USDA APHIS PPQ
2013 Emerald Ash Borer Survey Guidelines

Introduction

Survey for emerald ash borer (EAB) has undergone an evolution of tactics, scope, and application since its discovery in 2002. Survey was originally based on visually detectable symptoms (exit holes, bark cracks, epicormic branching, woodpecker feeding sites, etc.) to determine presence or absence of EAB. Visual survey was applied at various levels of intensity and with various techniques (*e.g.*, ground surveys, ladders, climbing devices, bucket trucks). Overall results were poor and newly infested areas were often left undiscovered. It soon became apparent that destructive sampling of suspect trees was necessary.

Artificially stressed (girdled) trap trees offered an alternative to visual survey and were adopted program-wide in 2005. This technique was an improvement for defining or delimiting the extent of an EAB infestation and was used to evaluate areas treated for EAB (eradication cuts). Trap trees, however, are expensive to establish and evaluate, and offer liability problems for workers and the public. Uniformity of survey is also an issue because of difference in size, species, and locations of trees as well as methodology and timing of stressing prior to adult flight.

Continued developments in trap and lure design enabled the EAB Program to implement a survey based on attractant-baited traps in 2008. Traps offer several advantages over trap trees including lower cost, uniformity of sampling unit, greater safety, fewer logistical problems, and more precision in sampling. Based on the positive results and feedback from the trap-based 2008 through 2012 surveys, APHIS's 2013 EAB survey will again use the purple prism traps.

Beginning in 2012, trap placement was based on a survey sampling design developed in collaboration between the APHIS EAB Program and the U.S. Forest Service's Forest Health Technology Enterprise Team (FHTET). The 2013 EAB survey will use the same methodology. This computer-generated EAB survey sampling design product combines a scientific model of the likelihood of detecting EAB with historical program data and regulatory knowledge. Very simply stated, the survey sampling design model will pre-select geographic locations (cells) to deploy EAB traps resulting in the highest probability of pest detection. The expected benefit of the 2013 EAB survey is three-fold:

- To increase the number of instances of successful EAB detections outside the known infested area
- To improve land managers capability of detecting EAB close to the date of a new attack
- To find locations that are best suited to implement controls

For additional information, see Appendix A on Page 11: Details of Survey Sampling Design Construction.

Survey Objectives

In 2013, the EAB Program seeks to accomplish two goals through survey activities:

1.) Conduct a national survey to determine whether additional pockets of infestation may exist undetected outside a 100-mile buffer surrounding the known infested areas. This 10,000-trap survey will target sites at risk for the introduction and establishment of EAB. In addition, the highly visible survey supports public outreach thereby increasing awareness and reporting of the pest. Each State will receive a list of trap locations (cells) designated by latitude, longitude, and county. A trap will be set in each one square kilometer cell. The criteria for trap placement within each designated cell are provided in the Trap Placement Protocols section of this document.

2.) Conduct a leading edge (10,000 traps) survey within a 100-mile buffer surrounding the known infested areas to better define the leading edge and identify areas for biological control and mitigation activities. A strong public awareness component is also a part of this survey. Each State will receive a list of survey locations or cells designated by latitude, longitude, and county. A trap will be set in each one square kilometer cell. The criteria for trap placement within each designated cell are provided in the Trap Placement Protocols section of this document.

All survey and public outreach activities should be coordinated with Tribes and Federal, State, and local agencies and organizations to ensure efficient use of resources.

Trap Placement Protocols

The APHIS PPQ/FHTET sampling design generates a science-based, objective survey. The sampling design identifies cell locations for the placement of traps with each cell identified by latitude, longitude, county, and state.

Trap placement should be coordinated with State Plant Regulatory Officials (SPRO) and Tribal governments where Tribal lands are involved. Coordination also should occur with other Federal, State, and local agencies, and non-governmental organizations involved in the program. To ensure the highest probability of detecting EAB, traps should be set in trees that meet the criteria as described in the Trap and Sign Placement paragraph on page five of these guidelines.

The list of trap cell locations generated by the survey sampling design includes the latitude and longitude for the center point of each cell in which a trap is to be placed. Navigating to each cell will require the use of a global positioning system (GPS) unit. Set-up and guidance information for GPS units is provided in Appendix B on page 13.

A limited number of threatened and endangered species of insects could be caught in the purple prism trap. These species include the delta green ground beetle, Hine's emerald dragonfly, Mitchell's satyr butterfly, Saint Francis' satyr butterfly, the Laguna mountains skipper, and the valley elderberry longhorned beetle. Sampling locations within critical habitat areas for potentially affected threatened and endangered insect species were discarded from the sampling design. Traps must not be set in critical habitat areas for these species. In addition, to avoid inadvertent capture of Karner blue butterflies, traps should not be set in jack pine and oak savannah with well drained sandy soils habitat in Massachusetts, New Hampshire, New York, and Wisconsin. Please consult EAB Program management for guidance if needed.

In cells where high-risk facilities or conditions are present and suitable ash trees are located, traps should be located in an ash tree as near as possible to the high risk facility. Prioritized high risk facilities include:

1. Campground, recreation area, cottage community, summer camp
2. Major transportation artery, rest area, truck stop
3. Sawmill, firewood dealer, nursery, tree care company
4. Recently landscaped residential and commercial property
5. Site of high attendance/ high profile cultural event: Pow-Wow ground, hunting lodge, NASCAR track, horse trail ride site, motor cross site, rafting and fishing camp

NOTE: Ash trees within the cell exhibiting two or more of the symptoms listed below should also be examined using destructive sampling techniques (*i.e.*, the removal of bark to inspect for EAB):

- Canopy stress/dieback
- Epicormic shoots/suckering
- Bark splits
- Woodpecker damage
- D-shaped exit holes (3-4 mm diameter)
- Serpentine larval galleries

Conducting Survey and Inspections:

- Identification of most suitable site and tree within the designated cell
- Distribution of educational material where appropriate
- Placement and maintenance of traps
- Visual survey of the environment for ash trees exhibiting signs and symptoms of EAB in proximity of the traps.

NOTE: For various reasons it may not be possible to place a trap in a cell as designated by the survey sampling design. Those cells must be recorded according to the following definitions:

Omitted: The cell is inaccessible – no trap can be set
Voided: The cell does not contain host material – no trap can be set
Declined: The cell is viable but survey resources are limited – no trap can be set

Each State will have a list of alternate cell sites equivalent to 20% of their allotted traps. This list should be used to place an omitted or voided trap at an alternate site. This list is in spreadsheet form and includes a column entitled “INCL PROB” with values ranging from “0” to “1”. The survey sampling design has generated these values and it is advised to choose the highest value listed for selection of alternate trap sites to provide the highest probability for pest detection.

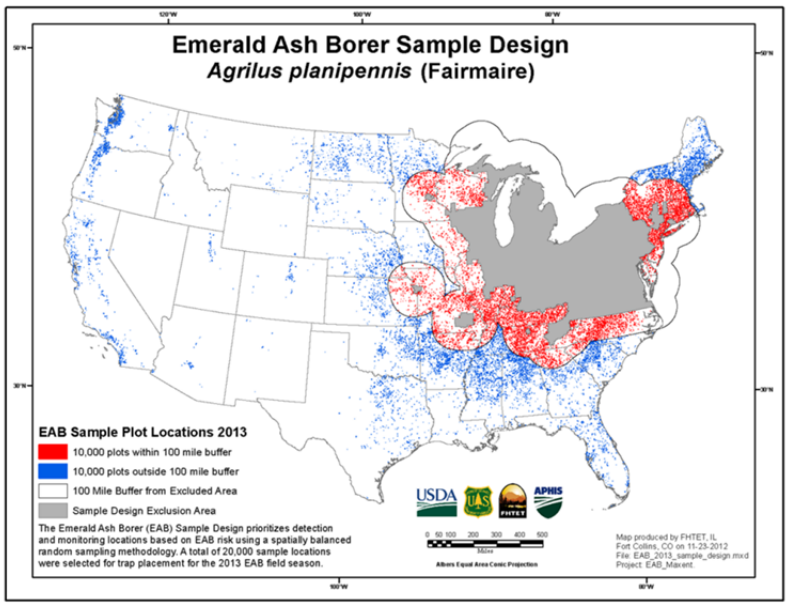

FIGURE 1. 2013 Emerald ash borer survey map (Please see page 16 for larger format map).

Trap Assembly and Placement

Timing of Trap Placement: Research indicates that an accumulation of 450 growing degree days (base 50°F) results in initial emergence of EAB adults. Traps should be placed just prior to 450 growing degree days (GDD) and lure replacement is recommended to occur just prior to the 60 day expiration date. In order to assist States with timing of trap placement, a map of the conterminous U.S. depicting predictive bands of initial emergence are appended to this document (Please see page 17 for GDD map). Appendix C (see page 14) defines, by state, when initial emergence is predicted to occur.

Trap: A prism trap consisting of three 14" x 24" panels with several holes for trap and lure attachment (Fig. 2) will be used. The trap is constructed from a sheet of pre-glued purple corrugated plastic. An instructional video detailing trap assembly and use can be found under News and Information – fifth bullet at:

http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/index.shtml

After the trap is assembled into its prism shape, spreaders are attached to the trap at holes labeled (3) in Fig. 2. Lures are attached to a loop on the spreader using a cable tie (Fig. 3).

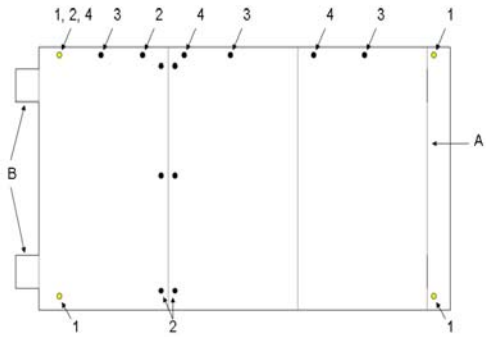

FIGURE 2: Prism trap diagram

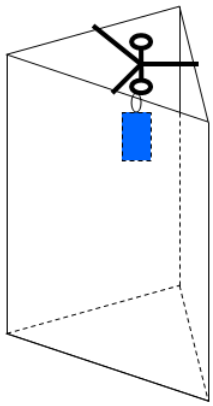

FIGURE 3: Lures hung from loop on spreader using a cable tie

***Lure**:* Two separate pouches of lure are recommended to be attached to each trap. One pouch will contain Manuka oil while the other will contain (Z)-3-hexanol. The lures provided by commercial firms are produced as a pouch and designed to last in the field for 60 days. Lure attachments to the trap should be reinforced with duct tape placed at the very top to ensure continued attachment during inclement weather. **Do not cover the lure with duct tape** as that will inhibit the release of the lure. If possible, any unused lure remaining at the end of the trapping season should be stored (refrigerated or frozen) for future use in EAB surveys.

Lure Handling, Transport, and Storage:
The Manuka oil and (Z)-3-hexanol lure pouches emit odors and volatiles which pose safety and health concerns in confined spaces. EAB Program Managers have worked closely with the APHIS Safety and Health Manager and the lure manufacturer to develop protocols for the safe handling, transport, and storage of our lures. In summary, prior to deployment, lures must be kept cold at all times by storing in a freezer. During transport, lures must be kept in coolers with cold packs or ice and stored in isolation from the vehicle's cab, or, as an alternative, kept in coolers with screw top lids that also must be chilled with cold packs or ice. Cooler should be labeled "NOT FOR FOOD OR BEVERAGE USE". To avoid skin irritation during handling, gloves may be worn. Additional information and precautions can be found in a Job Hazard Assessment and Material Safety Data Sheets for the lure pouches and are available from the local APHIS PPQ Safety Coordinator.

Trap and Sign Placement: Traps must be placed in ash trees (*Fraxinus* spp.). If possible, ash trees should be 8" or greater in diameter with *larger or largest ash tree in a stand of trees* located along edges, in open areas, or in open stands such as in parks. Traps should be placed in the lower to mid canopy, but with the bottom edge of the trap no lower than five feet above the ground. They should be placed on the sunny side of the tree, most typically, the south or southwest side.

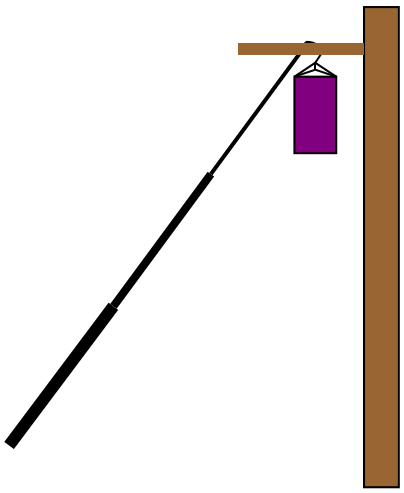

FIGURE 4: Trap hung using a telescoping pole

A wire hanger will be used to hang traps (Fig. 4). An 8' telescoping pole that extends to 23'+ (several sources including "Mr. Long Arm", available at Home Depot, or http://www.excelsails.com/telescopingextensionpoles.htm, or http://www.briarwoodproducts.com/newtools.htm , or http://www.woosterbrush.com/products.asp?=200), fitted with a hook to place the trap in one of the lower limbs, is recommended. The full extension of the pole may be necessary. Alternately, if all limbs are too high to reach with a pole, a throw line may be tossed over a limb, and a rope with a trap attached may be hoisted up into the canopy (Fig. 5).

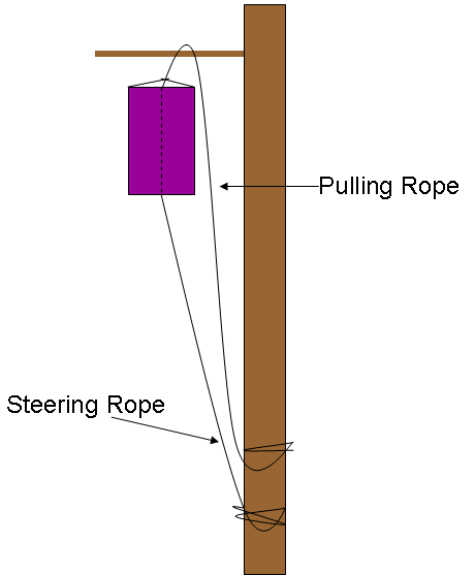

FIGURE 5: Trap hung using a rope

A 3”x5” survey sign (Fig. 6) will be provided and should be prominently displayed on the tree after the trap is set. States may also develop their own survey signs—please coordinate this activity with the APHIS EAB Program.

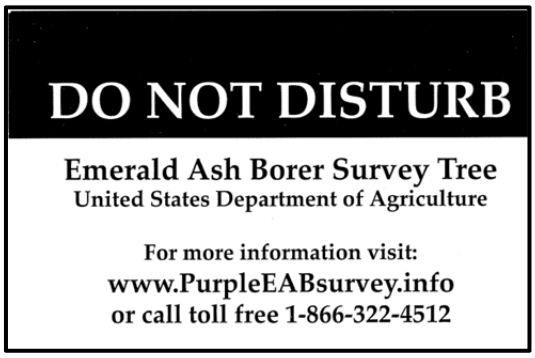

FIGURE 6: Survey sign

Trap Maintenance: Lures will last approximately 60 days and should be replaced just prior to expiration. Traps should be inspected for adult EAB at the time of lure replacement.

If trap surfaces are loaded with debris, they should be renewed by removing the debris and scraping the glue. Scraping can be accomplished with a trowel or putty knife. If necessary, glue can be added using a paint roller or trowel. The glued surface should remain intact throughout the season unless a trap is allowed to come in repeated contact with an adjacent branch or tree bole. Traps must not be removed prior to August 1 **and** before 1500 GDDs have been exceeded.

Trap Disposition: While the polypropylene material of the traps is recyclable, the glue that is adhered to the panels renders the traps undesirable to most recyclers. Alternatively, one may seek a user of waste fuel material for trap disposition. Hangers and spreaders are reusable and should be retained for future use. Hangers and spreaders that cannot be reused should be recycled.

Screening for Suspect Buprestidae and Specimen Submission

Any suspect Buprestidae adult or suspect adult EAB specimen collected from a trap in a **non-quarantined** county should be placed in a dry vial. Using Tanglefoot from the trap, stick the specimen to the side of the vial and/or gently pad with soft tissue placed into the vial on top of the specimen(s) to prevent damage during shipping. Larval samples need to be shipped in a vial containing 70% ethanol. (If guidance is needed on proper packaging to ship larvae in ethanol, please contact your local PPQ Safety Coordinator.) All suspect specimens should be delivered to the State Plant Health Director or APHIS representative to be packaged and shipped to Dr. James Zablotny along with a completed “Specimens for Determination” PPQ form 391. Be sure to include any survey record number and/or GPS coordinates on the PPQ form 391 so identified specimens can be linked to survey records.

Dr. James Zablotny
USDA, APHIS, PPQ
11200 Metro Airport Center Drive, Suite 140
Romulus, MI 48174

Phone: 734-942-9005
E-mail: james.e.zablotny@aphis.usda.gov

Dr. Zablotny will make a determination and send specimens to the Systematic Entomology Laboratory (SEL), if necessary, for initial State detection confirmation.

Any suspect Buprestidae adult or suspect EAB specimen collected from a trap in a **quarantined** county should be placed in a dry vial. Using Tanglefoot from the trap, stick the specimen to the side of the vial and/or gently pad with soft tissue placed into the vial on top of the specimen(s) to prevent damage during shipping. Larval samples need to be shipped in a vial containing 70% ethanol. (If guidance is needed on proper packaging to ship larvae in ethanol, please contact your local PPQ Safety Coordinator.) All suspect specimens should be delivered to the State Plant Health Director or APHIS representative to be packaged and shipped to Mr. Bobby Brown along with a completed "Specimens for Determination" PPQ form 391. Be sure to include any survey record number and/or GPS coordinates on the PPQ form 391 so identified specimens can be linked to survey records.

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Data Management Structure For: Emerald Ash Borer (EAB) – Agrilus planipennis

Introduction:

PPQ wants to make it clear that the utilization of the National "Integrated Plant Health Information System" (IPHIS) as a field data collection tool is not required. We do believe however that operationally specific data is of great importance and therefore have designated the IPHIS application to be utilized as the final holding tank (centralized database) for this data.

Access to IPHIS does not require VPN therefore anyone with internet access and an eAuthentication login will have access to IPHIS. (People without an eAuthentication username and password will need to register at: https://www.eauth.usda.gov/mainPages/eAuthSiteMap.aspx)

After receiving network access, a username, and a password for IPHIS, users can log into the system and utilize any (or all) of the four (4) data entry methods. These tools include; IPHIS web interface, Field Adaptable Survey Tool (FAST) desktop application, a FAST PDA (Personal Data Assistant) software application, and an Excel spreadsheet upload. The web upload tool, an Excel spreadsheet used for submission to IPHIS, is available at:

http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/index.shtml

When inputting survey data into IPHIS, please use the IPHIS template named: "EAB 2013 Natl Survey".

Note: IPHIS can receive up to 400 uploaded records in a spreadsheet at one time.

We will no longer ask surveyors to collect symptom data and the fields for DBH and trap height are optional. The new data fields created for the 2012 EAB survey in IPHIS will be used again for the 2013 EAB survey. These include: (1) a field for cells that are omitted, voided, and declined, (2) a field to identify and record the relocated traps due to omits and voids, and (3) an expanded field for comments. When recording the Cell_ID (Location Name) in IPHIS the Samp_ST_ID code assigned to each cell designated as a trap placement site by FHTET should be used if available. For cells which do not have an FHTET Samp_ST_ID code assigned, please use the following naming convention: 2 letters for State designation, 3 letters for surveyor's initials, and 3 numbers for trap number, e.g., IAJAD003, (Iowa, John A. Doe, Trap 3). Each surveyor should begin with 001 for the first trap which does not have a FHTET assigned Cell_ID and increased by one for each subsequent trap (the second such trap is 002, the third is 003 and so on).

We encourage users to use the PDA portion of IPHIS, but understand organizations have existing tools and/or applications used to collect data in the field. A field data form for the manual recording of data can be found in Appendix D. Organizations utilizing methods other than the PDA (paper, spread sheets, or third party software platforms) can enter data directly into the web interface or "bulk" upload data from the Excel spreadsheet using the web upload tool.

It is important for cooperators to upload data biweekly until all traps are set.

Technical Support
1 (877) 944-8457 (select option 3)
6:30am to 8:00pm ET, Monday through Friday

Dave Kowalski
IPHIS Data Manager
(970) 494-7510
David.G.Kowalski@aphis.usda.gov

Communication: 2013 EAB Survey

Employing the 2012 survey sampling design for EAB again in 2013 is a significant change to previous methods used to determine trap dispersal. Therefore a variety of materials will be developed to facilitate communication and understanding among key audiences who include Federal, State, and Tribal partners, survey cooperators and contractors, the media, and the public at large. Materials will include but are not limited to key messages, talking points, and Frequently Asked Questions (FAQ's).

The highly visible purple trap generates curiosity which often results in public questions and media inquiries. Individuals involved in the actual placement and maintenance of traps should be conversant with survey messages and understand media protocols. Furthermore the EAB survey provides a springboard for other program messages addressing control, regulation, and the human-assisted spread of the pest. Communication staff and program personnel should also be broadly familiar with the core program messages about these issues.

EAB Program Outreach & Education:

The active participation of target audiences to assist in preventing the spread of emerald ash borer throughout the United States is critical. Outreach, an integral element of the EAB Program supporting regulatory, survey, and control, is a basic task for all program staff and a value-added opportunity for each personal encounter, engagement, or exchange. Formal strategic communication and outreach campaigns targeting industries that move regulated material should be implemented together with public awareness campaigns designed to provide education to citizens about the dangers of moving infested host materials such as firewood. Since the beetle is difficult to detect, the more people trained to identify EAB symptoms or damage and report suspects, the greater the opportunity for successful outcomes. Outreach activities encourage the public to recognize and report possible beetle damage in their area as well as suspected incidents of quarantine violations.

Appendix A. Details of Survey Sampling Design Construction.

The 2013 EAB survey employs a computer-generated risk assessment product to guide the deployment of detection tools in a way which results in the following benefits:

- increase the number of instances of successful EAB detections outside the known infested area
- improve land managers capability of detecting EAB close to the date of a new attack
- find locations that are best suited to implement controls

The 2013 EAB Risk Assessment product was developed using two Maximum Entropy (MaxEnt) statistical models for predicting where EAB was most likely to be detected. The reason two models were used was to see if the dynamics of detecting EAB infestations in 2012 were different than those of detecting EAB across all years. More specifically, analysis revealed that the dynamics of detecting new infestations in 2012 relate more to variables associated with new EAB introductions, whereas variables relating to EAB detections across all years are more closely associated more with the establishment and subsequent natural dispersal of EAB. Because the variables driving EAB detections for introduction vs. more established populations are different, both of models were combined in a maximum value overlay (i.e. an overlay of the two outputs where the maximum value for a given pixel is retained) to develop the 2013 EAB Risk Assessment.

MaxEnt was used again in the 2013 model because it is a non-parametric learning spatial modeling approach that has been demonstrated to have utility for generating species distribution models. Due to its unique treatment of negative data, it is the preferred model for invasive species, which are currently expanding into new habitat ranges. Instead of discarding sites that are reported as having no pest present, MaxEnt uses negative or "pseudo-absence" locations as *potential* locations where the species might be present. This feature helps to account for the three scenarios that could cause a location to be deemed a negative location:

1. The species has not been introduced into that location yet but the habitat is suitable
2. The species is present and has not yet been detected
3. The site is unsuitable for supporting the species.

Four parameters were required to run the models. These were:

1) the dependent detection data from the APHIS IPHIS dataset (2002-2013), which consists of:
    a. historical EAB detection data
    b. negative and positive trap data
2) selected independent variables that correlate with the presence of EAB
3) a defined geographic area of interest.
4) limited to a maximum of 20,000 traps.

The independent variables were selected using the following sources:

1. a review of scientific literature
2. expert opinion
3. anecdotal evidence
4. correlation Analyses
5. preliminary statistical analyses.

Dissemination of trap resources is thus determined by this EAB Risk Assessment, combined with a spatially balanced sample design. The EAB Risk Assessment model has a known inclusion probability for every grid cell and provides an objective and transparent methodology for selecting

trap locations. In addition, traps spatially located across the entire CONUS area account for differences between locations that are near to, and those that are far away from, current EAB infestations.

Finally, the 2013 EAB sampling design increases spatial independence among sample locations and therefore, maximizes sampling efficiency and provides the most information available per sample unit.

Each trap location is recommended for placement within a one kilometer square grid cell designated within a Conterminous United States (CONUS) grid cell, each with a unique ID, and also by the center point of the grid cell (identified by latitude and longitude).

Appendix B. GPS Guidance and Sample Location Information

Initial Requested Information

1. Field Crew Name
    a. Crew ID (State and Affiliation (i.e., PPQ, State Dept. of Ag., Contractor, Volunteer) should be associated to the Crew ID)

Initial GPS Unit Setup Guidance

1. Depending on your GPS unit and what options that are available to you, please use the following guidance for collecting position information.

    a. WGS 84 geodetic datum
    b. Latitude/Longitude collected in Decimal Degrees format
    c. Satellite Almanac (where applicable): Download the most recent Satellite Almanac to your unit.
    d. Wide Area Augmentation System (WAAS) to improve the accuracy of the positions

Helpful Tips for Collecting Information at the Site

1. Turn the GPS unit on and allow the GPS unit to start gathering data when you arrive at the tree in which the trap will be hung. It may be helpful to turn the GPS unit on when you leave your vehicle.
2. Place the unit in a stable location while hanging the trap.
3. Collect location data at the tree in which the trap is hung
4. Ensure that you are collecting a signal from at least four satellites.
5. Location Data Collection
    a. Location Name for Grid Cell = Cell_ID
        i. When recording the Cell_ID (Location Name) in IPHIS the Samp_ST_ID code assigned to each cell designated as a trap placement site by FHTET should be used if available. For cells which do not have an FHTET Samp_ST_ID code assigned, please use the following naming convention: 2 letters for State designation, 3 letters for surveyor's initials, and 3 numbers for trap number, e.g., IAJAD003, (Iowa, John A. Doe, Trap 3). Each surveyor should begin with 001 for the first trap which does not have a FHTET assigned Cell_ID and increased by one for each subsequent trap (the second such trap is 002, the third is 003 and so on).
    b. Please see Appendix D for EAB Field Data form.
    c. Latitude/Longitude
    d. Omitted - with drop down list of potential reasons for the omitted cell (e.g. steep slope, inundated with water, dangerous terrain, dangerous neighborhood, etc.)
    e. Voided - with replacement plot location name and type
    f. Notes for the surveyor's assessment of the site conditions (e.g. firewood, riparian, wooded lot, campground, lumber/saw mill, suburban, urban, new development, tree service company, etc.
6. **NOTE: It is very important to upload data every other week throughout the season.**

Appendix C. Predicted Growing Degree Day Zones for Initial EAB Emergence.

Alabama	2/1/2013	Montana	6/1/2013
Alaska	6/22/2013	Nebraska	5/1/2013
Arizona	2/1/2013	Nevada	2/22/2013
Arkansas	3/15/2013	New Hampshire	6/1/2013
California	2/15/2013	New Jersey	5/8/2013
Colorado	4/22/2013	New Mexico	3/15/2013
Connecticut	5/22/2013	New York	5/15/2013
Delaware	4/22/2013	North Carolina	3/22/2013
Florida	1/22/2013	North Dakota	6/1/2013
Georgia	2/15/2013	Ohio	5/1/2013
Hawaii	1/22/2013	Oklahoma	3/5/2013
Idaho	5/22/2013	Oregon	5/22/2013
Illinois	4/22/2013	Pennsylvania	5/1/2013
Indiana	4/22/2013	Rhode Island	6/1/2013
Iowa	5/1/2013	South Carolina	3/8/2013
Kansas	4/8/2013	South Dakota	5/15/2013
Kentucky	4/8/2013	Tennessee	4/1/2013
Louisiana	2/15/2013	Texas	1/22/2013
Maine	6/1/2013	Utah	5/11/2013
Maryland	4/22/2013	Vermont	6/1/2013
Massachusetts	5/22/2013	Virginia	4/8/2013
Michigan	5/22/2013	Washington	5/22/2013
Minnesota	5/22/2013	West Virginia	5/1/2013
Mississippi	2/22/2013	Wisconsin	5/15/2013
Missouri	4/1/2013	Wyoming	5/22/2013

EAB Trap Sheet – 2013 Survey

1. **Date Set**:_____ **Date Serviced**: _____ **Date Picked up**: _____ **Trap Fallen/Replaced Date**: _____
   Sampled (Y/N): _____ **Sampled (Y/N)**: _____ **Trap Fallen/Replaced Date**: _____
   No. Specimens: _____ **No. Specimens**: _____

2. **Location – Site**: _____
   Use the 1 km grid number, and when outside the grid use "2 letter state name + 3 letter trapper initials + 3 digit sequential trap number" (ex. MIJHB001)

3. **Contact Name** (if known): _____ **Phone** (if known): _____

4. **Property Type Information** (Campground, Park, Sawmill, Nursery, etc.): _____

5. **Address / City / Zip** (if known): _____ / _____ /_____

6. **County**: _____

7. **Latitude/Longitude**: _____ / _____
   (ex. 43.123456 / -91.123456)

8. **Trap Height**: ☐ Low ☐ High

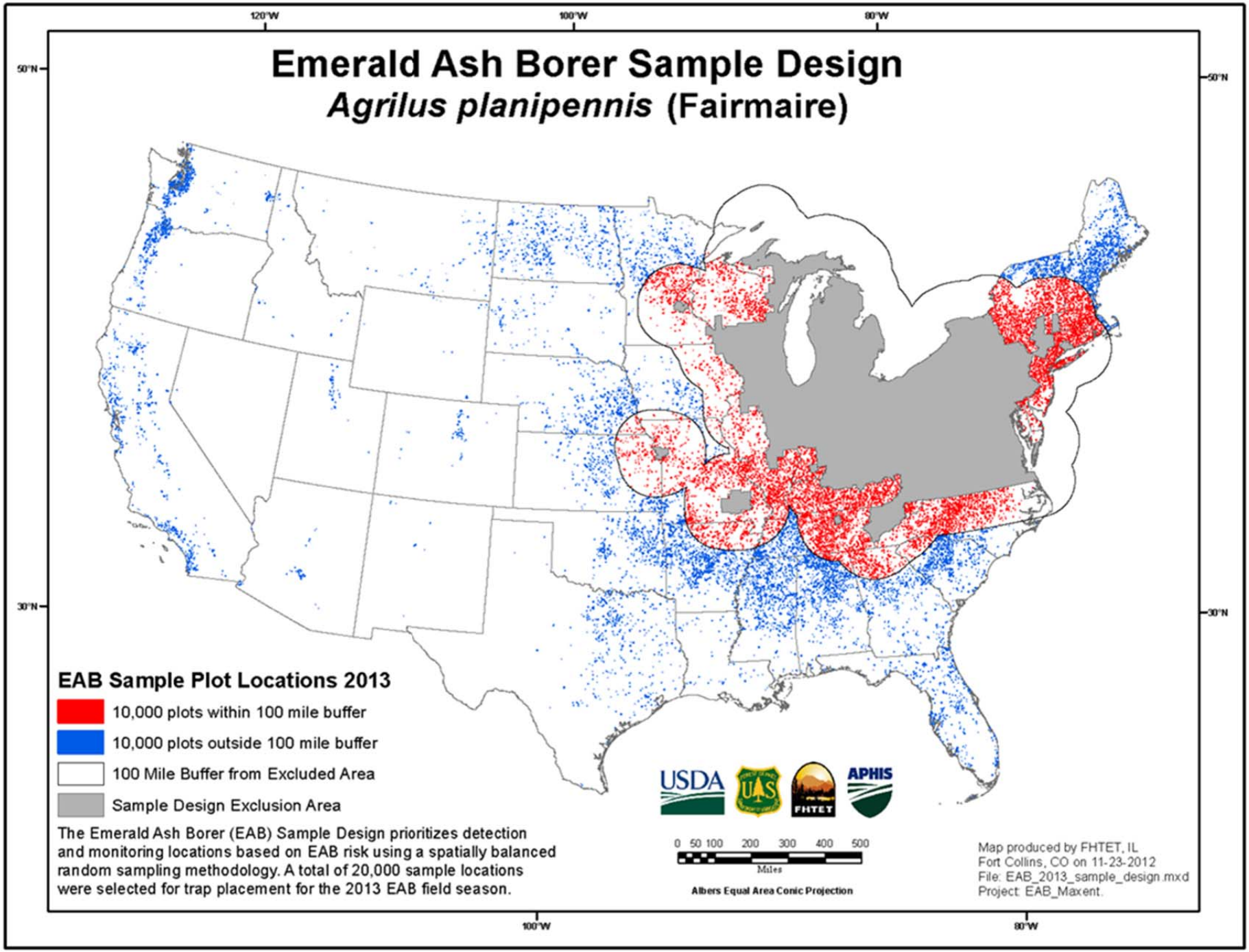
9. **Diameter Breast Height (DBH) Category**:
   ☐ 1 - 5 ☐ 6 - 10 ☐ 11 - 15 ☐ 16 – 20 ☐ 21+

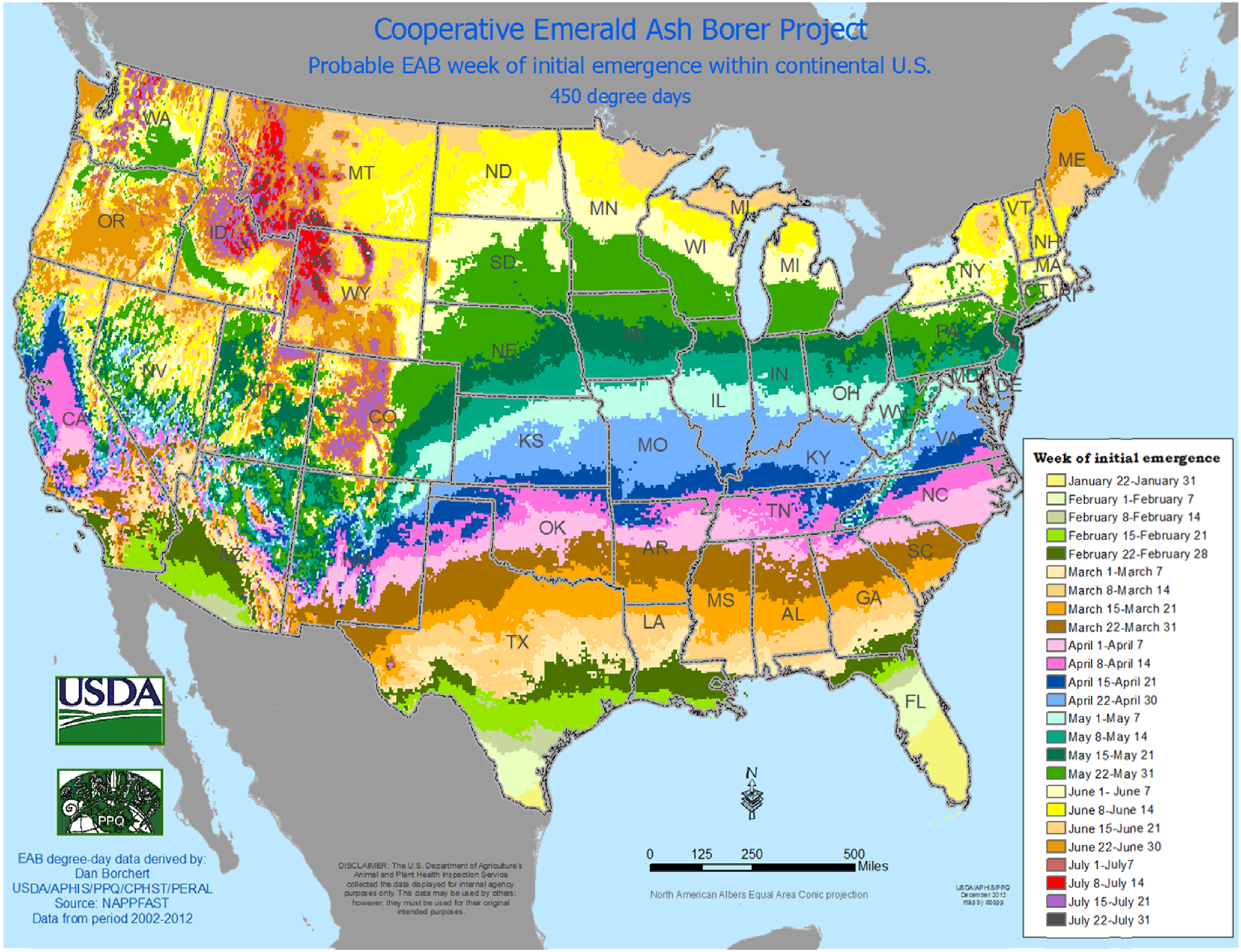
10. **Site Type**:
    ☐ Campground/Park ☐ Firewood Producers/Retailers
    ☐ Landscape Company ☐ Residence
    ☐ Rest Area ☐ Solid Wood Packaging/Pallet Site
    ☐ Special Interest Sites ☐ Tree Service
    ☐ Wooded Area ☐ Other: _____

11. **No Trap Placement**: ☐ Omit ☐ Void

12. **Omit Reason**:
    ☐ Dangerous neighborhood ☐ Landowner refusal
    ☐ No access, steep slope ☐ No access, swamp
    ☐ No access, other difficult terrain
    ☐ No road access ☐ Other: _____

Written or Sketched Location Details (Optional)


Emerald Ash Borer Sample Design
Agrilus planipennis (Fairmaire)
120°W
100°W
80°W
50°N
30°N
EAB Sample Plot Locations 2013
10,000 plots within 100 mile buffer
10,000 plots outside 100 mile buffer
100 Mile Buffer from Excluded Area
Sample Design Exclusion Area
The Emerald Ash Borer (EAB) Sample Design prioritizes detection and monitoring locations based on EAB risk using a spatially balanced random sampling methodology. A total of 20,000 sample locations were selected for trap placement for the 2013 EAB field season.
USDA
FHTET
APHIS
0 50 100 200 300 400 500
Miles
Albers Equal Area Conic Projection
Map produced by FHTET, IL
Fort Collins, CO on 11-23-2012
File: EAB_2013_sample_design.mxd
Project: EAB_Maxent.


Cooperative Emerald Ash Borer Project
Probable EAB week of initial emergence within continental U.S.
450 degree days
WA
OR
CA
NV
ID
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
FL
SC
NC
VA
PA
NY
MD
DE
NJ
CT
RI
MA
VT
NH
ME
Week of initial emergence
January 22-January 31
February 1-February 7
February 8-February 14
February 15-February 21
February 22-February 28
March 1-March 7
March 8-March 14
March 15-March 21
March 22-March 31
April 1-April 7
April 8-April 14
April 15-April 21
April 22-April 30
May 1-May 7
May 8-May 14
May 15-May 21
May 22-May 31
June 1- June 7
June 8-June 14
June 15-June 21
June 22-June 30
July 1-July7
July 8-July 14
July 15-July 21
July 22-July 31
USDA
PPQ
N
0 125 250 500
Miles
North American Albers Equal Area Conic projection
EAB degree-day data derived by:
Dan Borchert
USDA/APHIS/PPQ/CPHST/PERAL
Source: NAPPFAST
Data from period 2002-2012
DISCLAIMER: The U.S. Department of Agriculture's Animal and Plant Health Inspection Service collected the data displayed for internal agency purposes only. This data may be used by others; however, they must be used for their original intended purposes.
USDA/APHIS/PPQ
December 2012
map by dbopp