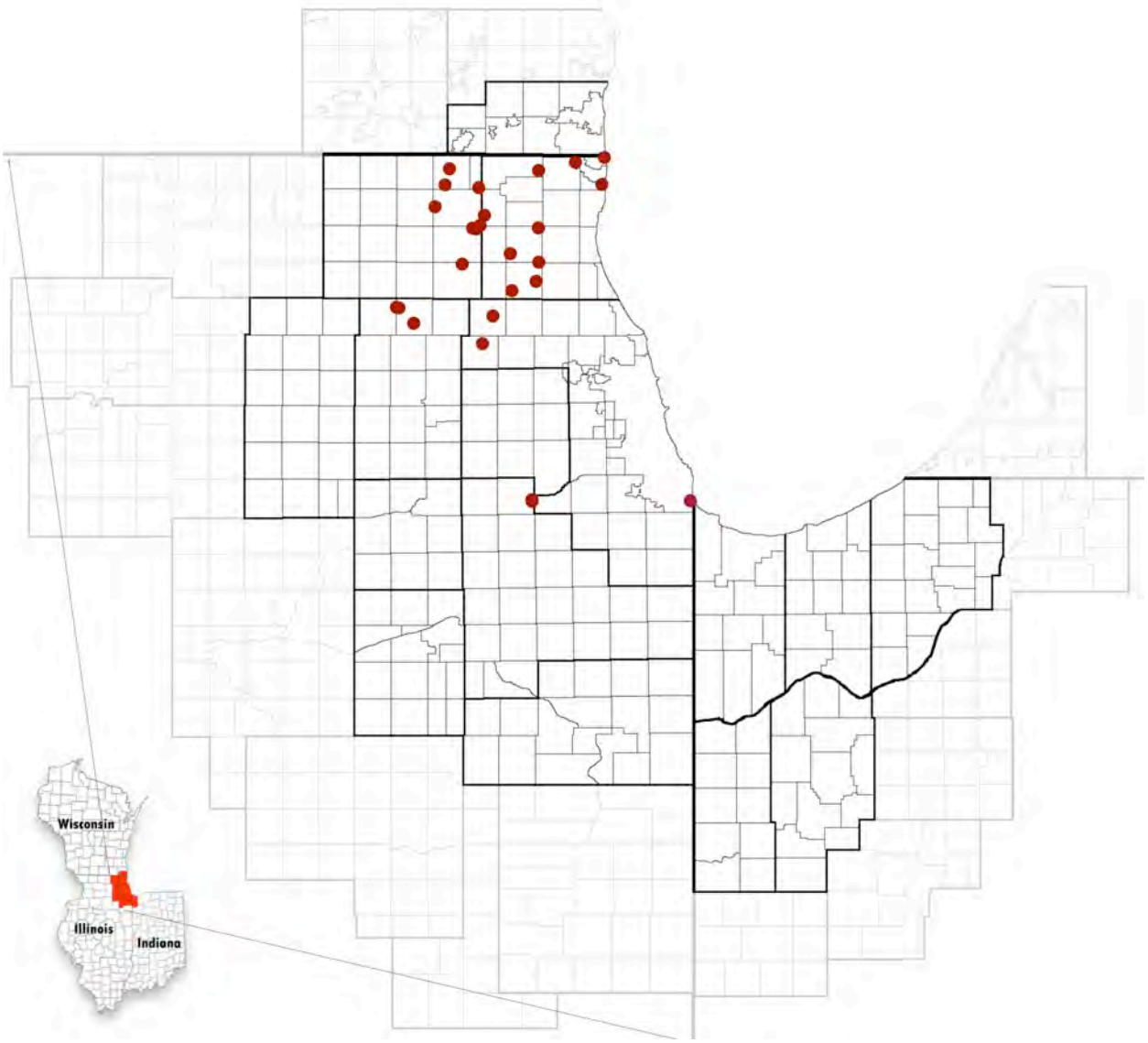


Figure 1. Map of 2012-2013 sample sites (N = 26) in northern Illinois. Reference Table 1 for a list of locations.

a)

b)

Figure 2. (a) Wetland at Moraine Hills State Park, McHenry County (42.31994, -88.21534) on 10 July 2013; and (b) Author dip-netting Lake Marie, Lake County (42.47628, -88.11944) on 8 June 2011. Photos by J.S. Tiemann (top) and K.S. Cummings (bottom).

a)

b)

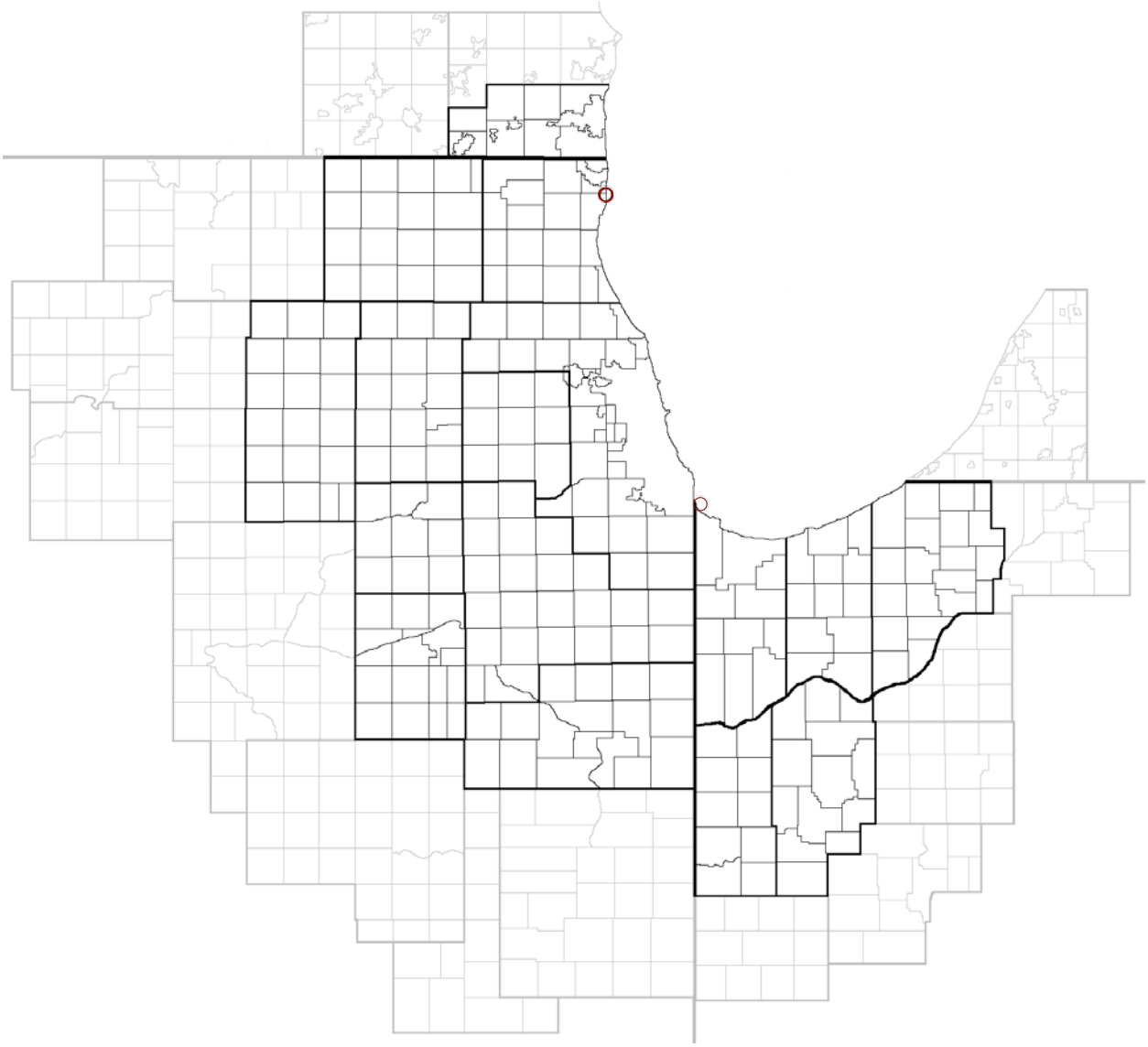
Figure 3. (a) Freshwater snails, mainly Tadpole Physa *Physella gyrina* (Say, 1821) and Marsh Pondsnail *Stagnicola elodes* (Say, 1821), on a submerged log; and (b) The exotic (non-native) Chinese Mysterysnail *Bellamya chinensis* (Reeve, 1863). Photos by K.S. Cummings.

Appendix – Species distribution maps

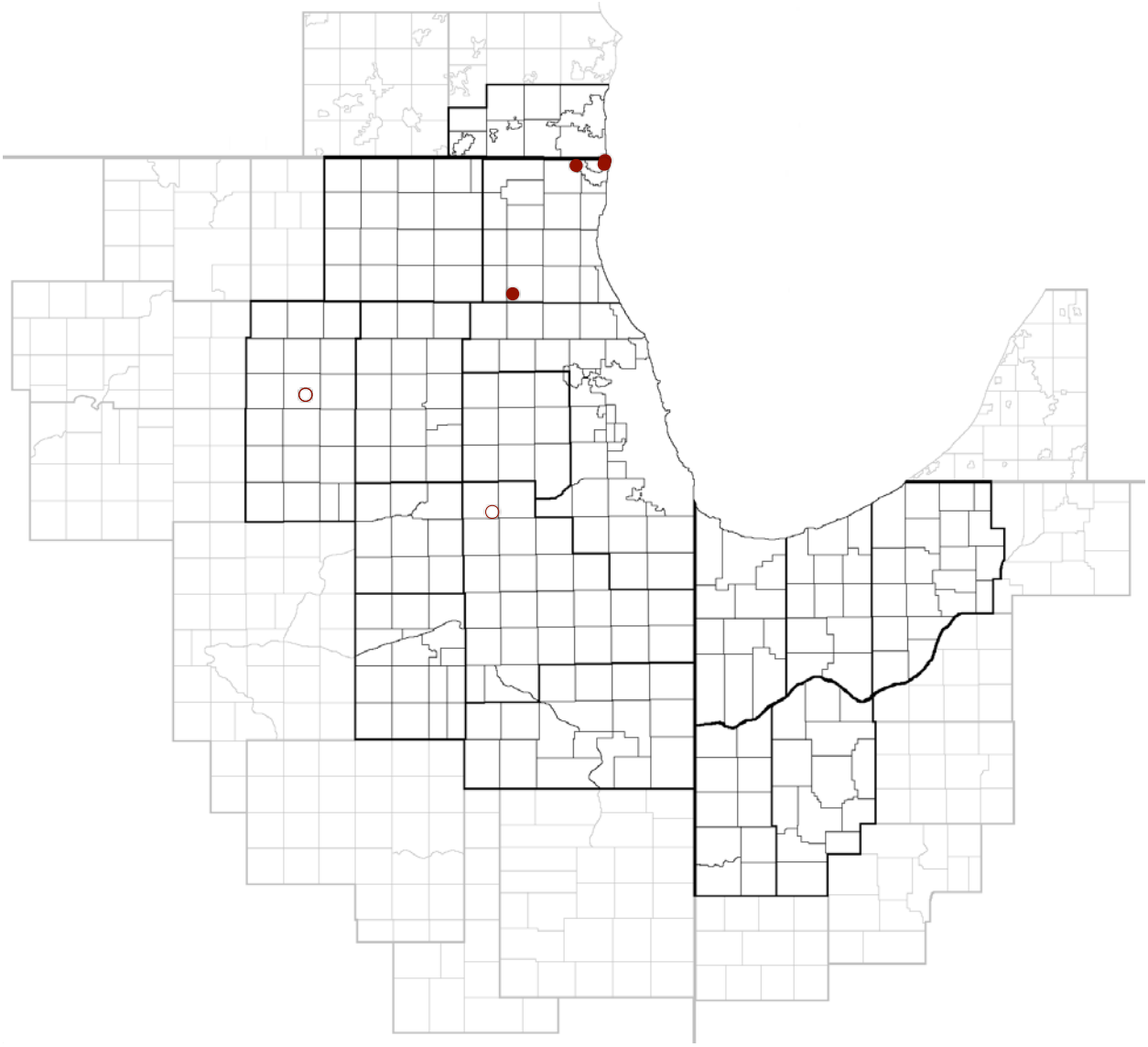
Freshwater snails found in northern Illinois. Maps include data from not only the 2012-2013 survey but also from those records that reside in museums list in the methods section. However, data from publications (e.g., Baker 1902, 1906, 1911, 1928) are not included in maps, but are noted in the text. Open circles are sites where the species has been found either as live or fresh-dead since 2000, whereas open circles are sites where historical records exists (e.g., relict shell). Species status includes AFS rank (from Johnson et al. [2013])[1] and Exotic (non-native) species.

[1] AFS rank definitions: endangered – imminent danger of extinction; threatened – imminently likely to become endangered throughout all or a significant portion of its range; vulnerable – imminently likely to become threatened throughout all or a significant portion of its range; currently stable – not currently at risk

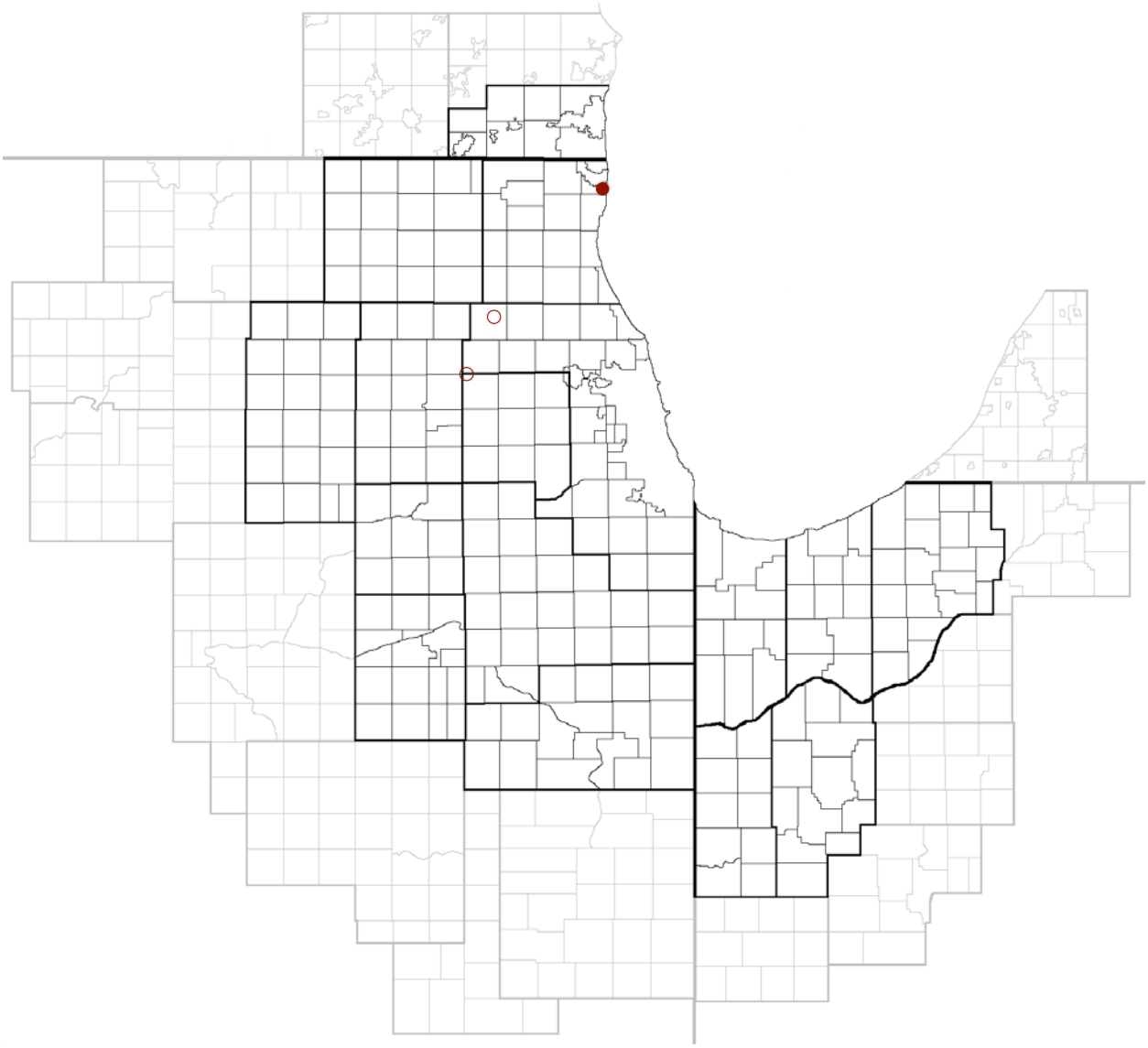
Acella haldemani (Binney, 1867) – Spindle Lymnaea – vulnerable. Very few Illinois specimens exist for this species in natural history museums. Most of the lots examined (e.g., FMNH 28141, UIMNH 39550) were from the Dead River, Lake County, but one was from Berry Lake, Lake County, Indiana (CAS 23583). Baker (1902) did not mention the snail from the Chicago region, but Baker (1906, 1911) reported *A. haldemani* from Cedar Lake in Lake County. The snail was not encountered during the 2012-2013 surveys nor during previous visits to the Dead River (e.g., 2011). Baker (1928) reported *A. haldemani* as rare in Wisconsin, and Jass (2004) reported it from only three counties in the state with the nearest one to Illinois being Milwaukee County. Although Goodrich and van Cleave (1944) and Johnson et al. (2013) listed it in Indiana, Pyron et al. (2008) did not find the snail during their survey. Stewart (2006) suggested *A. haldemani* no longer occurs in Iowa. Baker (1911) reported the snail as a deep water species that migrates toward the shore to spawn. Baker (1928) stated that it always is found in protect habitats. A more detailed survey focusing on deep water habitats in Lake County (e.g., the Dead River and Cedar Lake) should be done to determine the status of *A. haldemani* in Illinois.



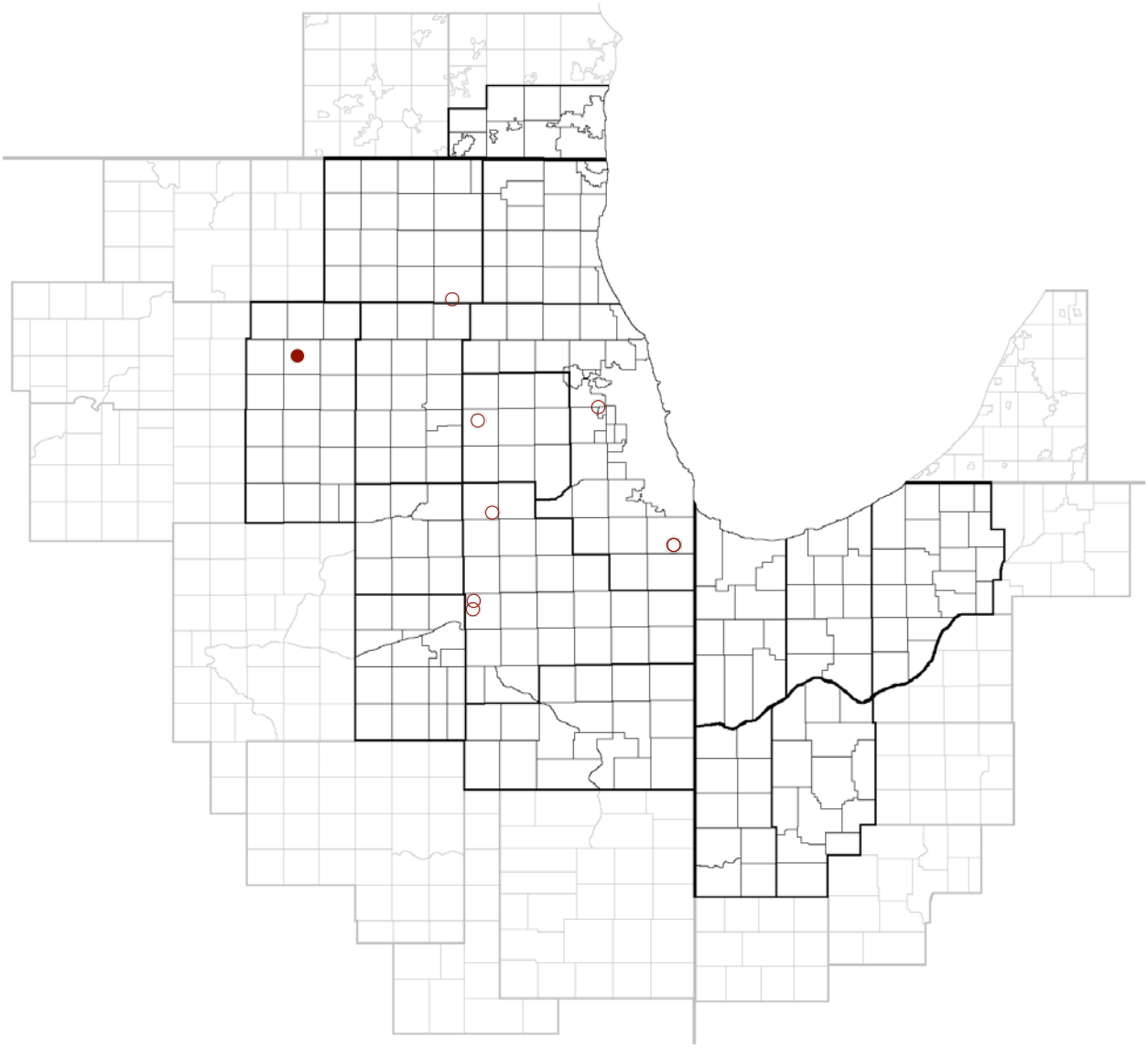
Galba dalli (Baker, 1907) – Dusky Fossaria – currently stable. This snail was collected in wetlands throughout Lake County during the 2012-2013 surveys. Although Baker (1902) did not mention it from the Chicago region, Baker (1906, 1911) reported *G. dalli* from northern Illinois "in drift." Johnson et al. (2013) listed it in Wisconsin, but Jass (2004) did not report the snail from the state. All *Galba* (= *Fossaria*) species were lumped by Stewart (2006) in Iowa and Pyron et al. (2008) in Indiana. Baker (1911) suggested *G. dalli* occurs in wet, marshy places, generally out of the water on sticks, rocks, and mud flats.



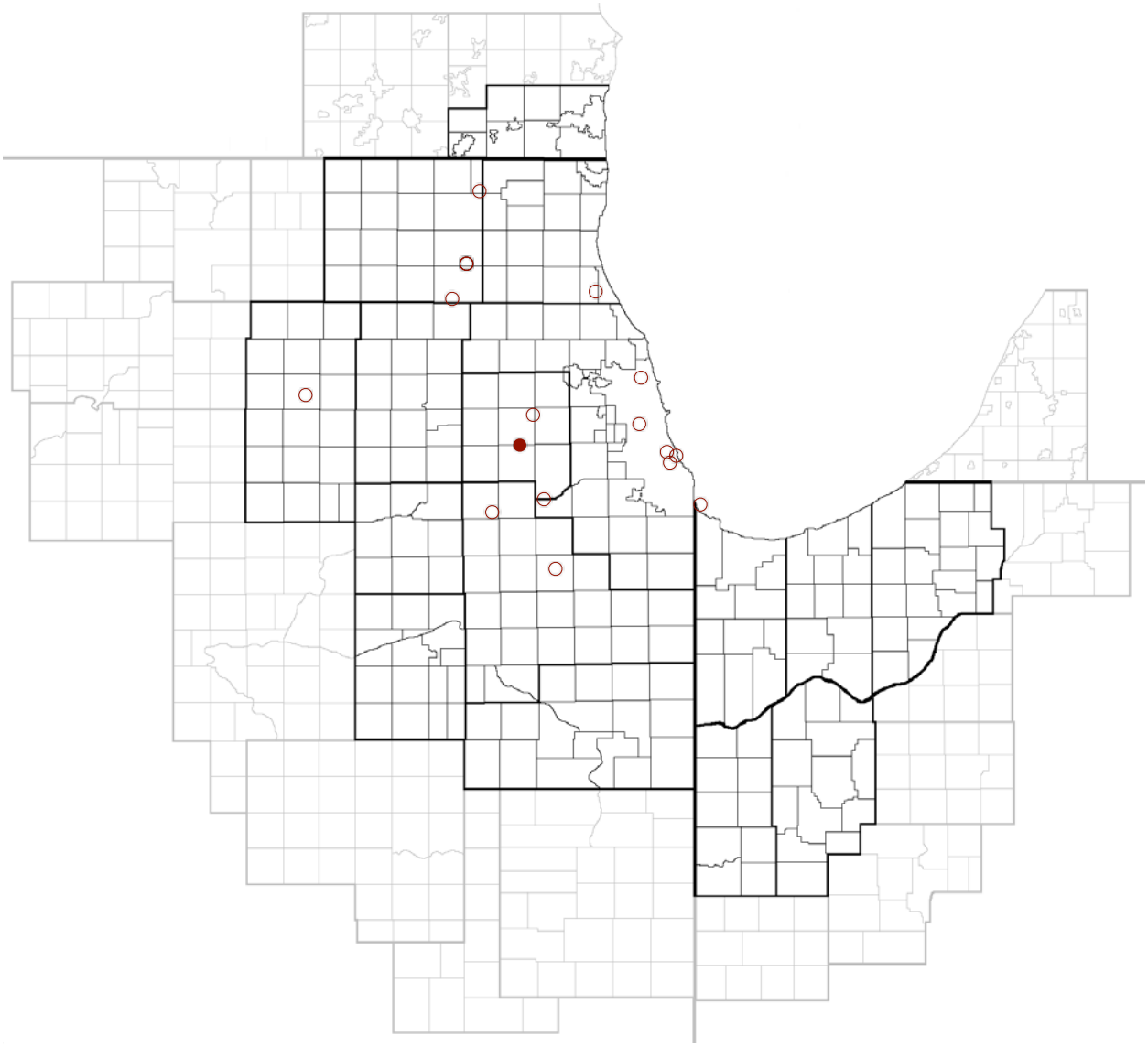
Galba exigua (Lea, 1841) – Graceful Fossaria – currently stable. This snail was collected alive at one location during the 2012-2013 surveys: in the Dead River at its confluence with Bull Creek, Illinois Beach State Park, Zion, Lake County. Although Baker (1902) did not mention it from the Chicago region, Baker (1906) reported *G. exigua* from Chicago and Rockford and Baker (1911) stated it was from "ditches, N.W. end Calumet Lake, Cook Co.; Drummond, Will Co.; Stony Island, Cook Co." Jass (2004) reported the snail from seven counties in Wisconsin with the nearest ones to Illinois being Milwaukee and Waukesha counties. All *Galba* (= *Fossaria*) species were lumped by Stewart (2006) in Iowa and Pyron et al. (2008) in Indiana. Baker (1911) suggested *G. exigua* occurs in "small ponds, lakes and streams, and the protected shores of rivers, on mud flats." Specifically, in Illinois, it "is generally found in ditches and on the margins of small lakes."



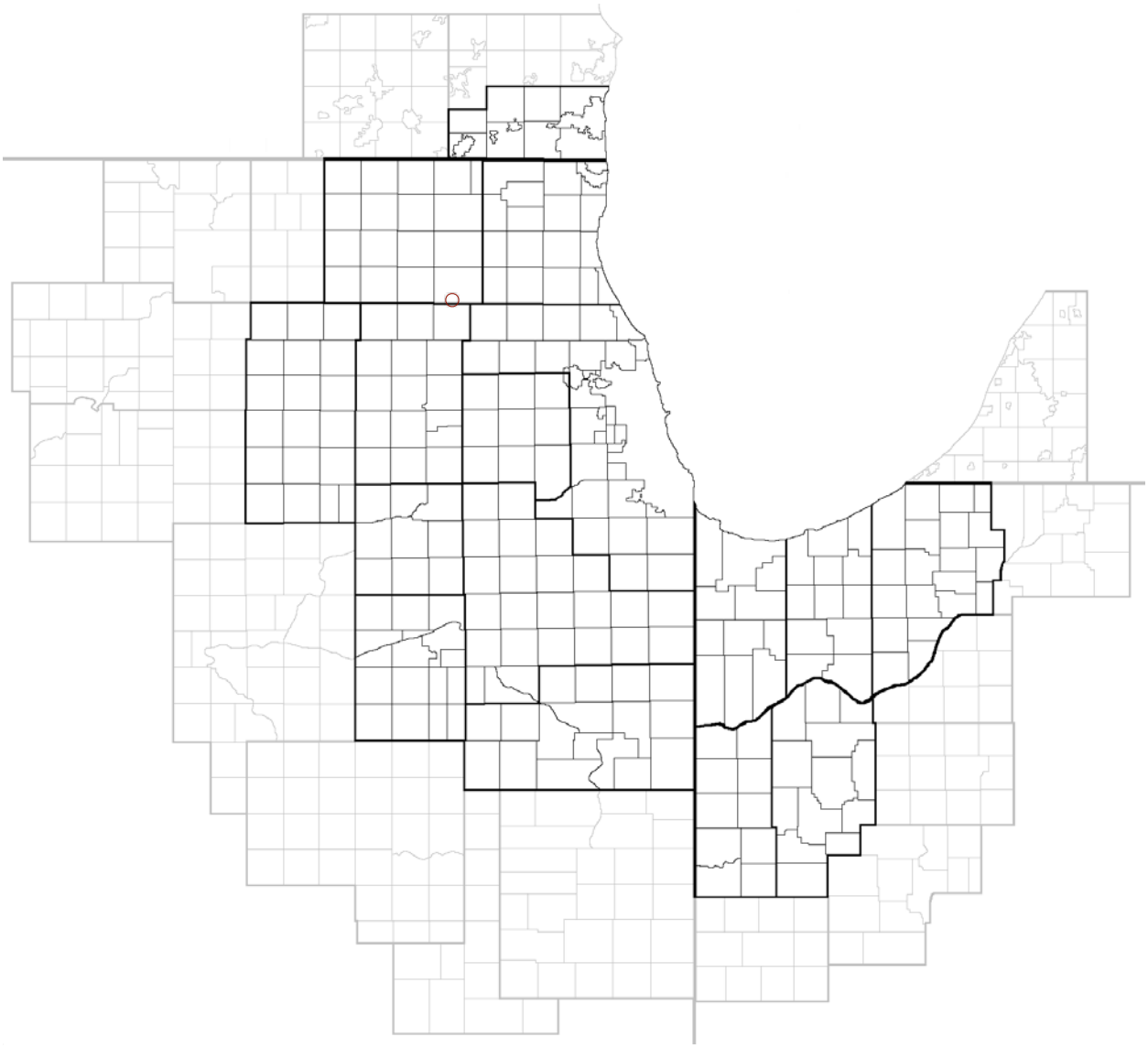
Galba modicella (Say, 1825) – Rock Fossaria – currently stable. Although not collected as live or fresh-dead during the 2012-2013 surveys, *G. modicella* was collected alive in a wetland near Clare, DeKalb County, in 2011 (INHS 45860). Baker (1902) did not mention the snail from the Chicago region, but Baker (1906, 1911) stated *G. modicella* has been found throughout northern Illinois, including "Cook Co.; Elgin, Kane Co; Fox River, Algonquin and Crystal Lake, McHenry Co." Jass (2004) reported the snail from ten counties in Wisconsin with the nearest one to Illinois being Milwaukee County. All *Galba* (= *Fossaria*) species were lumped by Stewart (2006) in Iowa and Pyron et al. (2008) in Indiana. Baker (1911) suggested *G. modicella* "usually selects as a habitat a mud flat or a strip of muddy beach which is kept rather moist," but also has been collected from "boards, sticks and other debris along the shore."



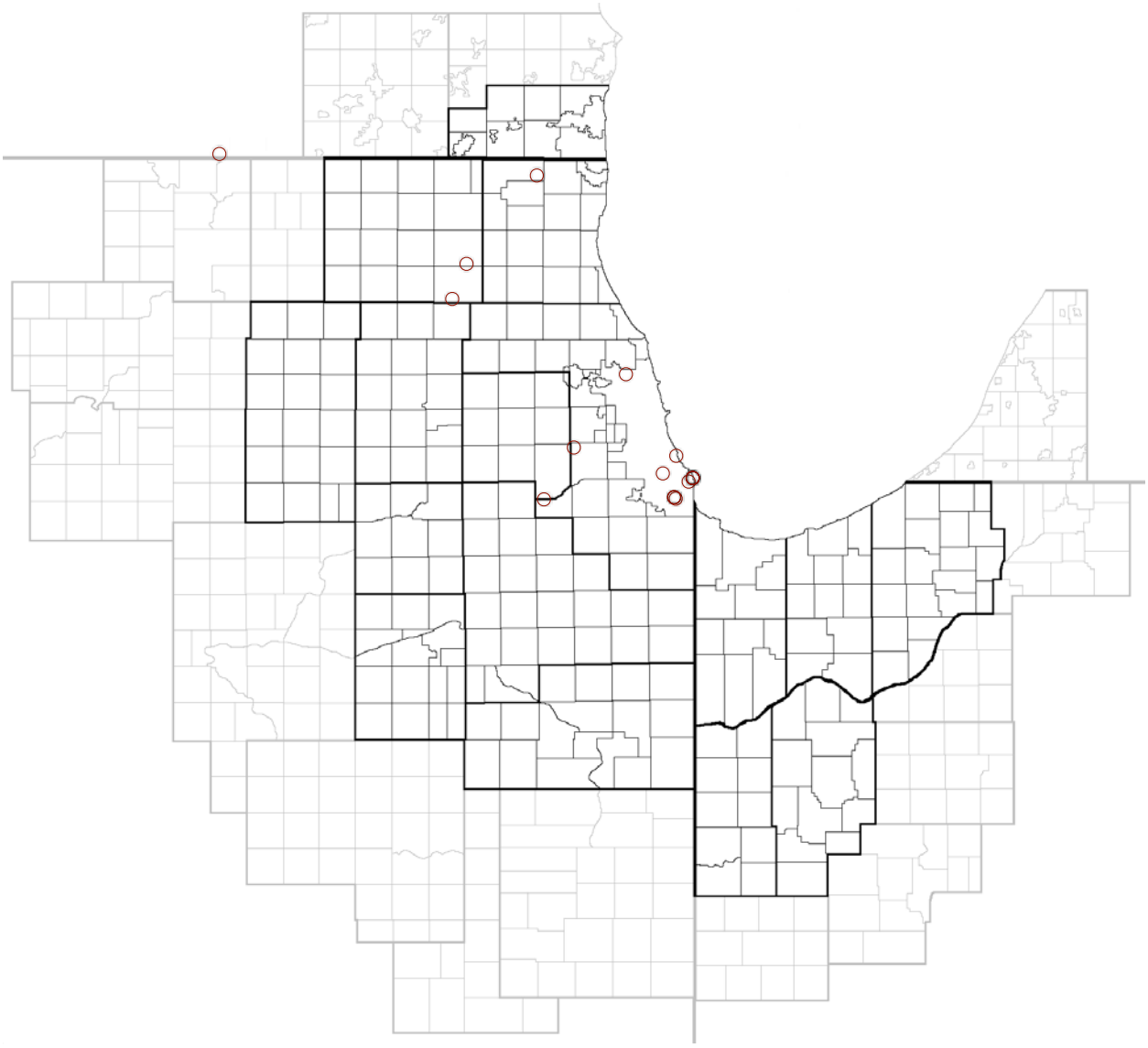
Galba obrussa (Say, 1825) – Golden Fossaria – currently stable. This snail was collected alive at one location during the 2012-2013 surveys: Nippersink Creek, Nippersink Canoe Base County Park, McHenry County. This area resembled a backwater lake (e.g., no flow, silted substrates with abundant aquatic vegetation). Baker (1902) did not mention the snail from the Chicago region, but Baker (1906, 1911) stated *G. modicella* has been found throughout northern Illinois, including the Silver Lake, McHenry Co.; Cedar, Fox, and Fourth lakes, Lake Co.; and the Fox and Des Plaines rivers. Jass (2004) reported the snail from 13 counties in Wisconsin with the nearest ones to Illinois being Milwaukee and Waukesha counties. All *Galba* (= *Fossaria*) species were lumped by Stewart (2006) in Iowa and Pyron et al. (2008) in Indiana. Baker (1911) suggested *G. obrussa* occupies "small bodies of water, as creeks, ponds, sloughs, bays and marshy spots along river banks." Like other *Galba* sp. it can be found on "sticks, stones, and exposed muddy surfaces."



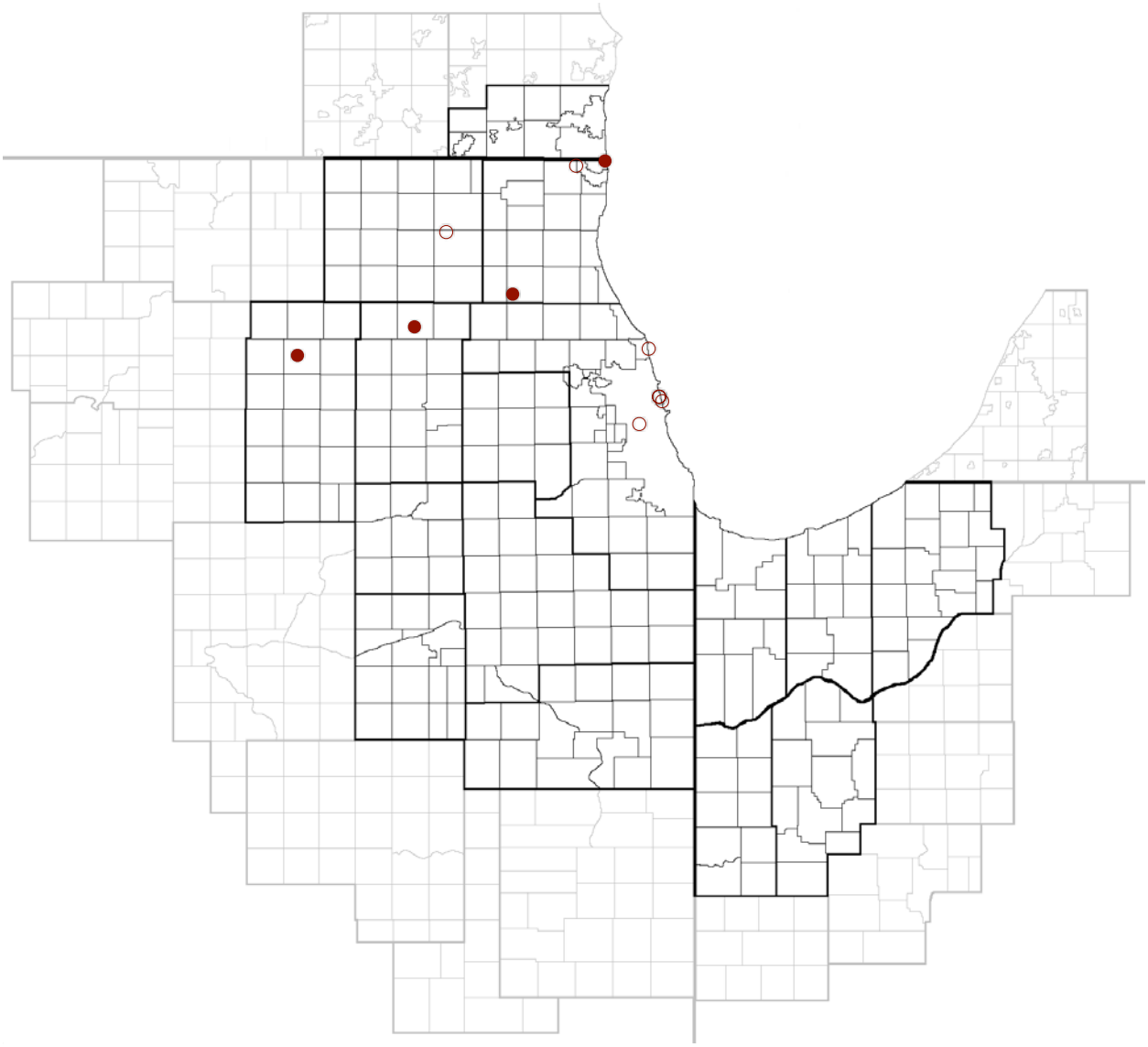
Galba parva (Lea, 1841) – Pygmy Fossaria – currently stable. Evidence of this species was not detected during the 2012-2013 surveys, and only one museum record was uncovered (UIMNH 41016) from the Fox River at Algonquin. Baker (1902) did not report the snail from the Chicago region, but Baker (1906) stated *G. parva* has been found throughout northern Illinois, including Cook, Kane, McHenry, and Will counties. Jass (2004) reported the snail from five counties in Wisconsin with the nearest ones to Illinois being Milwaukee and Waukesha counties. All *Galba* (= *Fossaria*) species were lumped by Stewart (2006) in Iowa and Pyron et al. (2008) in Indiana. Baker (1911) suggested *G. parva* can be "searched for in wet, marshy, places, generally out of the water, on sticks, stones, or muddy flats."



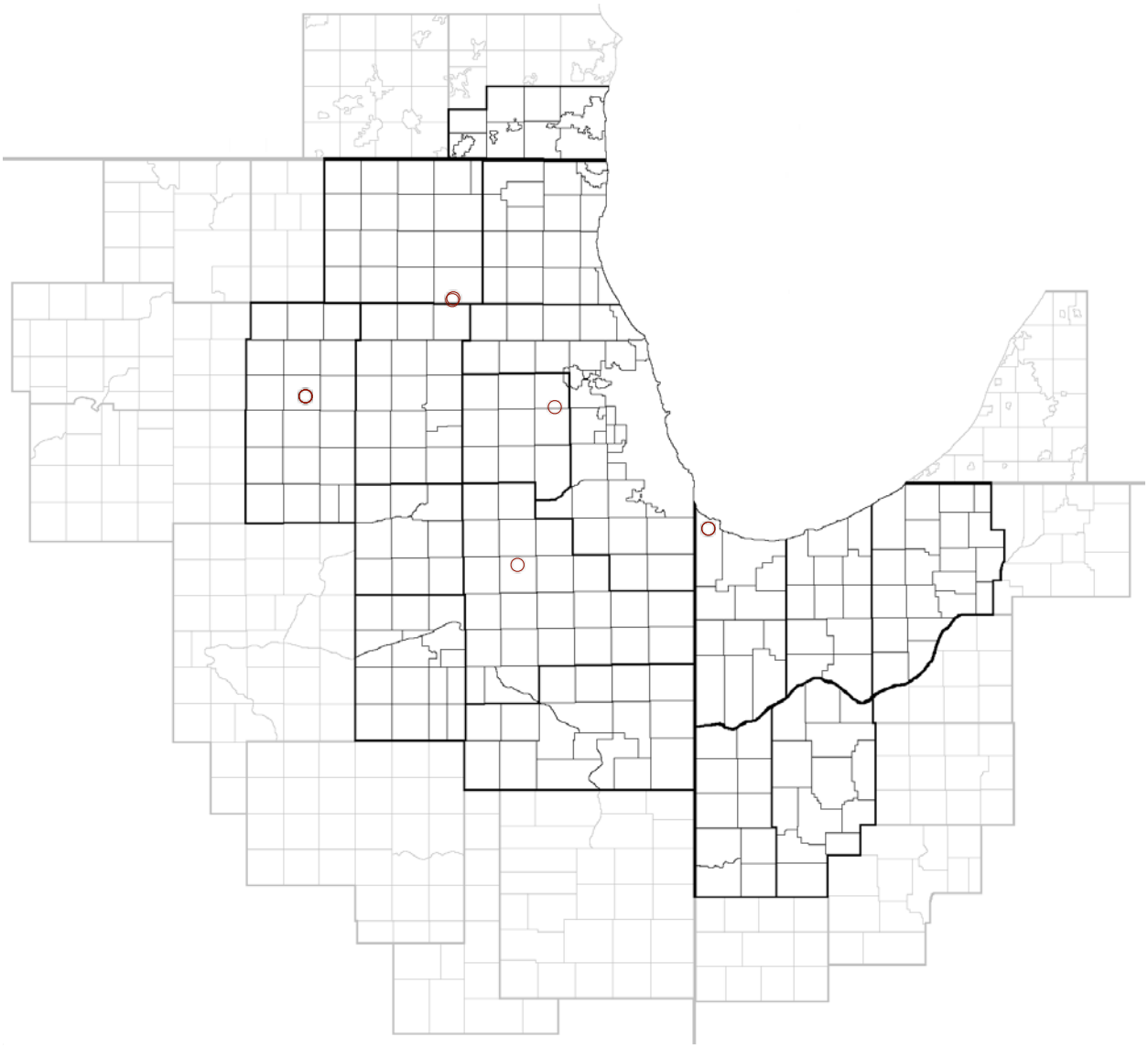
Lymnaea stagnalis Linnaeus, 1758 – Swamp Lymnaea – currently stable. The snail was not encountered during the 2012-2013 surveys. Few post-1950 specimens from Illinois exist for *L. stagnalis* in natural history museums; locations include Timber Lake, Lake County, from 2004 (INHS 40685) and Spring Rock Park, Cook County, from 1996 (FMNH 281936). Baker (1902) did not list specific locations found within the Chicago region, but Baker (1906) listed *L. stagnalis* from "Cook Co.; Northern Illinois; Desplaines River; Romeo, Will Co.; La Salle Co.; Lake Co.; Silver Lake and Algonquin, McHenry Co.; Cedar and Fourth lakes, Lake Co.; Chicago, Cook Co." Jass (2004) reported the snail from 19 counties in Wisconsin with the nearest one to Illinois being Kenosha County. Stewart (2006) stated *L. stagnalis* is less widespread now than historically in Iowa, and Pyron et al. (2008) suggested the snail is "critically imperiled" in Indiana. Baker (1902) suggested *L. stagnalis* occupies "stagnant spots of ponds and rivers about decaying vegetation." Goodrich and van Cleave (1944) reported it as an intolerant species. Baker (1928) stated that it "may frequently be seen floating among pond weeds and algae, the foot applied to the surface film of the water, the shell hanging downward." A more detailed survey needs be done to determine the status of *L. stagnalis* in Illinois.



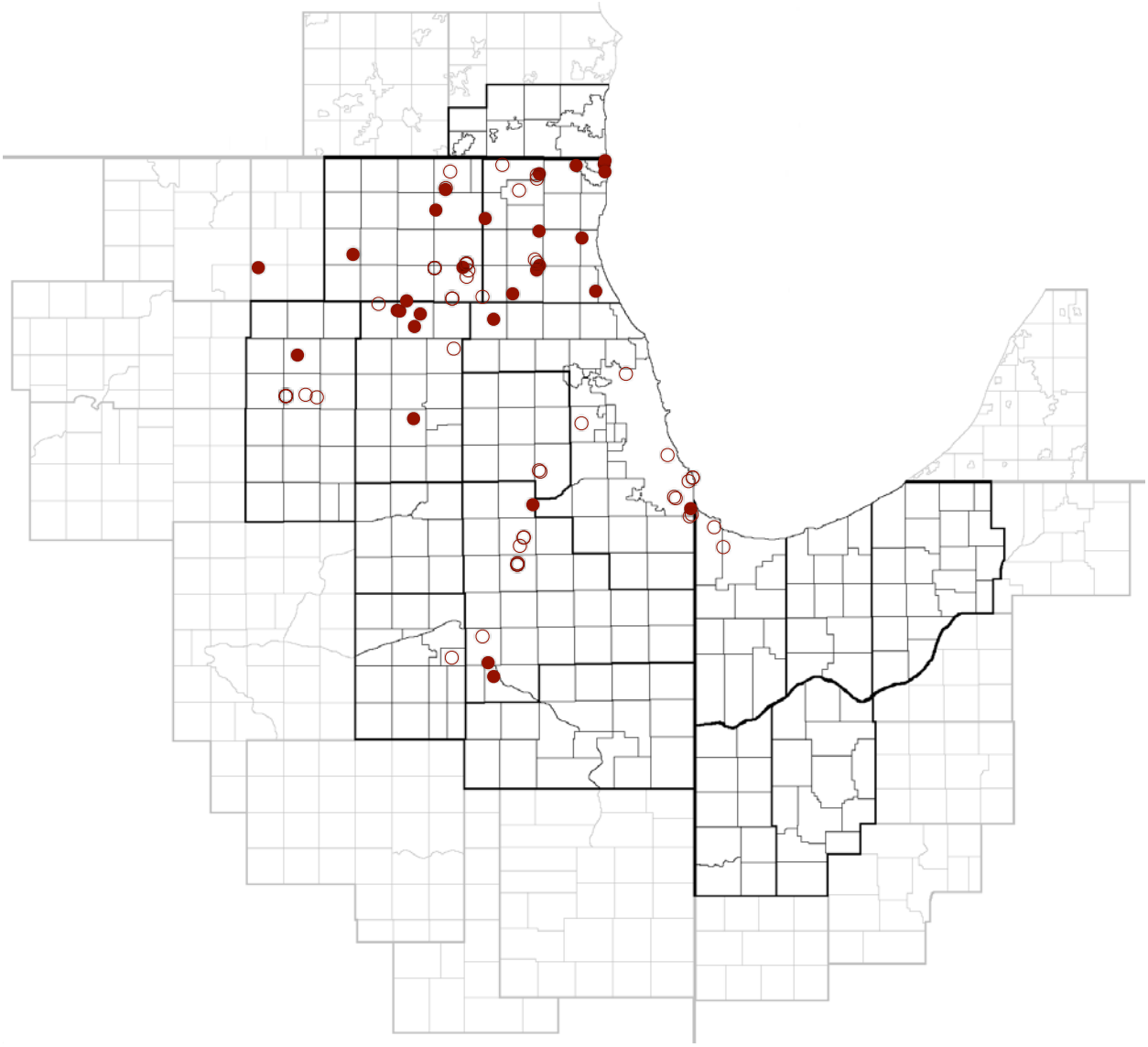
Pseudosuccinea columella (Say, 1817) – Mimic Lymnaea – currently stable. This snail was collected in four wetlands during the 2012-2013 surveys. Baker (1906) reported *P. columella* from Cook and McHenry counties. Jass (2004) reported the snail from six counties in Wisconsin with the nearest ones to Illinois being Milwaukee and Waukesha counties. Pyron et al. (2008) did not record it from northwestern Indiana. Goodrich and van Cleave (1944) stated *P. columella* "occurs in both standing and running waters." Baker (1911) suggested *P. columella* is "an inhabitant of ponds and streams where the water is more or less stagnant; a locality with an abundance of lily pads is particularly favorable; it is found also along the shore in shallow water in the vicinity of cat-tails (*Typha*) and other reeds, upon which it is often found, mimicking the situs of the pulmonate genus *Succinea*." Baker (1911) also mentioned the snail is "a lover of shallow bays and small ponds or creeks, where it may browse in the pond scum and on bits of rotting stems of water plants."



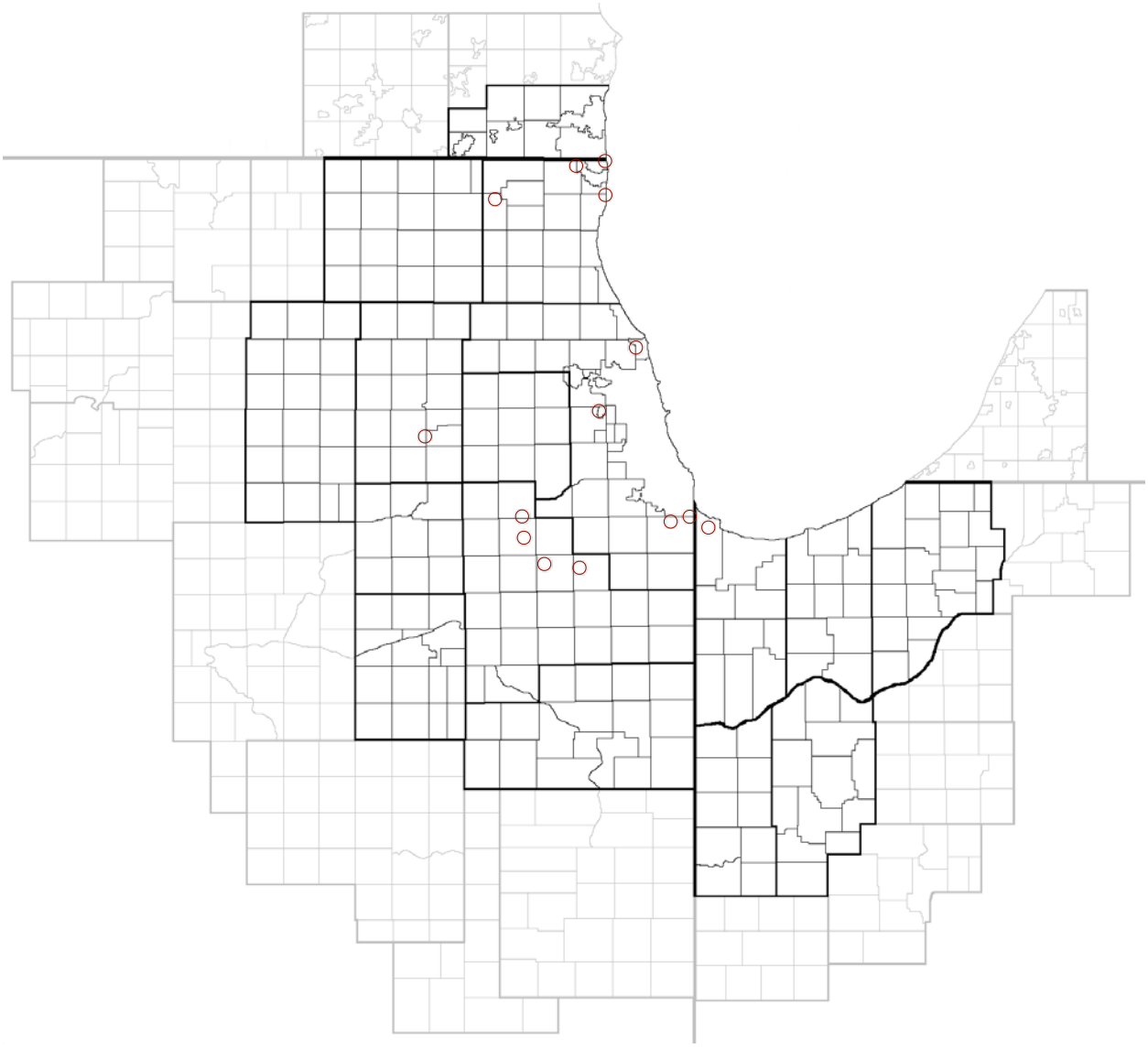
Stagnicola caperatus (Say, 1829) – Wrinkled Marshsnail – currently stable. Evidence of this species was not detected during the 2012-2013 surveys. Baker (1906) stated *S. caperatus* has been found throughout northern Illinois, including Cook, Kane, McHenry, Lake, Will and Winnebago counties. Jass (2004) reported the snail from four counties in Wisconsin with the nearest one to Illinois being Kenosha County. Although Goodrich and van der Schalie (1944) suggested *S. caperatus* occurred in every county of Indiana, Pyron et al. (2008) did not record it from northwestern Indiana. Stewart (2006) stated that few observations were made of *S. caperatus* in Iowa during recent surveys. Baker (1902) suggested *S. caperatus* is found "in small colonies in ditches and clear patches of wamp. It prefers submerged pieces of wood."



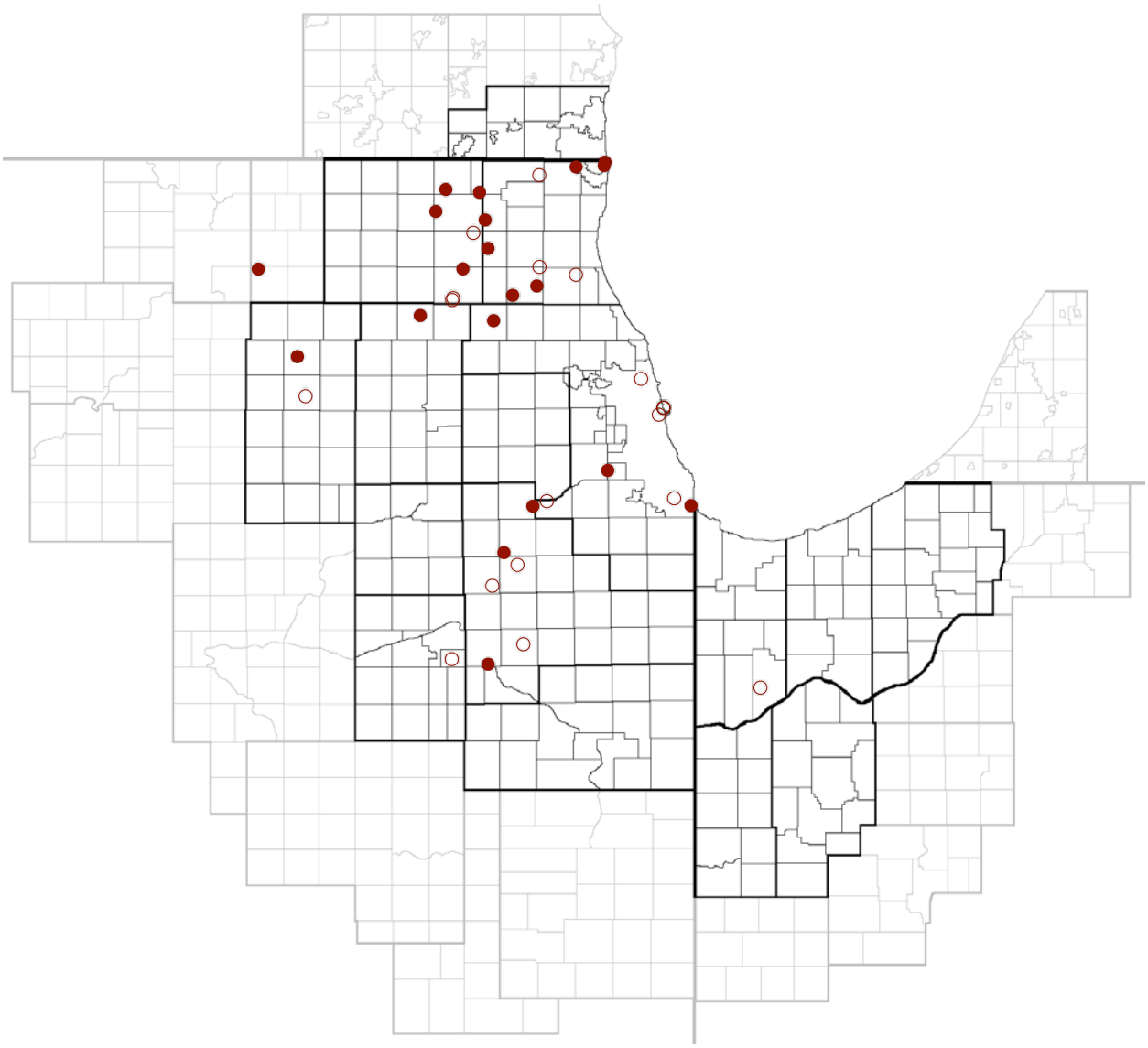
Stagnicola elodes (Say, 1821) – Marsh Pondsnail – currently stable. This snail was one of the most common species collected during the 2012-2013 surveys, and was found in wetlands and vegetated lakes throughout northern Illinois. Baker (1902, 1906, 1911) also reported *S. elodes* from these areas across northern Illinois. Jass (2004) reported the snail from 23 counties in Wisconsin with the nearest ones to Illinois being Kenosha and Walworth counties. The snail is common in Iowa (Stewart 2006) and Indiana (Pyron et al. 2008). Baker (1911) suggested *S. elodes* "inhabits ponds and sloughs which become more or less dry in summer."



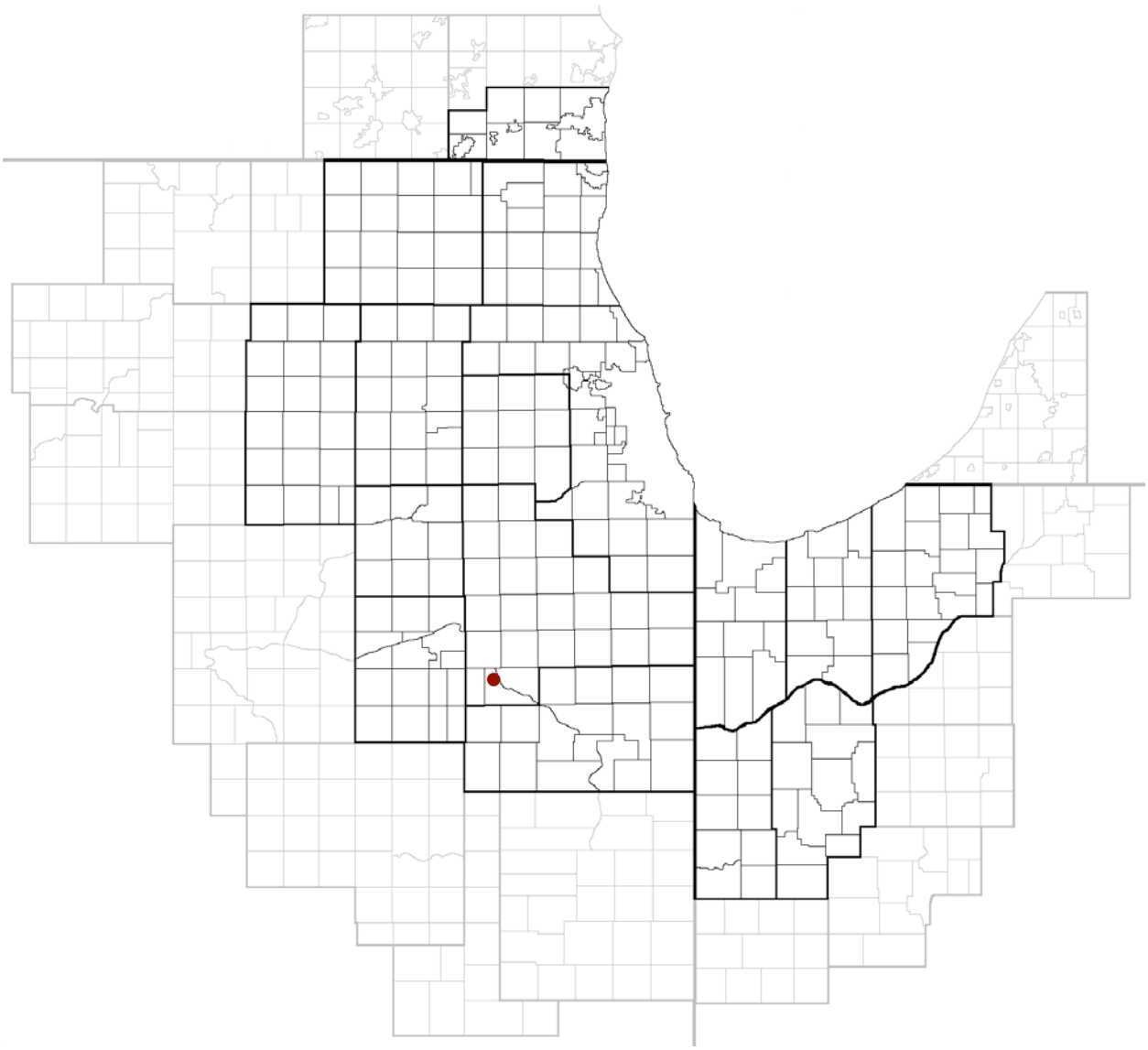
Aplexa elongata (Say, 1821) – Lance Aplexa – currently stable. The snail was found only as relict shell at two Lake County wetlands during the 2012-2013 surveys (Winthrop Harbor, Spring Bluff Nature Preserve and 1 mi SE Russell, off 9th St.). Few post-1950 specimens from Illinois exist for *A. elongata* in natural history museums; locations include Nelson Lake, Kane County, in 1996 (FMNH 282096) and Powerhorn Lake, Cook County, in 2002 (FMNH 303110). Baker (1906) reported it from northern Illinois including Cook, Kane, McHenry, and Winnebago counties. Jass (2004) reported the snail from 11 counties in Wisconsin with the nearest one to Illinois being Kenosha County. Stewart (2006) stated *A. elongata* is less widespread now than historically in Iowa, and Pyron et al. (2008) suggested the snail is "imperiled" in Indiana. Baker (1902) stated *A. elongata* is "found in the smaller rivers and lakes on a muddy bottom," and Goodrich and van Cleave (1944) reported it from small streams and "woods pools." Taylor (2003) suggested *A. elongata* is found it ditches and marshes, often is water bodies that dry during the summer. Goodrich and van Cleave (1944) stated the snail is able to endure long periods of aestivation and hibernation. A more detailed survey needs be done to determine the status of *A. elongata* in Illinois.



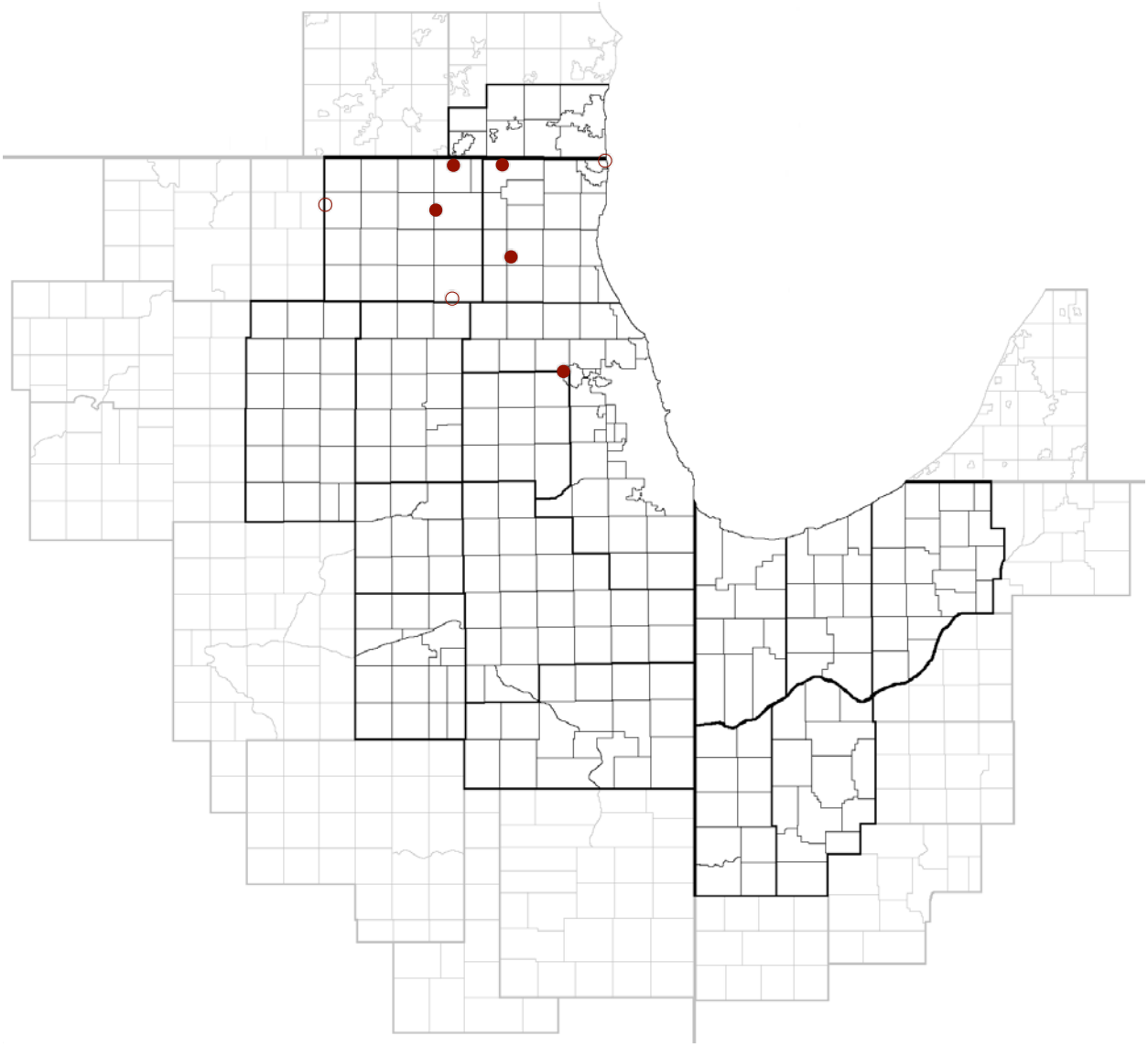
Physella gyrina (Say, 1821) – Tadpole Physa – currently stable. This snail was one of the most common species collected during the 2012-2013 surveys, and was found in wetlands and vegetated lakes throughout northern Illinois. Baker (1906) also reported *P. gyrina* from these areas across northern Illinois. Jass (2004) reported the snail from 31 counties in Wisconsin with the nearest one to Illinois being Kenosha County. The snail is common in Iowa (Stewart 2006) and Indiana (Pyron et al. 2008). Baker (1902) suggested *P. gyrina* is "found very abundantly in ponds and streams of greater or lesser size, adhering to sticks or stones and crawling over the muddy bottom."



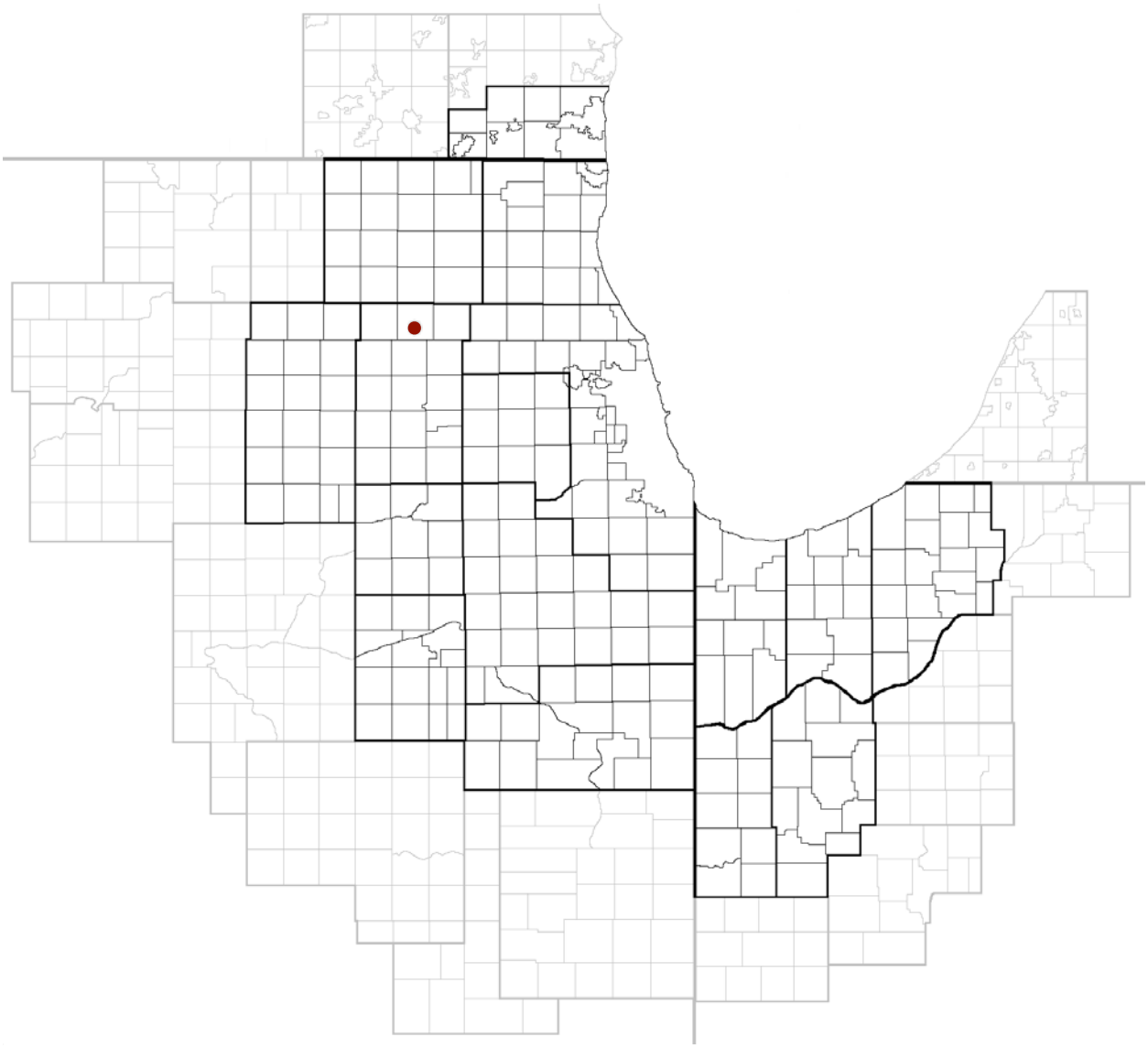
Physella heterostropha (Say, 1817) – Pewter Physa – currently stable. This snail was found at one wetland in Kane County during the 2012-2013 surveys. Baker (1906) reported it from northern Illinois including Cook, Lake, McHenry, and Winnebago counties. Jass (2004) reported *P. heterostropha* from 26 counties in Wisconsin with the nearest one to Illinois being Kenosha County. Several *Physella* species (e.g., *P. heterostropha*, *P. integra*, and *P. virgata*) were lumped by Stewart (2006) in Iowa and Pyron et al. (2008) in Indiana. Baker (1902) suggested *P. heterostropha* is found "in ponds and streams, adhering to sticks and stones and crawling over the muddy bottom."



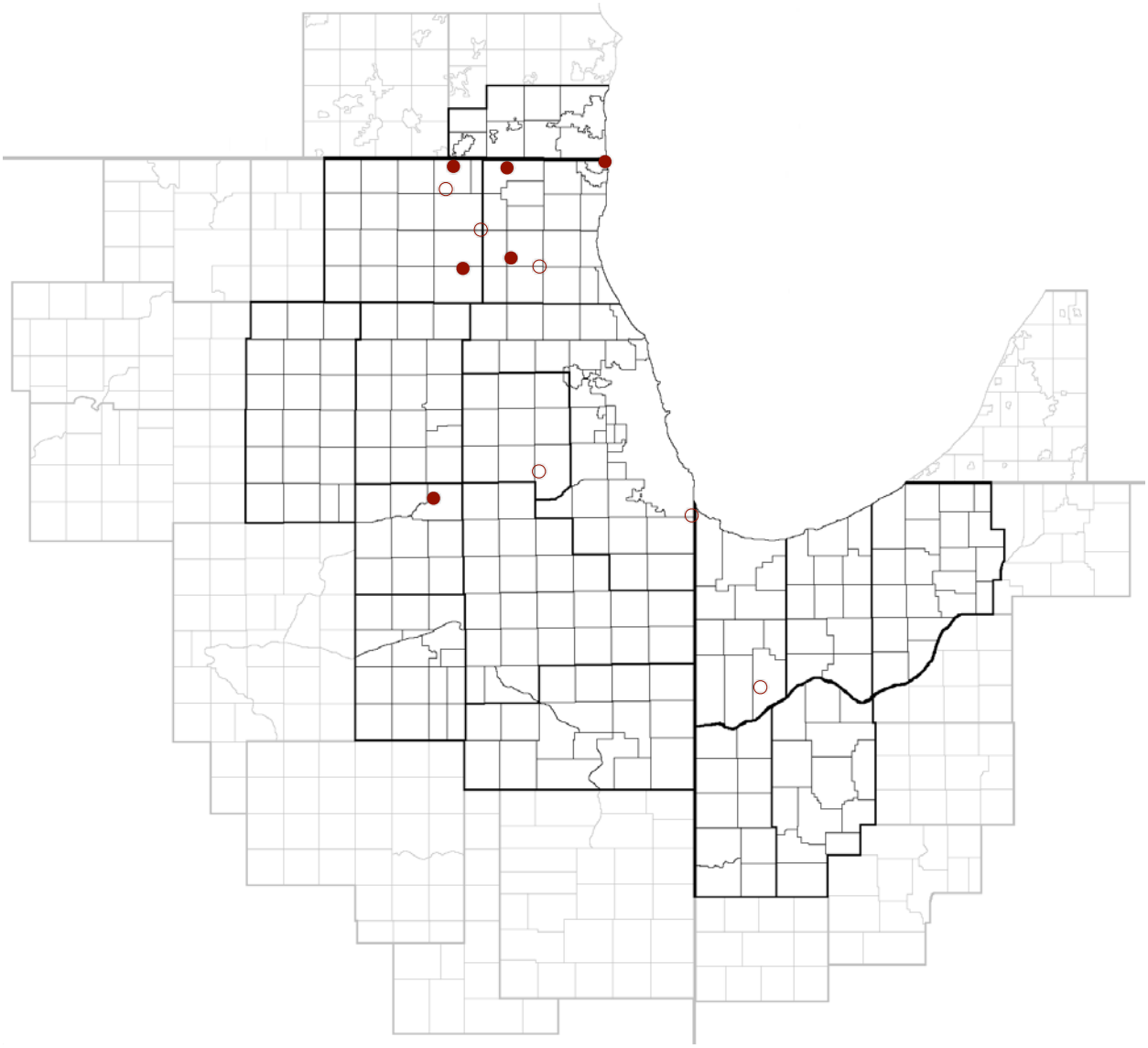
Physella integra (Haldeman, 1841) – Ashy Physa – currently stable. This snail was collected in six wetlands during the 2012-2013 surveys. Baker (1906) reported it from northern Illinois including Cook, Kane, Lake, McHenry, and Winnebago counties. Jass (2004) reported *P. integra* from 11 counties in Wisconsin with the nearest one to Illinois being Kenosha County. Several *Physella* species (e.g., *P. heterostropha*, *P. integra*, and *P. virgata*) were lumped by Stewart (2006) in Iowa and Pyron et al. (2008) in Indiana. Baker (1902) suggested *P. integra* is found in ponds and streams, adhering to sticks and stones and crawling over the muddy bottom.



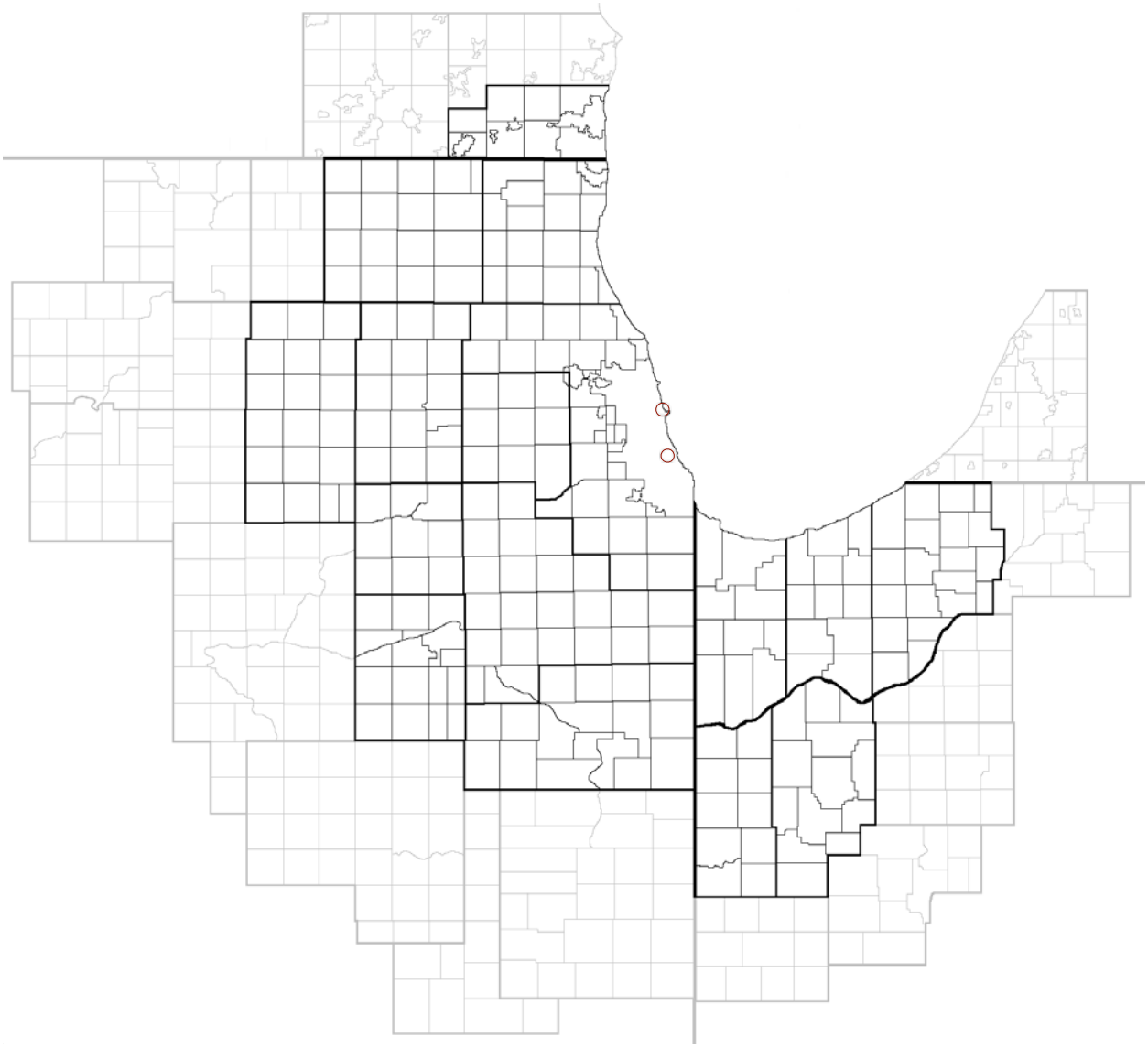
Physella virgata (Gould, 1855) – Protean Physa – currently stable. This snail was collected at one site during the 2012-2013 surveys: Tyler Creek, Kane County. Baker (1906) reported it (as *Physa anatina*) from Algonquin, McHenry County. Although Johnson et al. (2013) listed it in Wisconsin, Jass (2004) did not reported *P. virgata* from the state. Several *Physella* species (e.g., *P. heterostropha*, *P. integra*, and *P. virgata*) were lumped by Stewart (2006) in Iowa and Pyron et al. (2008) in Indiana. Not much has been published on the habitat requirements of *P. virgata*, but based on the habitat in Tyler Creek, it matches the habitat description Baker (1902) listed for other physids (e.g., ponds and streams, adhering to sticks and stones and crawling over the muddy bottom).



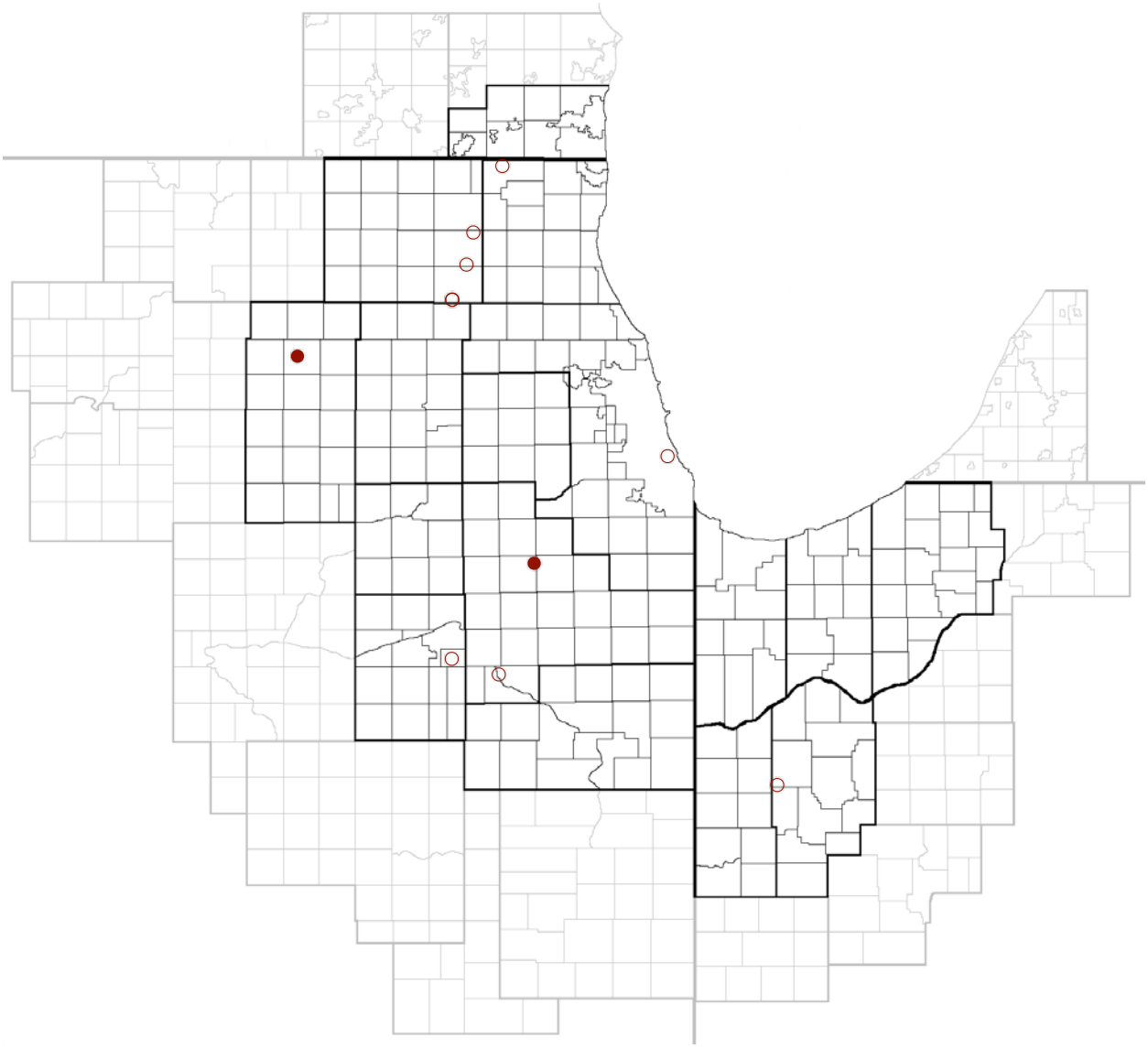
Gyraulus deflectus (Say, 1824) – Flexed Gyro – currently stable. This snail was found in wetlands and vegetated lakes throughout northern Illinois during the 2012-2013 surveys. Baker (1906) also reported *G. deflectus* from areas across northern Illinois, including Cook, Lake, McHenry, Will, and Winnebago counties. Jass (2004) reported the snail from 11 counties in Wisconsin with the nearest ones to Illinois being Milwaukee and Waukesha counties. The snail is uncommon in Iowa (Stewart 2006) and Indiana (Pyron et al. 2008). Baker (1928) suggested *G. deflectus* is "a species of quiet bodies of water" that occupies deeper water of protected areas with sand and mud bottoms.



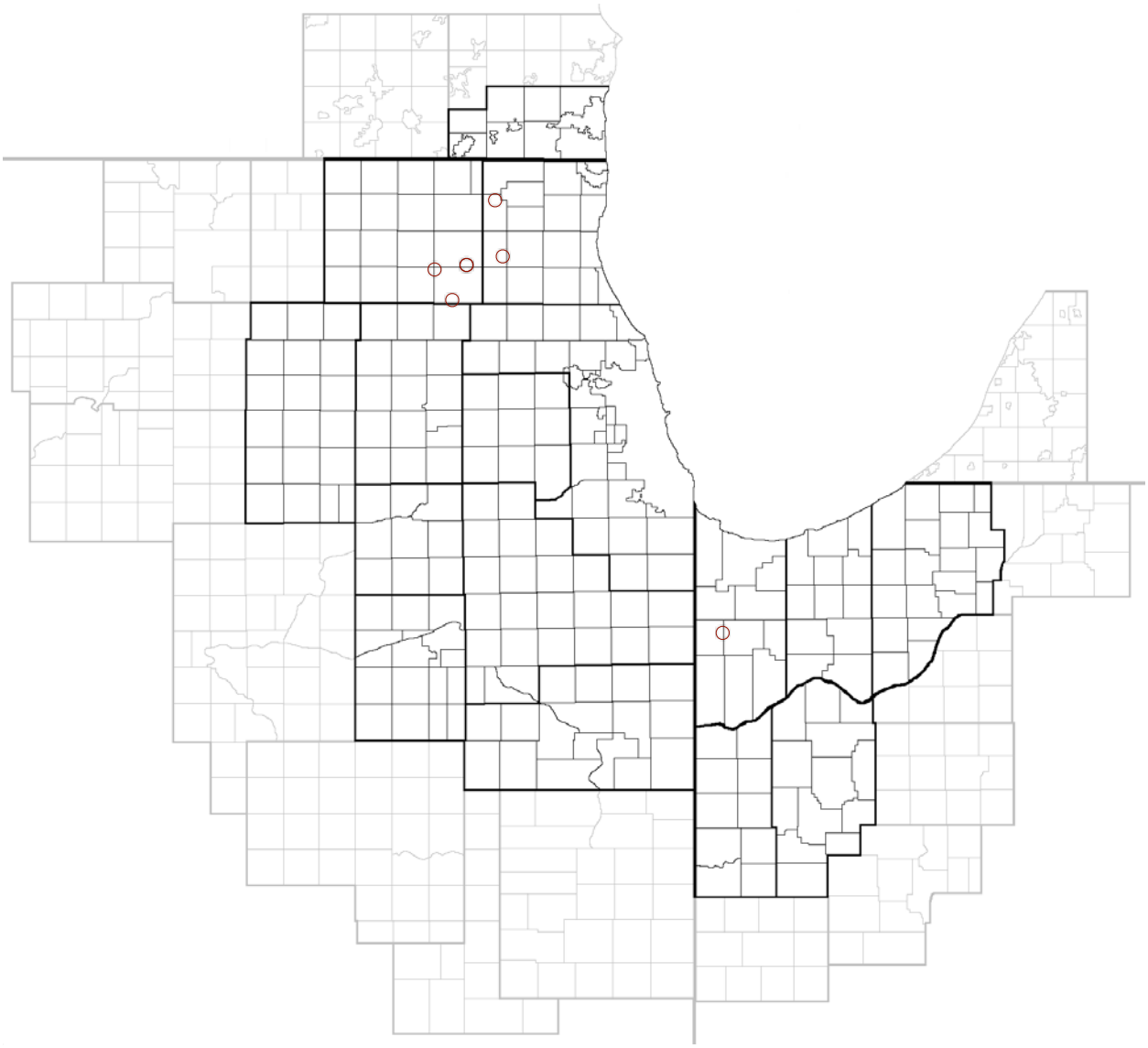
Gyraulus parvus (Say, 1817) – Ash Gyro – currently stable. Evidence of this species was not detected during the 2012-2013 surveys, and only two museum records were uncovered (INHS 15215 and UIMNH 41019 – both Chicago, Cook County). Baker (1902) listed it as common, and Baker (1906) stated *G. parvus* has been found throughout northern Illinois, including Cook, Kane, Lake, McHenry, Will, and Winnebago counties. Jass (2004) reported the snail from seven counties in Wisconsin with the nearest ones to Illinois being Milwaukee and Waukesha counties. The snail is uncommon in Iowa (Stewart 2006) and Indiana (Pyron et al. 2008). Baker (1928) suggested *G. parvus* can be found "in quiet bodies of water, often of small size." Baker (1902) stated the snail can be "found in great abundance on the stems of water plants, submerged objects and among floating vegetation."



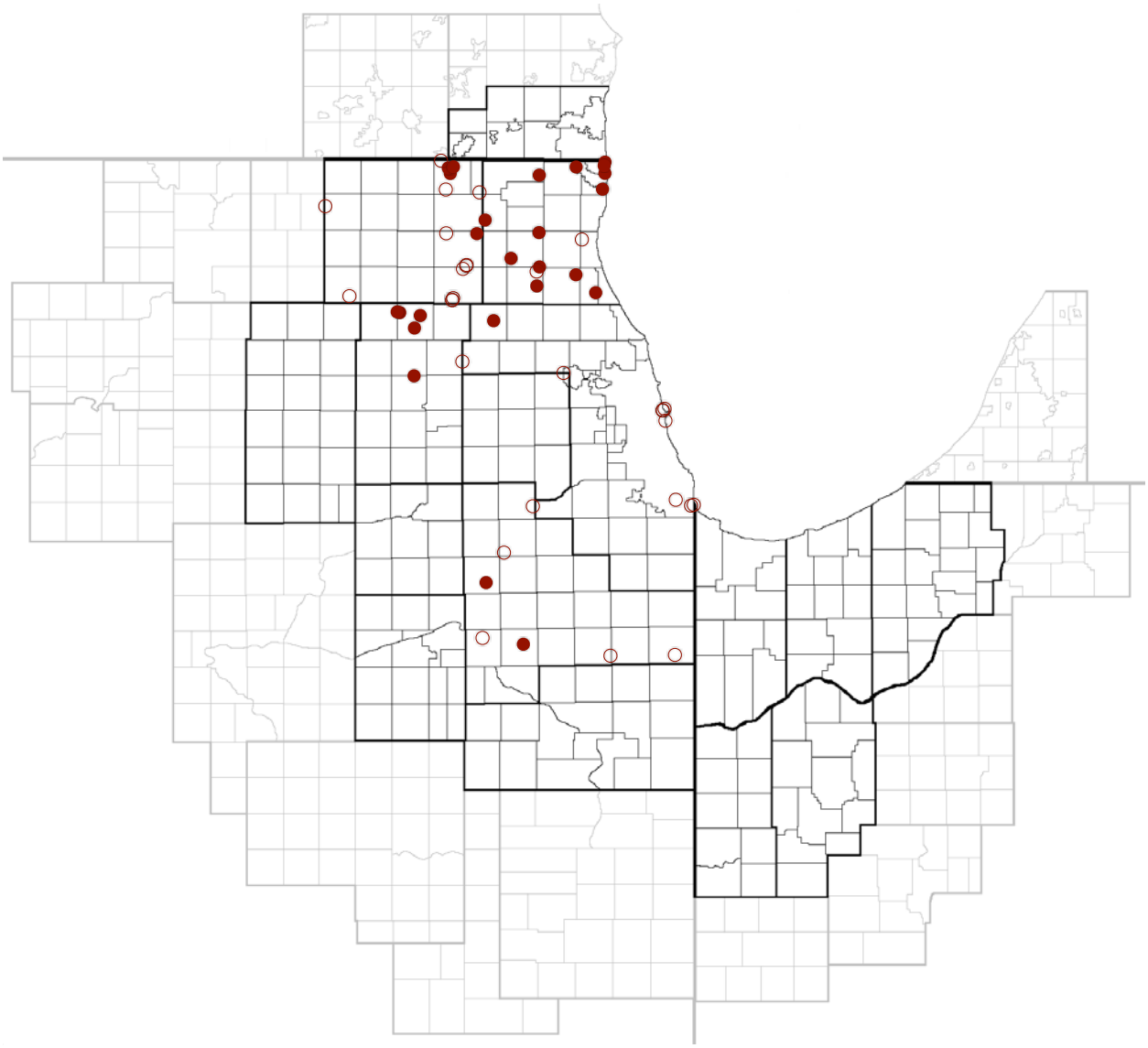
Helisoma anceps (Menke, 1830) – Two-ridge Rams-horn – currently stable. This snail was collected as fresh-dead at one location during the 2012-2013 surveys: Hickory Creek, Will County. It also was collected as fresh-dead in a wetland near Clare, DeKalb County, in 2011 (INHS 45857). Baker (1902) listed *H. anceps* (as *Planorbis bicarinatus*) as common, and Baker (1906) stated it has been found throughout northern Illinois, including Cook, Kane, Lake, and McHenry counties. Jass (2004) reported *H. anceps* from 14 counties in Wisconsin with the nearest ones to Illinois being Milwaukee and Waukesha counties. Stewart (2006) stated the snail is less widespread now than historically in Iowa, and Pyron et al. (2008) suggested it is "imperiled" in Indiana. Baker (1902) suggested *H. anceps* lives "in rivers and ponds, in water from two to ten or fifteen feet in depth, on a muddy bottom." He also stated the snail can be "difficult to obtain alive on account of it preferring deep water."



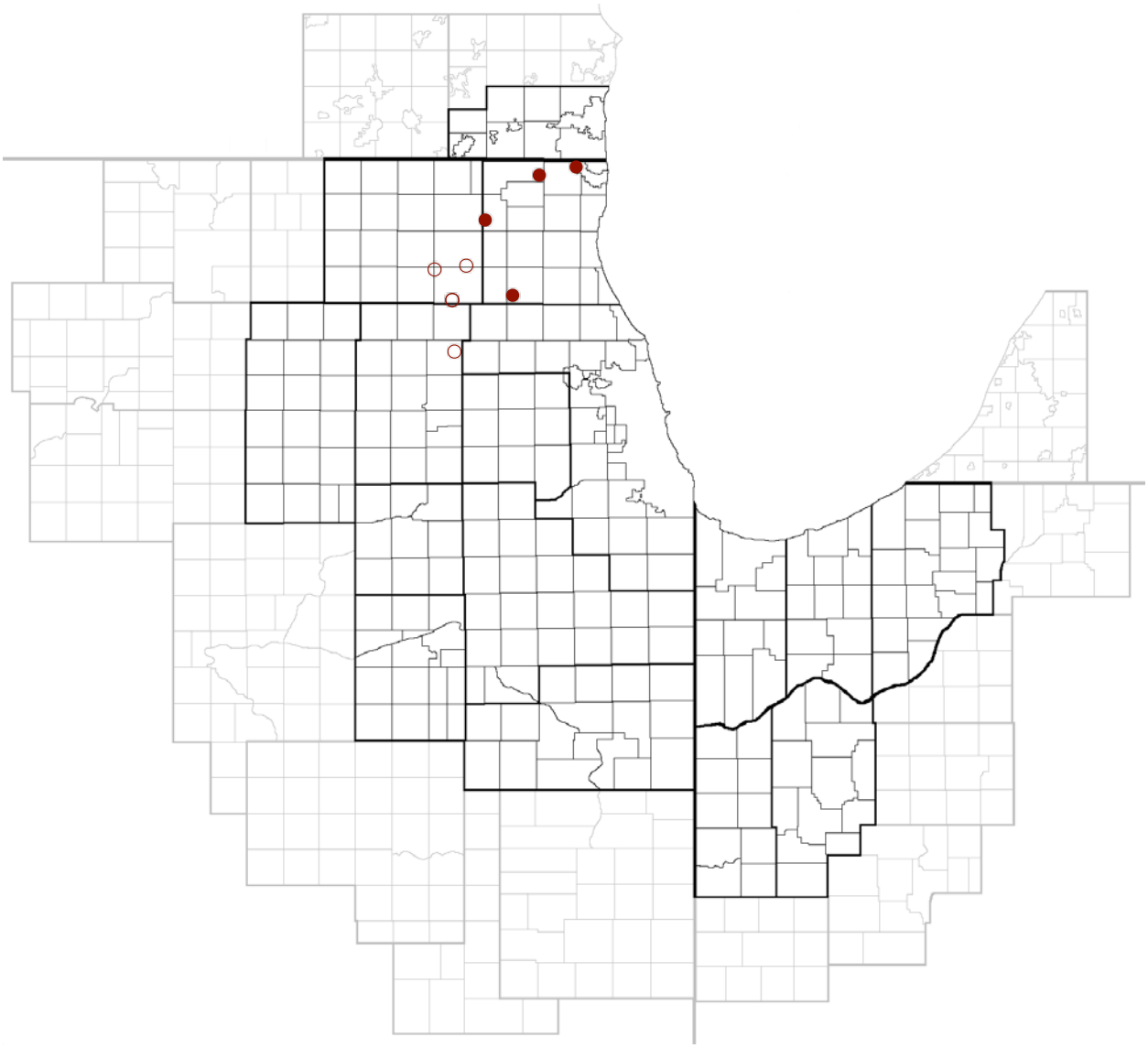
Planorbella campanulata (Say, 1821) – Bellmouth Ramshorn – currently stable. Evidence of this species was not detected during the 2012-2013 surveys, but museum records were uncovered. Baker (1902) listed *P. campanulata* as common, and Baker (1906) stated it has been found throughout northern Illinois, including Cook, Lake, McHenry, Will, and Winnebago counties. Jass (2004) reported *P. campanulata* from 26 counties in Wisconsin with the nearest ones to Illinois being Kenosha and Walworth counties. Stewart (2006) stated the snail is less widespread now than historically in Iowa, and Pyron et al. (2008) suggested it is "imperiled" in Indiana. Baker (1902) suggested *P. campanulata* lives in the deeper waters of rivers and ponds on a muddy bottom, which results it being difficult to collect.



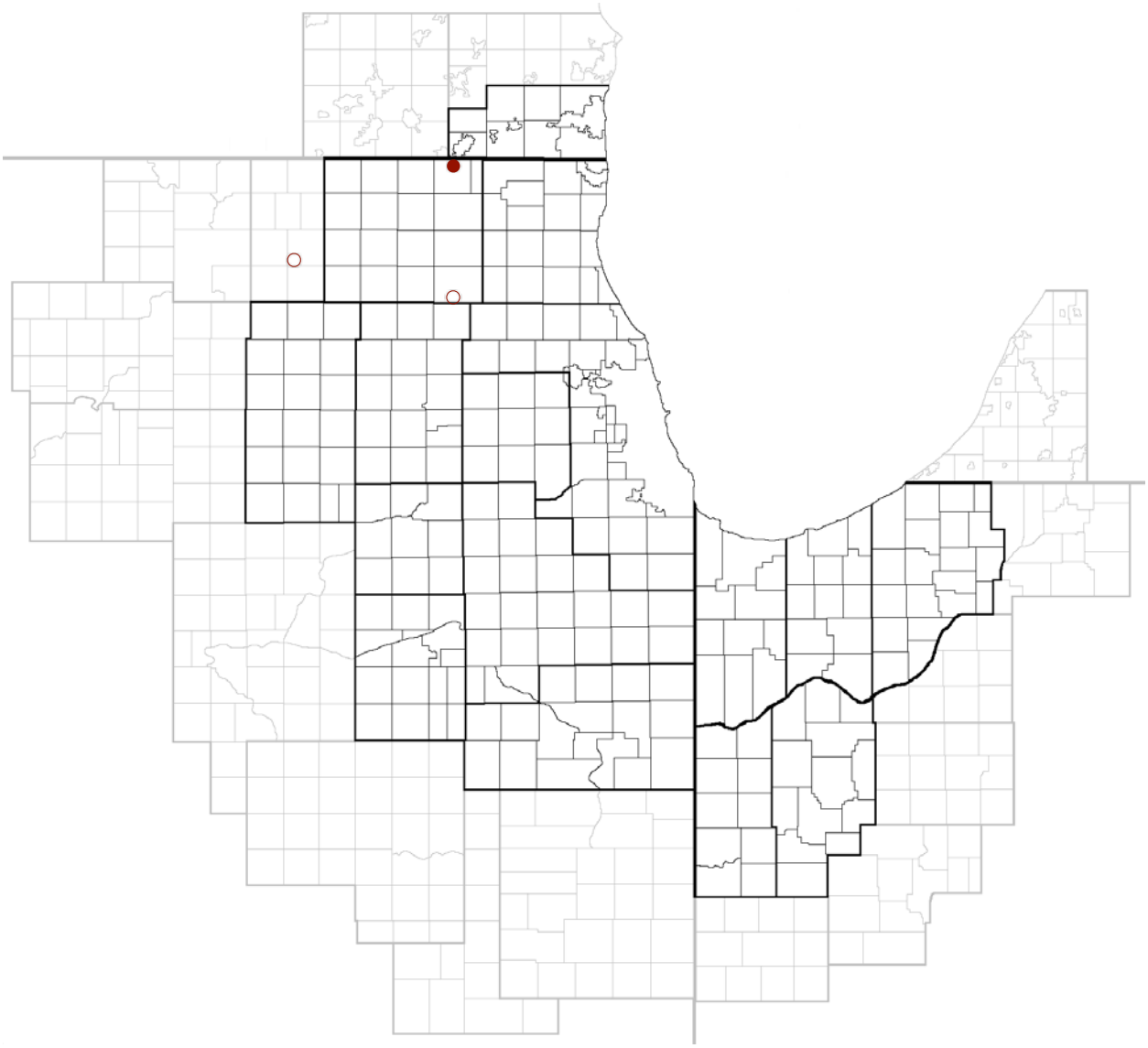
Planorbella trivolvis (Say, 1817) – Marsh Ramshorn – currently stable. This snail was one of the most common species collected during the 2012-2013 surveys, and was found in wetlands and vegetated lakes throughout northern Illinois. Baker (1902) called *P. trivolvis* one of the most common species in the Chicago region, and Baker (1906) reported it from across northern Illinois. Jass (2004) reported *P. trivolvis* from 20 counties in Wisconsin with the nearest one to Illinois being Kenosha County. The snail is common in Iowa (Stewart 2006) and Indiana (Pyron et al. 2008). Baker (1902) suggested *P. trivolvis* is "found abundantly in the small streams and large bodies of water, either crawling on the muddy bottom or on sticks or other submerged objects, including vegetation."



Planorbula armigera (Say, 1821) – Thicklip Ramshorn – currently stable. This species was collected alive at four sites in Lake County during the 2012-2013 surveys. Baker (1902) listed *P. armigera* (as *Segmentina armigera)* as common, and Baker (1906) stated it has been found throughout northern Illinois, including Cook, DuPage, Kane, Lake, McHenry, Will, and Winnebago counties. Jass (2004) reported *P. armigera* (as *Planorbella armigera*) from eight counties in Wisconsin with the nearest one to Illinois being Kenosha County. Stewart (2006) stated *P. armigera* is imperiled/extinct in Iowa, and Pyron et al. (2008) suggested it is "critically imperiled" in Indiana. Baker (1902) suggested *P. armigera* lives in "smaller streams, crawling over submerged sticks, stones and water plants."

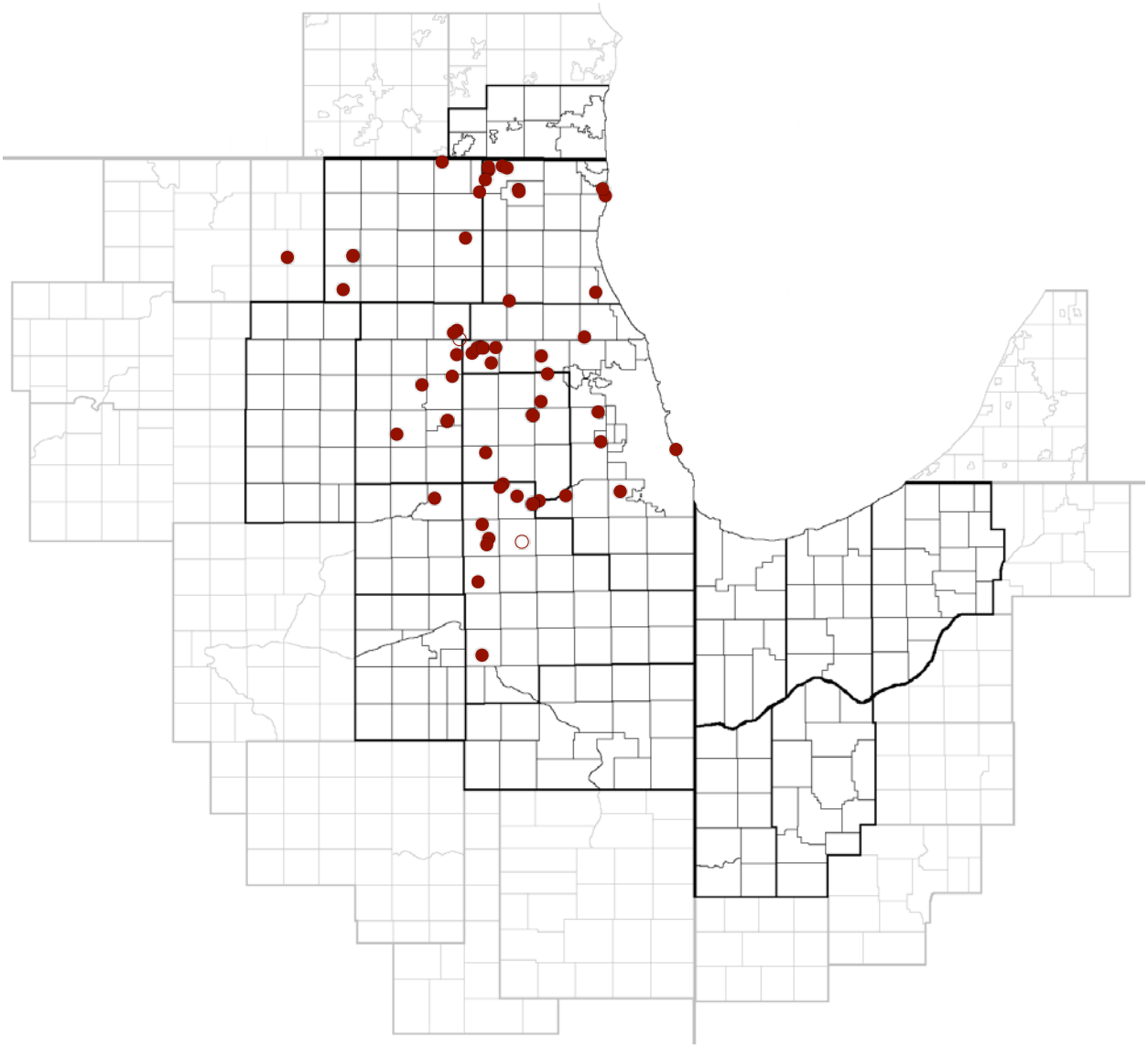


Promenetus exacuous (Say, 1821) – Sharp Sprite – currently stable. Although not collected as live or fresh-dead during the 2012-2013 surveys, *P. exacuous* was collected alive in a wetland near Richmond, McHenry County, in 2011 (INHS 45992). Baker (1906) reported it (as *Planorbis exacuous*) from areas across northern Illinois, including Cook, Lake, McHenry, Will, and Winnebago counties. Jass (2004) reported *P. exacuous* from eight counties in Wisconsin with the nearest ones to Illinois being Milwaukee and Waukesha counties. The snail is uncommon in Iowa (Stewart 2006) and Pyron et al. (2008) suggested it is "critically imperiled" in Indiana. Baker (1902) suggested *P. exacuous* can be "found quite abundantly in rivers and ponds in water from four to five feet in depth, either on a muddy bottom or crawling among algae."

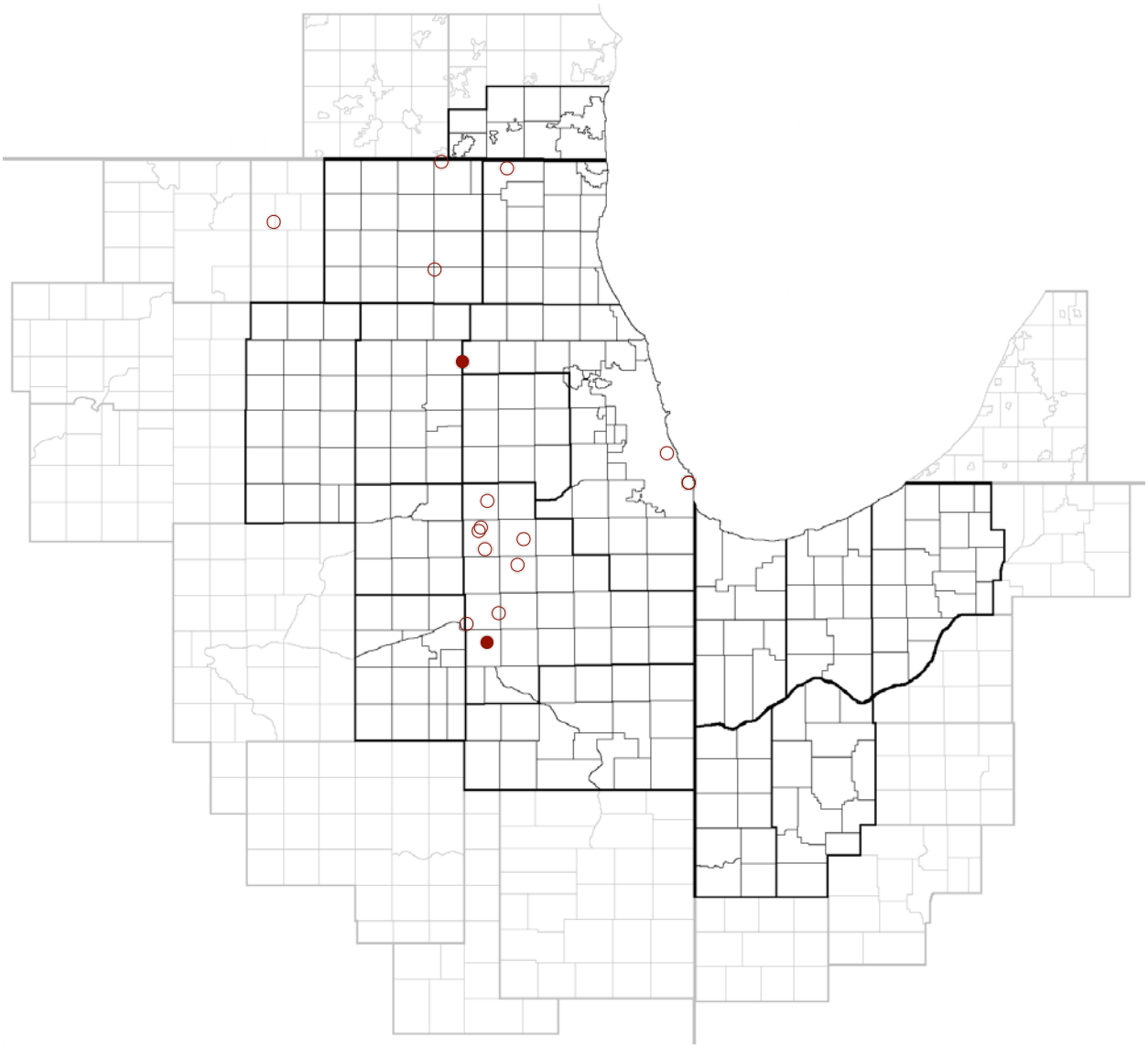


Bellamya chinensis (Reeve, 1863) – Chinese Mysterysnail – Exotic. This snail is native to Asia but has become established throughout North America (Jokinen 1982). It was first reported in United States in the early 1890s at food market in San Francisco (Wood 1892). Since then, it has been collected in almost 30 states and one province (Jokinen 1982; Solomon et al. 2010). It was first reported in Illinois in the 1930s (Haas 1939). Jass (2004) reported *B. chinensis* from Milwaukee and Waukesha counties, Wisconsin. During the 2012-2013 surveys, it was found throughout the Chicago region in wetlands, vegetated ponds, and streams.

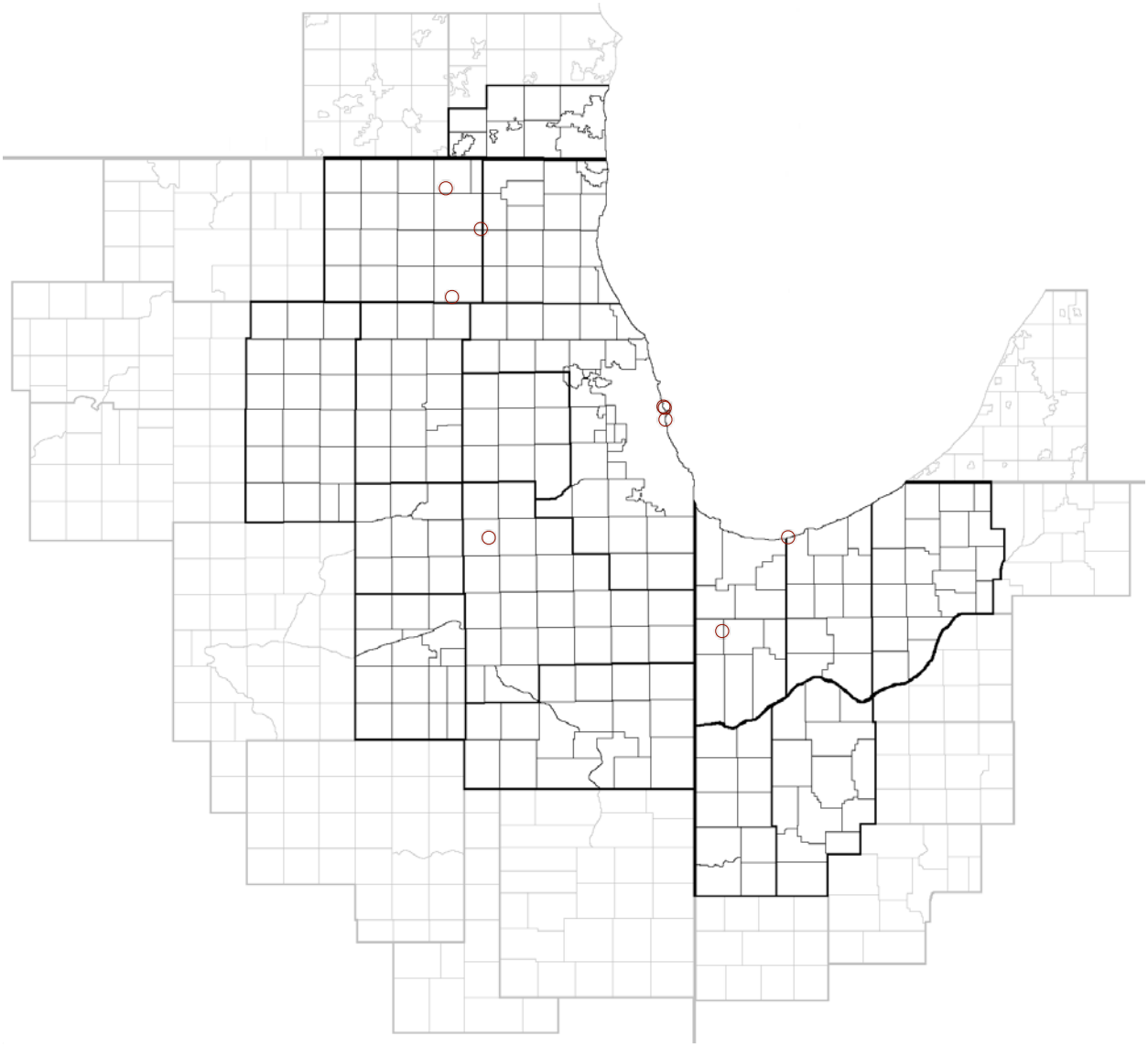
Bellamya chinensis snail can survive exposure to air for several days (Havel 2011) and can reach high densities of ~200 adults / m^2 (Tiemann pers. obser.). Due to its wide distribution and high densities, some authors have speculated that *B. chinensis* could negatively affect native gastropod assemblages (Bury et al. 2007; Johnson et al. 2009).



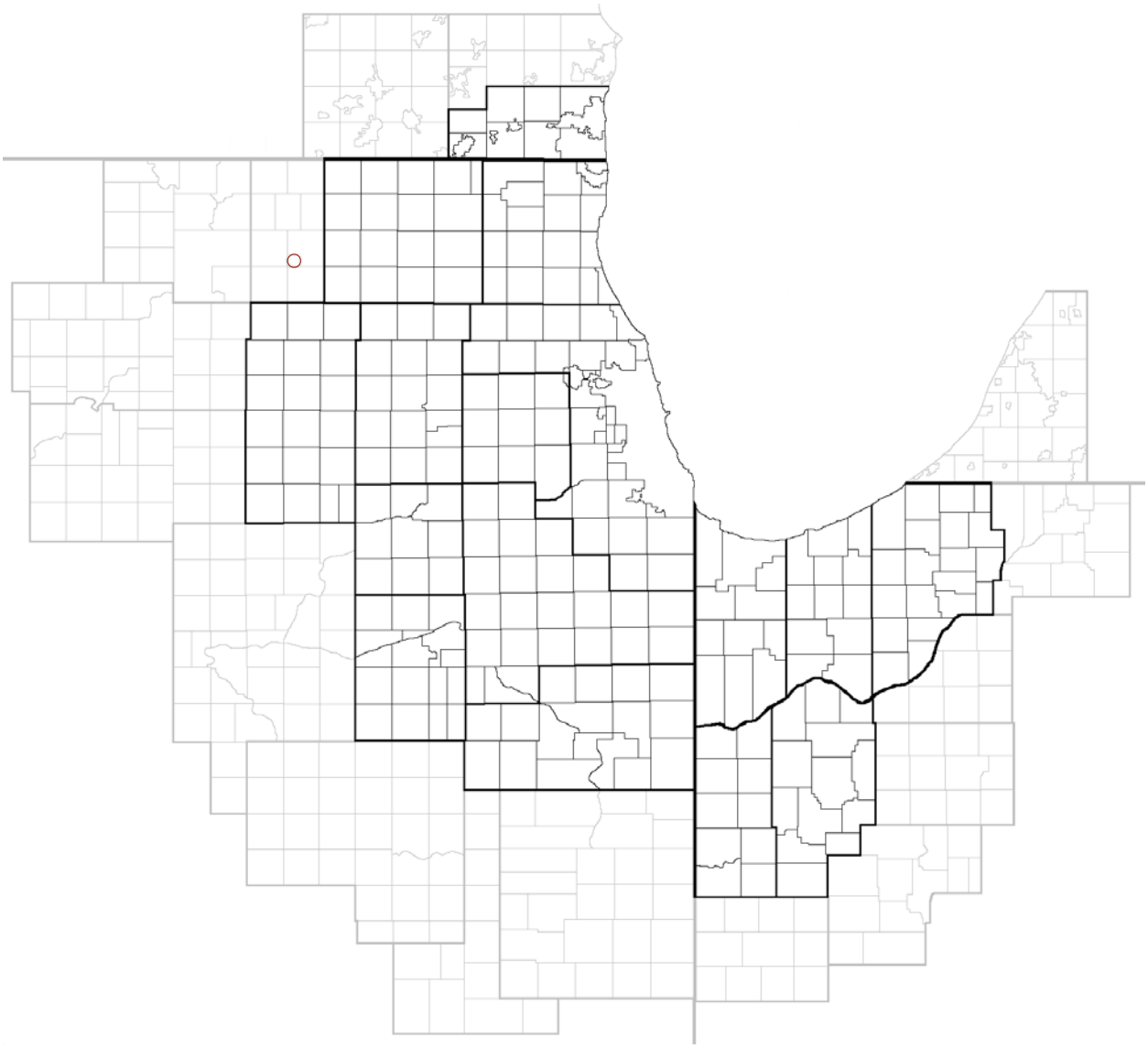
Viviparus georgianus (Lea, 1834) – Banded Mysterysnail – currently stable. Although not collected as live or fresh-dead during the 2012-2013 surveys, *V. georgianus* was collected alive at two sites in (INHS Mollusk Collection data, Champaign). Baker (1906) reported it (as *Vivipara contectoides*) from areas across northern Illinois, including Cook and Will counties. Jass (2004) reported *V. georgianus* from four counties in Wisconsin with the nearest one to Illinois being Milwaukee County. The snail is uncommon in Iowa (Stewart 2006) and Pyron et al. (2008) suggested it is "critically imperiled" in Indiana. Baker (1902) suggested *V. georgianus* can be "found lakes and rivers, where these is a muddy bottom, more frequently where these is a quantity of grass, in water from a foot to two or three feet in depth."



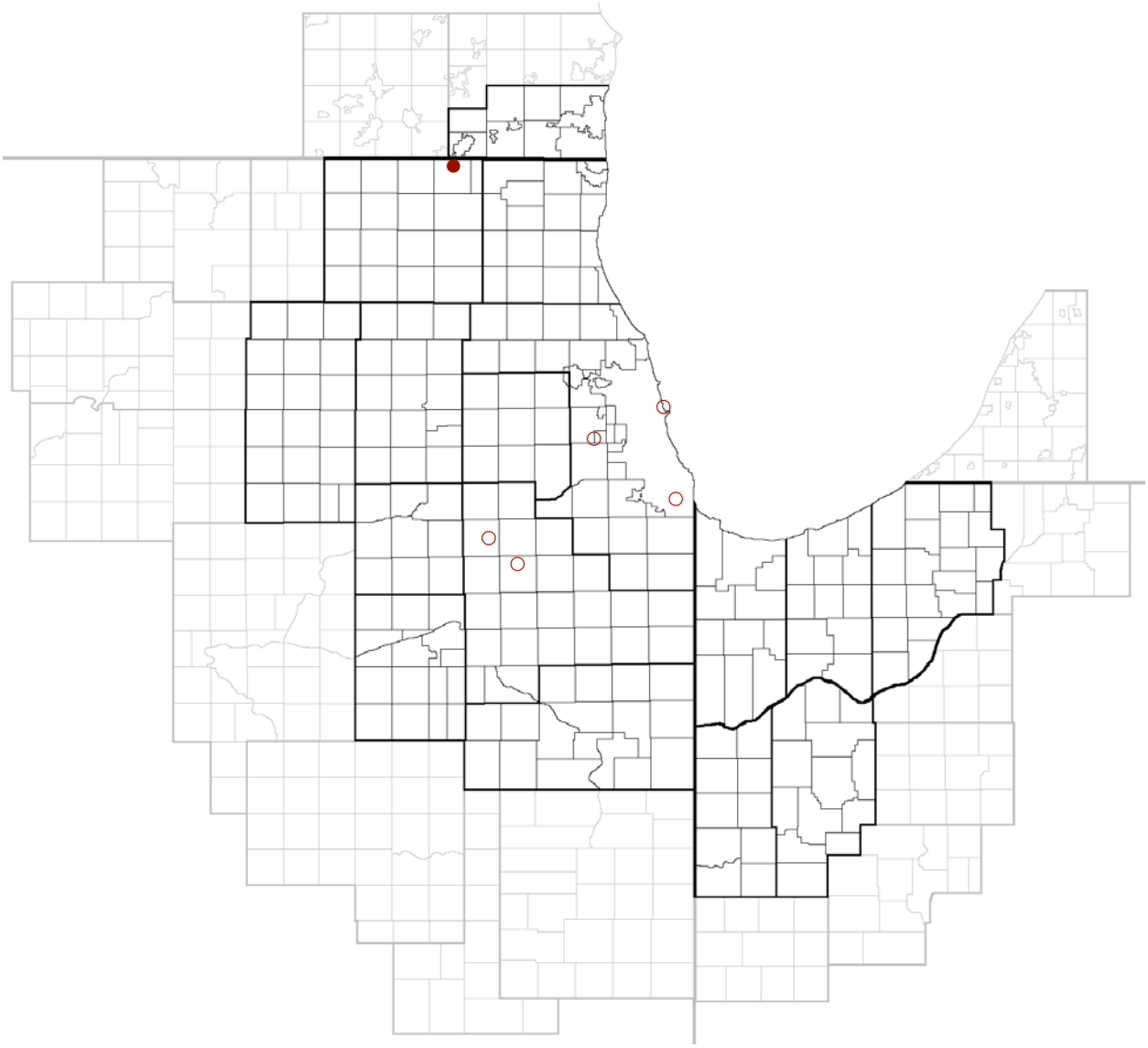
Amnicola limosa (Say, 1817) – Mud Amnicola – currently stable. The snail was found only as relict shell at two McHenry County wetlands during the 2012-2013 surveys (Lily Lake and a wetland in Glacial Park). Baker (1902) listed *A. limosa* as abundant, and Baker (1906) stated it has been found throughout northern Illinois, including Cook, Kane, Lake, McHenry, and Will counties. Baker (1928) said "in Illinois, *limosa* is recorded from the northern part of the state, especially in the northeastern part bordering Wisconsin." Jass (2004) reported *A. limosa* from ten counties in Wisconsin with the nearest one to Illinois being Milwaukee County. Stewart (2006) stated the snail is less widespread now than historically in Iowa, and Pyron et al. (2008) suggested it is "imperiled" in Indiana. Baker (1902) suggested *A. limosa* lives in "lakes and streams, on the muddy bottom, or on aquatic plants and submerged objects." Goodrich and van Cleave (1944) the snail "inhabits shallow waters on stones or under them, on stems of water weeds or on sticks."



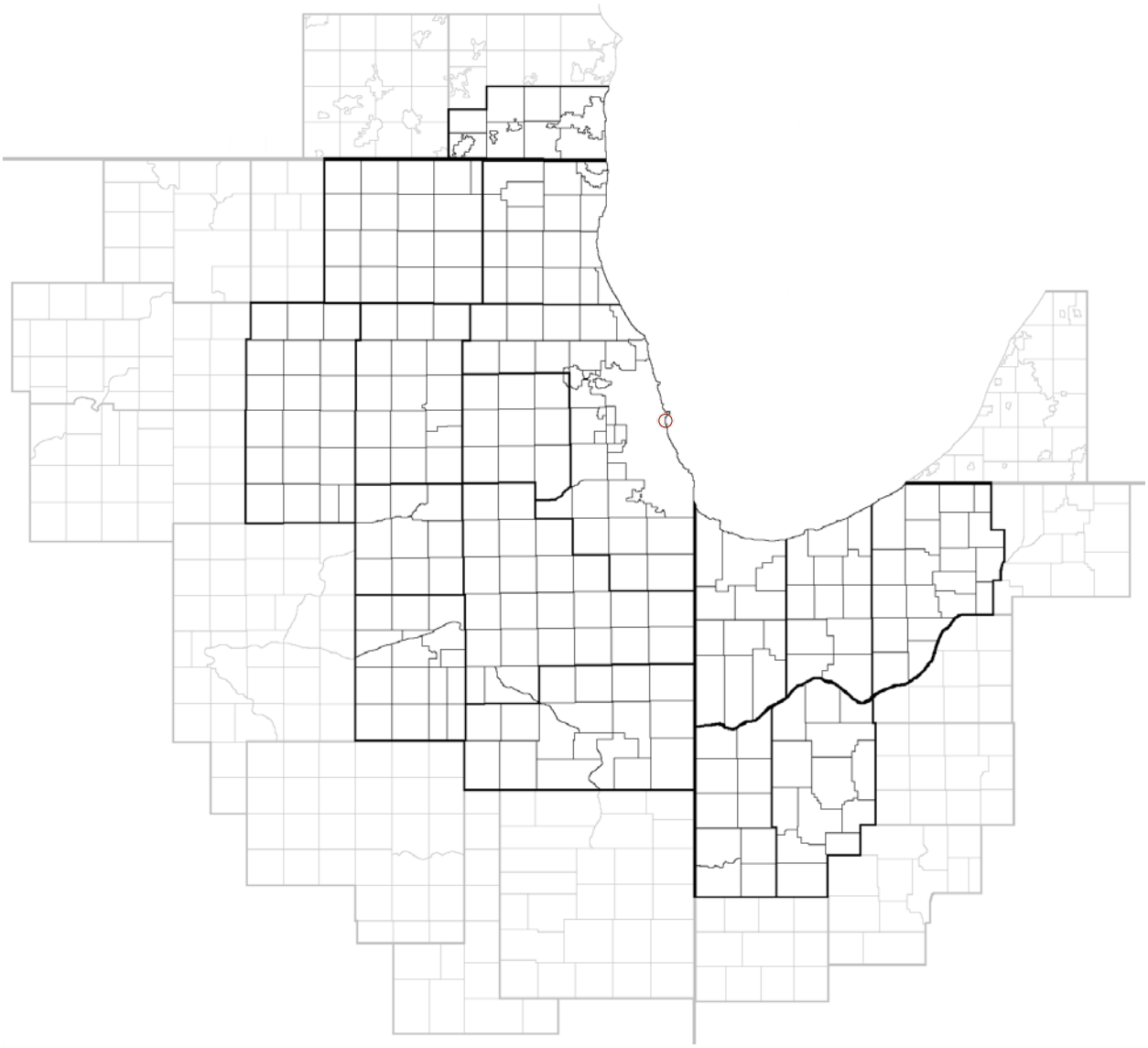
Lyogyrus pilsbryi (Walker, 1906) – Lake Duskysnail – currently stable. Evidence of this species was not detected during the 2012-2013 surveys, but one museum record was uncovered (UIMNH 40938 – pond, near Belvidere in Boone County). Although Baker (1902) did not mention it from the Chicago region, Baker (1906) reported *L. pilsbryi* from the following locations: "Rockford, Winnebago Co; Sand and Fox lakes, Lake Co." Jass (2004) reported the snail from four counties in Wisconsin with the nearest ones to Illinois being Milwaukee and Waukesha counties. Although Johnson et al. (2013) listed *L. pilsbryi* in Indiana, Pyron et al. (2008) did not find the species during their survey. The snail has not been reported in Iowa (Stewart 2006; Johnson et al. 2013). Baker (1902) suggested *L. pilsbryi* lives "in quiet lakes and sloughs."



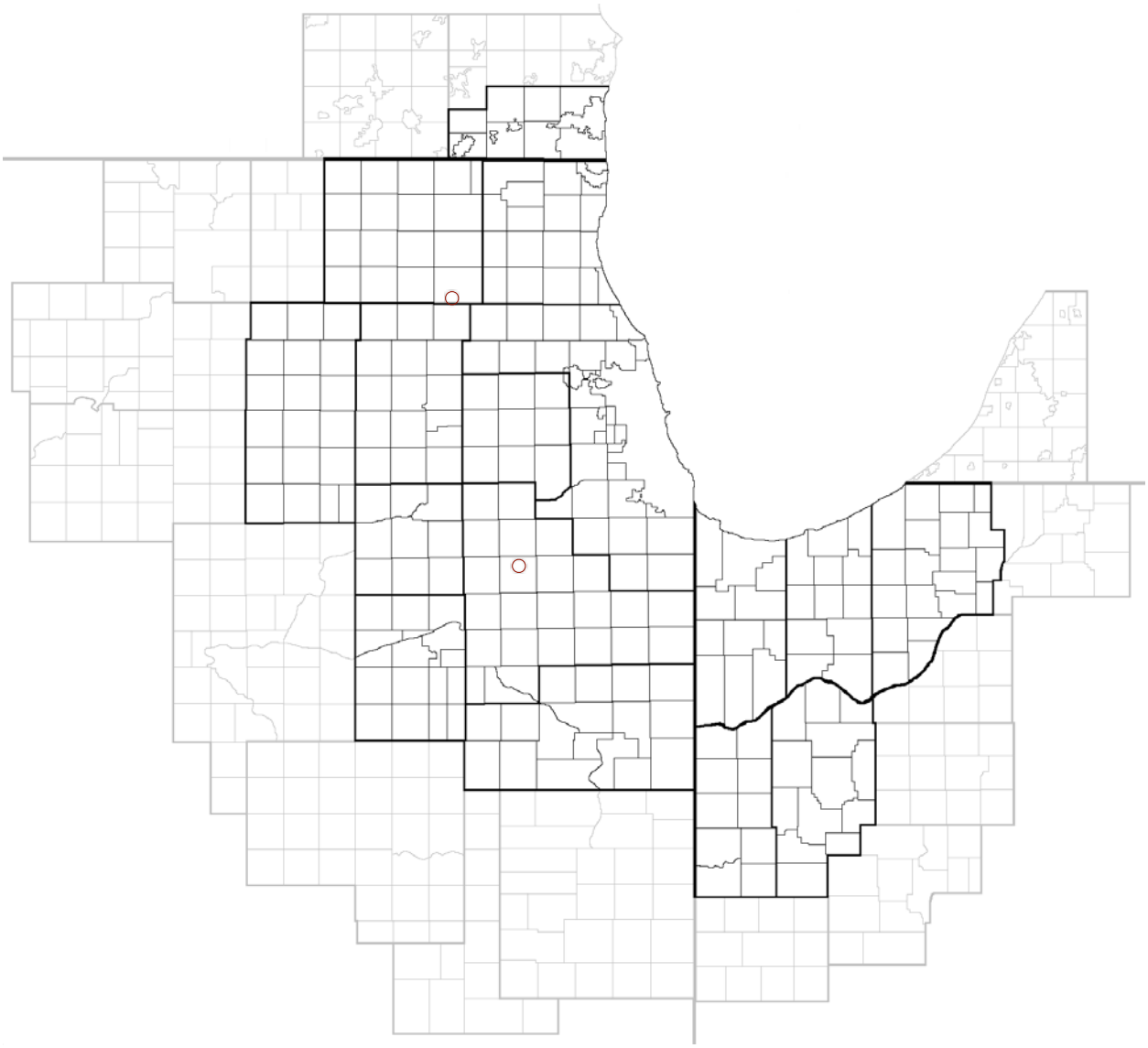
Cincinnatia integra (Say, 1821) – Midland Siltsnail – currently stable. Although not collected as live or fresh-dead during the 2012-2013 surveys, *C. integra* was collected alive in a wetland near Richmond, McHenry County, in 2011 (INHS 45994). Baker (1902) listed it (as *Amnicola cincinnatiensis*) as common, and Baker (1906) stated the snail has been found throughout northern Illinois, including Cook, Lake, McHenry, Will, and Winnebago counties. Although Johnson et al. (2013) listed it in Wisconsin, Jass (2004) did not reported *C. integra* from the state. Stewart (2006) stated the snail has declining populations in Iowa, and Pyron et al. (2008) suggested it is "critically imperiled" in Indiana. Baker (1902) suggested *C. integra* lives in quiet lakes and sloughs, but Baker (1928) stated it (as *Cincinnatia cincinnatiensis*) "is largely a species or rivers."



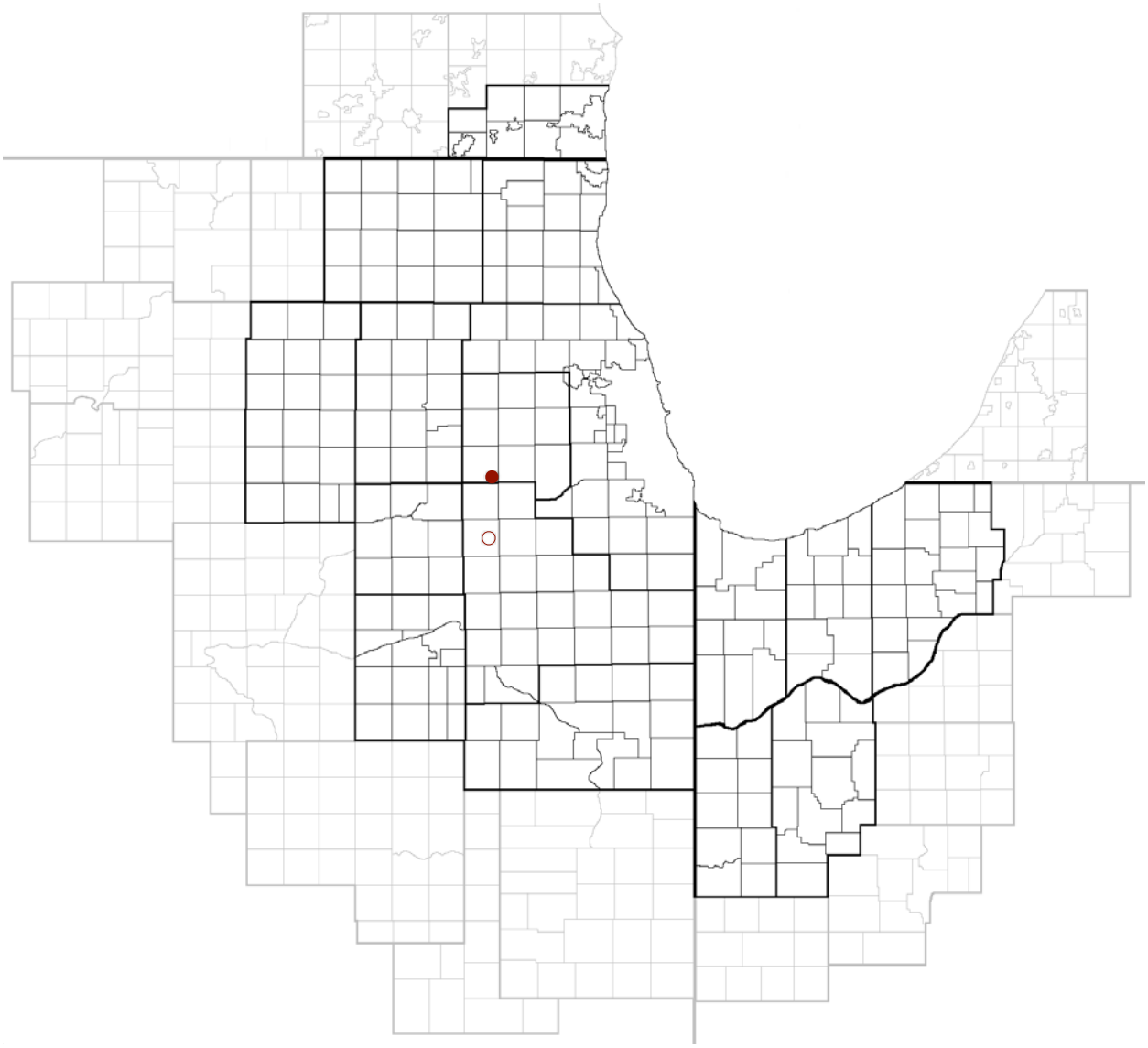
Fontigens nickliniana (Lea, 1839) – Watercress Snail – currently stable. Evidence of this species was not detected during the 2012-2013 surveys, but a museum record was uncovered (UIMNH 188379 - Chicago). Baker (1902) listed *F. nickliniana* (as *Paludestrina nickliniana*) as common, and Baker (1906) stated it has been found throughout northern Illinois. Jass (2004) reported *F. nickliniana* from one county (Door) in Wisconsin. Although Goodrich and van Cleave (1944) and Johnson et al. (2013) listed it in Indiana, Pyron et al. (2008) did not find the snail during their survey. The snail has not been reported in Iowa (Stewart 2006; Johnson et al. 2013). Baker (1902) suggested *F. nickliniana* lives "in the smaller ponds and rivers, clinging to water weeds and algae."



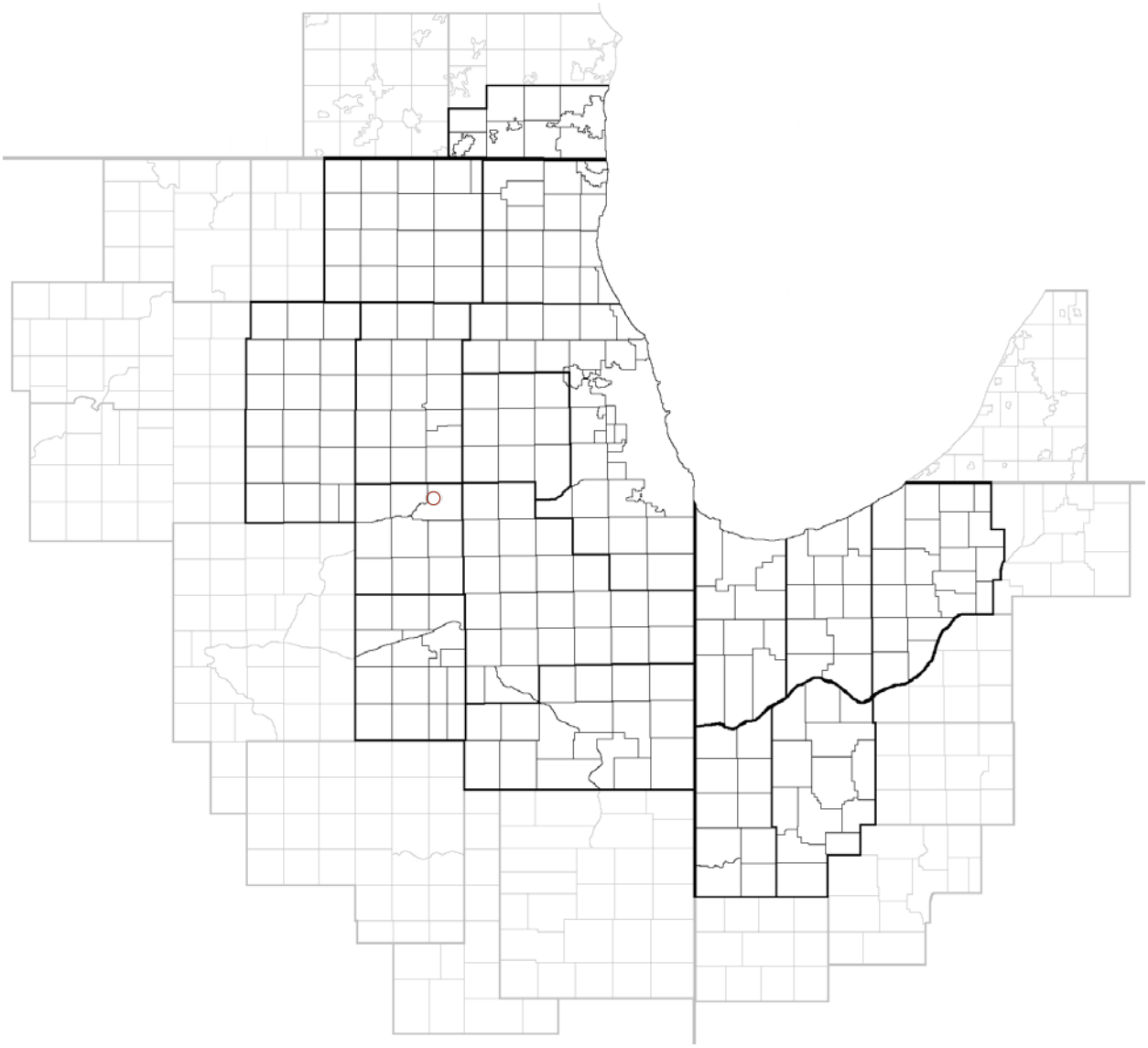
Somatogyrus depressus (Tyron, 1862) – Sandbar Pebblesnail – threatened. Evidence of this species was not detected during the 2012-2013 surveys, but museum records were uncovered (UMMZ 161662 – Algonquin; UMMZ 143739 – Joliet). Baker (1902) listed *S. depressus* (as *S. integer*) as common, and Baker (1906) has scattered records for the snail across northern Illinois. Jass (2004) reported *S. depressus* from six counties in Wisconsin with the nearest one to Illinois being Kenosha County. Stewart (2006) reported the snail as widespread in Iowa. Goodrich and van Cleave (1944) reported the snail from southern Indiana, but neither Pyron et al. (2008) nor Johnson et al (2013) reported from Indiana. Baker (1902) suggested *depressus* can be "found on muddy on clayey bottom in water from five or six inches to five or six feet in depth."



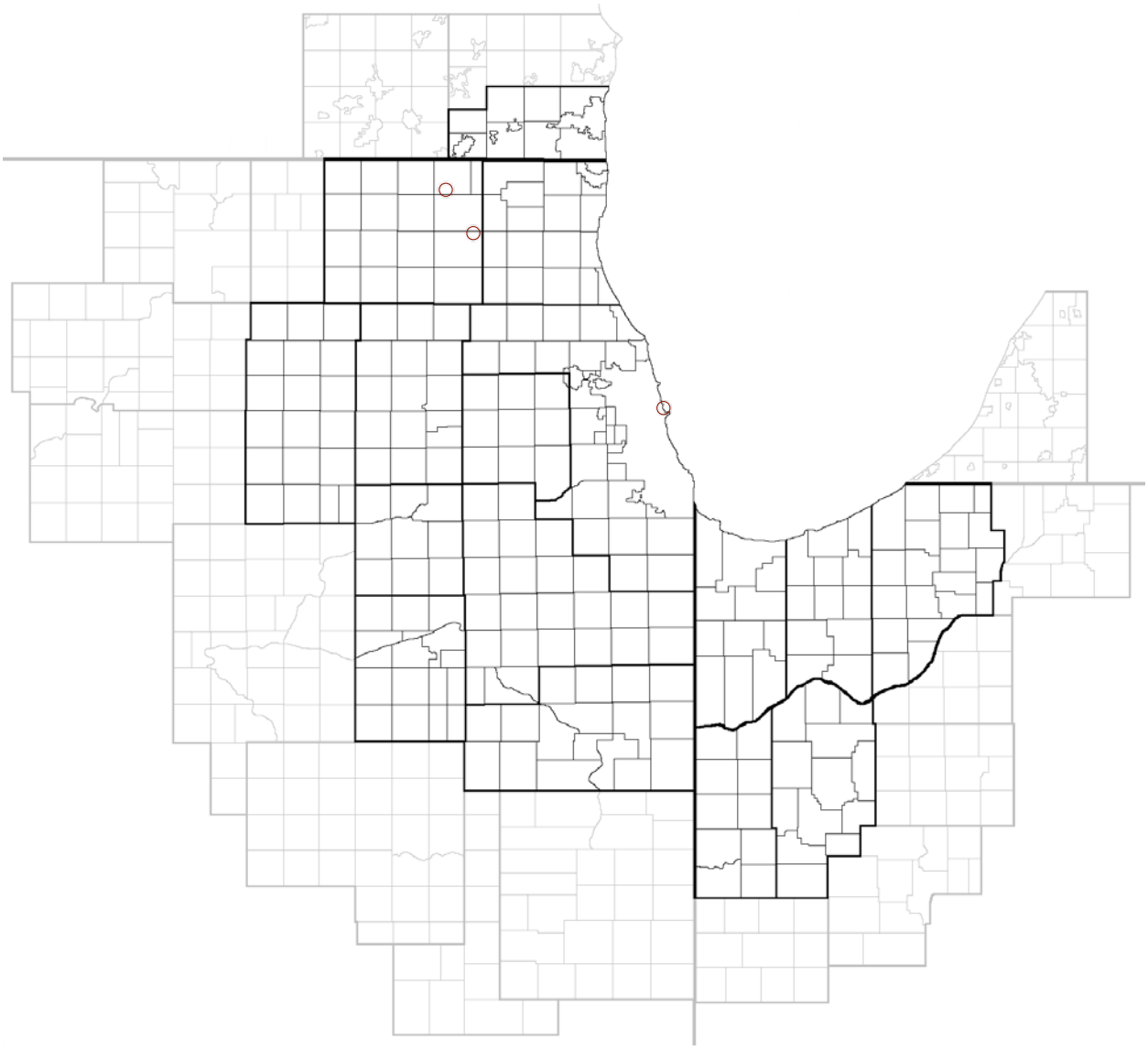
Pomatiopsis cincinnatiensis (Lea, 1840) – Brown Walker – currently stable. Although not collected as live or fresh-dead during the 2012-2013 surveys, *P. cincinnatiensis* was collected alive in Spring Brook in Springbrook Prairie Forest Preserve, DuPage County, in 2006 (INHS 45994). Baker (1902) listed *P. cincinnatiensis* as common, and Baker (1906, 1928) stated it has been found throughout northern Illinois. *Pomatiopsis cincinnatiensis* has not been reported from Wisconsin (Baker 1928; Jass 2004; Johnson 2013). Stewart (2006) stated the snail is imperiled/extinct in Iowa, and Pyron et al. (2008) suggested it is "vulnerable" in Indiana. Baker (1902) suggested *P. cincinnatiensis* is amphibious; when it is in water, it clings to stones. Baker (1928) reported the snail has been collected "on wet earth and roots of trees on the margin of a small stream."



Valvata bicarinata Lea, 1841 – Two-ridge Valvata – currently stable. Evidence of this species was not detected during the 2012-2013 surveys, but one museum record was uncovered (INHS 45800 - Waubansee Creek in Oswego, Kendall County). Baker (1906) stated it has been found throughout northern Illinois, including Cook, Lake, McHenry, and Will counties. Jass (2004) reported *V. bicarinata* from four counties in Wisconsin with the nearest one to Illinois being Milwaukee County. Stewart (2006) stated the snail was imperiled/extinct in Iowa, and Pyron et al. (2008) considered it extinct in Indiana. Baker (1902) suggested *V. bicarinata* lives lakes, ponds, and rivers, where there is little or no current.



Valvata tricarinata (Say, 1817) – Threeridge Valvata – currently stable. The snail was found only as relict shell at two McHenry County wetlands during the 2012-2013 surveys (Lake Defiance and a wetland in Glacial Park). Baker (1906) stated it has been found throughout northern Illinois, including Cook, Lake, McHenry, Will, and Winnebago counties. Jass (2004) reported *V. tricarinata* from 17 counties in Wisconsin with the nearest ones to Illinois being Milwaukee and Waukesha counties. Stewart (2006) stated the snail has fluctuating populations in Iowa, and Pyron et al. (2008) considered it "critically imperiled" in Indiana. Baker (1902) suggested *V. tricarinata* lives lakes, ponds, and rivers, where there is little or no current, and Goodrich and van Cleave (1944) reported the snail "among reeds and stones of shallow water."



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04/18/2013

ILLINOIS NATURAL HISTORY

MARGARET EMIAL

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By: Karen Clayton
Authorized Agent

Publisher's fee $48.51
Ad # 1174354

Illinois Natural History Survey Awarded Wildlife Preservation Funds

Acknowledgment Statement

These grants are administered by the Illinois Department of Natural Resources from funding made possible through donations to the Illinois Wildlife Preservation Fund, a check-off option on the state tax returns.

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FY13 Illinois Wildlife Preservation Fund Awards

Tiemann, J. Freshwater snail surveys of wetlands in Northern Illinois-$2,000 (13-032W)

Tiemann, J. Freshwater mollusks of the middle Mississippi River-$1,997 (13-031W)

Metzke, B. Survey of historic populations of fish species in greatest need of conservation-$18,845 (13-L03W)

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