

# Indiana Cooperative Agricultural Pest Survey

## 2018 Annual Report for Survey

1 January – 31 December



Department of Entomology at Purdue University  
Indiana Department of Natural Resources (IDNR)  
United State Department of Agriculture (USDA), Animal and Plant Health Inspection Service  
(APHIS), Plant Protection and Quarantine (PPQ)

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01 March 2019

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<b>State:</b>	Indiana
<b>Cooperative Agreement Name:</b>	Indiana Agricultural Pest Surveys (CAPS) 2018
<b>Cooperative Agreement Number:</b>	18-8218-0332-CA
<b>Project Funding Period:</b>	1 January 2018 – 31 December 2018
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Quarterly Report	<input type="checkbox"/>
Semi-Annual Accomplishment Report	<input type="checkbox"/>
Annual Accomplishment Report	<input checked="" type="checkbox"/>

## A. Narrative

Indiana Cooperative Agricultural Pest Surveys in 2018 were Corn Commodity, Soybean Commodity, Nursery and Retail Plants, and Exotic Wood Borer/Bark Beetle. All aspects of the Soybean Commodity survey were planned, executed and reported by the SSC. Only moth and invasive plant monitoring for the Corn Commodity survey was planned, executed and reported by the SSC. The disease monitoring portion of the Corn Commodity survey was a collaboration with the Purdue Plant Pest Diagnostic Laboratory (PPDL). Corn tissue samples were screened and tested by PPDL and the SSC reported data. The Nursery and Retail Plants survey was a collaborative effort of the SSC, Indiana Department of Natural Resources (IDNR), and PPDL. IDNR assisted in setting and servicing traps and obtaining foliar samples. PPDL screened foliar disease samples. The SSC assisted in survey planning/logistics, processing samples and archiving/reporting results. The Exotic Wood Borer/Bark Beetle survey was a collaborative effort with PPQ and CAPS. Pathway analysis was used to identify high-risk trap sites. PPQ co-planned the survey and set and serviced traps. The SSC co-planned the survey, processed and archived samples, and reported results. Survey data from APHIS collaborators (karnal bunt and khapra beetle) and IDNR collaborators (National Honey Bee, gypsy moth) were coded and/or uploaded.

Proposed and actual survey funding was \$31,012. Survey details follow.

### A.1. Soybean Commodity Survey:

#### Accomplishments:

Proposed and actual funding was \$5,473.

Proposed data were 1,458 records. Actual data were 1,544 records.

Cost per record was \$3.75.

A.1.a. Proposed total moth data for the Soybean Commodity Survey were 6 sites x 4 moth pests X 5 traps/pest X 12 weeks = 1440 records. Proposed yellow witchweed records were 6 sites x 1 observation x 3 sample dates = 18.

	Records	
	Proposed	Uploaded
1. Old world bollworm, <i>Helicoverpa armigera</i> ,	360	379
2. Egyptian cottonworm, <i>Spodoptera littoralis</i>	360	382
3. Silver Y-moth, <i>Autographa gamma</i>	360	386
4. Golden twin-spot moth, <i>Chrysodeixis chalcites</i>	360	379
5. <u>Yellow witchweed, <i>Alectra vogelii</i></u>	18	18
total	1458	1,544

A.1.b. Survey Methodology: Moth survey methods were adapted from the CAPS Pest Risk Assessment publication by Vennette, et al. 2003. Mini Risk Assessment, Old World Bollworm, *Helicoverpa armigera*, Hubner [Lepidoptera : Noctuidae] and the CAPS Soybean Commodity Guidelines (25 July 2007). Six high-risk trap sites (Jennings, Knox, La Porte, Randolph, Tippecanoe, and Whitley Counties) with high concentrations of grain crops (soybean and field corn) were chosen for this survey. Trap numbers and types placed at each site included: five bucket traps (green/yellow/white) with lure and kill strips for each of old

world bollworm, *Helicoverpa armigera*, Egyptian cottonworm, *Spodoptera littoralis*, silver Y-moth *Autographa gamma*, and golden twin-spot moth, *Chrysodeixis chalcites*. Traps were set on 8-11 May and were serviced weekly through the end of the reporting period 6-10 August. Yellow witchweed, *Alectra vogelii*, survey was a 20-minute rapid, visual search in an “M” shaped pattern across a soybean field performed monthly from 11 June to 10 Aug. This survey method was based on the generally recommended search pattern for pest insects and weeds by the Purdue Cooperative Extension Service.

A.1.c. Survey locations, trap service and weed search dates;

1. Jennings Co. Southeast-Purdue Agricultural Center, Butlerville, IN.  
Trap dates; weekly from 5/11 to 8/8. Weed search dates; 6/13, 7/12, 8/8
2. Knox Co. Southwest-Purdue, Vincennes, IN.  
Trap dates; weekly from 5/15 to 8/10 Weed search dates; 6/12, 7/11, 8/10
3. La Porte Co. Pinney-Agricultural Center, Wanatah, IN.  
Trap dates; weekly from 5/8 to 8/6. Weed search dates; 6/11, 7/9, 8/6
4. Randolph Co. Davis-Purdue Agricultural Center, Farmland, IN.  
Trap dates; weekly from 5/9 to 8/7. Weed search dates; 6/12, 7/11, 8/7
5. Tippecanoe Co. Meigs-Purdue Horticultural Center, Lafayette, IN.  
Trap dates; weekly from 5/10 to 8/8. Weed search dates; 6/11, 7/9, 8/6
6. Whitley Co. Northeast-Purdue Agricultural Center, Columbia City, IN.  
Trap dates; weekly from 5/9 to 8/7. Weed search dates; 6/12, 7/11, 8/7

A.1.d. Benefits and Results of Survey:

As in previous years, several endemic similar noctuid loopers were attracted to the *A. gamma* and *H. armigera* lures. This resulted in about 150 specimens received that required screening by micro-dissection (*H. armigera*) and/or external morphology (*A. gamma*). No target species were identified.

A.1.e. Database submissions:

Old world bollworm, *Helicoverpa armigera*,  
Date Range: 05-8-2018 thru 8-10-2018  
Counties 6 Sites 5 Pos 0 Neg 379

Egyptian cottonworm, *Spodoptera littoralis*,  
Date Range: 05-8-2018 thru 8-10-2018  
Counties 6 Sites 5 Pos 0 Neg 382

Silver Y-moth *Autographa gamma*;  
Date Range: 05-8-2018 thru 8-10-2018  
Counties 6 Sites 5 Pos 0 Neg 386

Golden twin spot Moth, *Chrysodiexis chalcites*,  
Date Range: 05-8-2018 thru 8-10-2018  
Counties 6 Sites 5 Pos 0 Neg 379

Yellow witchweed, *Alectra vogelii*,  
 Date Range: 06-11-2018 thru 8-10-2018  
 Counties 6 Sites 6 Pos 0 Neg 18

**A2. Corn Commodity Survey:**

A.2.a. Proposed moth data for the Corn Commodity Survey were 6 sites x 4 pests x 5 traps/pest X 12 dates = 1440 records. The proposed disease survey records were 75 sites x 4 pests X 1 visit=75 x4 =300 records. Proposed Asiatic witchweed data were 6 sites x 1 observation x 3 sample dates = 18 records.

Accomplishments:

Proposed and actual funding was \$5,473.  
 Proposed data were 1,758 records. Actual data were 2,376 records.  
 Cost per record was \$2.30.

	Records	
	Proposed	Uploaded
1. Old world bollworm, <i>Helicoverpa armigera</i>	360	381
2. Egyptian cottonworm, <i>Spodoptera littoralis</i>	360	382
3. Cotton cutworm, <i>Spodoptera litura</i>	360	383
4. Silver Y-moth, <i>Autographa gamma</i>	360	384
5. Brown stripe downy mildew, <i>Sclerophthora. rayssiae</i> var. <i>zeae</i>	75	203
6. Philippine downy mildew, <i>Peronosclerospora philippinensis</i>	75	203
7. Java downy mildew, <i>Peronosclerospora maydis</i>	75	203
8. Tar spot, <i>Phyllachora maydis</i>	75	219
9. Asiatic witchweed, <i>Striga asiatica</i>	18	18
Totals	1,758	2,376

A.2.b. Survey Methodology (Moth trapping protocol): For the moth portion of the survey, five bucket traps for each of adult silver Y-moth *A. gamma*, old world bollworm, *H. armigera*, cotton cutworm, *S. litura*, and Egyptian cotton leafworm, *S. littoralis* were deployed on 8-11 May at six high-risk sites. All traps were deployed according to recommendations in the Corn Commodity Survey Guidelines (August 2010) and the CAPS Approved Methods. Disease targets including brown stripe downy mildew, *S. rayssiae* var. *zeae*, Philippine downy mildew, *P. philippinensis*, Java downy mildew, *P. maydis*, and Tar spot, *P. maydis* were sampled in about 20 counties from about late July through mid -August. These samples were screened by Purdue Plant and Pest Diagnostic Laboratory. Asiatic witchweed, *Striga asiatica*, survey was a 20-minute rapid, visual search in an “M” shaped pattern across a soybean field performed monthly from 11 June to 10 Aug. This survey method is based on the generally recommended search pattern for pest insects and weeds by the Purdue Cooperative Extension Service.

A.2.c. Moth survey locations; trap service and weed search dates;

- Jennings Co. Southeast-Purdue Agricultural Center, Butlerville, IN.  
 Trap dates; weekly from 5/11 to 8/8. Weed search dates; 6/13, 7/12, 8/8

2. Knox Co. Southwest-Purdue, Vincennes, IN.  
Trap dates; weekly from 5/15 to 8/10 Weed search dates; 6/12, 7/11, 8/10
3. La Porte Co. Pinney-Agricultural Center, Wanatah, IN.  
Trap dates; weekly from 5/8 to 8/6. Weed search dates; 6/11, 7/9, 8/6
4. Randolph Co. Davis-Purdue Agricultural Center, Farmland, IN.  
Trap dates; weekly from 5/9 to 8/7. Weed search dates; 6/12, 7/11, 8/7
5. Tippecanoe Co. Meigs-Purdue Horticultural Center, Lafayette, IN.  
Trap dates; weekly from 5/10 to 8/8. Weed search dates; 6/11, 7/9, 8/6
6. Whitley Co. Northeast-Purdue Agricultural Center, Columbia City, IN.  
Trap dates; weekly from 5/9 to 8/7. Weed search dates; 6/12, 7/11, 8/7

A.2.c. Continued: Exotic mildews and corn tar spot survey locations, sample dates (number of sites for a sample date).

01. Allen Co. 9/20, 10/2
02. Bartholomew Co. 9/18
03. Benton Co. 8/15(3), 9/13 (4), 9/19
04. Boone Co. 8/30 (4)
05. Carroll Co. 9/19
06. Cass Co. 6/5, 9/19, 11/7
07. Clinton 9/19
08. Decatur Co. 9/4
09. DeKalb Co. 9/20
10. Dubois Co. 8/24
11. Elkhart Co. 8/23 (6), 9/18, 10/4
12. Fulton Co. 9/18
13. Gipson Co. 10/2
14. Hamilton Co. 7/6, 8/15 (4)
15. Hancock Co. 10/4
16. Harrison Co. 7/12
17. Henry Co. 6/6
18. Huntington Co. 6/19, 9/10
19. Jackson Co. 8/22
20. Jasper Co. 6/14, 7/19, 8/9 (2), 8/30 (2), 9/5, 9/14
21. Knox Co. 8/9, 8/20, 9/26
22. Kosciusko Co. 5/31, 8/23 (6), 9/18
23. La Porte Co. 8/22, 8/23, 8/28, 9/4 (3), 9/17 (6), 9/20 (5)
24. Lagrange Co. 8/30 (5), 10/2
25. Lake Co. 9/20
26. Marshall Co. 9/18
27. Monroe Co. 8/3 (3)
28. Montgomery Co. 5/31, 6/28, 8/30 (4), 10/10
29. Newton Co. 8/23 (2), 9/20, 9/26
30. Noble Co. 8/18, 8/21 (3), 10/6 (3)
31. Parke Co. 2/20
32. Perry Co. 10/5 (2)

33. Porter Co. 9/4 (2), 9/5, 9/6, 9/20 (3)
34. Posey Co. 6/11
35. Pulaski Co. 8/23 (3), 9/13, 9/20, 11/7
36. Putnam Co. 6/20
37. Randolph Co. 5/30 (3)
38. Rush Co. 5/31, 6/6, 10/17
39. Shelby Co. 9/6
40. St. Joseph Co. 8/17 (3), 8/23 (4), 9/7, 9/11
41. Starke Co. 8/17, 8/23, 9/17, 9/19, 9/20
42. Steuben Co. 8/30 (2)
43. Sullivan Co. 7/6 (3), 7/20, 8/3, 8/27
44. Tippecanoe Co. 6/15, 8/15, 8/30 (9), 9/11, 9/14, 9/21 (3), 10/21
45. Tipton Co. 5/30, 7/27, 8/15 (4)
- 46 Vermillion Co. 7/13, 7/26, 9/26
- 47 Vigo Co. 5/17
48. Wabash Co. 6/5 (3)
49. Warren Co. 5/15 (5), 10/10, 5/31, 9/5
50. Washington Co. 6/11
51. Wells Co. 9/17 (2)
52. White Co. 6/12, 7/9, 7/26, 8/2, 8/23 (7), 9/13 (2), 9/24 (2)

A.2.d. Benefits and Results of Survey: Tar spot, *P. maydis*, was confirmed at 73 sites in 52 counties resulting in 25 new county records: Bartholomew, Benton, Boone, DeKalb, Decatur, Elkhart, Hancock, Huntington, Jasper, Knox, LaPorte, Lagrange, Lake, Madison, Montgomery, Parke, Rush, Shelby, St. Joseph, Steuben, Tippecanoe, Vermillion, Warren, Wells, and Whitley.

A.2.e. Database submissions:

Old world bollworm, *Helicoverpa armigera*,  
 Date Range: 05-14-2018 thru 8-10-2018  
 Counties 6        Sites 5    Pos 0    Neg 381

Egyptian cottonworm, *Spodoptera littoralis*  
 Date Range: 05-14-2018 thru 8-10-2018  
 Counties 6        Sites 5    Pos 0    Neg 382

Cotton cutworm, *Spodoptera litura*  
 Date Range: 05-14-2018 thru 8-10-2018  
 Counties 6        Sites 5    Pos 0    Neg 383

Silver Y-moth *Autographa gamma*  
 Date Range: 05-14-2018 thru 8-10-2018  
 Counties 6        Sites 5    Pos 0    Neg 384

Philippine downy mildew, *Peronosclerospora philippinensis*  
 Date Range: 05-19-2018 thru 10-18-2018  
 Counties 65 Sites 281 Pos 0 Neg 203

Java downy mildew, *Peronosclerospora maydis*  
 Date Range: 05-31-2018 thru 11-7-2018  
 Counties 65 Sites 281 Pos 0 Neg 203

Brown stripe downy mildew, *Sclerophthora raysisiae*  
 Date Range: 05-19-2018 thru 10-18-2018  
 Counties 65 Sites 281 Pos 0 Neg 203

Tar spot, *Phyllachora maydis*,  
 Date Range: 05-30-2018 thru 10-17-2018  
 Counties 52 Sites 219 Pos 73 Neg 146

Asiatic witchweed, *Striga asiatica*  
 Date Range: 06-11-2018 thru 8-10-2018  
 Counties 6 Sites 6 Pos 0 Neg 18

**A.3. Nursery and Retail Plants Survey.**

A.3.a. Proposed *Helicoverpa armigera* observations were 45 sites x 6 visits=270 records. Proposed total boxwood blight, *Calonectria pseudonaviculatum*, observations were about 40 sites x about 5 cultivars=200 records. Proposed total data collections for sudden oak death (SOD), *Phytophthora ramorum*, were 35 sites x 5 plants x 2 visits = 350 records.

Accomplishments:

Proposed and actual funding was \$18,387.  
 Proposed data were 820 records. Actual data were 948 records.  
 Cost per record was \$19.40.

	Records	
	Proposed	Uploaded
1. Old world bollworm, <i>Helicoverpa armigera</i>	270	279
2. boxwood blight, <i>Calonectria pseudonaviculatum</i>	200	269
3. sudden oak death, <i>Phytophthora ramorum</i>	350	400
Totals	820	948

A.3.b. Survey Methodology: This survey was integrated with the annual plant nursery and retail outlet inspections conducted by Indiana Department of Natural Resources. Subsets of sites for various pests were sampled from about 360 sites visited annually. State nursery inspectors set and monitored traps for old world bollworm, *H. armigera*, at 46 locations in 19 counties; observed and sampled foliage of ornamental boxwood cultivars *Buxus* spp. for



boxwood blight, *C. pseudonaviculata*; at 69 sites in 33 counties; and observed and sampled a wide range of susceptible perennial plant foliage for sudden oak death, *P. ramorum* symptoms at 38 sites in 23 counties. Moth samples were sent to the SSC and foliar samples sent to Purdue University Plant Pest & Disease Laboratory.

For the moth survey, one plastic bucket trap with old world bollworm lure and kill strip was placed at each site. Sample interval was biweekly. Sampling for boxwood blight, *C. pseudonaviculata*, was visual with suspect boxwood leaf tissue submitted for microscopic confirmation at Purdue Plant Pest Diagnostic Laboratory (PPDL). Random and directed visual observations of potential host plants suspected of sudden oak death, *P. ramorum* lesions were tested at PPDL using an enzyme-linked immunosorbent assay (ELISA) consistent with the Nursery Survey Manual (Revised April 30, 2007) USDA-PPQ. Confirmation testing (PCR) was performed by an APHIS-approved lab at Michigan State University, East Lansing, MI.

The relatively high cost of the Nursery and Retail Plants survey was due to laboratory supplies and labor required for screening and confirmation.

#### A.3.c. Old world bollworm survey locations; trap service dates;

- |                                   |                                      |
|-----------------------------------|--------------------------------------|
| 01. Allen 6/1 – 9/7; 5 sites      | 11. La Porte 5/29 – 8/28; 3 sites    |
| 02. Boone 5/31 – 8/15; 1 site     | 12. Madison 6/4 – 8/14; 1 site       |
| 03. Clark 5/30 – 8/7; 2 sites     | 13. Marion 6/7 – 8/7; 2 sites        |
| 04. Dearborn 6/7 – 8/13; 1 site   | 14. Marshall 5/31 – 8/10; 5 sites    |
| 05. Dubois 06/07 - 8/28; 2 sites  | 15. Porter 5/29 – 8/28; 2 sites      |
| 06. Floyd 5/30 – 8/31; 1 site     | 16. Ripley 6/7 – 8/13 2 sites        |
| 07. Greene 6/1 – 8/10; 5 sites    | 17. Tippecanoe 5/31 – 8/15; 4 sites  |
| 08. Hamilton 6/4 – 8/14; 4 sites  | 18. Vanderburgh 5/29 – 8/28; 2 sites |
| 09. Harrison 5/30 – 8/7; 2 sites  | 19. Warrick 5/29 – 8/28; 1 site      |
| 10. Hendricks 5/31 - 8/15; 1 site |                                      |

#### A.3.c. Continued. Boxwood blight survey locations and dates

- |  |                                       |
|--|---------------------------------------|
| 01. Allen Co. 5/10, 7/18, 6/4          | 18. Madison Co. 5/10; 2 sites, 7/24   |
| 02. Boone Co. 6/13                     | 19. Marion Co. 5/22 to 6/15; 12 sites |
| 03. Cass Co. 6/19;                     | 20. Miami Co. 5/15                    |
| 04. Clark Co. 4/24; 2 sites, 6/18      | 21. Monroe Co. 5/16 to 5/23; 4 sites  |
| 05. Dearborn Co. 5/21; 2 sites         | 22. Morgan Co. 5/11                   |
| 06. Decatur Co. 5/23                   | 23. Perry Co. 5/9, 5/14               |
| 07. DeKalb Co. 8/29, 7/25              | 24. Porter Co. 5/22, 8/04;            |
| 08. Dubois Co. 5/17, 6/7, 6/20         | 25. Fayette Co. 7/11, 7/16            |
| 09. Elkhart Co. 5/23                   | 26. Spencer Co. 5/17                  |
| 10. Floyd Co. 4/18                     | 27. Vanderburgh Co. 5/11, 5/16        |
| 11. Grant Co. 7/26                     | 28. Vigo Co. 5/29 to 6/6; 4 sites     |
| 12. Hamilton Co. 5/10 to 7/19; 5 sites | 29. Wabash Co. 6/7                    |
| 13. Hancock Co. 5/9                    | 30. Warrick Co. 5/16, 7/27            |
| 14. Howard 6/22                        | 31. Washington Co. 4/25               |
| 15. Jasper Co. 6/20                    | 32. Wayne Co. 8/6                     |

16. Kosciusko Co. 5/10  
17. Lawrence Co. 5/14

33. Whitley Co. 7/3

A.3.2. Continued. Sudden oak death survey locations and dates.

01. Allen Co. 6/11; 2 sites	13. Madison Co. 7/24, 7/10
02. Boone Co. 6/25	14. Marion Co. 5/16 to 9/20; 6 sites
03. Brown Co. 5/31	15. Marshall Co. 7/9
04. Clark Co. 6/18	16. Monroe Co. 5/23; 4 sites
05. Dubois Co. 6/20, 6/21	17. Montgomery Co. 9/4
06. Elkhart Co. 7/17	18. Porter Co. 6/6
07. Floyd Co. 6/18	19. Tippecanoe Co. 3/28
08. Hamilton Co. 6/19, 2/26, 9/12	20. Vanderburgh Co. 9/12, 9/18
09. Hendrick Co. 6/25, 9/4	21. Vigo Co. 5/29
10. Knox Co. 9/13	22. Warren Co. 8/6
11. Kosciusko Co. 9/28	23. Warrick Co. 7/27
12. LaPorte Co. 5/29	

A.3.d. Benefits and Results of Survey. State record for boxwood blight, *C. pseudonaviculata*, was detected.

A.3.e. Database submissions:

Old world bollworm, *Helicoverpa armigera*,  
Date Range: 05-30-2018 thru 8-15-2018  
Counties 19 Sites 46 Pos 0 Neg 279

Boxwood blight, *Calonectria pseudonaviculata*,  
Date Range: 04-18-2018 thru 7-27-2018  
Counties 33 Sites 69 Pos 1 Neg 269 (=31,0009 stems)

Sudden oak death, *Phytophthora ramorum*  
Date Range: 03-28-2018 thru 9-28-2018  
Counties 23 Sites 38 Pos 0 Neg 400

**A.4 Exotic Woodborers/Bark Beetles Survey**

A. 4.a. Proposed data collection for the risk-based, exotic woodborers/bark beetles survey were: Japanese pine sawyer beetle, *Monochamus alternatus*; large pine weevil, *Hylobius abietis*, black fir sawyer, *Monochamus urussovii*; sixtoothed bark beetle, *Ips sexdentatus*; European spruce bark beetle, *Ips typographus*; Mediterranean pine engraver; *Orthotomicus erosus*; (35 sites X 7 visits X 6 pests = 1,470 records); six-tooth spruce bark beetle *Pityogenes chalcographus* (5 sites X 7 visits = 35 records); oak ambrosia beetle, *Playpus quercivorus*; European hardwood ambrosia beetle, *Trypodendron domesticum* (20 sites X 7 visits X 2 pests = 280 records); 9. Oak splendor beetle, *Agrilus*

*biguttatus*; 10. Goldspotted oak borer, *Agrilus auroguttatus* (6 sites X 12 visits X 2 pests = 144 records); and Asian longhorned beetle, *Anoplophora glabripennis* (6 sites X 3 visits = 18 records).

Accomplishments;

Proposed and actual funding was \$1,678

Proposed data were 1,947 records. Actual data were 2,167 records.

Actual cost per record was \$0.77.

A.4.b. Survey Methodology: This survey is an APHIS-PPQ/CAPS collaborative effort. PPQ set and sampled traps and CAPS processed, identified, and archived samples. Exotic Woodborer/Bark Beetle National Survey Guidelines, July 2011, were followed. Wet cup Lindgren funnel traps were deployed at 61 Indiana sites representing 33 counties. Sites were chosen by recognition of apparent risk of receiving target pests through commerce. One to 2 (varies by site) Lindgren funnel traps with wet cups containing dilute propylene glycol were placed at each site. Traps contained one of the following lures: Monochamol+alpha-pineneUHR+ethanol, Chalcogran, Lineatin, *P. quercivorus*, or IPS (tri-lure). A single purple prism trap deployed at 6 locations were suspended by rope about 10 feet above ground surface under/near oak in a mixed hardwood woodland. Asian longhorned beetle, *Anoplophora glabripennis*, survey consisted of a 30-minute random search in a mixed hardwood forest once monthly in June, July, and August at 6 locations.

A.4.c. Survey location and dates: Lindgren traps are located at 61 Indiana sites. Traps were deployed 3 March to 11 June. Traps are serviced about every two weeks until early-October. Prism traps are located at sites in Knox, LaPorte, Porter, Randolph, Jennings, Whitley Counties. Prism traps were set 8 -11 May and serviced weekly.

A.4.2. WB/EBB survey locations and date range.

Trap period extended from 2 March to 8 November.

Lindgren funnel trap

- |  |   |
|--|---|
| 01. Bartholomew Co. 7/1 – 11/8 (1 site)  | 18. Lake Co. 5/13 – 10/2 (1 site)         |
| 02. Boone Co. 6/25 (1 sample, 1 site)    | 19. Madison Co. 7/9 – 11/8; (1 site)      |
| 03. Clark Co. 3/26 – 10/17; (2 sites)    | 20. Marion Co. 5/22 – 11/6; (5 sites)     |
| 04. Crawford Co. 4/5 – 6/23 (1 site)     | 21. Martin Co. 4/18 – 10/6; (2 sites)     |
| 05. Daviess Co. 4/4 – 10/6 (1 site)      | 22. Montgomery Co. 7/12 – 11/15; (1 site) |
| 06. Decatur Co. 4/9 – 10/17; (1 site)    | 23. Orange Co. 4/5 – 10/10; (1 site)      |
| 07. Delaware Co. 5/23 – 10/25; (2 sites) | 24. Owen Co. 6/12 (1 sample, 1 site)      |
| 08. Dubois Co. 4/10 -10/12; 1 site)      | 25. Parke Co. 7/12 – 11/8; (2 sites)      |
| 09. Elkhart Co. 4/28 – 10/4; (2 sites)   | 26. Pike Co. 3/29 – 10-15; (2 sites)      |
| 10. Gibson Co. 4/3 – 10/8; (2 sites)     | 27. Porter Co. 4/27 – 10/2; (12 sites)    |
| 11. Greene Co. 4/10 – 10/12; (1 site)    | 28. Ripley Co. 4/9 – 10/17; (1 site)      |
| 12. Harrison Co. 4/5 – 10/16; (1 site)   | 29. Scott Co 3/16-10/18; (1 site)         |
| 13. Hendricks Co. 7/4–11/8; (5 sites)    | 30. Shelby Co. 6/8 -10/11; (1 site)       |

14. Jefferson Co. 4/2 – 10/10 (1 site)
- 15 Johnson Co. 6/26 – 11/8 (1 site)
16. Knox Co. 4/6– 10/10 (1 site)
17. La Porte Co. 4/28 – 10/3; (3 sites)

31. Starke Co. 4/28 – 10/3 (1 site)
32. Warrick Co. 4/20 – 10/10 (1 site)
33. Washington Co. 4/2 – 10/10 (1 site)

Purple prism trap (weekly)

1. Jennings Co. 5/15 to 8/8
2. Knox Co. 5/15 to 8/10
3. La Porte Co. 5/14 to 8/6
4. Randolph Co. 5/16 to 8/7
5. Tippecanoe Co. 5/14 to 8/6
6. Whitley Co. 5/16 to 8/7

Visual search (monthly)

- 6/13, 7/12, 8/10 (1 site)
- 6/11, 7/11, 8/10 (1 site)
- 6/11, 7/9, 8/6 (1 site)
- 6/11, 7/11, 8/7 (1 site)
- 6/11, 7/9, 8/6 (1 site)
- 6/12, 7/11, 8/7 (1 site)

A.4.d Benefits and results of survey: CAPS staff has logged or screened specimens 546 samples and 78 observation records for prism traps. No target species were detected.

A.4.e. Database submissions:

Asian longhorned beetle, *Anoplophora glabripennis*

Date Range: 06-11-2018 thru 8-10-2018

Counties 6 Sites 6 Pos 0 Neg 18

Oak splendor beetle, *Agrilus biguttatus*

Date Range: 05-14-2018 thru 8-10-2018

Counties 6 Sites 6 Pos 0 Neg 78

Goldspotted oak borer, *Agrilus auroguttatus*.

Date Range: 05-14-2018 thru 8-10-2018

Counties 6 Sites 6 Pos 0 Neg 78

Sixtoothed bark beetle, *Ips sexdentatus*

Date Range: 03-26-2018 thru 11-8-2018

Counties 23 Sites 37 Pos 0 Neg 307

European spruce bark beetle, *Ips typographus*

Date Range: 03-26-2018 thru 11-8-2018

Counties 23 Sites 37 Pos 0 Neg 307

Mediterranean pine engraver, *Orthotomicus erosus*

Date Range: 03-26-2018 thru 11-8-2018

Counties 23 Sites 37 Pos 0 Neg 307

Japanese pine sawyer beetle, *Monochamus alternatus*

Date Range: 03-26-2018 thru 11-8-2018

Counties 22 Sites 37 Pos 0 Neg 307

Large pine weevil, *Hylobius abietis*  
Date Range: 03-26-2018 thru 11-8-2018  
Counties 22 Sites 37 Pos 0 Neg 307

Black fir sawyer, *Monochamus urussovii*  
Date Range: 03-26-2018 thru 11-8-2018  
Counties 22 Sites 37 Pos 0 Neg 275

Sixtoothed spruce bark beetle, *Pityogenes chalcographus*  
Date Range: 04-27-2018 thru 10-2-2018  
Counties 1 Sites 5 Pos 0 Neg 60

Oak ambrosia beetle, *Playpus quercivorus*  
Date Range: 03-26-2018 thru 11-8-2018  
Counties 15 Sites 20 Pos 0 Neg 181

European hardwood ambrosia beetle, *Trypodendron domesticum*  
Date Range: 03-26-2018 thru 8-8-2018  
Counties 16 Sites 20 Pos 0 Neg 96

**B. If appropriate, explain why objectives were not met.** All objectives for reporting period 1 January to 31 December 2018 were met.

**C. Where appropriate, explain any cost overruns or unobligated funds in excess of \$1,000.** There were no cost overruns.

**D. Supporting Documents (if applicable).** None attached

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*\*indicates information is required per 7 CFR 3016.40 and 7 CFR 3019.5*