PENNSYLVANIA EMERALD ASH BORER ACTION PLAN

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EXECUTIVE SUMMARY

This document outlines an action plan for the various Pennsylvania state agencies and cooperating federal agencies to follow, when the emerald ash borer (EAB) is discovered in Pennsylvania. The EAB is a wood-boring beetle from Asia, which has been inadvertently introduced into Michigan, and is now in 2006 making its way south and east through Indiana and Ohio, respectively. It will be in northwestern Pennsylvania within 10 years at the latest, and probably within one to three years at the earliest. EAB attacks all species of ash trees (*Fraxinus* spp.), and its introduction into the state is expected to eliminate several million ash trees in both forest and urban areas. As an agent of lasting environmental change in the Northeast, it is on a par with the gypsy moth, Dutch elm disease, and chestnut blight of the last century. The Action Plan details what we will do before we detect the beetle, what we will do when the beetle is detected, and what we will do once the beetle becomes established.

The Action Plan presented here covers government actions both before and after EAB reaches the state, and the authority for taking such actions. Specifically: first, it delineates responsibility for surveys and protocols, and outlines the roles of various agencies; second, it covers potential control operations, procedures for treating with insecticides, and ash management as a mitigating strategy once the beetle has been discovered; third, it addresses public relations and outreach, both before and after the beetle has been found; and fourth and last, it looks at restoration and funding options. All of these are presented in considerable detail, to minimize lag time due to decision making, once we are in a crisis mode.

OVERVIEW OF THE THREAT/NATIONAL PERSPECTIVE

INTRODUCTION

The emerald ash borer (EAB), *Agrilus planipennis* Fairmaire, is a non-native invasive pest of ash (*Fraxinus* spp.) trees in the United States. It was first found in North America in the summer of 2002 in southeast Michigan and an adjacent area in Ontario, Canada. It is thought to have been introduced seven to ten years prior to its detection. Infestations have been subsequently detected in Ohio, Indiana, Maryland, and Virginia. Populations in Maryland and Virginia appear to have been eradicated. The pest is indigenous to Asia and occurs in China, Korea, Mongolia, the Russian Far East, and Taiwan. USDA Animal and Plant Health Inspection Service (APHIS) and the USDA Forest Service are working with state cooperators to detect, contain, and eradicate the pest. A review of the biology of EAB can be found in Appendix 3.

APHIS and its cooperators have developed national and state survey and eradication strategies for EAB that utilize management zones to detect, contain, and eradicate the pest. The EAB program in Pennsylvania began in May 2003 and consists of survey, regulatory, control, and education and outreach activities. Survey activities are ongoing in all states where EAB has been detected and in states with significant ash resources. Survey activities will be used to determine the boundaries of the management zones. Since 2003, federal and state agencies have conducted detection surveys to determine the presence or absence of EAB in Pennsylvania and it has not been detected to-date.

ACTION PLAN PURPOSE

The purpose of the Action Plan is to provide procedures to prevent the establishment of EAB and, if it is introduced, to eradicate the pest and prevent its spread within Pennsylvania. This plan will provide a means to address EAB and its associated risk, in order to reduce the economic and environmental impacts resulting from an infestation.

This Action Plan provides guidelines and actions for the survey, eradication, and control of EAB. The procedures described in this Action Plan were developed by consulting with USDA APHIS Plant Protection and Quarantine (PPQ), State Plant Regulatory Officials, USDA Forest Service, and other state and federal cooperators directly involved in EAB programs.

This document is not intended to be complete and exhaustive. As new information becomes known, the direction and strategies of the program may change to reflect best management practices.

IMPACT OF EMERALD ASH BORER

EAB poses a significant threat to North America's ash resources and has no effective natural enemies in North America. Control tactics are extremely limited with tree removal being the principal option. If left unchecked, the pest will continue to infest and destroy native and landscape ash trees, resulting in the loss of millions of dollars to the forest products and nursery

industries. The damage caused by EAB will directly impact the forest ecosystem due to the loss of ash species and its impact on biodiversity and wildlife.

In the eastern United States, nursery, landscaping, timber, recreation, and tourism industries are economically important. Nearly 114 million board feet of ash sawtimber with a value of $25.1 billion is grown in the eastern United States. In Pennsylvania, ash accounts for 5 percent of timber production. White, black, and green ash are widespread in the forests of the eastern United States and Canada, comprising over 7 percent of hardwood species and 5.5 percent of all species. The wood is used for a variety of applications including tool handles, baseball bats, furniture, cabinetry, solid wood products, packing materials, pulp, and paper.

Ash is an extremely popular landscape tree because of its tolerance to poor site conditions. Ash species are currently the most commonly planted tree in shopping centers, industrial parks, and urban developments. It was planted widely in many states to replace elms lost to Dutch elm disease. Common in parks, other public spaces, and neighborhoods across the United States, ash is a prolific seeder and readily establishes along fence rows, right-of-ways, and riparian areas. The spread of EAB could have an enormous impact on the U.S. nursery industry, municipal governments, and individual homeowners. Preliminary findings by USDA estimate that EAB's potential impact to the national urban landscape would be a loss of 0.5 to 2 percent of the total leaf area (30-90 million trees) with a value of $20 to $60 billion. As many as 300 million landscape ash trees have been planted in Michigan alone, with approximately 28 million in the infested area. The estimated cost of replacing ash trees in nine selected U.S. cities would be $565 million. Nationwide, the nursery industry produces an estimated 2 million ash trees each year. With median approximate values ranging from $50 to $70 per tree, the ash nursery stock crop is worth between $100 and $140 million annually.

State agencies within the Commonwealth of Pennsylvania have adopted a proactive program of Early Detection and Rapid Response. The relatively low cost of conducting an early detection survey now for this pest and early intervention to remove and destroy infested trees once detected, will be far less costly than waiting for the insect to become established and spending millions of dollars to eradicate populations of EAB. The Michigan eradication program cost over $328 million (as of 2003) and is rising yearly as new infestations are found in that state.

SURVEY COMPONENT

INTRODUCTION

Survey activities in Pennsylvania will involve a two-phase system: (1) Detection survey work to take place as long as EAB has not been found in the Commonwealth; and (2) delimiting survey work to be conducted to define the extent and range of an infestation in the event that EAB is found in the Commonwealth.

AUTHORITY TO CONDUCT SURVEYS

The Commonwealth has the authority to conduct survey work on any property within its boundaries under Section 18 ("Surveys to determine existence of pests") of the Pennsylvania Plant Pest Act of 1992 (P. L. 1228, No. 168). Section 18 states: *The department may make surveys to determine the existence, distribution and severity of damage caused by plant pests, may collect and transport samples of plants or plant products which are capable of harboring plant pests, may conduct studies relating to the control of plant pests, may make other investigations necessary to protect Pennsylvania agriculture and horticulture from certain plant pests, may prescribe treatment for control of plant pests and may report the results of plant pest investigations.*

Survey of public and private forests is granted under The Cooperative Forest Health Protection (CFHP) Program. The Cooperative Forestry Assistance Act of 1978, amended by the Forest Stewardship Act of 1990 authorizes a CFHP program. The program enables the USDA Forest Service to provide technical and financial assistance to cooperating states. This assistance may be used for projects that involve detection of forest pests, implementation of preventative management techniques that improve forest health, evaluation of alternatives to manage pests, and technical assistance.

In Pennsylvania the CFHP program is implemented through the State Forester's office. Program requirements include a full-time professional entomologist, pathologist, or pest management specialist, and the development of a program that addresses CFHP program content (detection, prevention, evaluation, technical assistance, and technology development). Pennsylvania's EAB surveys are a component of the CFHP objective of forest pest detection.

DEFINING THE ASH RESOURCE

For purposes of planning detection surveys, and in the event of detection of EAB in Pennsylvania, knowledge of the location of particular concentrations of ash trees would allow us to concentrate and/or prioritize our efforts more efficiently (Appendices 1 and 2). Host detection surveys can be used to delimit the ash resource and survey its condition in areas throughout the state prior to the arrival of EAB. Such surveys may be conducted by systematic ground observations, or possibly by remote sensing.

It is important to note that remote sensing will only be able to, at best, provide detailed information on ash distribution and ash condition throughout the state. The success of this technology hinges on its ability to distinguish ash from other hardwood species. If detected, extensive ground-truthing will be needed to identify the causal agent (EAB, other wood-boring insects, anthracnose, ash yellows, etc.) responsible for ash decline. In addition, the cost of image acquisition and post processing can be very high, depending on the type of imagery used (i.e., hyperspectral, Landsat, etc.). Therefore, the use of remote sensing will likely be limited to high-risk areas in the state not readily accessed by traditional ground surveys.

Statewide ash distribution compiled by FIA (Forest Inventory and Analysis) survey work will also be available for use in EAB surveys. This information will be provided by the USDA Forest Service in GIS raster format for ash on public and private lands on a sub-county level. Although exact coordinate data cannot be given out due to privacy agreements involved with the FIA program, the blurred coordinates that will be provided are accurate enough for our purposes of prioritizing areas of greatest risk and need for survey (Appendix 2).

DEVELOPMENT OF AN EAB RISK MAP FOR PENNSYLVANIA

A risk map has been developed by the USDA Forest Service and is available on line at: http://tncweeds.ucdavis.edu/photos/agrpl02.gif

This map has been developed by considering factors such as the abundance of host trees, the amount, type, and origin of commercial traffic to respective areas. According to this map, most of Pennsylvania is considered in the "low risk" category, with the metropolitan Pittsburgh and Philadelphia areas considered as "moderate risk." The Pocono region risk level is rated as slightly elevated.

Because of the (1) abundance and statewide distribution of preferred-host ash species in Pennsylvania and (2) the amount of interstate commerce traversing the state, perceived risk may vary considerably from that presented in the USDA Forest Service EAB risk map. The fact that the Harrisburg area serves as the second-busiest trucking hub in the nation would lead to the conclusion that the risk to the midstate is relatively high. Rest areas and truck stops along interstate highways also should be considered high risk. With this in mind, an EAB risk map developed by in-state entomologists likely would differ from the existing risk map. A preliminary attempt at a risk map that includes ash distribution, nurseries, rest areas, forest products companies that dealt with ash, and state parks was developed in 2004 (Appendix 1).

GENERAL SURVEY ACTIVITIES

Survey coordinators in respective stakeholder agencies will strive to: (1) provide training and direction to survey personnel as necessary (may be done through oral, on-site, or written methods); (2) keep abreast of current and new survey methods and protocols deemed efficacious as they are developed by research units; (3) assist in coordination of survey projects; (4) ensure verified specimen identification; and (5) provide progress reports, survey results/records, and project updates to stakeholder agencies.

SURVEY PROTOCOLS

Existing survey protocols for EAB are based on the fact that this pest does not respond reliably to artificial traps, and responds only weakly to manually stressed "trap trees" located on forest edges or in open areas.

1. **Visual Survey:** In defined grids, survey personnel will inspect individual trees for EAB symptoms such as crown thinning, branch/limb dieback, bark cracking, D-shaped exit holes, woodpecker activity, the presence of epicormic shoots and basal sprouting (suckering), and the presence of characteristic larval galleries beneath the bark. Suspect trees may contain viable life stages of EAB, and designation of an area positive for EAB must require the presence/identification of collected specimens.

2. **Aerial and Remote Sensing:** As survey methodology is developed by research agencies, the application of aerial and remote sensing may be possible in Pennsylvania, as a method to define approximate range of an infestation. This method will, of course, depend upon funding, availability of equipment needed to conduct such surveys, and also on the availability of personnel trained in interpreting images produced during flyovers. Remote sensing may serve as a guide in directing specific ground surveys.

3. **Trap Trees:** One element of existing survey protocol involves the use of manually injured "trap trees" to draw in adults for capture. In this method, each trap tree (4" to 8" dbh) is girdled by removing a twelve-inch wide band of bark. A band of sheet plastic is placed around the trunk adjacent to the wound and coated with "stickem" (Tanglefoot®) to capture beetles that are attracted to the injured ash tree. Trees are girdled by mid-May, prior to adult emergence. Trap trees will be located on forest edges, open areas, rest areas and along highway right-of-ways. Sticky bands on each trap tree are inspected approximately once a month. Bark is removed from felled, girdled trees in September to inspect them for EAB larval infestation. A second trap-tree can be left standing until the fall of the following year. It should be noted that trap trees are not an efficient method for determining population density; rather, this method is the best method developed to-date for detection. Trap trees should serve only as a part of a total survey that involves visual survey.

4. **Firewood Blitz:** Temporary firewood inspection sites are placed at rest areas along the Ohio border on weekends during the spring through fall when many out-of-state campers are anticipated (i.e., Memorial Day, Fourth of July, and Labor Day). The public will be notified about EAB, surveyed to determine their trip origin and intended destination. Any firewood that is transported from known infested areas will be confiscated. The objective of this activity is to improve public awareness of the problem, provide data for risk map analysis, and prevent new EAB introductions.

COLLECTION OF LIFE STAGES

Designation of an area as "positive" in any survey activity is contingent upon the confirmed identification of any collected EAB specimens. Life stages of EAB should be preserved in 80 percent ethanol. *No living EAB specimens are to be removed from the vicinity of the collection*

site (this is to eliminate the possibility of escape and subsequent accidental introduction to a new area). After initial screening and identification by state regulatory entomologists, the identity of specimens must be verified by either a USDA APHIS PPQ specialist or designee.

QUALITY CONTROL OF SURVEY ACTIVITIES

Efforts will be made to ensure the results of surveys are accurate and verifiable. This will be accomplished by re-inspection of a sub-set of surveyed units by specialists.

DATA MANAGEMENT AND REPORTING FOR SURVEY ACTIVITIES

Survey information will be entered into the National Agricultural Pest Information Service (NAPIS) within a reasonable time after completion of surveys. Field data collection must contain all the data elements needed to satisfy both NAPIS and USDA Forest Service record entry. Data is collected using paper or iPAQ pocket PCs. NAPIS data are entered only by a designated person; the person designated to enter entomological data from surveys in Pennsylvania is located in the PDA. Data are also submitted to the USDA Forest Service Access database. The data are available to APHIS and PA DCNR BOF - Forest Pest Management as georeferenced shape files that may be viewed using GIS software such as ArcPad and ArcGIS. November 1 is the deadline for submitting data to the USDA Forest Service and NAPIS each year.

See the Data Management section of this action plan for information on specific data elements that will be recorded in the NAPIS and USDA Forest Service databases.

DETECTION SURVEY

1. **Purpose:** Cooperating agencies will conduct detection survey work as deemed necessary, in consideration of available manpower and funding limitations. Detection surveys are, by definition, exploratory inspections and/or trapping with the intent of discovering EAB in the Commonwealth or a particular area within the Commonwealth where EAB was not previously known to exist. Targeted priority areas for survey include, but are not limited to: state parks, interstate highways, rest areas, campgrounds, nurseries, sawmills, and forest products dealers.

2. **Action Upon Initial Discovery:** If suspect EAB or EAB damage is found, the information on specimens seen or collected must be forwarded to the State Plant Regulatory Official - SPRO (PDA-Bureau of Plant Industry) and/or the State Plant Health Director - SPHD (USDA APHIS PPQ). Preferably, this will be a direct contact; however, it is acceptable for that agent to handle such matters through his or her chain of command (this is not preferred because of possible time delays, possible "dilution" of accompanying information, and possible loss or damage of specimens). The aforementioned officers (SPRO and SPHD) shall notify respective survey entomologists in their agencies, as well as other stakeholder agencies. The SPRO/SPHD shall see to the identification and verification of the specimens, either directly or through a designee.

3. **Verification:** (covered earlier: initially by state entomologist, then verified by USDA area identifier or Systematic Entomology Laboratory entomologist).

4. **Agency Roles and Staffing:** The PDA shall incorporate detection survey activities in its annual work plan, to varying degrees, as this agency is charged with enacting and enforcing the Pennsylvania Plant Pest Act of 1992. PDA Plant Inspectors are responsible for inspection of ash trees while evaluating nursery stock and regulating its movement. The PDA will include EAB surveys as part of its commitment to CAPS. As long as EAB detection survey remains part of the Bureau of Plant Industry's CAPS work component, the PDA will be required to conduct this survey work.

   The USDA APHIS PPQ is also involved in detection survey work, as part of their domestic activities.

   The DCNR Bureau of Forestry will conduct EAB surveys on public forested land containing ash, *Fraxinus* spp., trees. Sites include state parks, state game land, and state forest land. Public forest sites near nurseries or tree farms with ash, campgrounds, major transportation routes (including roadways, waterways, and airports), or areas where ash decline has been previously recorded will be considered priority survey areas.

DELIMITING SURVEY

1. **Purpose:** In the event EAB is detected, and a control/management program is to be initiated, it will be necessary to conduct a delimiting survey in order to define the extent/distribution of the infestation and determine what appropriate action will be taken. Data derived from the delimiting survey will dictate if control strategy will be to eradicate the infestation by removing and destroying all infested trees (small population scenario), or instituting a larger "concentric zone" approach (large population scenario).

2. **Agency Roles and Staffing:** A positive EAB find in Pennsylvania will result in a quarantine and a potential eradication project. These types of activities require a substantial manpower resource. In such an event, the USDA APHIS PPQ calls upon emergency response personnel. State agencies will likely contribute manpower as managers deem necessary, contingent upon the urgency of the situation. Factors such as infestation size, time of year, potential for movement into larger areas or for artificial spread, among others, must be considered before agencies can commit personnel. Lead agencies in an eradication project must be the regulatory agencies: the PDA and the USDA APHIS PPQ, but cooperating agencies will contribute personnel in proportion to the threat posed to their charges (i.e., the DCNR -Bureau of Forestry will enlist staff in the event of EAB infesting State Forest Land; the Bureau of State Parks will participate if an infestation affects a state park, etc.).

   PDA and USDA APHIS PPQ will delimit the area that needs to be surveyed for EAB once an initial detection is made. All land within a 1/2-mile radius of the initial find will be surveyed, with survey areas divided into 50-x-50-m or 100-x-100-m grids, depending on availability of participating agency personnel. Before surveys begin, lead agencies will

organize a training session for all participants comprised of information such as recognizing life stages of EAB, damage symptoms, identification of ash trees and similar plant species, description of the infested site and survey instructions, data collection protocols, and safety considerations. An Incident Command System group will be convened to organize survey logistics, which will include the State Plant Regulatory Official, the State Plant Health Director, a supply coordinator, a communications and transportation coordinator, a field survey coordinator, a data management coordinator, emergency medical technician(s), and a GIS specialist. Survey participants should be divided into teams in such a way that representatives from various agencies are present in each group. At least one person in each group should have tree identification skills, and one person should be familiar with operating GIS software and equipment. Once the infestation has been delimited, survey areas may need to be expanded as more EAB are found, and plans for removal of susceptible hosts within infestation zones (all ash within a 1/2-mile radius of each infested tree) will be implemented. Trees that are removed will be chipped and burned on site or at a nearby facility. Ash that can be utilized for timber would help to reduce the volume of material needing to be destroyed. Public notification procedures will be necessary if EAB is detected on private land.

REGULATORY COMPONENT

INTRODUCTION

The regulatory component supports the eradication effort by ensuring that EAB is not spread artificially by human activities. This section provides a general outline of the overall Regulatory component functions and activities.

REGULATORY AUTHORITIES

1. USDA APHIS PPQ – Plant Protection Act

   http://www.aphis.usda.gov/ppq/Ppa.pdf

2. The Federal Emerald Ash Borer (EAB) Quarantine, 7 CFR 301.53 provides the authority to conduct the regulatory activities in this plan.

   http://www.aphis.usda.gov/ppq/ep/eab/quarantine.html

3. Pennsylvania Department of Agriculture – Plant Pest Act – Authority to establish quarantines

   http://www.agriculture.state.pa.us/agriculture/lib/agriculture/legalreference/plantpestact.pdf

4. Regulatory Officials:

   State Plant Regulatory Official
   Walt Blosser
   Pennsylvania Department of Agriculture
   Bureau of Plant Industry, Division of Plant Protection
   2301 North Cameron Street
   Harrisburg, PA 17110
   (717)772-5205
   wblosser@state.pa.us

   State Plant Health Director
   Coanne O'Hern
   USDA APHIS PPQ
   401 E. Louther St., Suite 102
   Carlisle, PA 17013
   (717)241-2465 or (717)241-0705

REGULATED ARTICLES

1. The emerald ash borer (Coleoptera, Buprestidae, *Agrilus planipennis)* in any living stage of development.

2. Firewood (all hardwood species).

3. Nursery stock, green lumber, and other material living, dead, cut, or fallen including logs, stumps, roots, branches, and composted and uncomposted chips of ash, *Fraxinus* spp.

4. Any article, product, or means of conveyance when it is determined to present the risk of spread of the EAB.

GENERAL REGULATORY ACTIVITIES

Regulatory activities are directed to the implementation and enforcement of quarantine provisions governing movement of regulated articles (defined in section above) which could result in artificial spread of EAB. Typical activities include:

1. Identifying persons and establishments whose business or personal activities could result in the artificial spread of EAB. For example, but not limited to:

    - Nurseries
    - Landscapers and garden centers
    - Firewood dealers
    - Logging companies
    - Utilities companies
    - Tree removal companies
    - Tree pruning companies
    - Municipalities whose workers remove or trim trees
    - Yard waste removal firms
    - Campgrounds
    - Civil War Re-enactors

2. Contacting by telephone and/or personal visits to those identified persons or establishments to explain quarantine provisions.

3. Determining if provisions in the quarantine (e.g., treatment or processing) may be applied to permit the person or establishment to move regulated materials out of the quarantined area. If such provisions are applicable, enter into a formal Compliance Agreement with the person or establishment. The Compliance Agreement will stipulate the specific way ash materials must be handled by the person or establishment to meet the provisions of the quarantine.

4. Issuing limited permits (PPQ Form 530) to allow movement of regulated articles out of the quarantine area to a specific destination for further processing or treatment.

5. Issuing certificates (PPQ Form 540) to allow movement of regulated articles out of the quarantine area when they have been treated or processed in such a manner that they no longer present a risk of artificially spreading EAB.

6. Monitoring the activities of those persons or establishments placed under Compliance Agreement by overseeing treatments or other processes and activities.

7. Conducting and/or assisting with investigations of suspected violations of the quarantine as necessary and appropriate.

8. Recording information about contacts, visits, and Compliance Agreements and maintaining a database of persons or establishments affected by the quarantine.

9. Reporting results of regulatory activities to management officials on a weekly basis.

GENERAL CONSIDERATIONS - ASH TREE DISPOSAL ACTIVITIES

If the quarantined area is heavily infested and covers a large area as it does in Michigan and Canada, there may be thousands of dead and dying trees which may still be infested with eggs, larvae, or pupae of EAB. Municipalities, private tree companies, utilities, and private citizens will cut them down because they present a danger of falling, are unsightly, or because they simply want to eliminate a future problem from their landscape. This abundance of cut ash material within the quarantine area presents serious concerns about artificial spread of EAB. Because of the unique problems presented by the large number of trees being removed, special provisions need to be outlined which deal with regulating sanitation and disposal activities.

The eradication strategy also calls for the removal and disposal of substantial numbers of ash trees, both infested and noninfested, as a control measure. Regulatory and control personnel will work together to efficiently accomplish sanitation and disposal activities as necessary.

REGULATORY ASH TREE DISPOSAL ACTIVITIES

The focus of disposal activities will be to locate appropriate marshaling/collection sites and set up a system where municipalities, tree service companies (including those which may be under contract to the Eradication Program), utilities, and individuals can drop off cut ash material which will be further processed and disposed of in a manner to support program objectives to prevent artificial spread.

Designated marshaling locations will be required to meet certain size, security, operational, and accessibility criteria. Processing and disposal activities will be specified and supervised by regulatory personnel and will be consistent with those specified in the quarantine. Designated marshaling/collection locations may be contracted by the program or they may be provided by municipalities or other entities that are willing to cooperate with the activity. Marshaling locations, processing activities, and disposal activities will operate under contract, Memoranda of Understanding, and/or Compliance Agreements to ensure that stipulated activities are clear and consequences for noncompliance are known.

As part of good regulatory practices, marshaling yards will be only located within the quarantine area.

The following general disposal activities will be performed by regulatory personnel:

1. Develop general specifications for marshaling yards, processing activities, and disposal activities.

2. Supervise and monitor the operations of the marshaling yards.

3. Supervise and monitor grinding operations to ensure the chips are of the proper size as a product of the process.

4. Schedule and supervise the movement of the mobile grinders between the designated sites, as needed.

5. Schedule and supervise the movement of ground ash to approved disposal sites. This will include issuing Permits (PPQ Form 530) to truckers, if necessary.

6. Enter into compliance agreements with disposal sites to ensure that stipulated activities are clear and consequences for noncompliance are well known.

7. Monitor disposal activities at approved disposal sites. This will include verifying documentation of trucks arriving at the site and ensuring that regulated material is handled and disposed of properly.

8. Conduct or assist with investigations of suspected violations of specified procedures as necessary and appropriate.

9. Record information about contacts, visits, and compliance agreements and maintain a database of persons or establishments affected by the quarantine.

10. Report activities and results on a regular basis to EAB management officials.

REGULATORY INVESTIGATIONS AND VIOLATIONS

Regulatory incidents are movement of regulated articles by artificial means (firewood, nursery stock, logs, etc.) to areas not contiguous with the natural spread of the EAB. When regulated material is suspected to have been moved out of the regulated area in violation of the quarantine, regulatory personnel will conduct investigations to determine if a violation of the quarantine has occurred. Penalties for willful violations of the quarantine could result in civil or criminal prosecution with fines up to $20,000 under the Pennsylvania Plant Pest Act. These investigations will also attempt to identify and to trace (trace back and trace forward) the source and destination of any other related shipments of regulated materials that may have occurred.

- Trace back inspections will be conducted in an attempt to determine the source of the infestation. These inspections will begin at the epicenter of the infestation and work outward from there.

- Trace forward inspections will be conducted to determine if infested host material has been moved out of the regulated area. These inspections will start with the regulated establishments located in and/or conducting business within the regulated area.

Preliminary investigations by regulatory personnel will allow management to determine whether the situation warrants additional formal investigation by USDA APHIS, Investigation and Enforcement Services (IES) personnel. IES personnel have specialized law enforcement training and are authorized to take affidavits and to subpoena records. Formal investigations by IES could result in civil or criminal prosecution for interstate movement of regulated articles with fines up to $50,000.

QUARANTINE BOUNDARIES

Typically, entire counties are quarantined. However, a small, infested site discovered outside of current quarantine boundaries may not necessarily result in an entire county being quarantined. Under these conditions, a temporary quarantine may be established for the infested site in accordance with the federal Plant Protection Act 7 CFR 301.53-3 (b) while eradication activities are in progress. In areas undergoing eradication efforts or considered regulatory incidents, the township unit will be the smallest unit of area to be considered for quarantine purposes. Quarantined areas will be released following three consecutive years of negative survey. Release of the quarantined area will occur with the consensus of the cooperating regulatory agencies.

REGULATORY MANAGEMENT OF OUTLYING INFESTATIONS ("OUTLIERS")

Isolated infestations outside of the quarantined area are common occurrences in all eradication programs. These isolated infestations generally represent artificial spread of EAB from the movement of infested articles from the infested area either before or after that area was placed under quarantine.

Regulatory management of outlying infestations will be handled using the following procedures:

1. Upon confirmation by a USDA EAB identifier and with consensus of the cooperating regulatory agencies, a temporary quarantine will be established immediately surrounding the infested area. The quarantined area will consist of a minimum unit area equal to one township and may be adjusted based on additional survey information.

2. A delimiting survey will be initiated as soon as possible to establish the area of impact.

3. Provisions of the temporary quarantine will be the same as those established in the formal quarantine. Newspapers and direct mailings will be used to notify those within the established area that a temporary quarantine is in effect.

4. Ash trees known to be infested and all ash trees within 800 meters (1/2 mile) of the outermost evidence of infestation regardless of whether they are showing symptoms of infestation will be cut down and processed as if they were infested*.

   *Eight hundred (800) meters (1/2 mile) is the assumed distance that an infestation would spread in one year given abundant nearby host trees. Removal of surrounding trees is necessary because existing visual survey techniques are generally limited to detecting only trees manifesting D-shaped exit holes or bark splits through which serpentine galleries are visible. When these symptoms are found on a tree, the infestation has been present for one year or more.

5. If timing and other factors (i.e., adult emergence) cause a delay in the control action, the infested area may be treated with an appropriate program-approved treatment for containment purposes, or other program-approved containment strategies, until such time as eradication actions can commence.

6. If the cause of the outlying infestation is not readily determined, regulatory/survey personnel will contact homeowners and businesses within the local area of the infested tree to attempt to determine its source. A specific interview form will be developed and used for this purpose. All data will be computerized so that it can be further analyzed.

REPORTS FOR REGULATORY ACTIVITIES

The regulatory program will establish a computerized database for regulatory personnel to use. All data related to regulatory activities will be submitted daily. The greatest possible use will be made of electronic data collection devices in the field such as laptop computers or palm pilots to promote speed and accuracy in submitting data.

Regulatory personnel will use the database to record information such as:

1. Date of visit
2. Purpose of visit (routine, investigation, monitoring)
3. GPS coordinates of the business site
4. Name and address of person or establishment contacted
5. Phone, fax, e-mail of establishment
6. Type of business
7. Compliance Agreement number (if applicable)
8. Actions taken/needed.

Weekly status reports will be made by regulatory personnel to EAB management officials summarizing their activities and highlighting immediate or developing problems.

CONTROL COMPONENT

INTRODUCTION

An EAB eradication/suppression program will be initiated should this insect be detected in Pennsylvania. The proactive survey and outreach programs of the Task Force (TF) members should provide an opportunity to detect EAB sufficiently early that an eradication program will be feasible. Any recommendation to switch from eradication to suppression tactics should be agreed upon by all TF members.

IDENTIFYING PROPERTY OWNERS

TF members will contact county assessment/GIS offices to obtain names and parcel locations of all landowners whose properties are within a 1/2-mile radius of the EAB-infested tree (or such a list may already be available from the survey section). Affected parties will be contacted (telephone or mail) and provided with information on EAB and responsibilities of the TF; also include an individual's name and telephone and e-mail contact information. Staff in charge of control and regulatory activities will schedule a meeting with the affected landowners to explain the EAB eradication program. Points to cover at the meeting:

- Regulatory authority of PDA and USDA
- Brief history of EAB in the U.S.
- Economic importance of EAB in North America
- Life cycle of EAB—brief
- Eradication strategy to be followed
- Importance of early detection/rapid response
- Federal and state plant pest acts, treatment orders, etc.
- Anticipation of questions - "How do you know this strategy will work?", "Will I be reimbursed for my landscape and/or wild trees?"
- Timetable of the removal and destruction (R & D) activities
- Delivery of pertinent outreach material

CONTROL OPERATIONS

1. **Initiation of Control Activities:** Initial R & D of trees will begin at the location of the infested tree and extend for a 1/2-mile radius. The GIS specialist with PDA will provide aerial maps that show the 1/2-mile radius R & D zone. Whenever another EAB-infested ash tree is found, a new 1/2-mile radius R & D zone will be established.

2. **Verification of Ash Trees in the Removal & Destruction Zone:** Staff from TF agencies (plant inspectors, entomologists, foresters, etc.) will identify and mark condemned ash trees (paint or flagging tape on the trunk at breast height). GPS coordinates will be recorded for each ash tree or group of ash trees, where practicable, found within the 1/2-mile-radius buffer area. An aerial map showing locations of all ash trees within the R & D zone will be prepared and shared with any contractors who may be involved.

3. **R & D Activity:** All ash trees within a 1/2-mile radius of an EAB-infested tree will be R & D. All tree parts one inch diameter and greater will be seized by regulatory officials and taken to a designated marshaling site and chipped to a specific size. This work will be contracted to one or more tree service companies. TF members will verify that the correct trees have been R & D and maintain records of daily progress.

4. **Neutralizing of Ash Stumps:** Wherever ash trees are felled, the stump should be cut as close to the ground as possible. Herbicides will be used to kill the stump.

5. **Sentinel Ash Saplings and Sprouts:** A few ash stumps will not be treated with herbicide, but instead will serve as sentinel sites. The stumps will produce new sprouts that will serve as a sentinel. Leaves can be checked for presence of adult EAB feeding damage. A few ash saplings < 1 inch DBH also can remain as sentinel plants.

6. **Sentinel Ash Trees:** Uninfested ash trap trees within the control area may be deliberately damaged in such a way (e.g., girdled) so they attract EAB adults seeking egg-laying sites. After the damaged trees have become infested, they are to be removed and destroyed, killing the life stages present.

7. **Timing of R & D of Infested Ash Trees:** R & D of infested ash trees should begin immediately when there is no danger of EAB adult emergence. If adult emergence is imminent, then R & D will be delayed until mating and oviposition have occurred. Infested ash trees in areas where the control strategy calls for EAB population suppression rather than eradication may be left standing for one year. This is because a lightly infested ash tree, if left standing, can act as a "sink" to attract additional oviposition and reinfestation by EAB. Timing the removal of these trees to coincide with their heaviest infestation can result in the elimination of large numbers of EAB larvae. Infested trees left standing for this purpose will be cut down in the fall, winter, or early spring prior to adult emergence. Noninfested ash trees being removed to eliminate host material may be removed at any time of the year. Noninfested trees could be R & D along with infested trees at the appropriate time for the sake of efficiency and any potential uncertainty about a tree's status of infestation.

8. **Contracting for Tree Removal:** Tree removal will be contracted to certified arborists in the private sector. Companies under contract with APHIS or a cooperating state agency will remove trees under the supervision of regulatory/survey/control program personnel. Contract specifications will include requirements for tree chipping and stump R & D in accordance with eradication program requirements. Ash logs that can be utilized for wood products (lumber, railroad ties, pulpwood, etc.) can be addressed in contract specifications with the tree removal vendors, contractors, and affected landowners. All contractors will be notified that they are prohibited from selling any felled ash trees as firewood or taking the wood for personal use.
9. **Recordkeeping:** TF members will record the daily numbers of ash trees R & D in the control program. Other data to be recorded will include date, locality, GPS coordinates, dbh, height of tree, and method of destruction.

PROCEDURES FOR PESTICIDE TREATMENTS

1. **Treatment of Ash Trees With Insecticides:** EAB adults are the reproductive and dispersal life stage of the pest. Registered insecticides may be applied, when approved, from ground equipment on certain occasions to reduce EAB populations or to prevent further dispersal. Environmental and community considerations will dictate the use of this control measure.

   Selective treatment of infested trees may be done in certain zones where tree removal is impractical and where treatment measures are appropriate to prevent population buildup. Also, selective treatment may be done on noninfested trees proximal to an infested site in the outer zones. Treatment of non-infested trees would be done only after infested trees and those immediately adjacent neighboring trees had been removed. TF members would be responsible for supervising and approving the activities of contract personnel who do the actual work.

2. **General Considerations for Insecticide Treatments:** At this time available chemical treatments are not considered effective enough to substitute for tree removal as an eradication measure. Consequently, until the effectiveness of chemical treatments for eradication can be established, they will only be used for program-approved applications and as a last resort.

3. **Authority to Apply Insecticides to Trees on Public and Private Property:** State and federal laws governing the authority to enter and apply insecticides on public and private property will be reviewed, and such actions will be in keeping with the authorities prescribed by statute.

4. **Identification of Trees and Notification to Property Owner:** When individual trees at a specific site are to be treated, control personnel will identify the trees selected for insecticide treatments by marking the trunk with paint or flagging tape. A sketch map of the area showing the trees in relation to fixed reference points will be drawn. GPS coordinates for each tree to be treated will be recorded on the map. Property owners will be provided written notice either by mail or by direct delivery and oral notification which provide the explanation for the action and a contact number where further information can be obtained. The Pennsylvania Pesticide Hypersensitivity Registry will be checked to determine whether any pesticide-sensitive people must be notified.

5. **Timing of Insecticide Applications:** Program-approved insecticides will be applied according to the label recommendations and as prescribed by a land grant university authorized to develop suggestions or a specialist familiar with EAB control.

6. **Contracting for Pesticide Applications:** Pesticide applications may be contracted to private companies by the eradication program. Companies under contract with APHIS or a cooperating state agency for this purpose will be properly licensed and will apply pesticides under the supervision of regulatory or survey program personnel. Contract specifications will include licensing requirements and application procedures in accordance with the insecticide specimen label and eradication program requirements.

7. **Data Management and Reporting for Control Activities:** The control program either will establish a database or use the one developed by the survey section. All data related to tree treatment and tree removal will be submitted daily. Where possible, laptop computers will be used to promote speed and accuracy in submitting data.

   Control personnel will use the database to record specific data related to tree removal or pesticide treatment to include:

   a. Date and time of activity
   b. Type of activity (tree removal, pesticide treatment, etc.)
   c. If treatment, type performed, chemical used (Mauget, soil treatment, bark spray, etc.), rate applied, and method of application
   d. If treatment, amount of chemical applied
   e. Location of host material (street address or GPS coordinates)
   f. DBH of the tree
   g. Property owner name, address, and phone number
   h. Contractor name conducting the treatment or removal
   i. Temperature
   j. Weather conditions
   k. Name of inspector supervising treatment

ASH UTILIZATION, SILVICULTURE, AND FOREST STEWARDSHIP

1. Introduction: The DCNR Bureau of Forestry will work with the PDA, USDA APHIS PPQ, and USDA Forest Service to develop programs to reduce the ash component in private and state-owned forest lands prior to infestation. The Forest Stewardship program is available to develop land management programs with private forest land owners. In addition, the Rural and Community Forestry Section of the DCNR Bureau of Forestry will work with urban foresters to diversify plantings in urban forests and help to coordinate inventories of city-owned trees. After EAB is detected in an area, reducing the amount of ash material that needs to be destroyed will be a priority.

2. Prior to infestation: Landowners should consider reducing ash abundance to minimize EAB impacts prior to infestation. Ash should make up no more than 10 to 25 percent of the basal area (in a mature forest this is approximately 5 to 10 large trees per acre). Non-commercial ash trees that are in poor health can be cut and left in the woods, as decaying ash will not be suitable for EAB reproduction. Waiting until EAB infests a forest will limit marketing options due to the imposition of quarantines. Private landowners can contact DCNR Bureau of Forestry Service Foresters to assist them with the development of a management plan.

On State Forest lands, ash stems of poor quality and vigor should be harvested. High quality, healthy stems should be maintained and managed. The forest stand should be managed so that ash makes up no more than 10 to 25 percent of the basal area. Do not completely remove ash from the stand. Harvesting should continue the reduction of the ash component while encouraging a few vigorous ash stems of good form to maintain diversity

and to provide a seed source for the future. Healthy ash trees are better able to withstand an attack by a single or few beetles, but unhealthy trees easily succumb to a beetle attack.

3. **After EAB is Detected:** Once EAB is detected in an area, reducing the volume of ash wood that needs to be destroyed will significantly reduce the cost of eradication and control. On-site portable saw mills or log de-barkers can be employed to remove bark and about one inch of the outside portion of the log. Once the infested portion of the tree is removed, ash logs could then be moved outside the quarantine zone under a compliance agreement with the USDA and PDA.

   On private and public forest lands, merchantable ash including pulpwood and saw-timber size trees could be sold to reduce the economic impact of EAB to the landowner. DCNR can assist landowners to find markets for ash.

   Under no circumstances should firewood be moved from an infested site.

PUBLIC OUTREACH COMPONENT

INTRODUCTION

The public outreach component supports the EAB action plan by providing information services which increase public awareness, understanding, and support for the program. Increased public awareness and understanding enhance the effectiveness of detection survey efforts, help to prevent adverse public reaction to control efforts, and promote compliance with regulations. This section provides a general outline of the overall public outreach component functions and activities. The outreach component will provide multiple sources of contact to work cooperatively with federal, state, and local authorities, industry groups, community groups, and others to establish and convey a consistent message.

GENERAL OUTREACH OBJECTIVES

1. Coordinate outreach efforts among cooperators to ensure that the program has a consistent message.

    a. Establish a Pennsylvania EAB outreach committee with membership from state, federal, private, and PSU Cooperative Extension partners.

        - Identify roles and responsibility—individually and as a whole
        - Identify policies and procedures for releasing information to the public and stakeholders such as professional landscapers and arborists, the lumber and wood industry, nursery owners, environmental organizations, and any other group who may be economically impacted by the program.
        - Address financial responsibilities for outreach activities.

2. Develop outreach materials to meet various programs needs and reach various audiences.

    a. The public outreach staff will work with the PA EAB Task Force to identify areas or activities where outreach materials are needed and develop informational materials to meet those needs.

        Priorities:

        - Identify target audiences
        - Identify commonly ask questions and develop appropriate, consistent responses
        - Identify key messages for all program initiatives; don't move firewood, examine your trees, know state and federal quarantines/regulations, etc.

3. Deliver outreach materials through a variety of outlets to ensure widest exposure.

    a. Create a marketing mix using mainstream media to reach targeted audiences—television, radio, internet, outdoor-, recreational-, newspaper-, and industry publications.

b. Network with the PA EAB Task Force and other groups to support the program's communication to specialized target audiences through industry newsletters, website links, and association meetings.
c. Deliver education information on the EAB to stakeholders and the public at country fairs, home and garden shows, regional association meetings, chamber of commerce events, etc.
d. Create PowerPoint presentations on various EAB messages.

GENERAL OUTREACH ACTIVITIES AND INITIATIVES

1. Maintain a website in the Department of Entomology at the Pennsylvania State University to provide access to current information on EAB. Coordinate with pubic outreach efforts in Michigan, Ohio, and Indiana.

    a. Establish policies and procedures for placing information on the website.
    b. Ensure links are in place from other related websites (cooperators) (Appendix 4).
    c. Ensure that the PA EAB Task Force website incorporates all cooperator logos.

2. Plan for a toll-free EAB hotline staffed by trained and knowledgeable personnel who can answer questions about EAB and for establishing a tracking mechanism of public EAB inquiries.

3. Catalogue and review existing informational materials (brochures, posters, pest alerts) to prevent duplication of effort and to ensure consistency.

4. Develop public service announcements and arrange for broadcast on radio and/or television as needed.

5. Arrange, moderate, and provide presentations and audiovisual support at public meetings.

6. Choose some specialized communication vehicles (magnets, tattoos, stickers, door knob hangers, etc.) to support EAB awareness.

7. Continually refine and develop communication vehicles (brochures, posters, newsletters, etc.) to ensure accuracy and current program information.

8. Develop news releases for mainstream and ethnic media.

9. Public announcement in the state park campsite reservation system (EAB and firewood).

PUBLIC MEETINGS

Public meetings will take place where management efforts such as ash tree removal or pesticide treatments will have an impact on a community. The purpose of these meetings will be to address public concerns and secure community support for EAB management activities.

Outreach personnel will coordinate scheduling and facilities and ensure that public meeting notifications are posted in appropriate newspapers and other media outlets. Handouts, fact sheets, informational posters, and other outreach materials should be available at these meetings.

Public meetings will include the following:

1. A federal moderator who can ensure the orderly conduct of the meeting and direct questions to the appropriate person(s) for response.

2. Political representatives and community leaders who are recognized by the local community.

3. State, federal, and PSU Cooperative Extension program representatives who can respond to questions about EAB, quarantine restrictions, control measures, and community impact.

MEDIA AND COMMUNITY RELATIONS

The PA EAB TF will identify an individual from each participating or cooperating agency as a media and community relations spokesperson to maintain contact with the media and involved community groups. The spokespersons will develop and maintain contacts with each other, reporters and community group leaders. A representative from the PA EAB outreach committee will be designated to keep in touch with outreach personnel in Michigan, Ohio, Indiana, Maryland and Virginia to provide accurate and consistent information.

STAKEHOLDERS

The following organizations and agencies are examples that may be affected by EAB and will be kept informed about EAB activities and asked to participate in program activities.

Pennsylvania Invasive Species Council
Pennsylvania Landscape and Nursery Association
Local governments (County, City, Borough, Township)
Pennsylvania Campgrounds Association
Sawmills
Utility companies
Arborists
Tree care companies
Arboreta (e.g. Morris Arboretum)
The Nature Conservancy
Fairmount Park Commission
Longwood Gardens
PA Forest Products Association
PA Hardwoods Development Council
PA Urban and Community Forestry Council
Woodlands Owners Associations

Conservation Districts
Watershed Councils
International Society of Arboriculture, Penn-Del Chapter

DATA MANAGEMENT COMPONENT

INTRODUCTION

This component will ensure that all data gathered by the program is rapidly entered into a standardized format and is readily available for analysis. Further, we intend that this database will be flexible enough to expand as the needs of the program expand.

Data should be recorded onto paper forms that are to be copied on a weekly basis and sent to the point of contact (below) on a weekly basis for entry into the USFS EAB Access database. Agencies may also choose to collect data into ArcPad software using Pocket PC's. However, agencies that use this method are responsible for submitting data collected in this manner to the USFS in a form that is compatible with the current database.

POINT OF CONTACT

Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry, Division of Forest Pest Management
208 Airport Drive, 2nd Floor
Middletown, PA 17057-5030
717-948-3941
717-948-3957 Fax

STANDARDIZED SURVEY PROTOCOL

EAB Trap Tree Data Fields:
Data fields to be collected (whether on paper or using electronic forms) are as follows:
1. Observer: (First Initial + Last Name)
2. Organization: PA DCNR BOF-FPM, USDA APHIS, PDA, or OTHER
3. Site Name
4. Land Manager: (Name and Phone Number)
5. Ownership (PENN DOT, PA TURNPIKE, STATE PARK, STATE FOREST, STATE GAME LAND, PRIVATE, MUNICIPAL, FEDERAL, OTHER)
6. Land Use: ROADSIDE, RECREATION, FOREST, STREET-TREE, LANDFILL, RESIDENCE, WOODLOT, OTHER
7. County
8. Township
9. Ash Density: SINGLE, FEW, STAND
10. Tree Latitude: (Decimal Degrees, NAD 93) (Take using GPS unit)
11. Tree Longitude: (Decimal Degrees, NAD 93)
12. Ash Species (GREEN, WHITE, BLACK, UNKNOWN)
13. Tree DBH
14. Tree Location: (OPEN, HEDGEROW, EDGE, CLOSED CANOPY)
15. Tree Tag #: (EAB-TT-sequential#-mm/dd/yyyy)
16. Girdle Date: (mm/dd/yyyy)
17. Evaluation Date: (mm/dd/yyyy)

18. Evaluation Time: (minutes)
19. EAB Adults: Indicate number collected during inspection
20. EAB Larvae: Indicate number collected during inspection
21. D-Holes: Indicated number of adult emergence holes observed
22. S-Galleries: Indicate if serpentine larval galleries were observed
23. Bark cracks: Indicate if bark cracks due to EAB larvae were observed
24. Other Borer Adults: List, if present
25. Other Borer Larvae: List if present (collect if unknown species).
26. Comments: If possible, specify distance and azimuth to nearest fixed landmark.

EAB Visual Survey Data Fields:
Data fields to be collected (whether on paper or using electronic forms) are as follows:
1. Observer: (First Initial + Last Name)
2. Organization: PA DCNR BOF-FPM, USDA APHIS, PDA, or OTHER
3. Site Name: (include street address if applicable)
4. Ownership (PENN DOT, PA TURNPIKE, STATE PARK, STATE FOREST, STATE GAME LAND, PRIVATE, MUNICIPAL, FEDERAL, OTHER)
5. Land Use: ROADSIDE, RECREATION, FOREST, STREET-TREE, LANDFILL, RESIDENCE, WOODLOT, OTHER
6. County
7. Township:
8. Ash Density: SINGLE, FEW, STAND
9. Estimated Acres Surveyed
10. Ash Species (GREEN, WHITE, BLACK, UNKNOWN)
11. DBH Class: 1-5", 6-10", 11-15", >15"
13. Tree Health: (Healthy, Branch Dieback, Epicormics, Yellow Leaves, Dead)*
14. EAB Signs: Please note that this section is just for EAB damage, and not insect damage or symptoms in general, or even for damage similar to that of EAB. (N=None, D=D-holes, S=S-galleries, B=Bark Splits)*
15. EAB Adults: Indicate number collected during inspection
16. EAB Larvae: Indicate number collected during inspection
17. Woodpecker Damage: Yes or No
18. If Suspect Tree, Latitude: (Decimal Degrees, NAD 93) (Take using GPS unit**)
19. If Suspect Tree, Longitude: (Decimal Degrees, NAD 93)
20. Comments: (list other borer adults, larvae if present, etc.)
* Record all that apply, circle most prevalent.
**GPS, Tag and Flag all EAB suspect trees for confirmation.

CENTRALIZED DATABASE
Visual and trap tree survey data for a summer should be submitted to the State Survey Coordinator each month so that summaries can be compiled by November 1 of the survey year. The original copies of data sheets or Access database should also be archived and retained by the surveyor. The state coordinator will collate the data and submit it to the USDA Forest Service, Morgantown Field Office. Data will be submitted in MDB format (i.e., Microsoft Access).

Copies of the USFS form of the visual and trap tree entry forms can be viewed at:
http://www.fs.fed.us/na/morgantown/fhp/eab/eabhcf.pdf

The state EAB data coordinator is:

Shahla M. Werner, Ph.D., Forest Entomologist
Pennsylvania Department of Conservation & Natural Resources
Bureau of Forestry, Division of Forest Pest Management
208 Airport Drive, Second Floor
Middletown, PA 17057-5030
717-948-3941
717-948-3957 Fax
shawerner@state.pa.us

The state coordinator will send the data to:

Helen A. Butalla
USDA Forest Service
180 Canfield Street
Morgantown, WV 26505
304-285-1548
304-285-1505 Fax
hbutalla@fs.fed.us

NAPIS

All suspected specimens of EAB will be forwarded to the USDA APHIS PPQ Local Area Identifier for preliminary confirmation, accompanied by PPQ Form 391. The Area Identifier will retain any EAB he identifies, and will notify the USDA APHIS PPQ Pest Survey Specialist of positives. The Pest Survey Specialist will then contact the individual at the Pennsylvania Department of Agriculture who is responsible for entering data into NAPIS, as well as appropriate people at the USDA Eastern Region Headquarters in Raleigh, North Carolina. New state and county positive identification records must be reported in NAPIS within 48 hours of verification. Negative survey data must be submitted to NAPIS by December 1 of each year.

The Local Area Identifier is:

Frank Salantri
USDA APHIS PPQ
PNBC Building 6, Suite 320
4900 South Broad Street
Philadelphia, PA 19112
215-334-0300, Extension 16
fjsalantri@aphis.usda.gov

The Pest Survey Specialist is:

Stephen W. Bullington, Ph.D.
USDA APHIS PPQ
401 East Louther Street, Suite 102

Carlisle, PA 17013
717-241-2465, Extension 23
717-241-0718 Fax
stephen.w.bullington@aphis.usda.gov

The individual at the Pennsylvania Department of Agriculture who handles NAPIS data entry is:

James Stimmel
Pennsylvania Department of Agriculture
Bureau of Plant Industry
2301 North Cameron Street
Harrisburg, PA 17110-9408
717-772-5228
717-705-6518 Fax
jstimmel@state.pa.us

Data elements needed to complete a NAPIS record are listed below:

1. Observation number (generated by person entering the data)—required
2. Observation date—required
3. Data source (organization)—required
4. State/county—required
5. Type of site (forest, urban, etc.)—required
6. Life stage of host—optional
7. Situation (detection or delimiting survey?)—required
8. GPS coordinates—optional, but we count as required
9. Name of pest—required
10. Life stage of pest—conditional (only if pests are found)
11. Pest status (designated by person entering data)—required
12. Survey method (visual, trap tree, etc.)—required
13. Quantification (number of pests seen or caught)—conditional
14. Descriptor units (designated by person entering data)—required
15. Total units checked—optional
16. Number of positive units—conditional
17. Duration of observation—optional
18. Diagnostic lab—optional
19. Confirmation method—optional

Data and information will go into the USDA Forest Service Database as well. The U. S. Forest Service database contains the following:

RESTORATION COMPONENT

The DCNR Bureau of Forestry will coordinate federal and state funding for restoration of urban sites. USDA Forest Service funding is currently used in the Urban Forestry Program for planting of trees. Restoration programs in Michigan and Ohio will be examined to help develop a restoration program in Pennsylvania. Key participants in this program will be the Rural and Community Forestry Section in the DCNR Bureau of Forestry, the Pennsylvania Urban and Community Forestry Council and the USDA Forest Service.

The Ohio State University Extension Bulletin 924 (2005), Ash Replacements for Urban and Woodland Plantings, is an excellent reference for identifying tree species that can be used to replace ash or be used in future plantings.

EAB INCIDENT COMMAND SYSTEM

A) EAB Task Force Incident Command/Planning Staff

1. Purpose: The EAB TF incident command (IC)/planning staff will coordinate the overall response, follow the developed action plan, and serve as final authority on all activities and decisions.

2. Command Staff:

a. Incident Commander(s)

   1) Pennsylvania Department of Agriculture, Bureau of Plant Industry, State Plant Regulatory Official (PDA, BPI, SPRO)
   2) U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, State Plant Health Director (USDA APHIS PPQ, SPHD)

b. Liaison – Emergency Plan Liaison Officer (EPLO)
c. Safety Officer
d. Science & Technology Team(s)
e. Public Information Team

3. Planning Members:

a. PDA BPI, SPRO
b. USDA APHIS PPQ, SPHD
c. USDA APHIS PPQ, Pest Survey Specialist
d. Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry (DCNR BOF), Division of Forest Pest Management, Chief
e. DCNR BOF, Division of Forest Pest Management, Forest Entomologist
f. PDA BPI, Division of Plant Protection, Chief
g. PDA BPI, Division of Health and Safety, Chief
h. PDA BPI, Survey Entomologist
i. USDA Forest Service, Forest Health Protection (USDA FS)
j. Pennsylvania State University (PSU), Cooperative Extension, Department of Entomology
k. Team Leaders as needed:

   1) Public Information
   2) Operations
   3) Logistics
   4) Administration/Finance

l. Others as determined by the Incident Commander(s)

4. Tasks:

a. The Incident Commander(s) will:

- Upon official verification of an EAB detection, convene a meeting of the TF incident command/planning staff
- Appoint individual team leaders to coordinate efforts on each team and to serve as TF planning members.
- Have overall command of the incident

b. The Task Force Command Staff and Planning Members will:

- Make the decision to initiate the action plan
- Assess pest risk and determine the appropriate response method and approve a response plan
- Mobilize teams as needed
- Initiate appropriate state and federal quarantines
- Assign actions to be taken by team leaders
- Coordinate and approve all team activities
- Resolve issues not easily addressed by any team

B) Public Information Team:

1. Purpose: The public information team will develop a strategy to release information, serve as spokesperson, issue press releases, advisories, and otherwise manage media and public relations as directed by the command/planning staff. This team will also develop and deliver educational programs to help the public understand prevention and detection and control mechanisms for EAB.

2. Members:

a. PDA, Public Information Officer
b. USDA APHIS PPQ
c. PA DCNR, Public Information Officer
d. USDA FS, Information, Management and Analysis Group
e. PSU Cooperative Extension, Department of Entomology
f. Others as determined by incident and team

3. Tasks:

- All agencies will collaborate to communicate accurate information quickly and broadly in a manner that supports the prevention, identification and control of a possible infestation.
- Upon direction from the incident commander(s), will convene and determine the appropriate communication strategy that will be made a component of the incident action plan and may include consideration of targeted audiences and approval mechanisms.
- Spokespersons will be chosen by each agency and will serve throughout the entire event in order to provide continuity.

- Spokespersons will be members of the communications group and approved by the incident commander(s).
- The team will also provide assistance with drafting press release(s) for local government and provide local support as needed.
- The team will coordinate activities with technical experts to ensure their availability to assist in press briefings when needed.
- This team will apprise cooperating agencies, legislative liaisons, department secretaries and appropriate directors of all activities as appropriate.
- The incident commander(s) will review press releases issued by the state.
- The need for press conferences will be determined by the communications group and approved by the incident commander(s).

C) Operations Team

1. Purpose: The operations team will implement the "on the ground" management of an EAB incident. This team will be responsible for field operations to determine the scope of the infestation, implement management options (including quarantines if necessary), conduct follow up assessments and restore impacted areas. As field operations are implemented, the team will provide information to the incident command / planning staff and the logistics and administration/finance teams. Members of the team will receive direction from the incident command/planning staff and work closely with the logistics and administration/finance teams.

2. Members:

a. PDA BPI, Division of Plant Protection, Survey Entomologist
b. PA DCNR BOF, Forest Pest Management, Forest Entomologist
c. PA DCNR BOF, Forest Pest Management, Field Operations Supervisor
d. USDA APHIS PPQ: SPHD, Domestic Program Coordinator, and Pest Survey Specialist
e. PA DCNR BOF, District Foresters or staff
f. Adjunct Members may include representatives from:

1) PDA BPI, Health and Safety Division
2) PA DCNR Bureau of State Parks
3) Pennsylvania Department of Environmental Protection (DEP): Permitting
4) USDA Forest Service
5) State and local government permitting and review agencies
6) Local, municipal and community groups (police, EMT etc.)
7) Pennsylvania Landscape and Nursery Association
8) International Society of Arboriculture Penn-Del Chapter
9) Pennsylvania Game Commission
10) PA Department of Transportation
11) Forest Products Association

3. Tasks: Upon direction from the incident commander(s), the team will convene and determine the appropriate response action including:

- Delimit the scope of the infestation
- Conduct trace-back surveys to determine source of infestation
- Develop and implement survey methodologies
- Conduct evaluation surveys
- Implement management and quarantine options
- Conduct follow-up surveys
- Implement restoration efforts
- Inform incident commander(s) of survey results
- Coordinate with logistics and administration/finance team the scope of activities and need for resources, funding and permits
- Make daily reports to the incident commander

D) Logistics Team

1. Purpose: The logistics team shall obtain appropriate resources and conduct proper administrative management of the technical aspects of the incident response. As planning and finance activities occur, the team will provide information to the incident commander, operations team, administration /finance team and joint information team.

2. Members:

a. PDA BPI, Chief, Plant Protection Division
b. PDA BPI, Chief, Agronomic and Regional Services Division
c. PA DCNR BOF, Chief, Forest Pest Management
d. Representative of the operations team
e. Representative of the public information team
f. Adjunct members include representatives of:
   1) Pennsylvania DEP
   2) PDA BPI, Health and Safety Division
   3) Local jurisdiction park & planning
g. Municipal government or community organization (township where EAB infestation occurs)
h. Others the team leader feels are needed, potentially including but not limited to, individuals from the represented organizations that have needed expertise/capability.

3. Tasks: Once informed of an incident, the logistics team will consult with the incident commander(s) and the operations team and others to evaluate and assess the scope of the event and together develop the incident action plan. Within the incident action plan there will be the following tasks and responsibilities for the logistics team. Each of these responsibilities is carried out in consultation with and in coordination with the operations team and others within the structure of the incident command system.

a. Assessment and monitoring:

   - Continually monitor and be aware of scope and severity of the situation.
   - Review monitoring data and monitoring effort needed.

b. Determine the amount and type of response effort needed including:

- Type and amount of material, equipment and services
- Personnel resources, including capabilities/expertise and amount of workers or person hours needed.
- Interface with landowners, other agencies, legislature, municipalities and general public as necessary.
- Permits and environmental requirements.
- Lodging, transportation and travel approval.

c. Make daily reports to the incident commander.

E) Administration/Finance Team

1. Purpose: conduct proper administrative management of the legal and fiscal aspects of the incident response. This team is responsible for budget and financial management.

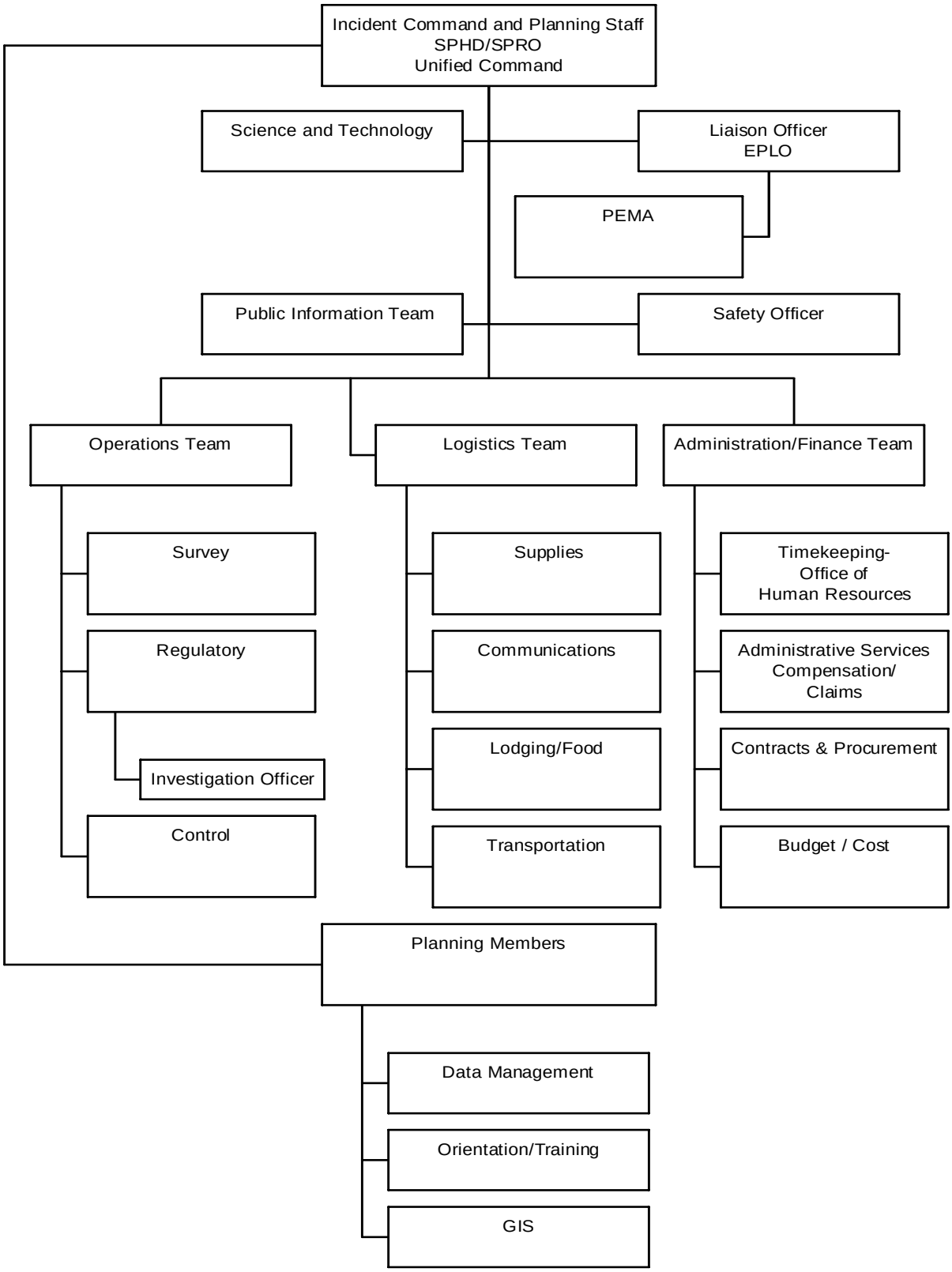
2. Members:

a. PDA, Bureau of Administrative Services
b. PDA BPI, Bureau Director
c. PDA BPI, Division of Plant Protection, Chief
d. PDA BPI, Division of Agronomic/Regional Programs, Chief
e. PDA BPI, CAPS Coordinator
f. USDA APHIS PPQ, SPHD

3. Tasks:

- Closely monitor and manage expenditures and available resources.
- Anticipate future resource needs.
- Keep the incident commander(s) apprised of current financial and resource status.
- Make contacts – reference grant/funding availability and requirements
- Write grants
- Satisfy NEPA requirements and deadlines
- Provide logistics for obtaining environmental permits
- Satisfy grant reporting requirements
- Work with PDA contracts and procurement to procure necessary supplies and services.
- Writing commodity or service contract specifications.
- Make daily reports to the incident commander

Emergency Response Organization Chart



FUNDING COMPONENT

Introduction

When the emerald ash borer is detected and confirmed in Pennsylvania the U.S. Secretary of Agriculture would declare an extraordinary emergency allowing the establishment of an emerald ash borer emergency program in Pennsylvania with supportive funding and personnel. Currently, state and federal agencies within Pennsylvania receive funding from USDA to conduct surveys for EAB and to implement public education and outreach programs.

Surveys

Currently, the PDA receives funding from USDA under the Cooperative Agricultural Pest Survey Program (CAPS) to conduct detection surveys in nurseries, garden centers, greenhouses, Christmas tree farms, orchards and on other private lands.

The USDA APHIS PPQ office in Pennsylvania receives survey funding from USDA for surveys on private lands in counties such as campgrounds, parks, cemeteries, industry, and ports of entry.

The DCNR Bureau of Forestry receives funding from the USDA Forest Service under the Cooperative Forest Health Protection program to conduct forest surveys on state forest lands, state parks, and state game commission lands.

Public Outreach and Education

Both the PDA and DCNR Bureau of Forestry receive funds from USDA for public outreach and education, such as brochures, poster displays, identification kits, telephone hotline.

Management and Control

Eradication and control funding would be provided to the PDA through cooperative agreement funds with the USDA APHIS PPQ.

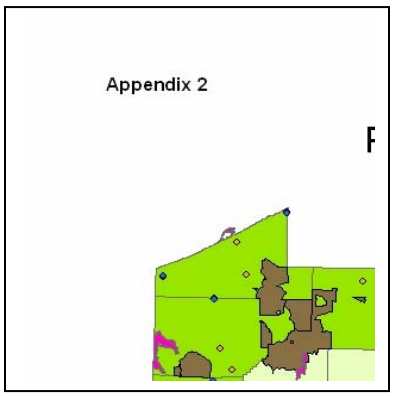
Restoration

Restoration funding would be provided to DCNR Bureau of Forestry and the PA Urban and Community Forestry Council from the USDA Forest Service for planting trees in urban environments.

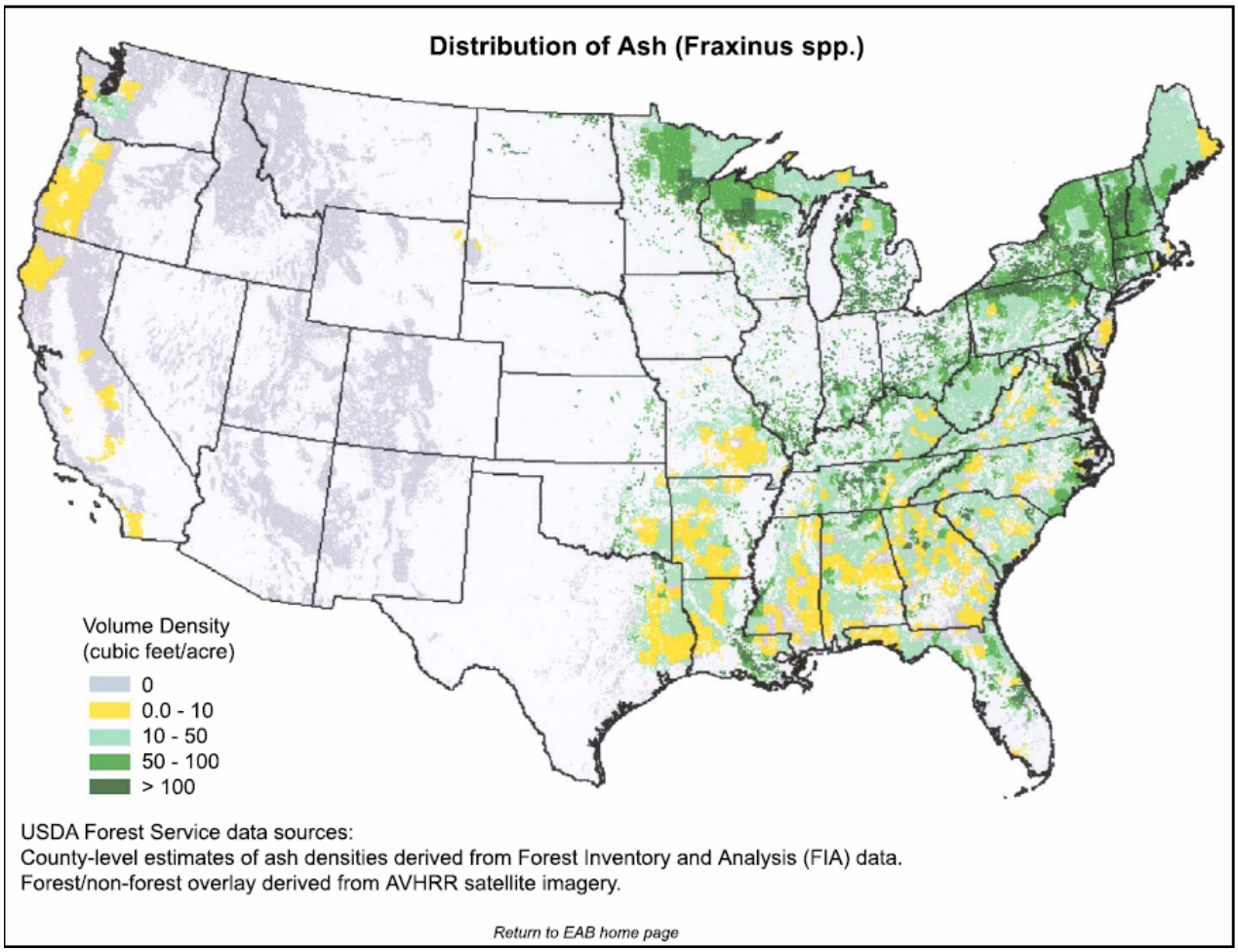
The State Legislature in Pennsylvania and the Governor’s Office would be informed of the threat and may appropriate additional funds for survey, control, and public outreach.

APPENDICES

APPENDIX 1. - PA Emerald Ash Borer Risk Map



APPENDIX 2. – Distribution of Ash



APPENDIX 3. - Insect Biology and Damage

Emerald ash borer, *Agrilus planipennis* Fairmaire, is in the family Buprestidae, or metallic wood boring beetles. Some other *Agrilus* forest species include the bronze birch borer and the two-lined chestnut borer. All species of beetles in the genus *Agrilus*, including the emerald ash borer, complete one generation per year or less, depending on conditions. Most adult *A. planipennis* emerge from ash trees in spring and early summer, at which time they feed on ash foliage. Their emergence creates 3-4 mm diameter D-shaped holes on the tree trunk. Adults fly up to 1.5 km soon after feeding, becoming most active in warm, sunny conditions. After mating, females lay up to 90 eggs along the bole and branches of ash trees between May and September. Cream-colored flat-headed larvae emerge from eggs about one week after they are laid. They feed on the inner bark or phloem, creating S-shaped serpentine galleries, and tunnel through sapwood until October. Larvae darken as they age, and probably undergo 4 instars. Most larvae overwinter as mature larvae or "prepupae" in pupal cells.

Emerald ash borer is only known to attack and reproduce successfully in ash, *Fraxinus* spp., trees in North America, including black, green, white, blue and pumpkin ash. Emerald ash borer does not attack mountain ash (in the genus *Sorbus*). Ash may be recognized by its opposite branching pattern and compound leaves, with 5-9 similar-sized leaflets per leaf. Other trees with compound leaves, like walnut or hickory, have alternate branching patterns. The bark of older trees may be recognized by its diamond pattern. Black ash, *Fraxinus nigra,* has dark brown bud scars, grows to a height of about 45 ft tall, and generally grows around wet, swampy areas. Green (or red) ash, *Fraxinus pennsylvanica,* is more common, and grows to about 50 or 60 feet in height. White ash, *Fraxinus americana*, grows to a height of 80 ft.

Ash trees affected by *A. planipennis* often exhibit dieback that initially appears the upper crown. Epicormic branches may sprout on the trunk and main branches and chlorotic (yellow) foliage are also indicative of a possible infestation. However, it is important to note that these symptoms may be due to other stressors, such as ash yellows (caused by a Phytoplasm vectored by Homopterans), ash anthracnose (*Gloeosporium aridum*), ash decline, or ash root rot (caused by *Ganoderma lucidum* and *Laetiporus sulfurous*). Some signs of larval infestation include vertical bark splits and signs of woodpecker feeding on the tree bole. Trees usually die within four years of initial infestation regardless of age, vigor or ash species.

APPENDIX 4. – EAB Websites

Canadian Food Inspection Service:
http://www.inspection.gc.ca/english/plaveg/protect/pestrava/ashfre/agrplae.shtml

IL Emerald Ash Borer Readiness Plan:
http://www.agr.state.il.us/Environment/Pest/emeraldashborer.pdf

Indiana Dept of Natural Resources
http://www.in.gov/dnr/entomolo/pestinfo/ashborer.htm
http://www.in.gov/dnr/forestry/news/eabashguide.html

Maryland Department of Agriculture:
http://www.mdinvasivesp.org/eab/index.html

Michigan Department of Agriculture:
http://www.michigan.gov/mda/0,1607,7-125-1568_2390_18298---,00.html

Michigan, Ohio, and Indiana EAB website:
http://www.emeraldashborer.info/

Michigan State University
http://www.pestid.msu.edu/profiles/eab%20stuff/slideshow/besteab/index.htm

Michigan State University Fact Sheet
http://www.pestid.msu.edu/profiles/eab%20stuff/slideshow/besteab/eabpdf8X11.pdf

Minnesota Department of Agriculture:
http://www.mda.state.mn.us/invasives/eab/

Ohio Dept of Agriculture
http://www.ohioagriculture.gov/pubs/divs/plnt/curr/eab/PLNT-eabindex2.stm

Ohio State University Emerald Ash Borer Ash Alert:
http://ashalert.osu.edu/

Ohio State University Fact Sheets
http://ashalert.osu.edu/mainpage.asp?pageview=factsheets

PA Department of Conservation and Natural Resources, Invasive Forest Threats,
http://www.dcnr.state.pa.us/forestry/fpm_invasives_EAB.aspx

Purdue Entomology Extension Emerald Ash Borer Information:
http://www.entm.purdue.edu/EAB/

USDA APHIS NAPIS:
http://ceris.purdue.edu/napis/pests/eab/

USDA Forest Service, North Central Research Station:
http://www.ncrs.fs.fed.us/4501/eab/

USDA Forest Service, Northeastern Area, Forest Health protection:
http://na.fs.fed.us/fhp/eab/

Wisconsin Department of Conservation and Natural Resources:
http://www.dnr.state.wi.us/org/land/Forestry/FH/Ash/

APPENDIX 5. - References

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APPENDIX 6. – Glossary

Action plan: comprehensive document that contains the basic outline and narrative defining a problem and describing the components that will be called into play should this problem appear in the Commonwealth

Agrilus planipennis: scientific name for emerald ash borer:
Phylum Arthropoda
Class Insecta (insects)
Order Coleoptera (beetles)
Family Buprestidae (flat-headed borers)
Genus *Agrilus*
Species *planipennis*

ArcGIS: a database (software) system using information derived from the Geographic Information System, and is used for mapping

ArcPad: computer program for entering geo-referenced data.

Artificial spread: passive movement of an organism into a previously unoccupied area by human commerce or activity

Ash: deciduous hardwood trees in the genus *Fraxinus*

Biodiversity: the degree to which a given biota contains separate species occupying unique and distinct ecological niches

Buprestidae: the beetle family commonly referred to as "flat-headed borers" or "metallic wood boring beetles"

Coleoptera: beetles

Compliance agreement: any written agreement between a person and a regulatory agency to achieve compliance with any set of requirements being enforced by the agency

Control: activities aimed at reducing the size of-, economic/cultural impact of-, or eliminating a pest population

Cooperative Forest Health Protection Program: USDA Forest Service annual grant to DCNR Bureau of Forestry Division of Forest Pest Management to conduct forest pest surveys in Pennsylvania; including training and pubic outreach and education activities

DBH: "diameter at breast height" standard method of designating the size of a tree

Delimiting survey: sampling regime used to define the geographical range of a target pest

Detection survey: sampling regime used to determine if a target pest has entered a particular area

Dutch elm disease: a disease of elm trees that eventually kills the tree, caused by a fungus, *Ceratocystis ulmi*, carried by a bark beetle

Emerald ash borer (EAB): *Agrilus planipennis*; beetle in the family Buprestidae, native to the Orient, initially discovered in the Detroit, MI, area killing millions of ash trees

Epicormic shoots: fast-growing, relatively soft stems (or clusters of same) arising from the main trunk or root crown below the crown of a dying tree. Sometimes referred to as "water sprouts" or "suckering"

GIS: Geographic Information System; A system for capturing and manipulating data relating to the Earth. A common use of GIS is to overlay several types of maps (for example, train routes, elevation data, street maps) to determine useful data about a given geographic area

GPS: Global Positioning System: satellite system that generates latitude and longitude coordinates

Ground-truthing: conducting hands-on survey/investigation and comparing the results with gross survey/surveillance/investigation of the same area conducted from a remote location

Incident Command System: an ordered, flow-based system or hierarchy designed to deal with all aspects of situation management

iPAQ: small, portable, hand-held electronic instrument that displays maps, yields GPS (latitude/longitude) coordinates, and can be used to record data

Marshaling yard: specific designated area, usually within a quarantine zone, where infested materials are brought for purposes of destruction or sanitation

NAPIS: National Agricultural Pest Information System: the USDA-APHIS' database in which collection records of significant, select, pests of agricultural commodities are stored. NAPIS is the repository for information gleaned from CAPS (Cooperative Agricultural Pest Survey)

Natural enemies: living organisms that are parasitic or predaceous upon other living organisms (hosts), to the detriment of the host's viability or reproductive capacity.

Non-native invasive species: a non-native organism that colonizes an ecosystem, to the detriment of that ecosystem

Pennsylvania Plant Pest Act of 1992: legislation intended to prevent/restrict the introduction/spread of organisms that are or could have any type of negative impact on agriculturally significant plants within the Commonwealth of Pennsylvania. The agency charged with enforcing this Act is the Bureau of Plant Industry, of the Pennsylvania Department of Agriculture

Quarantine: a restriction, imposed by duly constituted authorities, whereby the production, movement or existence of plants, plant products, animals, animal products, or any other article or material, or the normal activity of persons, is brought under regulation, in order that the introduction or spread of a pest may be prevented or limited, or in order that a pest already introduced may be controlled or eradicated, thereby reducing or avoiding losses that would otherwise occur through damage done by the pest or through a continuing cost of control measures.

Remote sensing: a method of surveying for a specific target from a distance great enough to prevent direct contact or sighting of individual target units. The methods usually involve color analysis of photographs taken of a mass of target hosts using various optical filtering devices to detect select wavelengths of light reflected by healthy vs. damaged host material.

Removal and destruction zone (R&D): an area, usually within a quarantine zone, from which all or select host material is either taken and delivered to a marshalling yard or destroyed on site

Riparian area: area surrounding a waterway or streambed

SEL (Systematic Entomology Laboratory): Insect identification staff located in Washington, DC, that serves as the ultimate identifying authority for state, national, and (in select instances) international agricultural regulatory issues relating to insects. SEL is part of the USDA-APHIS-ARS

Sentinel tree: a tree or tree part known to attract EAB set out in an area and monitored so that survey crews can detect the pests as they fly to it

S**takeholde**r: person or organization that has an interest in a given commodity

State Plant Health Director (SPHD): the USDA-APHIS-PPQ official within a particular state in charge of administering all federal activities dealing with pest establishment/movement on agriculturally significant plants

State Plant Regulatory Official (SPRO): the individual within state government who serves as the primary contact for USDA-APHIS-PPQ (usually the state Department of Agriculture) with the authority to place or rescind regulations dealing with pest establishment/movement on agriculturally significant plants

Task force: coalition of officials from participating stakeholder agencies/organizations whose mission is to combine resources to address/regulate/manage a problem or threat

Trap tree: a host tree that is artificially manipulated in any of a variety of ways to enhance its attraction qualities to target pest organisms and is placed in a survey area as a means of capturing said pests

USDA Forest Service: branch of the U. S. Department of Agriculture responsible for the health and management of federal, state and private forest lands

USDA-APHIS-IES: USDA Animal and Plant Health Inspection Service -- Investigation Enforcement Services

USDA-APHIS-PPQ: USDA Animal and Plant Health Inspection Service – Plant Protection and Quarantine

Protocol: procedural guidelines/instructions/methods

MDB format: Microsoft Database

APPENDIX 7. - Paper form of data sheets

PA 2006 Emerald Ash Borer Trap Tree Data Sheet

Observer(s): First Initial +Last Name			
Organization:	PA DCNR-BOF-FPM USDA APHIS PDA OTHER:		
Site Name:			
Land Manager: Name and Phone #			
Ownership: Circle One	PENN DOT PA TURNPIKE STATE PARK STATE FOREST STGAME LAND PRIVATE MUNICIPAL FEDERAL OTHER:		
Land Use: Circle One	ROADSIDE RECREATION FOREST STREET-TREE LANDFILL RESIDENCE WOODLOT OTHER:		
County:		Township:	
Ash Density:	SINGLE FEW STAND		

COMPLETE AT TIME OF GIRDLING: (Girdle Trees May-June 2006) Staple Laminated Label with Contact & Tree Tag # to Bole of Tree

Tree	Latitude: (dd.ddddd NAD 93)	Longitude: (dd.ddddd NAD 93)	Ash Species: Green, White Black, Unknown	Tree DBH: (4-10")	Tree Location: Open, Hedgerow, Edge, Closed Canopy	*Tree Tag #: EAB-TT-#-mm/dd/yyyy	Girdle Date:
1			W G B U				
2			W G B U				

COMPLETE AT TIME OF EVALUATION: (Inspect Tree 1 Fall 2006, Tree 2 Fall 2007) Collect EAB in vial with 75% ethanol)

Tree	Evaluation Date:	Evaluation Time (min.):	# EAB Adults:	# EAB Larvae:	# D-Holes:	S-Galleries (Y or N):	Bark Cracks:	List Other Borer Adults:	List Other Borer Larvae
1									
2									

COMMENTS: (If possible, specify Distance and Azimuth to Fixed Object)

Send copy of data form after girdling and each evaluation to S. Werner, 208 Airport Drive, 2nd Floor, Middletown, PA 17057. * See example of Tree Tag # on back of sheet.