Cerceris Wasp Survey Protocol

Cooperative Agricultural Pest Survey

2014 Version

Contents

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Cover Image
Cerceris fumipennis with EAB.
Image courtesy of Philip Careless.

Draft Log

November 2014: 2014 Version posted to CAPS website.
June 2012: Original draft posted to CAPS website. Comment period open from June 15, 2012 to July 31, 2012.

November 2014 Revisions

1) Starting in 2014, it is acceptable to enter negative data from *Cerceris* surveys for EAB. Changes were made throughout the document referencing this information.
2) Added additional information to the **Biology** section.
3) In the **Site Selection** section, added information on baseball diamonds are often preferred sites for *Cerceris* surveys.
4) In the **Site Sampling** section, revised the "Ideal number of beetles to collect per sampling site" from the same number of beetles as there are nests to a goal of 50 beetles per site.
5) Added additional references and information from recent literature.

Introduction

Cerceris Wasps

Biology

Information excerpted with permission from "WaspWatcher: How to find the wasp that hunts emerald ash borer" (Careless, n.d.):

Cerceris fumipennis Say (Hymenoptera: Crabonidae) is a solitary, ground-nesting wasp that captures beetles in the family Buprestidae. *Cerceris fumipennis* (referred to as "*Cerceris* wasps" in the rest of this document) has been the subject of much research for its use in detecting *Agrilus planipennis* (emerald ash borer) and other buprestid beetles. In areas infested by emerald ash borer, emerald ash borers have been shown to represent up to 60% of the overall *Cerceris* wasp captures (Careless and Marshall, 2010). Female *Cerceris* wasps capture buprestid beetles and carry them into their nests to feed their larvae.

Each female wasp constructs a nest for the duration of the flight season. Nests are located in close proximity to other each other. The nests form informal colonies (aggregations of independent burrows); there may be 2 to 500 nests in one colony (Careless et al, 2013). The nest's entrance is marked by a hole and a small mound of loose soil. Note: though the term "colony" is usually reserved to describe social insects, this is the term commonly used in the *Cerceris fumipennis* literature; the term "nesting aggregation" is also used.

The female wasp attacks the beetles and injects venom to paralyze the prey. The wasp then carries the beetle into its nest and deposits it into a brood cell. Next, the wasp lays an egg onto the beetle's body. When the wasp egg hatches, the wasp larva feeds on the buprestid beetle (Careless and Marshall, 2010).

Note: *Cerceris* wasps have not been observed to sting humans, even when handled. The wasps may bite with their mandibles; however, they do not sting to defend nests the way that social bees and wasps do (Careless et al, 2013).

For more detailed information on the biology of *Cerceris*, visit
http://www.cerceris.info/pdf/guidebook_biosurveillance_cerceris.pdf

Distribution

This survey protocol will focus on the *Cerceris* species that is found in the eastern United States, *Cerceris fumipennis*. This species is known to capture buprestids and has been researched in detail. There is a species found in the western United States, *Cerceris californica*, which has not been studied as a survey method for buprestids. At this time, negative data may not be reported from *Cerceris californica* surveys. If you are interested in conducting pilot surveys using *Cerceris californica* **for positive data**

reporting only, please contact Lisa Jackson (919-855-7549; lisa.d.jackson@aphis.usda.gov).

Cerceris fumipennis is found in the eastern United States from Florida to Maine and westward to Texas and Wyoming (Careless et al., 2009).

Survey Method for CAPS Program

In November of 2011, *Cerceris* wasps became an approved survey method for the 2012 survey season and beyond. In order to report negative data, this survey protocol must be followed.

Targets

The *Cerceris* method is approved for negative data reporting for the following four *Agrilus* targets:

Agrilus auroguttatus	**(Goldspotted oak borer)**
Agrilus biguttatus	**(Oak splendor beetle)**
Agrilus planipennis	**(Emerald ash borer (EAB))***
Agrilus sulcicollis	**(European oak borer)**

Agrilus auroguttatus, A. biguttatus, and *A. planipennis* are CAPS Priority Pests (targets in the Exotic Wood Borer/Bark Beetle Survey). *Agrilus sulcicollis* is established in the United States but may be of state concern.

*Starting in the 2014 survey season, negative data for *Agrilus planipennis* may be entered from Pest Detection and CAPS *Cerceris* wasp surveys. For surveys funded by the EAB program, *Cerceris* may not be used. These surveys should use the purple prism trap and approved lures.

Cerceris wasps capture many different species of beetles in the family Buprestidae. New county, state, and country records should be reported for any **exotic** buprestids that are of potential regulatory concern.

For a complete list of buprestid species caught by *Cerceris fumipennis*, visit the **Working with *Cerceris fumipennis*** website to see the table **"**Known Prey Diversity of *Cerceris fumipennis"* at http://www.cerceris.info/pdf/prey_diversity_c_fumipennis.pdf.

Survey Planning

Getting Started

1. Important: Please read this entire protocol before planning your survey.
2. Determine if anyone is already doing *Cerceris* surveys in your state for possible coordination opportunities.
    - Regional *Cerceris* Contacts: http://www.cerceris.info/contacts.html

- Other groups who may be participating in *Cerceris* surveys include: local U.S. Forest Service cooperators, state agriculture departments, state forestry cooperators, local cooperative extension personnel, university researchers, local arboretum personnel, etc.

3. Determine when *Cerceris* are active in your state.
4. Determine which targets you will survey for and when the adults are in flight.
5. Look for baseball diamonds, campgrounds, sandy trails, any areas with hard packed sandy soils, etc. Elementary and middle schools are good because the fields are not frequently used during the summer break, when *Cerceris* are active.
6. Determine the number of sites that you can effectively monitor. There is no minimum number of sites required to conduct *Cerceris* surveys.
7. Ask the appropriate authority for permission to sample the location(s).

Survey Supplies

- Vials with 70-80% ethyl alcohol (ethanol) for beetle samples (one for each method of collection: Collar, Ground, and Netted (methods are explained in detail in the **Beetle Collection Methods** section). You will need one vial for each method for each sampling site (*i.e.*, up to three per site, depending on which collection methods you plan to use).
- Squirt bottle with extra alcohol.
- Mesh insect net (not a canvas one).
- Survey cards (see **Forms** section).
- Pencils.
- Scissors to cut the collection tags.
- GPS unit for collecting the coordinates (Decimal Degree format is preferred).
- The *Cerceris* letter and pamphlet (in case of questions) (See **Forms** section).
- Golf tees or flags, to mark nests while you are there to make it easier to collect beetles.
- Recommended safety supplies for surveys in hot direct sunlight: lightweight clothing, wide brimmed hat, sunscreen, plenty of water, hand sanitizer, etc.
- If working in a field that is not in use (*e.g.*, schools during the summer) you can leave the golf tees for when you return but remove the flags.
- Paper to create hand-drawn maps to describe the nest locations, if you are using this method instead of golf tees.

Site Selection

1. Locate promising nest sites (if this is the first time surveys are done in state). Look for sites with the following characteristics (information excerpted, with permission from "WaspWatcher: How to find the wasp that hunts emerald ash borer" (Careless, n.d.)):
    - Hard-packed ground with relatively fine, sandy soil;
    - Areas of human disturbance (baseball diamonds, old sand pits, trail and road edges, informal parking lots, fire-pits, etc.);
    - Full sunshine;
    - Sparse vegetation (about 50% hard-packed soil and 50% short vegetation);

- About 200 meters (650 feet) or less from potential host trees, depending on the pest species (ash for *Agrilus planipennis* and oak for the other three *Agrilus* targets) (Nalepa et al., 2013);
- Dead buprestids lying on the ground are a good sign that you have found a colony.
- Avoid any recently disturbed soil (new landscaping, etc.). The wasps overwinter beneath the soil, and the ground needs to be left undisturbed for more than one year.

Figure 1. Example of *Cerceris* nest site. Image courtesy of Philip Careless.

2. Visiting sites with known colonies (if surveys were completed in previous years):
   - Start with colonies with the largest nest numbers recorded.
   - Visit all known colonies in your assigned areas BEFORE looking for new colonies.
   - Take a list of multiple locations out with you when you do this survey. Some of the locations may not have active wasps on that day or may no longer have *Cerceris* colonies. It is important to record which sites do not have *Cerceris* for future survey efforts. Colonies will grow or decline from year to year.

3. General guidance on choosing sites with the highest likelihood of having *Cerceris* nests.
   - Baseball diamonds are often preferred sites for *Cerceris* surveys as they:
     - Are easier to locate (for instance, Google Earth can be used to located ball fields (Nalepa et al., 2012));
     - Are usually in full sun;
     - Have predictable soil types (commercially available screened soil mixes are often used (Nalepa et al., 2012));
     - Have nests that are distributed in a compact area that is easier to survey;

- Are located in safer areas for the surveyors and volunteers (urban locations, usually free from poison ivy and other hazards, etc. (Nalepa et al., 2012)).

Figure 2. Example of *Cerceris* nest site. Image courtesy of Philip Careless.

- More *Cerceris* nests have been found at ball fields that are not maintained during the summer but that are maintained during the rest of the year (for instance, fields on elementary and middle schools) (Nalepa et al., 2012). Ball fields that are highly manicured (college, high school, and private athletic parks) are generally not conducive to *Cerceris* nest-building due to frequent disturbances (Nalepa et al., 2012).

Time of Year to Survey

In order to claim negative data for *Agrilus* targets in your state, be sure to match the expected active *Cerceris* wasp period with the expected adult flight period of your chosen targets (*e.g.*, in the Northeastern United States, survey during June (after *Cerceris* wasps become active) and July to report negative data for the three *Agrilus* targets listed below). If possible, survey for *Cerceris* during as much of the wasps' active period as possible to potentially catch additional species and to account for adjustments to the climate of your region (*i.e.*, in warmer climates, targets may be active earlier in the year). **Note:** droughts may postpone and/or shorten flights.

Adult Flight Period of *Agrilus* Targets

Agrilus auroguttatus

A. auroguttatus has one generation per year (Coleman and Seybold, 2008a, 2008b). In California, adults begin flying in mid-May and are most active in flight from mid-June through mid-July, but small numbers of adults continue to fly throughout summer and fall, with trap

captures as late as November (Coleman and Seybold, 2008a, 2008b; S. J. Seybold, personal communication, 2009; Seybold et al., 2009). Surveys in southeastern Arizona suggest the insect has a similar life cycle to populations in California (S. J. Seybold, personal communication, 2009).

Agrilus biguttatus
A. biguttatus adults emerge from hosts from May to July in Belgium (Vansteenkiste et al., 2004).

Agrilus planipennis
Research indicates that an accumulation of 450 growing degree days (base 50°F) results in initial emergence of EAB adults. Use **Appendix C. Predicted Growing Degree Day Zones for Initial EAB Emergence** section of the **USDA APHIS PPQ Emerald Ash Borer Survey Guidelines** to determine when EAB adult emergence will begin in your state.

Agrilus sulcicollis
A. sulcicollis has been caught in traps from May to July in Europe. In Michigan, it has been caught in May; and in Ontario, it has been caught from May to early July.

Cerceris Active Period
Cerceris wasps are active from late June through September in the Northeastern United States. Florida has multiple generations of *Cerceris* per year. The Midwest likely has an active period similar to the Northeast, June through September. In general, *Cerceris* has a flight season of five to eight weeks; however, wasps may emerge earlier in southern states (Table 1) (Careless et al., 2013).

Table 1: Dates of *Cerceris* Emergence for Selected States*

State	Month
Connecticut	late June
Florida	late March
Maine	Mid-July
Maryland	mid-June
New York	late June
North Carolina	mid-May
Texas	early May

*Information obtained from Careless et al. (2013), Hellman and Fierke (2014), and Nalepa et al. (2012).

How to Identify *Cerceris* Wasps and Nests

Cerceris Nests
The following information has been excerpted, with permission from "WaspWatcher: How to find the wasp that hunts emerald ash borer" (Careless, n.d.).

- Entrance hole is the diameter of a pencil, between 0.4 to 0.7 cm ($^{3}/_{16}$ to ¼ inch) in diameter (Careless et al., 2013).
- Entrance hole travels straight down (not angled into the ground).
- Entrance hole is surrounded by a circle of soil; much like an ant mound (Figure 3). If the soil is fanned out to one side it is likely the burrow of another species of digger wasp.
    - Nest is often tucked beside or partially under a clump of grass.
    - Nests are often found clustered in a small area (a colony). Each colony may have between 5 to 500 nests.
    - Nests are sometimes found near other ground wasps and ants.

Figure 3. *Cerceris fumipennis* nest entrance. Image courtesy of Philip Careless.

Cerceris Wasps

The following information has been excerpted, with permission from "WaspWatcher: How to find the wasp that hunts emerald ash borer" (Careless, n.d.).

- About the size of common yellow jacket wasps;
- 1.3 to 2 cm ($^{1}/_{2}$ to $^{3}/_{4}$ inch) long;
- Dark smoky, blue/black wings;
- The wasp's body is predominantly black except for a few yellow markings. The body has a conspicuous, single broad creamy yellow abdominal band (Figure 4).
- Females have three creamy yellow patches between the eyes (Figure 5); while males are marked with two yellow triangles abutting their eyes.

Figure 4. Female *Cerceris fumipennis*. Image courtesy of Philip Careless.

Figure 5. Facial markings of a female *Cerceris fumipennis*. Image courtesy of Philip Careless.

Survey Instructions

Sample Size

Since negative data will be reported and interpreted on a site-specific level (*i.e.*, assumptions about target pest presence/absence can only be interpreted from each specific sampling site), there is no minimum number of sites that must be surveyed at the state level. Each state must determine the number of sites that can be effectively monitored with the staff and resources available. Make every effort to select sites that are near high risk areas to increase the effectiveness of this survey method.

Site Sampling

What to do at each site to say it has been sampled.

- Start checking old sites several weeks before the expected target flight period for any signs of activity.
- Visit the sites on sunny days, starting between 10:00 AM and noon, if possible. Start earlier if it is extremely hot. If you wait too late, you may miss that day's activity.
- When you first arrive at the site, count the number of nests present and take note of any flying activity. While counting nests, survey the ground for any "dropped" beetles to pick up. If you do not notice any flying activity during this time, stay an additional 15 to 30 minutes to see if any foraging wasps return. If no wasps are present, conclude that day's survey at that site. The wasps may be done for the day. Try to arrive at an earlier time the next time that you visit. Wasps will forage more in the beginning of the season than at the end of the season. The wasps also tend to be less active on cloudy days and right after rainfall.
- Monitor the wasps returning to their nests for one to three hours (or as long as the wasps are actively foraging).
- Record any *Cerceris* nests and beetle collections that you make. In an effort to make your survey as efficient as possible, only return to your largest colonies for additional surveys and beetle collecting. You may find larger colonies to sample at new locations. The larger the colony size, the more likely it will be that foraging will occur when you visit.
- Collect the ideal number of beetles to collect per sampling site: collecting 50 beetles provides the optimal sample size for Buprestidae at a given site. After 50 beetles are collected, the rate of new species collected drops significantly. Try to reach the goal of 50 beetles per site. It has been observed that 50 beetles collected in one day represents 80% of the prey diversity in the nearby area on that date (Careless, 2009). Sampling on more than one date throughout the season will provide an even greater representation of the nearby buprestid population. Once 50 beetles have been collected at a site, do not collect more beetles. In addition, the wasps need the beetles to feed their young. Collecting too many beetles may diminish the following year's *Cerceris* population. You can take as many "dropped" or "discarded" beetles as you want to get additional samples.
- Visit each site as many times as possible until you collect the desired number of beetles. The colony size will grow and shrink throughout the season.

Beetle Collection Methods

There are three methods to collect beetles. It is often best to combine methods (*e.g.*, net wasps but also collect from the ground).

Collar

The collar method uses a small piece of note card and a golf tee. The collar's hole is wide enough for the wasp to enter the nest when not carrying prey (Figure 6). The wasp is unable to enter the nest when holding prey. Wasps may be able to pass through the collar with smaller prey; therefore, it is best to net the wasp before it passes through the collar. The wasp will slow down and hover over its nest when it sees the collar, which may enable you to net it before it drops the prey. If the wasp drops the prey, simply collect the beetle.

To make the collar, use a standard hole-punch and cut one hole into each end of a 2 x 6 cm ($^{3}/_{4}$ x 2 $^{1}/_{3}$ inch) plastic or paper note card (Figure 7).

Figure 6. Collar method. Image courtesy of Philip Careless.

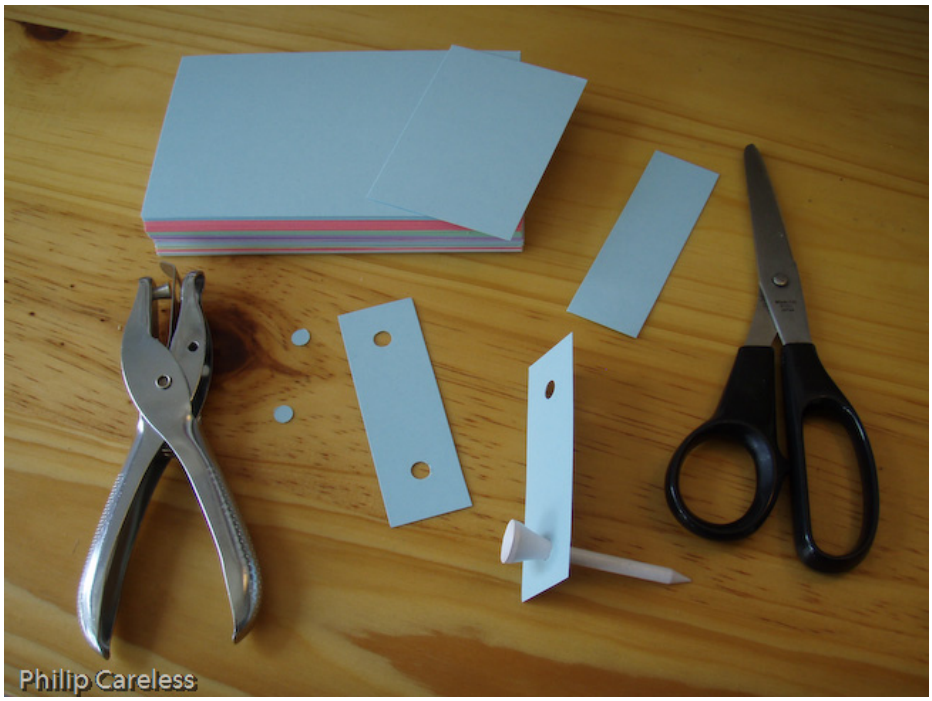


Figure 7. Components used to make a "nest-collar." Image courtesy of Philip Careless.

Ground

This is the easiest method. Simply pick up all beetles and beetle parts lying on the ground. Elytra, the colorful forewings of buprestid beetles, and other body parts can be used to identify whether the beetle is a buprestid. Scavengers (including velvet ants and tiger beetles) also take the prey; therefore, the more frequently you check the site, the more often you will find freshly discarded beetles.

Net

Use a mesh insect net (not a canvas net) to capture the *Cerceris* wasp. Watch for approaching wasps. Net the wasp, collect the beetle, and release the wasp. Sometimes the wasp will drop the beetle even if the wasp is not caught in the net. Even if you miss the wasp, it is worth searching the ground to see if the wasp dropped the beetle.

Sample Preparation

- Place beetle specimens directly into vials filled with 70-80% ethyl alcohol (ethanol) or an equivalent such as isopropyl alcohol.
- When you return to the office, fill the vials with more alcohol if necessary, making sure the beetles are completely covered by alcohol.
- Label specimens with the "Sample Tags" (see **Forms** section). These can be partially filled out ahead of time.
- Use a separate vial and separate sample tag for each collection method: Collar, Ground, or Netted.

- Using a pencil, fill in the date, your initials, and circle the collection method (Net = netted, Grd = ground, and Col = collar). This will help prevent mislabeling samples in the field.

Data Collection

Cerceris Survey Card

- Fill out one paper survey card (see **Forms** section) for each sampling site visited.
- The contact information (of the person you contacted at the location to get permission for the survey) and phone number can be left blank if you do not speak with anyone; however, make every effort to contact someone responsible for the location. See the **Survey Card Aid** on pages 22 – 23 for more information.
- Record the total number of buprestids found in each sample. This data will be required for entry into NAPIS. The total number of buprestids can provide information as to how much of the nearby buprestid population has been sampled. For instance, if no target beetles were found out of a total buprestid sample of 60 beetles, we can assume with a high level of certainty that the targets are absent from the sampling site. If no target beetles were found out of a total buprestid sample of only 10 beetles, we have less certainty that the targets are absent from the sampling site. In this way, data may be entered from all surveys (even those collecting small numbers of beetles), while allowing additional information that can strengthen the survey results to be captured as well.

Sample Submission

Screen all samples immediately for any target suspects. If suspects are found, complete a PPQ-391 and forward it to the appropriate identifier. If no suspects are found, set aside the collection for further identification. Make every attempt to identify your collections to genus and record the data.

Screening Aids

Agrilus planipennis Fairmaire Screening Aid

Discriminating *Agrilus sulcicollis* Lacordaire from *Agrilus cyanescens* Ratzeburg

Follow the submission instructions in the **Guidelines for Submitting Wood Borer and Bark Beetle (WBBB) Specimens for Identification.**

Data Reporting

Biosurveillance Spreadsheet

The project coordinator should manage a Biosurveillance Spreadsheet for each year. Data should be entered after each visit or by the end of each week. The number of active nest sites and beetles collected must be monitored to ensure that sufficient sites are being visited and samples collected. The *Cerceris* survey is only conducted during a very small window of time.

Entering Data into NAPIS

To locate NAPIS data entry templates, go to the CAPS Resource and Collaboration website and click on Data Entry, and then Insects. On the **Data Entry - Insect Worksheets page,** find the individual templates for each species, such as Goldspotted Oak Borer - *Agrilus auroguttatus*: Cerceris Bio-surveillance. To open the correct version of the template, click on the survey year that you are entering data for.

Starting in the 2014 survey season, negative data for *Agrilus planipennis* (Emerald ash borer) from *Cerceris* surveys can be entered into NAPIS. Therefore, the 2014 templates for all four targets: *Agrilus auroguttatus*, *Agrilus biguttatus*, *Agrilus planipennis*, and *Agrilus sulcicollis* are all the same. Some of the template fields have unique entry requirements for *Cerceris* surveys. Please follow the guidance listed in the templates.

New county, state, and country records should be reported for any **exotic** buprestids that are of potential regulatory concern.

For any *Cerceris* data entry questions, please contact Nichole Carrier (Pest Survey Specialist) at nichole.c.carrier@aphis.usda.gov.

Forms

The following forms have been developed and used in pilot surveys for the past few years. They are included here for your convenience.

A. Informational Letter
See example letter on page 19. Follow this link to a Word version to use for your state.

B. Survey Card
See example survey card on pages 20 - 21 and the **Survey Card Aid** on pages 22 - 23. Follow this link to a Word version to use for your state.

C. Sample Tags
Sample Tags are used to document where, when, how, and who collected the beetles in the field. Each tag should have a minimum of a date, sample number, method of collection (ground, net, or collar), and collector's initials. Please see "Sample Preparation" on page 15 for more details about how to complete a sample tag.

See example sample tags on page 24 and **Sample Tag Aid** on page 25. Follow this link to a Word version to use for your state.

D. Biosurveillance Spreadsheet
Record all of your *Cerceris* survey information on the Biosurveillance Data Sheet. The Excel workbook has 3 spreadsheets: **README Field Descriptions**, **Site**, and **Species**. Refer to the **README Field Descriptions** spreadsheet for insructions on how to enter the data into the **Site** and **Species** spreadsheets. See example Biosurveillance Spreadsheet on page 26. Follow this link to an Excel version to use for your state.

E. For Screening Use Only Addendum Page
This is an optional Excel spreadsheet to use if you have multiple collections and genera from one site to record. See the example on page 27. The spreadsheet is meant to be used in conjunction with your paper survey card to record your screening prior to sending specimens to a PPQ identifier for further identification. You can also use the "Species" page on the Biosurveillance Spreadsheet to record the information. Follow this link to an Excel version to use for your state.

Form A. Informational Letter (example only)

United States Department of Agriculture

Animal and Plant Health Inspection Service

Plant Protection and Quarantine

Your letterhead

Subject: **Year** *Cerceris fumipennis* Biosurveillance Survey

Date

To: Whom It May Concern:

The U.S. Department of Agriculture, Animal Plant & Health Inspection Service, Plant Protection and Quarantine (USDA APHIS PPQ) and its cooperators are planning to conduct biosurveillance surveys in **your state**. Biosurveillance is a strategy of using an organism's behavior to our benefit. In this case, we will be using *Cerceris fumipennis,* an insect that is native to the U.S., to survey for exotic buprestid beetles. Some of our target insects include the Emerald Ash Borer (*Agrilus planipennis*), European Oak Borer (*Agrilus sulcicollis*), the Oak Splendor Beetle (*Agrilus biguttatus*), and the Goldspotted Oak Borer (*Agrilus auroguttatus*).

The survey consists of capturing *Cerceris fumipennis* using insect nets and collecting its Buprestid beetle prey. These insects are not aggressive towards people. We also collect any discarded buprestids surrounding Cerceris colonies from the ground.

The survey period is **June – September**. *Cerceris* colonies can be found in soils that are sandy and compact, such as baseball fields, hard packed hiking trails, camp fire sites, etc. Surveys will occur mostly on sunny days during the day time until the end of the survey period.

Your cooperation with this important survey is greatly appreciated. Please visit **www.cerceris.info** for more information about this survey. I am also happy to answer any questions or concerns that you may have about this survey.

Sincerely,

Your Name
Your Contact Information

Form B. Survey Card

Cerceris Biosurveillance Survey

Site Number (Code): CT12CERNCC01-1	Site Name: St. Dominic School	Field 1 OF 2
Contact Name/Title: Mr. Bob		Site Address: 100 North Main Street
Phone Number:	County: New Haven	City: Springfield
GPS Position in Decimal Degrees: Latitude: 41.555673	Longitude: -71.267542	
Ash Nearby? Circle One Yes NO	Oak Nearby? Circle One Yes NO	State: CT Zip: 00102

Enter Appropriate Survey Activity for Each Visit

Visit #	Int	Date, Time	Colony Size	# of Beetles Collected	How? Collar, Netted, Ground	Sample Codes	Comments Or Risks Evident
1	DCC	7/1/12 10:30 am	68	10	N-4	CT12CERNCC01-1A	Overcast, not much activity. Other ground nesting wasps present.
					G-6	CT12CERNCC01-1B	

Optional Section
This Section is meant to be filled in by the pre-screener in your lab. You can also use the Species page of the Biosurveillance Excel Workbook to accomplish the species documentation without using this section or the Addendum page. This is only useful if you like to use paper.

For Screening Use Only

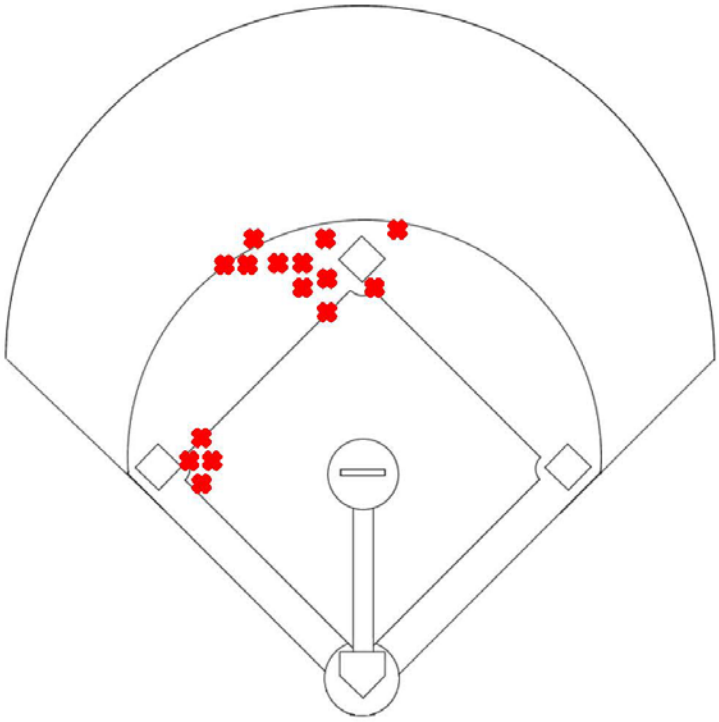
Sample Code	Date	Screener	Genus	Species
CT12CERNCC01-1A	7/3/12	NCC	*Dicerca*	*lurida* (3)
CT12CERNCC01-1A	7/3/12	NCC	*Agrilus*	Spp. (1)

Cerceris Biosurveillance Survey

Trap Site Diagram: Include information on nearest intersection and major landmarks, including nearby fields at the same location.

Sketch a diagram of the field locations on the sites.

Draw on Location of Colonies. Add Colonies until Season Peak.



Survey Card Aid

Section 1: Site Information	
Site Number (Code):	Enter a unique number to identify the site. Possible naming convention: For colonies located in prior years: Enter the site number as already established. If no number has been previously established for the location, use the following: 2 digit State, 2 digit Year, 3 digit Survey, 3 digit Surveyor Initials, 2 digit consecutive number starting at 1. If more than one field is located at the site, add a -1, -2, -3, etc. to denote multiple fields at one location. For example, West middle school has two ball fields. Name them CT12CERNCC01-1 & CT12CERNCC01-2.
Site Name:	Enter the name of the site. Include name of baseball field , high school and/or park.
Field:	When more than one ball field is located at the site, note which field you are surveying and how many total fields are at the site. For example: 1 of 3, 2 of 3, or 3 of 3.
Contact Name/ Title:	Enter the name of the person you contacted at the location to get permission for the survey. Also, enter their title (owner, operator, etc.) if known.
County:	Enter the name of the County.
GPS Position in Decimal Degrees:	Use your hand held GPS unit to take a Latitude and Longitude reading. Coordinates must be in Decimal Degrees.
Ash Within 200 m? Circle One	If Ash is present within 200 meters of the nests, circle Yes. If Ash is not present, circle No. ***Ash must be present for negative EAB data in NAPIS.
Oak Within 200 m? Circle One	If Oak is present within 200 meters of the nests, circle Yes. If Oak is not present, circle No. ***Oak must be present for all other target negative data in NAPIS.
Site Address:	Enter number and street name of site.
City:	Enter City of location.
State:	Enter State of location.
Zip:	Enter zip code of location.

Section 2: Trap Service Record	
Visit #	Enter the number of times you have visited the site.
Int	Enter your initials.
Date, Time	Enter the date of your visit and the time you began your survey activities.
Colony Size	Enter the number of Cerceris holes found at the site.
# of Beetles Collected	Enter the total number of beetles collected from the site that day.
How? Collar, Netted, or Ground	Enter whether the beetles were collected by collaring or netting Cerceris wasps or by simply picking them up from the ground. This is a split field so you can specify more than one option if needed. If specifying both netted and ground, include the number of each beetle collected in this manner. The total for collar, netted, and ground should equal the "# of Beetles Collected" in the previous box.
Sample Code	Enter a unique sample code for each individual collection. Possible naming convention: Use your site code + a letter starting with A. Example: CT12CERNCC01-1A, CT12CERNCC01-1B, etc.
Comments or Risks Evident	Include comments and/or any risks to the colony that are evident. Risk examples include flooded fields, other predatory wasps present, parasitic flies, etc.
Section 3: For Screening Use Only	
Surveyors: Do Not Write In This Section.	
Section 4: Trap Site Diagram	
Draw a diagram to make it easy for somebody else to find the site or for use in subsequent years. Include legible road names. If at a site with multiple fields, mark all of the fields on every card, note which one you are at, and specify which fields have the colonies.	
Section 5: Draw on Location of Colonies	
An outline of a baseball field is provided. Draw the location of each colony throughout the season. If a colony disappears, Do Not Erase it from the diagram. f your location is NOT a baseball field, do not complete this section. Draw your colonies directly onto the Trap Site Diagram above.	

Additional Notes:

1. The Survey Card should be printed as a double-sided single sheet of paper.
2. Only use a #2 Pencil.
3. Cut out the separate Sample Tags and put them directly into vials containing beetle samples.

Form C. Sample Tags

Code: CT12CERNCC01-01A Date: 7/1/12 Ini:DCC Collar Ground Net	Code: CT12CERNCC01-01B Date: 7/1/12 Ini:DCC Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net
Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net
Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net
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Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net
Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net
Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net
Code: Date: Ini: Netted or Ground	Code: Date: Ini: Netted or Ground	Code: Date: Ini: Netted or Ground	Code: Date: Ini: Netted or Ground
Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net
Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net	Code: Date: Ini: Collar Ground Net
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Sample Tag Aid

Sample Tags	
Code	Copy this Code from the **Site Number (Code)**. Additionally, this sample code will end in a letter of the alphabet. Begin with the letter "A" on the first sample tag and then proceed in order through the alphabet for each new tag used.
Date	Enter the date of your visit.
Ini.	Enter your initials.
Collar, Netted, or Ground	Circle whether the beetles in this sample where collected using the collar, net, or picked up from the ground. ONLY CIRCLE ONE. Use a separate vial and separate sample tag for Collar, Ground, or Netted.

Form D. Biosurveillance Spreadsheet

Site Page Example

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	SiteID	Date	Year	State	Site Name	Town	County	Site description	Latitude	Longitude	Colony size	# Beetles collected?	Surveyor	Comments	Risks
2	CT12CERNCC01-1	7/1/2012	2012	CT	St. Dominic School	Springfield	New Haven	Baseball Field	41.555673	-71.267542	68	10	DCC	Overcast, not much activity	other ground nesting wasps present
3															

Site Summary Page Example

ID Species Page Example

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	SiteID	Latitude	Longitude	Site Name	Year	Date	Gspecies	Nest Collar	Dropped	Netted	# Beetles collected?	Identifier	Notes
2	CT12CERNCC01-01A	41.555673	-71.267542	St. Dominic School	2012	7/1/2012	Dicerca lurida	0	0	3	3	NCC	new to collection, pinned
3	CT12CERNCC01-01A	41.555673	-71.267542	St. Dominic School	2012	7/1/2012	Agrilus spp.	0	0	1	1	NCC	not target, further ID needed
4													

Form E. For Screening Use Only Addendum Page

Sample Code	Date	Screener	Genus	Species	Count

Resources

Additional *Cerceris* Information

Cerceris PowerPoint Presentation for 2010 National CAPS Meeting

Literature

Regional *Cerceris* Contacts

Videos

"Working With *Cerceris fumipennis*" website

Images

Cerceris Gallery

Screening Aids

Agrilus planipennis Fairmaire Screening Aid

Discriminating *Agrilus sulcicollis* Lacordaire from *Agrilus cyanescens* Ratzeburg

Emerald Ash Borers & Similar Buprestidae Beetles Found on EAB Purple Sticky Traps

For assistance with your survey, contact:

Nichole Carrier
USDA-APHIS-PPQ
Pest Survey Specialist
97 Barnes Road, Unit 200
Wallingford, CT 06492
(203)-741-5645
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