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New Records of Native and Non-Native Bark and Ambrosia Beetles (Coleoptera: Curculionidae: Scolytinae) in Illinois

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New Records of Native and Non-Native Bark and Ambrosia Beetles (Coleoptera: Curculionidae: Scolytinae) in Illinois

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Abstract

From 2009–2012, we conducted surveys with Lindgren funnel traps for native and non-native bark and ambrosia beetles (Coleoptera: Curculionidae: Scolytinae) in northeastern Illinois. During this study, we collected a total of 10,194 bark and ambrosia beetles representing 50 species in 28 genera. Ten scolytine species not previously reported to occur in Illinois were collected during this survey. Three of these new records are species not native to North America, including *Cyclorhipidion bodoanum* (Reitter), *Cyclorhipidion pelliculosum* (Eichhoff), and *Hylastinus obscurus* (Marsham). Native species reported from Illinois for the first time include: *Anisandrus obesus* (LeConte), *Dryocoetes autographus* (Ratzeburg), *Hylocurus spadix* Blackman, *Pityophthorus cariniceps* LeConte, *Pityophthorus puberulus* (LeConte), *Pseudothysanoes lecontei* Blackman, and *Xyleborinus gracilis* (Eichhoff). The results presented here will update and improve the somewhat limited information regarding the overall bark and ambrosia beetle community in northeastern Illinois.

Most bark and ambrosia beetles (Coleoptera: Curculionidae: Scolytinae) are primary decomposers that favor stressed or recently fallen timber, and most are often of no economic importance. However, under certain conditions, ambrosia beetles in particular can be serious pests in nursery operations (Oliver and Mannion 2001), and some bark beetle species are currently causing widespread mortality of conifers throughout western North America (Logan and Powell 2001, Bentz et al. 2010). Also, there is growing concern because of the continued accidental importation and subsequent establishment of potentially damaging non-native bark and ambrosia beetles. As of 2010, a total of 58 species of exotic scolytines representing 27 genera are known to be established in the continental United States (Haack and Rabaglia 2013) and of this total, 12 species were first reported since 2000.

Because of the persistent threat posed by non-native bark and ambrosia beetles, state and federal surveys to detect and monitor new introductions have steadily increased (PPQ/EDP/EP 2006). The USDA Forest Service Early Detection and Rapid Response (EDRR) Project for Non-Native Bark and Ambrosia Beetles (Rabaglia et al. 2008) identified five species of scolytines new to North America and 47 new state records for native species during a 5-year Pilot Project (PPQ/EDP/EP 2006, Rabaglia et al. 2008). Ongoing surveys within the Great Lakes region have resulted in numerous reports of new state records of native and exotic bark and ambrosia beetles (Lightle et al. 2007, Cognato et al. 2009, Gandhi et al. 2010). Currently, an on-line database dedicated to the bark and ambrosia beetles of the New World that compiles distribution information based on over 300 published scientific articles and electronic records of EDRR survey results (Atkinson 2014) lists 74 scolytine species in Illinois. Thirteen

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species recorded from Illinois are not native to North America. However, since there are few published reports of comprehensive surveys of bark and ambrosia beetles in Illinois, the species checklist in this database must rely primarily on original distribution records reported in Wood (1982), a 35-year old survey of black walnut plantations in extreme southern Illinois (Weber and McPherson 1991), and a few more recent reports of EDRR trap catches provided by the US Forest Service. Thus, additional survey activities are needed to determine the presence of new Illinois species or to better refine the distribution of established species within the State.

Following the general guidelines of the EDRR project (PPQ/EDP/EP 2006, Rabaglia et al. 2008), we conducted an intensive survey of native and introduced bark and ambrosia beetles in four northeastern Illinois counties using Lindgren funnel traps. Since these counties encompass the greater Chicago metropolitan area (including O'Hare International Airport, the Port of Chicago, and innumerable commodity import and distribution facilities), they are considered to be of especially high risk for the accidental introduction of non-native bark and ambrosia beetles. Survey sites were primarily restricted to county forest preserves adjoining Canadian National Railroad lines at the request of the Illinois Natural Resources/Water Resources Stakeholder Group and the Canadian National Railroad. The primary objectives of this study were not only to detect possible new infestations of exotic bark and ambrosia beetles but also to update and improve the somewhat limited information regarding the overall scolytine beetle community in northeastern Illinois.

Materials and Methods

Study Locations. Eight natural areas in four separate County Forest Preserve Districts were selected as study sites (Fig. 1). The two northernmost locations in Lake County were MacArthur Woods and Cuba Marsh Forest Preserves; south of these sites were Spring Creek Valley and Poplar Creek preserves in Cook County; DuPage County locations included Pratt's Wayne Woods Forest Preserve and the Fermi National Accelerator Laboratory site; and farthest south in Will County were Lake Renwick Forest Preserve and Lockport Prairie Nature Preserve.

Forested areas within study locations consisted of diverse stands of hardwoods primarily represented by oak-hickory woodlands, open oak groves, and elm-ash-cottonwood stands. A scattering of mixed conifers was present within all locations. These wooded areas were typically interspersed among a complex of prairie, old field, and wetland habitats. All eight locations were surveyed in 2009 and 2010, but only the four higher quality wooded sites in Lake and Cook counties were monitored in 2011 and 2012.

Trapping Protocol. Sampling methodology followed protocols outlined in the EDRR Project (Rabaglia et al. 2008). In 2009 and 2010, two sets of three Lindgren funnel traps (8-funnel units) were placed along forest edges at each location. Traps were suspended from elbowed metal poles with the collecting cup positioned approximately 1–1.25 m above the ground. Individual traps were placed at least 25 m apart and each set of traps was separated by at least 100 m. Within each 3-trap set, an individual trap was baited with one of the following three lures: 1) ultra-high release ethanol, 2) ultra-high release alpha-pinene, or 3) three-component exotic bark beetle lure (combination of methyl butenol, *cis*-verbenol, and ipsdienol) (Contech Enterprises, Victoria BC, Canada). Lures were replaced during the season according to manufacturer's recommendations, approximately every four to six weeks. Vaportape (Contech Enterprises) killing strips were placed in each collection cup (dry trapping method) and were replaced at eight week intervals during the trapping season to ensure a quick kill of collected insects. Traps were in place from 1 June to 23 September in 2009 and from 17 May to 20 September in 2010.

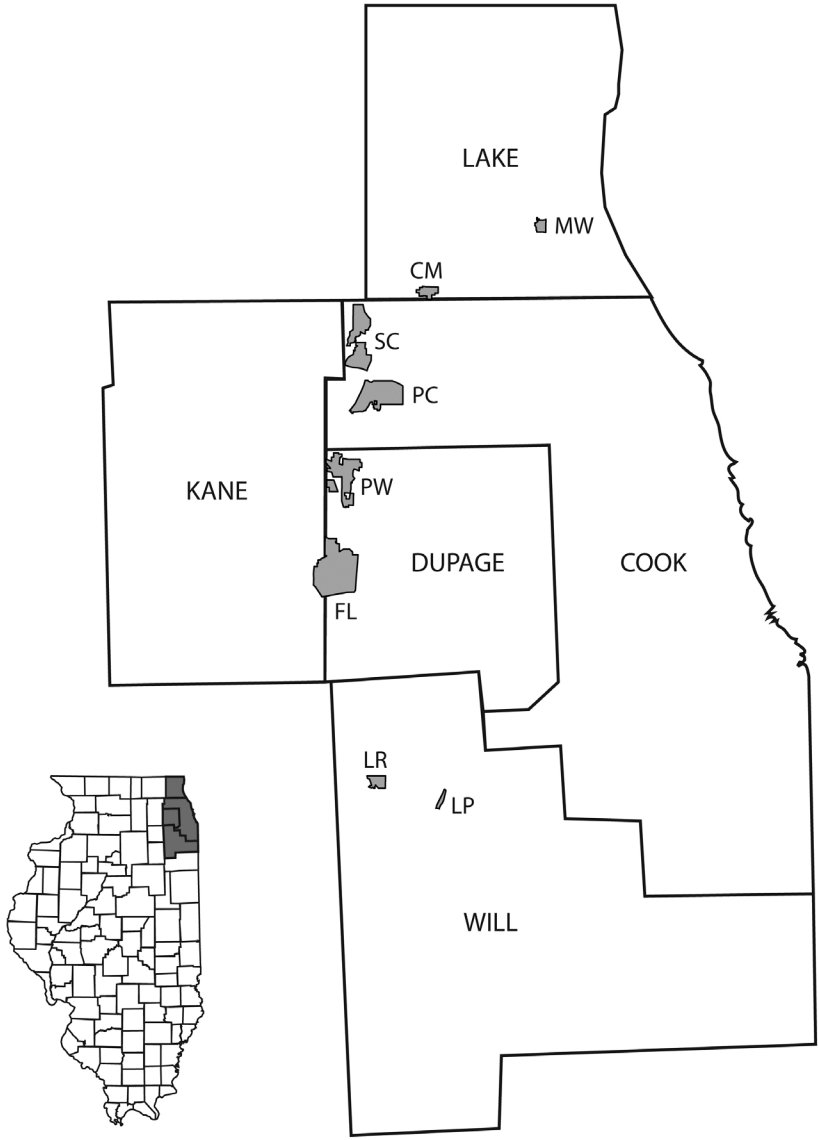

Figure 1. Map of Illinois showing survey locations in four northeastern Illinois counties. MW=MacArthur Woods Forest Preserve; CM=Cuba Marsh Forest Preserve; SC=Spring Creek Valley Forest Preserve; PC=Poplar Creek Forest Preserve; PW=Pratt's Wayne Woods Forest Preserve; FL=Fermi National Accelerator Laboratory (Fermilab); LR=Lake Renwick Forest Preserve; LP=Lockport Prairie Nature Preserve.

In 2011 and 2012, only the four northernmost sites in Lake and Cook County were included in the survey program. Each location was sampled following the same protocols as before, with the exception of trap placement. A single 3-trap set was once again placed along the forest edge, but the second 3-trap set was placed a minimum of 30 m within the forest interior. Trapping began on 17 May and ended on 4 October in 2011 and extended from 15 May to 15 October in 2012.

Sample Processing. Samples were collected at approximately two-week intervals. On each collection date, the contents of each collection cup were transferred to a labeled Whirl-Pak bag in 95% ethanol and stored in a freezer prior to further processing. All bark and ambrosia beetles were sorted, counted, and identified to species by the lead author. Identifications were confirmed by Dr. E. Richard Hoebeke, Associate Curator and Collection Manager of the Museum of Natural History, University of Georgia. Voucher specimens for all species were deposited in the Illinois Natural History Survey Insect Collection on the campus of the University of Illinois, Urbana-Champaign, IL.

Results

Overall, 10,194 bark and ambrosia beetles were captured in this study representing 50 species in 28 genera (Table 1). The two most common and abundant species, encountered at all trapping locations and most every collecting date, were *Xyleborinus saxeseni* (Ratzeburg) and *Lymantor decipiens* (LeConte). These two species alone accounted for 84% of the total scolytine captures. Three other species, *Xylosandrus germanus* (Blandford), *Ips grandicollis* (Eichhoff), and *Hypothenemus interstitialis* (Hopkins) also were collected from all survey sites but in far lower numbers. Together these three species represented only slightly over 4% of the total trap captures. The third most abundant species, *Anisandrus sayi* Hopkins, also accounted for slightly over 4% of the total captures, but it was not collected at either site in DuPage County and only a single specimen was captured at Lockport Prairie in Will County.

Eleven of the species collected during this study are not native to North America (Table 1), but all are considered to be established within the Great Lakes region. These non-native species represented 62% of the bark and ambrosia beetles collected during this study, primarily due to the frequency and abundance of *Xyleborinus saxeseni* and to a lesser degree, *Xylosandrus germanus*, in trap captures.

In contrast, 14 of the species identified were very rarely encountered, occurring in only one trapping location and in some cases, are represented by only a single specimen. The two most northern locations in Lake County accounted for 10 of these single location occurrences. MacArthur Woods was the only site to produce specimens of *Anisandrus obesus* (LeConte), *Chramesus chapuisii* LeConte, *Hylocurus spadix* Blackman, *Hypothenemus rotundicollis* (Eichhoff), *Xyleborinus gracilis* (Eichhoff), *Xyleborus ferrugineus* (Fabricius), and *Xyloterinus politus* (Say), while the Cuba Marsh site was the only location where we detected *Chramesus hicoriae* LeConte, *Hylocurus binodatus* Wood, and *Xyleborus viduus* Eichhoff. In Cook County, specimens of *Ambrosiodmus rubricollis* (Eichhoff) and *Pityophthorus cariniceps* LeConte were only collected at the Poplar Creek location and *Cyclorhipidion pelliculosum* (Eichhoff) was only found at Spring Creek. Finally, Lockport Prairie in Will County was the only site where *Monarthrum fasciatum* (Say) was captured.

Overall, 41 of the 50 species we collected occurred within the Lake County study sites. Of the four locations surveyed for the full four years of this study, MacArthur Woods Forest Preserve had the highest number of species detected at 36. The lowest number of species collected from a single site over four years was 27 at the Poplar Creek Forest Preserve in Cook County.

Ten scolytine species not previously reported to occur in Illinois were collected during this survey (Table 1). Three of these new records are species not native to North America, including *Cyclorhipidion bodoanum* (Reitter)*, Cyclorhipidion pelliculosum,* and *Hylastinus obscurus* (Marsham). The seven other native species representing new Illinois records are: *Anisandrus obesus, Dryocoetes autographus* (Ratzeburg)*, Hylocurus spadix, Pityophthorus cariniceps*, *Pityophthorus puberulus* (LeConte), *Pseudothysanoes lecontei* Blackman, and *Xyleborinus gracilis.* Nearly half of these new records (*Cyclorhipidion bodoanum, Hylastinus obscurus*, *Dryocoetes autographus, Pityophthorus puberulus,* and *Pseudothysanoes lecontei*) were detected at more than one location. Seven of the new state records occurred in MacArthur Woods, three of which (*Anisandrus obesus, Hylocurus spadix,* and *Xyleborinus gracilis*) were unique to that location.

Discussion

From 2009 to 2012 the native and non-native bark and ambrosia beetles were documented in northeastern Illinois in four forest preserves (Fig. 1). Comparing the 50 species collected during the four years of this survey with the most up-to-date Illinois checklist provided by the on-line bark and ambrosia beetles database (Atkinson 2014), we determined that 10 of these species (Table 1) had not previously been reported to occur in the state. These new additions bring the Illinois state inventory of bark and ambrosia beetles to 84 species. In comparison, inventories for neighboring states in the region provided by this same database range from 113 species in Michigan, 110 in Indiana, 81 in Minnesota, 74 in Ohio, and a low of 53 species for Wisconsin (Atkinson 2014). Of the 11 non-native species collected in this survey, three constitute first state records, which brings the total number of exotic bark beetle species known to occur in Illinois to 16. Numbers of non-native species reported in these same neighboring states range from a low of 4 in Minnesota to 10 in Wisconsin, 19 in Michigan and 20 species in both Indiana and Ohio.

A number of species already known to occur in Illinois were newly detected in our regional survey of northeastern Illinois, well distant from reported records in the extreme southern portion of the state (Weber and McPherson 1991). However, these disjunct records are not necessarily indicative of a true range expansion in all cases, since most of the species we detected for the first time in northeastern Illinois also are known from similar or more northern latitudes in neighboring states (Deyrup 1981, Cognato et al. 2009, Gandhi et al. 2010, Pfammatter et al. 2011, see also Bark and Ambrosia Beetles of the U.S. and Canada species distribution maps in Atkinson 2014). For instance, prior to this survey, *Hylocurus binodatus* was known in Illinois only from Alexander County at the extreme southwestern tip of the state (Atkinson et al. 1991). Although our new record from Cuba Marsh is well over 600 kilometers north of the previous Illinois record, this species is also known to occur in east-central Indiana (Deyrup and Atkinson 1987) as well as southeastern Michigan (Atkinson 1989). However, this species has not been recorded in either Wisconsin or Iowa.

For several species, though, these new northeastern Illinois records represent their northernmost known range in the Great Lakes region. Our records for *Hypothenemus interstitialis, Hypothenemus rotundicollis*, and *Chramesus chapuisii* are nearly 200 kilometers north of their reported known range in Indiana (Deyrup 1981), and none of the three species have been reported in Michigan, Wisconsin, or in neighboring Iowa. Likewise, the single specimen of *Xyleborus viduus* we collected at the Cuba Marsh site in Lake County is the most northern collection record for this unique and somewhat infrequently collected species. This species was previously collected in east-central Illinois 300 kilometers south of our study sites (electronic collection record, Atkinson 2014), and there are no records of *X. viduus* from Michigan, Wisconsin, or Iowa.

Exotic bark and ambrosia beetles collected in this survey represented 22% of the total species recorded and 62% of the total individuals collected. A similar survey in Ohio (Gandhi et al. 2010) reported that exotic species constituted 32% of the total number of scolytine species and approximately 60% of the total individuals collected. Non-native ambrosia beetles were even more abundant in a Missouri survey of oak-hickory forest stands where exotic species accounted for 87% of the total individuals collected (Reed and Muzika 2010). Except at the Poplar Creek location in Cook County, *Xyleborinus saxeseni* was the dominant species collected throughout our survey (Table 1). Nearly 59% of the total scolytine specimens collected during our study were *X. saxeseni*. Lindgren funnel surveys in Missouri (Reed and Muzika 2010) and Tennessee (Oliver and Mannion 2001) also reported *X. saxeseni* as the most abundant species where it comprised 33% and 50%, respectively, of the total individuals collected.

Collection records for the ten species not previously reported from Illinois in published records or documented in the bark and ambrosia beetles on-line database (Atkinson 2014) are summarized below. Data provided for each species includes county, specific site information (name of preserve, latitude and longitude), date of first collection each year, and lure information.

Exotic Scolytinae

Cyclorhipidion bodoanum (Reitter). Lake Co., MacArthur Woods Forest Preserve, 42° 15′18″N 87°55′36″W, 29 May 2011, alpha-pinene; 18 July 2011, ethanol; 26 May 2012, ethanol; 23 June 2012, exotic *Ips* lure. Lake Co., Cuba Marsh Forest Preserve, 42° 10′28″N 88°06′42″W, 29 May 2011, both ethanol and alpha-pinene lures; 26 May 2012, both ethanol and alpha-pinene lures. Cook Co., Spring Creek Valley Preserve, 42° 05′18″N 88°11′43″W, 26 May 2012, ethanol. Cook Co., Poplar Creek Forest Preserve, 42° 02′46″N 88°12′51″W, 23 June 2012, ethanol.

Although absent from all locations during the first two years of our survey, this species was captured in relatively high numbers at the MacArthur Woods location (65 individuals) and was also encountered at the other three sites in Lake County and Cook County during 2011 and 2012. First reported in the eastern United States in 2000 (Vandenberg et al. 2000), it is now widely distributed in the Midwest (Rabaglia et al. 2006, Lightle et al. 2007, Cognato et al. 2009, Reed and Muzika 2010).

Cyclorhipidion pelliculosum (Eichhoff). Cook Co., Spring Creek Valley Preserve, 42° 05′18″N 88°11′43″W, 29 May 2012, ethanol.

This introduced species was first reported in North America in 1987 (Atkinson et al. 1990). It has since established along the east coast from Maine south to Virginia and west to Ohio (Lightle et al. 2007), Tennessee (Rabaglia et al. 2006), and Missouri (Reed and Muzika 2010). Although not reported to occur in Indiana or Wisconsin, an unpublished electronic EDRR record (Atkinson 2014) shows it present in far southeastern Michigan at a latitude similar to our Cook County detection.

Hylastinus obscurus (Marsham). Cook Co., Spring Creek Valley Preserve, 42° 05′18″N 88°11′43″W, 1 June 2010, ethanol, alpha-pinene, and exotic *Ips* lures; 26 May 2012, ethanol. DuPage Co., Fermi National Laboratory, 41° 50′16″N 88°12′45″W, 1 June 2010, alpha-pinene. Will Co., Lake Renwick Forest Preserve, 41° 35′58″N 88°10′50″W, 1 June 2010, both ethanol and exotic *Ips* lures.

Although this species is known to occur in Indiana (Deyrup 1981) and Wisconsin (Atkinson et al. 1991) and is widely distributed in other northeastern states and the Pacific northwest (Wood 1982), until now *H. obscurus* has not been reported in Illinois. This species feeds on the roots of clovers and several other species of legumes (Wood 1982).

Table 1. Summary of bark and ambrosia beetle trap captures at eight locations in four northeastern Illinois counties. Scolytine species not previously reported to occur in Illinois are preceded by the symbol (*).

	2009–2010				2009–2012				
	DuPage Co.		Will Co.		Lake Co.		Cook Co.		Species Total
Species	**PW**	**FL**	LR	LP	MW	CM	SC	PC	
Introduced Species									
Ambrosiodmus rubricollis (Eichhoff)	0	0	0	0	0	0	0	2	**2**
Ambrosiophilus atratus (Eichhoff)	0	2	0	2	6	1	7	42	**60**
**Cyclorhipidion bodoanum* (Reitter)	0	0	0	0	65	21	6	2	**94**
**Cyclorhipidion pelliculosum* (Eichhoff)	0	0	0	0	0	0	1	0	**1**
**Hylastinus obscurus* (Marsham)	0	1	2	0	0	0	9	0	**12**
Scolytus multistriatus (Marsham)	1	0	0	0	1	3	3	0	**8**
Scolytus rugulosus (Muller)	0	2	0	0	0	0	0	1	**3**
Scolytus schevyrewi Semenov	1	2	4	2	0	0	2	5	16
Tomicus piniperda Linnaeus	0	1	0	0	12	1	1	10	**25**
Xyleborinus saxeseni (Ratzeburg)	146	186	756	162	1,038	2,231	907	549	**5,975**
Xylosandrus germanus (Blandford)	1	6	1	1	58	14	23	27	**131**
Native Species									
**Anisandrus obesus* (LeConte)	0	0	0	0	2	0	0	0	**2**
Anisandrus sayi Hopkins	0	0	0	1	195	106	73	70	**445**
Chramesus chapuisii LeConte	0	0	0	0	2	0	0	0	**2**
Chramesus hicoriae LeConte	0	0	0	0	0	1	0	0	**1**
Corthylus columbianus Hopkins	0	0	0	0	16	10	5	3	**34**
Corthylus punctatissimus (Zimmermann)	0	0	0	0	5	2	4	9	**20**

Table 1. Continued.

Species	2009–2010 DuPage Co. PW	2009–2010 DuPage Co. FL	2009–2010 Will Co. LR	2009–2010 Will Co. LP	2009–2012 Lake Co. MW	2009–2012 Lake Co. CM	2009–2012 Cook Co. SC	2009–2012 Cook Co. PC	Species Total
Dendroctonus valens LeConte	0	1	0	1	3	1	2	0	8
**Dryocoetes autographus* Ratzeburg	0	0	0	0	1	1	0	0	**2**
Dryocoetes granicollis (LeConte)	0	0	0	0	7	13	0	1	**21**
Gnathotrichus materiarius (Fitch)	0	1	0	0	4	0	4	0	**9**
Hylesinus aculeatus Say	2	5	0	0	1	3	11	4	**26**
Hylocurus binodatus Wood	0	0	0	0	0	1	0	0	**1**
Hylocurus rudis (LeConte)	1	0	2	1	0	5	0	1	**10**
**Hylocurus spadix* Blackman	0	0	0	0	1	0	0	0	**1**
Hypothenemus dissimilis (Zimmermann)	0	0	1	0	28	18	5	3	**55**
Hypothenemus eruditis Westwood	0	0	0	0	3	5	3	2	**13**
Hypothenemus interstitialis (Hopkins)	1	3	1	1	45	1	3	4	59
Hypothenemus rotundicollis (Eichhoff)	0	0	0	0	1	0	0	0	**1**
Ips grandicollis (Eichhoff)	26	25	13	9	61	83	17	18	**252**
Ips pini (Say)	0	0	1	0	0	2	1	1	**5**
Lymantor decipiens (LeConte)	70	91	115	26	293	759	481	757	**2,592**
Micracis suturalis LeConte	0	0	0	0	1	1	1	1	**4**
Monarthrum fasciatum (Say)	0	0	0	1	0	0	0	0	**1**
Monarthrum mali (Fitch)	4	0	1	0	38	15	14	4	**76**
Orthotomicus caelatus (Eichhoff)	0	0	0	0	5	4	7	0	**16**

Table 1. Continued.

Species	2009–2010				2009–2012				Species Total
	DuPage Co.		Will Co.		Lake Co.		Cook Co.		
	PW	FL	LR	LP	MW	CM	SC	PC	
Phloeotribus dentifrons (Blackman)	0	0	0	0	0	0	1	1	**2**
Phloeotribus liminaris (Harris)	3	2	0	0	35	3	17	8	68
**Pityophthorus cariniceps* LeConte	0	0	0	0	0	0	0	1	**1**
Pityophthorus lautus Eichhoff	3	1	15	0	15	4	9	20	**67**
**Pityophthorus puberulus* (LeConte)	0	0	0	0	1	2	0	0	**3**
Pseudopityophthorus asperulus (LeConte)	1	0	0	0	4	1	0	0	**6**
Pseudopityophthorus minutissimus (Zimmermann)	0	2	0	0	19	5	10	1	**37**
**Pseudothysanoes lecontei* Blackman	0	0	1	0	1	3	0	0	**5**
Scolytus muticus Say	0	3	0	0	0	0	11	0	**14**
**Xyleborinus gracilis* (Eichoff)	0	0	0	0	1	0	0	0	**1**
Xyleborus ferrugineus (Fabricius)	0	0	0	0	1	0	0	0	**1**
Xyleborus viduus Eichoff	0	0	0	0	0	1	0	0	1
Xyleborus xylographus Say	0	0	0	1	1	0	2	0	**4**
Xyloterinus politus (Say)	0	0	0	0	1	0	0	0	**1**
Total per Study Site	260	334	913	208	1,971	3,321	1,640	1,547	10,194

Native Scolytinae

Anisandrus obesus (LeConte). Lake Co., MacArthur Woods Forest Preserve, 42° 15′18″N 87°55′36″W, 12 June 2011, ethanol.

This species is known from Indiana (Deyrup 1991), Michigan (Cognato et al. 2009), and Wisconsin (Bright 1968). Given its presence in these surrounding states, its discovery in Illinois is not surprising. A variety of hardwoods, including poplar, oak, and beech, are reported as hosts (Wood 1982).

Dryocoetes autographus (Ratzeburg). Lake Co., MacArthur Woods Forest Preserve, 42° 15′18″N 87°55′36″W, 9 June 2009, alpha-pinene. Lake Co., Cuba Marsh Forest Preserve, 42° 10′28″N 88°06′42″W, 6 September 2011, alpha-pinene.

This species is well known from Indiana (Deyrup 1981), Wisconsin (Bright 1963), and throughout North America (Rabaglia and Valentini 2003) but was first reported to occur in Ohio as recently as 2007 (Lightle et al. 2007). It most often inhabits the base of injured or dead conifers and *Liriodendron* (Bright 1963).

Hylocurus spadix Blackman. Lake Co., MacArthur Woods Forest Preserve, 42° 15′18″N 87°55′36″W, 14 June 2010, ethanol.

Until this new Illinois record, the known distribution for *H. spadix* was limited to Pennsylvania and North Carolina (Wood 1982), Delaware (electronic EDRR record, Atkinson 2014), and an unpublished Tennessee trapping record from 2013 (Atkinson 2014). The Lake County, IL record represents a significant range expansion for this species, but whether this is due to normal movement or the result of an accidental introduction into this new region is unclear. Little is known about the biology of this species other than its presence in *Carya* (Wood 1982).

Pityophthorus cariniceps LeConte. Cook Co., Poplar Creek Forest Preserve, 42° 02′46″N 88°12′51″W, 1 June 2010, alpha-pinene.

This species is known from both Indiana (Deyrup and Atkinson 1987) and Wisconsin (Wood 1982) where it has been collected from the twigs of a number of coniferous hosts. It is widely distributed throughout the northeastern United States (Rabaglia and Valentini 2003).

Pityophthorus puberulus (LeConte). Lake Co., MacArthur Woods Forest Preserve, 42° 15′18″N 87°55′36″W, 26 June 2010, alpha-pinene. Lake Co., Cuba Marsh Forest Preserve, 42° 10′28″N 88°06′42″W, 1 June 2010, both ethanol and exotic *Ips* lures.

This is yet another species widespread in Indiana (Deyrup 1981) and Wisconsin (Wood 1982) as well as most northeastern states. It, too, breeds in small twigs of various pine, spruce, and fir hosts.

Pseudothysanoes lecontei Blackman. Lake Co., MacArthur Woods Forest Preserve, 42° 15′18″N 87°55′36″W, 9 June 2012, exotic *Ips* lure. Lake Co., Cuba Marsh Forest Preserve, 42° 10′28″N 88°06′42″W, 12 June 2011, both ethanol and exotic *Ips* lures. Will Co., Lake Renwick Forest Preserve, 41° 35′58″N 88°10′50″W, 1 June 2010, alpha-pinene.

Prior to this new Illinois record, Indiana was the only Great Lakes state reporting the occurrence of this species (Deyrup 1981). Until its detection in Texas in 2005 (Atkinson and Riley 2013), the range of this species was restricted to several states east of the Appalachians (Wood 1982, Weber and McPherson 1991, Atkinson et al. 1991). It is most frequently encountered in freshly killed branches and twigs of oaks.

Xyleborinus gracilis (Eichhoff). Lake Co., MacArthur Woods Forest Preserve, 42° 15′18″N 87°55′36″W, 4 August 2012, ethanol.

The reported distribution of this species was limited to several southern

and southeastern states, including Florida, Louisiana, North and South Carolina (Rabaglia et al. 2006) until it was detected in Missouri in 2007 (Reed and Muzika 2010) and in New Jersey in 2010 (electronic EDRR record, Atkinson 2014). Missouri specimens were recovered from oak-hickory forest stands. This Illinois record represents a fairly significant midwestern range expansion for this species.

The extensive list of native and non-native bark and ambrosia beetles identified during this study, including ten species not previously recorded in Illinois, broadened our knowledge of their distribution throughout the Great Lakes region. Many of the species detected in our survey, including several reported as new state records, may well have been present in northeastern Illinois for some time and were simply undetected. We base this assumption either on their abundance and widespread distribution among our study sites or because of their presence in neighboring states. For these reasons, the new state records for *Anisandrus obesus, Dryocoetes autographus,* the two *Pityophthorus* species, and even two of the exotic species, *Hylastinus obscurus* and *Cyclorhipidion bodoanum,* are not particularly unexpected. The four remaining new state records are more noteworthy. The detection of *Cyclorhipidion pelliculosum* and *Pseudothysanoes lecontei* in northeastern Illinois represents the western edge of their known range in the Great Lakes region and more significant range expansions are suggested by the new Illinois records for *Hylocurus spadix* and *Xyleborinus gracilis.*

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