New York State
Department of Environmental Conservation
Division of Lands & Forests
Bureau of Private Land Services (PLS)

Bureau of Private Land Services

Emerald Ash Borer Management Response Plan

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I. Introduction:

The Division of Lands & Forests is charged with the protection and conservation of trees and forests in rural and urban settings across New York State. Attacks by invasive exotic insects represent one of the greatest threats to our state's trees and forests and to forest owners, forest-dependent businesses and industries, communities, homeowners and urban residents.

Emerald ash borer, *Agrilus planipennis* (Fairmaire), or EAB, is a non-native wood-boring pest of North American ash trees. This devastating pest was first found in 2002 in North America where it was discovered in southeastern Michigan and adjacent areas in Windsor, Ontario, Canada. It is thought to have been introduced in the 1990's on solid wood packing material originating from Asia. This extremely destructive beetle poses an enormous threat to all of North America's rural and urban ash resources.

Unlike many other wood boring beetles, EAB aggressively kills stressed ***and*** healthy ash trees; most dying within two to three years of becoming infested. Currently, EAB has no known natural enemies in North America, no effective control options over the forested landscape, and few, expensive options for protecting individual, high-value specimen trees. If EAB is not contained or its population growth and spread are not slowed, this pest will continue to infest and kill all species of trees in the genus *Fraxinus (ash)*. The impact on ash in North America has been compared to the effects of chestnut blight and Dutch elm disease, which devastated rural and urban forests in the 20th century.[1]

Since its initial North American discovery in Michigan, EAB has spread across the upper Midwest and by 2009, had been found in 12 States (excluding New York) and the provinces of Ontario and Quebec, Canada. Forestry experts and stakeholders in New York have been keeping a keen eye on the progression of EAB eastward and been cooperating with USDA Animal Plant Health Inspection Service (APHIS) and New York State Department of Agriculture and Markets (NYSDAM) on extensive detection surveys and trapping efforts to try to detect any infestations in our State as early as possible. As of August, 2010, 15 states and 2 Canadian provinces (Ontario and Quebec) have confirmed EAB discoveries.

According to the APHIS National EAB Program Manual (2009), "The Emerald Ash Borer Program has transitioned from an eradication program to a management program. Effective and cost efficient control technologies are not currently available to apply area-wide to effect pest eradication. In the future additional tools may become

[1] USDA–APHIS. 2009. *Emerald Ash Borer Program Manual, Agrilus planipennis* (Fairmaire) USDA–APHIS–PPQ–Emergency and Domestic Programs–Emergency Planning, Riverdale, Maryland

available to suppress the dispersal of the pest. Program partners are conducting extensive research to develop additional tools and methodologies." (See footnote 1) Based on the latest New York satellite discoveries, and following established EAB response protocols outlined by USDA APHIS and the latest scientific information, the Bureau of Private Land Services, in conjunction with the US Forest Service, has developed this EAB Management Response Plan to guide program investments and activities.

New York's EAB Response Plan will be a multi-year effort, including multiple components and involving multiple partners. Federal, State and local governments and agencies, environmental non-governmental organizations, forest and nursery industries, utilities, forest owners, homeowners, all have a stake and will need to be engaged. Some of these activities are already underway, using existing resources or grants, but others will require new (or renewed) funding to implement this year and in future years.

II. Current situation:

In June of 2010, outreach by a Cornell University researcher, funded by APHIS, in Randolph resulted in a report by a landowner that he had a suspicious tree on his property. This report was in the general vicinity of the 2009 EAB discovery in Randolph, Cattaraugus County. Seasonal DEC Forest Health field staff, funded by the USDA Forest Service (USFS), were dispatched to investigate and discovered numerous additional EAB-infested ash trees, mostly within ½ mile of the original discovery site, and as far out as 1 mile. Collaborating researchers from Cornell University, ESF and USDA ARS, who were already setting up research studies in the Randolph area, were immediately notified and visited the new discoveries. Samples were sent to E. Richard Hoebeke, a USDA-approved EAB National Identifier, to verify the identification. Within a week, the number of infested ash trees identified in the immediate Randolph-area had grown to 75. Visible, extensive woodpecker damage on the boles of ash trees was the primary indicator of infestation and was what drew the attention of the survey crews. This increased woodpecker activity on ash trees, seeking out EAB larvae, has frequently been cited as an indicator or EAB presence in other infested States.

New York's "Summer of EAB" got much busier from that point on. On June 19, confirmation was received of a single EAB adult caught in a purple prism trap placed in an identified, high-risk site in Bath, Steuben County. Subsequent intensive surveying around that site failed to locate any evidently-infested or EAB-killed trees, or detect any additional beetles in traps. On July 20, another purple prism trap yielded confirmed EAB adults in Saugerties, Ulster County, on the eastern edge of the Catskill Park. Field investigations revealed an established population covering approximately 15 square miles and extending mostly south and east from Saugerties.

By the end of August, four additional satellite EAB occurrences had been detected and confirmed in Cementon, Greene County; Caledonia, Livingston County; Scottsville, Monroe County; and Pembroke, Genesee County. In each case, delimitation surveys were conducted by staff from participating agencies, primarily DEC, USDA APHIS, NYSDAM and Cornell to determine the extent of the infestations and counties involved (for future regulatory purposes.) All were smaller in size than the Ulster satellite.

The State Forester's office initiated an interagency discussion with APHIS, USFS, NYSDAM, NYS Office of Parks, Recreation and Historic Preservation (OPRHP) and NYS Department of Transportation (DOT) to gather input and develop response to these new discoveries. Input was also solicited from the scientific community, particularly the NY Forest Health Advisory Council and researchers from Cornell, USDA ARS and ESF already working on EAB in the Randolph area.

The three agencies with regulatory authority – DEC, NYSDAM and USDA APHIS – met with regulatory stakeholders to discuss potential quarantine expansions in response to the six new satellite discoveries. On September 8, 2010, NYSDAM and NYSDEC imposed parallel Emergency Quarantine Orders, on 16 counties in western New York and 2 Counties in eastern New York, to restrict the human-assisted movement of EAB and to support businesses by facilitating the industrial uses and movement of regulated articles. The counties included are Chautauqua, Cattaraugus, Niagara, Erie, Orleans, Genesee, Wyoming, Allegany, Monroe, Livingston, Steuben, Wayne, Ontario, Yates, Schuyler, Chemung, Ulster and Greene. The Federal government, USDA APHIS, is simultaneously moving forward with their own quarantine covering interstate movement of EAB and regulated articles that will mirror the State orders and cover the same counties. Each agency will continue to work aggressively outside the quarantine boundaries to find new infestations, and enforce the quarantine restrictions.

This DRAFT EAB Management Response Plan for activities within the New York EAB quarantine area has been developed out of those discussions further informed by other States' EAB Response Plans, current "SLow Ash Mortality" research and activities pioneered in Michigan and discussions with Dr. Nate Siegert, formerly with Michigan State University and now with the US Forest Service Northeastern Area, based in Durham, NH.

III. Private Land Services Authorities, Program Areas and Partners

The Division of Lands & Forests is charged, under the Environmental Conservation Law, with the protection and conservation of trees and forests in rural and urban settings across New York State. Within the Lands and Forests, the Bureau of Private Land Services is responsible for DEC's Forest Health Management Program, Private Forestry
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Assistance Program, Urban & Community Forestry Program, and the Saratoga Tree Nursery. These programs, and their Federal partners and counterparts in the US Forest Service State & Private Forestry Program, all have integral, unique and complementary roles in responding to invasive species attacks on New York trees and forests. The Bureau collaborates and cooperates closely with numerous other public, private and academic sector partners in EAB response, including Cornell University and Cornell Cooperative Extension, NY Forest Owners Association, SUNY ESF, NYS OPRHP, NYS Urban & Community Forestry Council, NY Society of American Foresters, Empire State Forest Products Association, USDA NRCS, Regional Resource Conservation & Development Councils, County Soil & Water Conservation Districts, USDA APHIS, NYSDAM, and, of course, our sister Bureaus of State Lands and Forest Preserve in the Division of Lands & Forests.

IV. Private Land Services EAB Management Response Plan Goal: "SLow Ash Mortality" or "SLAM"

Simply stated, our Bureau's goal in responding to EAB is to keep as many ash trees alive as possible, in as much of New York State as possible, for as long as possible.

Our mantra for EAB, and all other invasive, exotic forest pests, has been: "early detection, rapid response". When exclusion efforts fail, the next best protection tool is intensive surveying and monitoring which enables infestations to be detected quickly, and early, while they are still relatively small. Early detections must then be delimited, and evaluated, to determine their extent, intensity and (where possible) age. While infestations are still relatively small and isolated, a suite of appropriate control measures can then be rapidly implemented to (1) reduce the pest's population, minimize the population's growth and limit its natural spread to adjacent areas. These measures will, in turn, reduce or slow the rate of ash mortality from EAB infestation. This concept, as being developed by the research community, is known as "Slow Ash Mortality", or SLAM.

Aggressively pursuing a SLAM approach, on our multiple program fronts, will achieve numerous benefits for the State. We can:

- Save economic value and preserve value growth as long as possible on ash timber trees on private forests, to the direct benefit of forest owners;
- Save yard and community ash trees for as long as possible, providing continuing, tangible benefits for homeowners and municipalities;
- Forestall the need for expensive and repeated chemical treatments of high-value landscape or urban trees to protect them from imminent EAB attack;
- Postpone time when urban ash trees are killed by EAB, become hazards and must be removed, forcing costs on homeowners and communities;
- Buy time for research to develop better protection and control measures(chemical, biological);

- Buy time for communities to budget and prepare for calculated and planned ash treatments, removals, disposal and replacement;
- Support ash timber markets and ash-dependent industries for as long as possible by maintaining a steady supply of raw material, and avoid flooding markets with ash timber unnecessarily and beyond the markets' capacity to absorb (i.e. baseball bats, tool handles, basket-making) which would drive value and prices down.

The US Forest Service's Gypsy Moth "Slow-The-Spread Program", implemented at the perimeter of the known Gypsy moth infested area since 1993, has demonstrated that considerable economic and ecological benefits can be gained by slowing the rate at which gypsy moth populations build and spread spatially. A similar approach, applied to EAB, could yield even greater benefits. In the past five years, scientists have learned much about the biology of this invasive pest. Technology and methods for EAB survey and control have progressed considerably. Continued research may yield more options for EAB management and increase the effectiveness of existing technology.

V. Private Land Services EAB Management Response Plan: A "Tiered" and "Threat-Based" Approach

The NYSDEC Division of Lands and Forests has the primary mission for protecting, conserving and sustainably managing New York's urban and rural forest resources. We share this mission with our principal Federal forestry partner, the USFS Northeastern Area State & Private Forestry program, as well as other Federal and state collaborators.

Research has shown that the rate at which ash tree mortality advances is directly related to the density of EAB. As "outlier", or satellite populations build, spread and coalesce, the area and number of dead, dying and declining ash trees increases dramatically. A do-nothing approach to EAB or a regulation-only approach to EAB means that EAB will advance unchecked, more rapidly killing billions of ash trees in forests, rural and urban areas in a relatively short amount of time. Continued expansion of EAB threatens the long-term viability of at least 15 ash species native to the U.S. and will drastically alter the ecology of forests in New York. It also threatens communities faced with tree removal and replacement costs, forest owners faced with the loss of valuable timber resources, forest industries that rely on ash wood, and even the National pastime – baseball – that features the use of North American ash bats. (Ironically, ash became the bat wood of choice to replace chestnut that was no longer available due to Chestnut blight.)

To achieve fulfill our mission and achieve our goals, the Bureau of Private Land Services will expand our activities to help the most directly-impacted stakeholders – private forest owners and municipalities closest to identified EAB satellite occurrences - live with,

and manage the economic, environmental and social impacts of EAB in their midst and immediate vicinity. Primarily, these efforts all only "buy time":

- Time that is needed for researchers to develop better means of controlling EAB or protecting trees.
- Time for communities and forest owners to prepare for EAB arrival.
- Time for governments to spread out the inevitable costs of dealing with EAB-killed, public ash trees.

As a Milwaukee, Wisconsin DPW Supervisor recently said, "We want to remove these trees on our schedule rather than the beetle's."

In order to set priorities and wisely invest limited fiscal and staff resources, we have developed a new, targeted management response approach, in cooperation with Nate Siegert with the US Forest Service. Our approach focuses PLS program efforts in and around our satellite infestations, and first characterizes these EAB occurrences into 3 "Tiers", based on specific criteria concerning the nature and extent of each new discovery. We then establish three "Management Response Areas" or "Levels" around Each delimited Satellite Core Area" and develop appropriate program responses based on relative threat, correlated directly to proximity to infested core areas. From these assessments, we then develop a matrix showing our program management responses appropriate to each Tier and Threat-level. Our intent is to apply this strategic approach to all our Private Forestry Program areas – Private Forest Stewardship, Urban & Community Forestry, Forest Health Management and Utilization & Marketing, as well as our EAB outreach efforts. It will guide our development of grant proposals, preparation of regional workplans and targets, and allocation of available staff and fiscal resources. Using this process, we can focus our efforts to provide the most assistance to the most-immediately threatened stakeholders, while still providing information and scaled assistance to landowners and communities farther from this threat, both in distance and time.

A. Survey, Detection and Delimitation

To achieve our mission and goal of keeping as many ash trees alive, in as much of New York State as possible, for as long as possible, it is critically important that we continue to monitor and evaluate identified satellite EAB occurrences. This need will continue until the various satellite occurrences coalesce and the entire state becomes infested, or available resources are exhausted.

PLS proposes to maintain a statewide EAB detection and monitoring program, around the delimited satellite occurrences, within the quarantined counties, and in high-risk locations across the non-quarantined areas of the State. We will continue to enhance the delimitation surveys to monitor the identified satellite occurrences, track EAB movement and expansions of detectable, infested areas, and assess population changes. Special emphasis will be placed on enhancing our surveying and population monitoring to the east of the Hudson Valley detections in Ulster and Greene Counties, to better track any movement

of EAB toward Massachusetts, Connecticut and Vermont, and down the Hudson River toward the New York City metropolitan area. Data gathered will be used to set response priorities, target management activities and evaluate results of our SLAM efforts.

B. Tier criteria and characterization

Our Tier system for classifying EAB satellite occurrences uses three simple criteria, and assigns satellites to one of 3 Tiers.

1. Trigger Criteria: Initial, confirmed EAB discovery

The entry point or trigger for our classification system is an initial EAB discovery in a new location. This may be a single EAB adult caught in a purple prism trap, larva discovered in a sentinel tree, EAB life stages in or around dying or dead ash with galleries present, or other verifiable, confirmed evidence. An initial discovery automatically makes the delimited site a Tier 1, pending further evaluation.

2 Criteria Two: Number of discovered, EAB-killed ash trees within the delimited core area.

The extent and severity of an EAB infestation can be measured and characterized by the number of EAB-killed ash trees found within the delimited are. Number of EAB-killed trees directly relates to the size of the population. It will also reflect the physical size of the infested area, which also comes into play in Criteria 3. Ash mortality also provides an indirect indication of the age of the infestation (which will be supplemented by dendrochronology analysis, if suitable samples can be taken).

Tier 1 = 0 EAB-killed ash trees found in delimited area
Tier 2 = < 25 EAB-killed ash trees found in delimited area
Tier 3 = > 25 EAB-killed ash trees found in delimited area

3. Criteria Three: Greatest distance between EAB discoveries in the delimited area

Upon discovery of a new EAB satellite occurrence, a delimitation survey will be conducted to more accurately define the area infested, to the best extent possible with existing technology and resources. Additional EAB occurrences (trap catches, infested or killed trees, gallery evidence,

etc.) will be plotted on a GIS, allowing a map to be made showing the detected, infested core area. For our planning purposes, the delimited "Core Area" will be defined and mapped by connecting the outermost identified occurrences around the initial satellite detection. Our metric for Criteria 3 will the distance between the two farthest identified points associated with the new detection.

Tier 1 = 0- 500 feet
Tier 2 = 501 feet - 6 miles
Tier 3 = > 6 miles

C. Threat-based Management Response Areas

Around these Tiered satellite infestations, and their delimited "Core Areas", we propose to create "Management Response Areas" or "Priority Response Areas", at increasing distances, that will correspond to differing types and intensities of management responses undertaken by DEC, L&F PLS and (potentially) willing partners. This system of responding based on threat will be incorporated in our plans for our Private Forest Stewardship Program, our Urban & Community Forestry Program and our Forest Health Management Program. Our objectives are to provide information, assistance and direct responses appropriate to the nature of the identified and delimited infestation and appropriate to the threat or risk to PLS customers and constituents. Those constituents are primarily (a) rural private forest landowners, (b) communities - homeowners and municipal governments, (c) ash using industries and stakeholders, and (d) state and Federal government.

1. Satellite Core Area

The Satellite Core Area will be determined based on the initial detection, intensified first-year delimitation surveys and subsequent, annual monitoring and delimitation surveying. Our plan is to annually evaluate, re-assess and redefine the individual Satellite Core Areas, until such time as they coalesce with adjacent satellites. The limits of each Satellite Core Area will be delineated by a line drawn on the GIS map connecting the outermost, detected EAB occurrences around each initial detection. Each delimited area may be as small as a single point (i.e. one EAB caught in one trap) or may cover many square miles.

In Tier 1, the initial detection does not include any dead ash trees and may not include any discovered EAB-infested trees. Response in this situation would be limited to increased surveillance and monitoring,

including use of girdled trap trees. In Tiers 2 and 3, stakeholders likely already have EAB-infested, dead and dying ash. All ash trees in this Core, or infested area should be evaluated for condition and steps should be taken to prioritize removals to salvage value (in woodlots) and reduce hazards and liability on municipal property and around homes. Infested ash are at imminent risk of death, in as little as 1-3 years, so these actions must be begun immediately.

2. First Management Response Area, "Level 1" (Threat Level "Red")

The First Management Response Area, or "Level 1", corresponds to the highest threat from EAB and extends 0-5 miles out from the delimited Satellite Core Area. Next to those stakeholders within the Core Area, these landowners, homeowners and communities are most imminently at-risk from EAB, and should be taking immediate steps to respond to that risk. Given current detection capability, and the inherent difficulty in finding low-level EAB populations, it is highly likely that ash trees in this Level 1Response Area may already be infested, or the EAB population in the Core Area could spread to these ash trees within the next year or two.

Stakeholders should have already inventoried and assessed their ash resources or should do so immediately, to determine their potential exposure and liability. Woodlot owners should be contacting a DEC or private sector forester for forest management advice and assistance in harvesting their ash-containing stands to salvage ash value and promote regeneration of non-host tree species to replace ash in their woodlots for the future. If homeowners or municipalities have high-priority, individual ash trees, they should look into chemical treatment options and decide if they want to invest in treatment to protect them from attack.

3. Second Management Response Area (Threat Level "Orange")

The Second Management Response Area, or Level 2, extends from 5-10 miles out from Satellite Core, again following the delimited perimeter. Ash stands and trees in this area are at an elevated risk, but are not immediately threatened with attack or mortality. EAB has not been found here yet and this area is beyond the projected annual flight range of EAB. It is unlikely that existing populations, even unimpeded, will grow or spread naturally to affect ash resources in the Level 2 Area within the next 2-5 years.

Forest owners, homeowners and municipalities should definitely be assessing their ash resources and making plans to respond or take proactive measures, but they have some time to prepare and act in a prudent and measured manner. Inventories should be conducted, ash resources should be evaluated and annually monitored, stakeholders may opt to participate in specific SLAM strategies such as biocontrol releases, ash volume reduction, detection trapping or establishing girdled sentinel trees.

4. Third Management Response Area (Threat Level "Yellow")

The Third Management Response Area, or Level 3, comprises those areas > 10 miles from the Satellite Core Area, extending out in the state until you encounter another Satellite Core Area Level 2 boundary. Graphically, and for our management planning and response purposes, this area is essentially the remainder of the State. This extensive area may already be within State and Federal EAB quarantine boundaries or could extend outside those counties to the State lines. Based on the distance from the individual Satellite Core Areas, these forests and communities are considered to be at the lowest risk of imminent infestation and, barring additional human-assisted spread, forest owners and municipal officials likely have the most time to plan and prepare for EAB's arrival. We would anticipate at least 5-10 years before EAB is detected in the Level 3 regions of the State.

Program efforts in Level 3 will focus on early detection surveying, outreach, education and planning for direct response when EAB is detected much closer to potentially-impacted forest owners, homeowners or communities.

VI. Forest Health Program Management Responses

Tier 1: "Detection only"

Level 1:

- Increase detection surveying, supplementing purple prism traps with girdled trap trees, sentinel trees, bio-surveillance and visual surveillance. (See attached protocols). Target establishment of 10-25 trap trees, evenly-spaced around the initial detection, out to ½ mile

- Continue increased trapping for 3 years or until additional detections warrant move satellite occurrence to Tier 2 or 3.

Level 2:

- Continue detection surveying following USDA APHIS National EAB Program protocols using trap trees and the purple prism traps (PPT). Follow the National EAB grid survey pattern, as well as targeting additional "high-risk areas", deploying traps at campgrounds, rest areas, mills, industrial areas and other potential entry points for EAB. The goal is to detect new infestations of EAB, or spread of EAB populations, as quickly as possible, using the best tools available and site selection criteria informed by current science.

Level 3:

- Same as Level 2.

Tier 2: "Small-scale, or early infestation"

Level 1:

- Increase detection surveying, as in Tier 1, Level 1.
- Coordinate research and SLAM efforts with EAB Science Team
- Reduce known EAB populations by removing and disposing of infested trees, preferably prior to emergence/flight season or after adults have mated and laid their eggs on host trees. Priority will be placed on removing large diameter trees, known to be infested, farthest from the core (per latest guidance from Dr. Nathan Siegert at Michigan State University). Results of visual detections, sentinel trees assessments and trap catches will all be used to identify and target priority tree removals.
- Annually, create clusters of girdled trap trees as "sinks" to attract EAB adults and hold populations within the known infested "core" as long as possible.
- Establish "sentinel trees" extending out from periphery of delimited infestation area (the "core action area") to assess effectiveness of SLAM efforts and detect any spread of EAB outside the core action area.
- Promote removal of EAB-infested ash trees from forested areas (and communities), during non-flight seasons, as part of a comprehensive Forest Stewardship management plan, to reduce the size of the coming summer's potential EAB populations, as well as to capture economic value for forest landowners.
- Conduct and collaborate in **biocontrol research** with USDA Agricultural Research Service, USDA APHIS, USFS, and the

academic research community. Research will include permitted release of approved parasitoids, monitoring of release sites and sampling of ash trees to determine fate of introduced parasitoids and rates of parasitism.

- Conduct and collaborate on insecticide research, trials and applications with USDA APHIS, USFS, Cornell Cooperative Extension, academic researchers, community governments and land or homeowners to protect high-value, individual landscape ash trees. Provide outreach, information and education on available insecticides, techniques and decision-criteria to homeowners, communities, arborists and applicators.

Level 2:

- Establish sentinel trees to monitor EAB population growth and track movements. Data gathered will be used to annually adjust Tiers and Threat Levels, and determine new priorities and targets for management responses.

Level 3:

- Same as Tier 2, Level 2.

Tier 3: "Large-scale or established infestation"

Level 1:

- Same as Tier 2, Level 1

Level 2:

- Same as Tier 2, Level 2

Level 3:

- Same as Tier 3, Level 3

VII. Private Forest Stewardship Management Responses

We have developed Private Forest Stewardship Response "Components" that will be applied relative to the Tier and Threat Level for each Satellite EAB occurrence. We apply these Components across the response matrix, with some repeating in multiple scenarios.

Component #1 -Targeted outreach to landowners (ranging from direct mailings to forest owners in highest risk areas identified from local tax records to press releases, media contacts, presentations to stakeholder groups, etc) within established distances from infestation promoting the following:

- Awareness of signs and symptoms of EAB infestation
- Encouragement of vigilance and reporting of suspicious tree mortality or presence of insect
- Information about SLAM and discussion of landowner participation
- Information about Forest Stewardship
- Encourage annual inspection of trees / forest

Outreach to municipalities within delimited core and from 0 to 5 miles out (Threat Level 1) with following :

- Awareness of EAB signs and symptoms
- Information about SLAM and advice being provided to forest landowners
- Role of local laws & ordinances that regulate forestry activities

Component #2 - Press outreach to inform the public and municipal officials about EAB

- Awareness of signs and symptoms of EAB infestation
- Information about SLAM
- Sources of forestry assistance

Component #3 – Provide Forest Stewardship technical assistance to promote the following:

- Landscape level strategy to address needs and opportunities to conduct tree cutting/harvesting actions on private forest land, to reduce ash component, capture economic value, and reduce EAB larvae populations in infested trees, consistent with recommended levels
- Provide technical assistance to individual owners to:
    - Inventory tree resource on individual properties
    - Develop Landowner Forest Stewardship Plans
    - Develop silvicultural cutting strategy/prescriptions
    - Provide detailed information on the marketing of timber products in federal and state quarantine areas
    - Direct landowners to private sector professional services to facilitate implementation of tree cutting strategies

Component #4 – Conduct municipal & community educational outreach to:
Inform officials about EAB as it pertains to local forestry regulation:

- Awareness of signs and symptoms of EAB infestation
- Stewardship actions that can slow ash mortality (SLAM)
- Role of local laws & ordinances that regulate forestry activities

Response Levels

	RED 0 to 5 mile radius	**ORANGE** 5 to 10 mile radius	**YELLOW** >10 mile radius
Tier 1	Component 1	Component 2	Component 2
Tier 2	Components 1 3 4	Components 1 & 4	Component 2
Tier 3	Components 1,3, 4	Components 1,3, 4	Component 2

VIII. Urban and Community Forestry Program Management Responses

Our Urban & Community Forestry Program management response plan is designed to assist at-risk local communities in developing and implementing their own "Community EAB Preparedness and Response Plans".

The greatest economic impacts from EAB will be felt by communities when EAB infestations reach them. Ash trees that die deteriorate quickly and become hazards and liabilities to municipalities and homeowners. New York communities are largely unprepared and, especially now, are under severe economic constraints, leaving them highly vulnerable to the potential impacts on EAB infestations. While we work to slow the spread of EAB across the state, and forestall the day when EAB invades our communities, it is also important to takes steps now to help communities understand their risk and exposure, make plans for dealing with the impacts, and start budgeting now for necessary response and recovery measures. As we previously have outlined, individual communities' risk, urgency to respond, and the appropriate actions to take will be determined by a number of factors.

A. Risk

The most important determinants of a community's risk from EAB factor are the **amount and condition of ash trees in the community's urban forest**. Now that EAB has been found in New York state, all communities should be looking at their **street tree inventories** and past tree management records to assess how many ash they are responsible for on public properties (rights-of-way, around public buildings, in school yards, in parks, etc.). If the community does not yet have a street tree inventory, they should be looking at ways to get that information now. Communities with a high number of ash trees and/or a high percentage of their urban forest resource comprised of ash, face a much greater risk and liability than those with few ash trees, or a more diversified mix of trees on public and private lands. Municipal street tree inventories tend to focus only on those trees that are the responsibility of the municipality, in right-of-way or on public property. These are the trees the municipality must maintain, remove and potentially replace and the ones that present public liability issues when they die, deteriorate and start falling down. Municipalities – and homeowners or property owners in communities - should also be assessing how many ash trees are on private property in town, as that also affects the risk and potential spread of EAB should it appear. Green ash, for example, has become a very popular landscape tree in recent years and is often planted around existing homes and in new developments.

B. Urgency

The urgency of getting street tree inventory information is directly related to the community's **proximity to EAB occurrences** ("Threat Level") and the nature of that occurrence, or Tier. Communities within a delimited core area are probably already dealing with dead or dying ash trees, or will be shortly, and need this inventory data immediately for work planning and budgeting purposes. Conversely, communities beyond 10 miles (Threat Level 3), particularly around Tier 1 occurrences, and in counties that do not yet have a detection, have more time to get this information, perhaps 3-5 years, but still need to be working in that direction.

C. Necessary and Appropriate Responses

Management preparations and responses that are necessary and appropriate for any given community are also directly related to the Tier and Threat Level of their closest documented EAB occurrence. Communities that are within the delimited core, or within 5 miles, should be removing dead, dying and infested trees, identifying trees to protect through chemical treatment and applying those treatments, and replacing removed ash trees with non-host trees appropriate to the site. Communities with a large number of dead or dying trees will have to prioritize removals based on their location, hazard condition and potential liability concerns. Municipal budgets will have to be adjusted to account for increased tree removal and disposal costs.

1. Outreach and education

Cornell Cooperative Extension, NYSDEC and the US Forest Service will partner and collaborate in providing **outreach and education to municipal governments** in EAB awareness, recognition and preparedness planning through workshops, web materials, publications, personal contact and development of a "Municipal Guide for EAB Response" (underway by Cornell, under APHIS contract). Information will be provided to help municipal officials and residents understand the potential impacts of EAB infestation, the response options and their pros and cons, and the importance of wisely using the preparation time being provided to them through our comprehensive SLAM and regulatory efforts.

2. Direct technical assistance

DEC's Urban & Community Forestry Program, working with the NYS Urban & Community Forestry Council, Cornell Cooperative Extension, Cornell University's Student Weekend Arborist Teams (SWAT) and private sector urban forestry consultants can **provide direct technical assistance** to municipalities in developing response plans, conducting municipal tree inventories, training municipal staff, developing grant proposals, and selecting appropriate replacement trees for municipal spaces. Priority for outreach and technical assistance will be based on the previously-outlined Tier and Threat Level characterization system.

3. Chemical treatment advice and guidance

Cornell University, Cornell Cooperative Extension, DEC's Urban & Community Forestry Program and the US Forest Service will continue to provide **advice, guidance and criteria** to help municipalities, homeowners and property owners determine if **chemical treatments** are warranted and meet their needs and desires, understand what chemicals are approved for use on EAB in New York State, and gain access to the latest scientific information about their effectiveness, impacts and applicability.

4. Additional financial resources

DEC and our urban and community forestry partners and advocates, including the NYS Urban & Community Forestry Council, will also **seek and advocate for additional financial resources needed for communities** to inventory public ash resources and undertake necessary response activities including tree removals and disposal, tree replacement, chemical treatment of high-value trees, staff training and equipment purchases (wood chippers, tub grinders, mulching equipment, etc).

Ideally, municipalities receiving State or Federal EAB assistance funding would be encouraged to share equipment, training, skills and resources for EAB response (as Monroe County already does with other public works equipment) to maximize efficiency and reduce overall costs.

Urban & Community Forestry Program EAB Response Levels

	Level 1 - RED 0 to 5 mile radius	**Level 2 -ORANGE** 5 to 10 mile radius	**Level 3 - YELLOW** >10 mile radius
Tier 1	- Outreach and education - Preparedness planning training	- Outreach and education - Preparedness planning training	-Outreach and education
Tier 2	Same as Tier 1 plus: - Street tree inventories - Tech assist with staff training - Preparedness planning assistance - Assistance with grant proposals - Provide criteria to help determine if pesticide treatments are appropriate - Provide information, training and assistance with ash utilization or disposal	Same as RED, Tier 2	- Outreach and education - Preparedness planning training
Tier 3	Same as Tier 2	Same as RED, Tier 3	- Outreach and education - Preparedness planning training - Street tree inventories

Appendix A. SLAM Operational Tactics

Action elements:

A. Survey

1. **Detection trapping.** Following USDA APHIS National EAB Program protocols, NYS has been cooperating since 2004 in the National EAB survey (using trap trees and the purple prism traps (PPT) as part of the National EAB grid survey, as well as additional "high-risk area" surveying that locates traps at campgrounds, rest areas, mills, industrial areas and other potential entry points for EAB. The goal is to detect new infestations of EAB as quickly as possible, using the best tools available and site selection criteria informed by current science and risk assessments.
2. **Biosurveillance using Cerceris fumipennis wasp.** DEC will continue to collaborate with USFS, SUNY CESF researchers and other partners to seek funding to continue evaluating and advancing the use of the native ground wasp Cerceris fumipennis. Biosurveillance efforts will focus on high priority areas outside of known and confirmed infested areas and will provide additional early detection capability.

3. **Intensified delimitation surveying.** Once an initial detection is confirmed, DEC, USDA APHIS and NYSDAM will immediately coordinate and begin an expanded delimitation survey, focusing on adjacent counties, for the specific purpose of informing future quarantine discussions and decisions. This surveying will use all available and practical methods - within fiscal and human resources available - including, but not limited to, ground-based field visual inspections of ash trees and ash-containing forests, inspection of high-risk, accessible, ash trees using aerial bucket trucks, destructive sampling of symptomatic ash trees, aerial surveying and remote sensing. Survey crews will identify and GPS locate infested trees and "suspect" or "watch list trees" for future action or ongoing monitoring (may include other visual marking such as flagging watch trees). Priority will be placed on areas with symptomatic or unhealthy-looking ash, areas with high ash volumes or composition, and high-risk areas (roadsides, forest edges, near camping areas or near ash-using facilities (mills, firewood producers, etc.), proximity to facilities that receive imported solid wood packaging. Surveys will be concluded when the participating agencies are satisfied they have identified the counties involved in any infestation, to the extent infestation can be determined at the time.

4. **SLAM Assessment and Evaluation.** After the regulatory delimitation has been accomplished, it is necessary for SLAM planning to further delimit and

characterize the extent and nature of an identified EAB infestation and the forest and tree resources in and around the infested area. This involves a closer delimitation of the limits of the identifiable infestation, even if that is within a single quarantined county. Provided funding is available, either for research or implementation projects, this "core area delimitation can be accomplished through additional ground-based visual surveys spiraling out from the known infested area, establishment and subsequent removal and evaluation of girdled "sentinel trees", and through aging of the infestation using dendrochronology techniques. Target density for sentinel trees would be 1 per 20 acres with increased density along the periphery of the known-infested area, decreasing towards the center. Girdled sentinel trees will also have a purple prism trap (PPT) hung in them, without additional chemical lures, as an additional detection tool, serviced as deemed necessary for research purposes. Before the next flight season, all girdled trap trees will be removed and sampled for presence of EAB and new sentinel trees will be established in their place.

Development of more detailed ash (and overall forest)inventory data for core action area (based on delimitation and dendrochronology) is also needed, including density, size, condition and distribution. Data can be collected through field plot sampling supplemented by aerial photography analysis and satellite imagery. Data should be entered into an accessible GIS database for use by all program partners. Standardized data management protocols need to be collaboratively developed for consistent use by all involved partners: NYSDEC, NYSDAM, USDA APHIS, USDA Forest Service, NYS Office of Parks Recreation & Historic Preservation (NYSOPRHP), NYS Department of Transportation (NYSDOT) and various academic, State and Federal researchers.

B. Management (SLAM)

The USDA National EAB Program Plan dictates that APHIS has transitioned from an eradication program to a management program for this invasive, exotic pest. Effective and cost efficient control technologies are not currently available to apply area-wide to effect pest eradication. In the future additional tools may become available to suppress the dispersal of the pest. Program partners are conducting extensive research to develop new tools and methods to suppress EAB populations, inhibit their growth, minimize their spread and delay the death of ash trees.

The rate at which ash tree mortality advances is related to EAB density. Therefore, an over-riding theme within the "Low Ash Mortality" or "SLAM" approach is to reduce EAB numbers and the growth of EAB populations. This can occur by destroying EAB life stages before adults can disperse and reproduce and by concentrating adult beetles and eliminating their progeny before the next emergence season. As outlier populations build and coalesce, the area encompassing dead, dying and declining ash trees increases dramatically. A do-nothing or a regulation-only approach means that EAB populations will build and advance unchecked. Under that scenario,

extensive local tree mortality is likely to occur much sooner than under a SLAM management scenario

Applying a SLAM approach will not eradicate EAB, nor will it eliminate tree mortality. The goal of this management strategy is to slow the local invasion process and allow land managers time to be proactive rather than simply reacting to overwhelming numbers of dead, often hazardous trees. When EAB was first identified in North America in 2002, little information about this beetle was available. Tools available for EAB survey and control have progressed considerably. Continued research and methods development will yield more options for EAB management and increase the effectiveness of existing technologies. Slowing the movement of EAB and the advance of ash mortality buys time for research and technology development. Since New York is really the "gateway" to New England, our efforts to slow the spread of EAB eastward will have innumerable benefits to the New England states – Connecticut (hard hit by Hemlock wooly adelgid), Massachusetts (already reeling from ALB), Vermont (whose maple industry lives in fear of ALB), New Hampshire, Maine and Rhode Island. SLAM investments in New York now will greatly benefit those states and their ash resources, possibly for years to come.

The SLAM initiative, is a forest pest management effort, and as such is primarily a role of, and is supported by the USDA Forest Service, the research community and State Forestry agencies. NYSDEC proposes to aggressively seek funding for, collaborate and implement SLAM, on an operational rather than research-oriented basis, around known populations of EAB in New York State. If funding is available, this effort will continue at least until, or unless, the generally-infested area in the State becomes so large that this approach is deemed ineffective.

C. SLAM Operational elements:

1. **Reduce known EAB populations** by removing and disposing of infested trees, preferably prior to emergence/flight season or after adults have mated and laid their eggs on host trees. Priority will be placed on removing large diameter trees, known to be infested around the perimeter of the delimited core (per latest guidance from Dr. Nathan Siegert at Michigan State University). (Larger trees have greater potential to harbor EAB larvae and, consequently, produce more emerging adults.) Results of visual detections, sentinel trees assessments and trap catches will all be used to identify and target priority tree removals. Consideration will also be given to focusing infested tree removals in areas closest to uninfested (or, at least, undetected) ash-heavy stands or areas, and/or in line with high-value and high-risk ash resources in nearby communities.

2. **Annually, create clusters of girdled trap trees as "sinks"** to attract EAB adults and hold populations within the known infested "core" as long as possible. Protocol will be:
   - seek landowner permission to girdle, inspect and eventually remove trap trees

- physically girdle trap trees in clusters, according to most current research-based protocols
- collect and record GPS location data for each trap tree and cluster
- remove trap trees prior to next flight season and dispose of them per regulations
- sample trap trees to detect and evaluate EAB attack/catch

Establishment of sinks (research and/or management purposes) to be coordinated among participating agencies, research teams and other partners through the DEC EAB Program Manager in coordination with the NY EAB Science Panel.

3. **Establish "sentinel trees"** extending out from periphery of delimited infestation area (the "core action area") to assess effectiveness of SLAM efforts and detect any spread of EAB outside the core action area. Sentinel trees should be created by girdling selected ash trees that have attractive features to EAB (large diameter, open or edge-grown, dominant canopy position, etc., based on current science) and hanging the latest trap model, according to the current trapping protocols (if additional traps and lures are available) . These trees would be GPS-located, removed at the end of each flight season, and destructively sampled to look for evidence of EAB attack.

4. **Ash reduction and utilization.** DEC and other potential partners, including , US Forest Service, Cornell Cooperative Extension, NY Forest Owners Association, NY Society of American Foresters, and others, will provide outreach, information and technical assistance to private forest owners, forest owner organizations, private sector foresters, timber harvesters, wood-using industries, non-governmental environmental organizations and other State and local natural resource-related agencies to encourage reduction (and quarantine-compliant utilization) of ash within 20 miles of the infested "core action areas". Research has shown that that removal of merchantable ash trees from a forest as part of a comprehensive forest management plan can be an effective way to reduce the size of potential EAB infestations, and capture economic value before EAB attack.

5. **Conduct and collaborate in biocontrol research** with USDA Agricultural Research Service, USDA APHIS, USFS, and the academic research community. Research will include permitted release of approved parasitoids, monitoring of release sites and sampling of ash trees to determine fate of introduced parasitoids and rates of parasitism. Research activities to be coordinated through the NYS EAB Science Panel in close cooperation with USDA Agricultural Research Service, APHIS EAB researchers in Brighton, MI, academic researchers in Michigan and US Forest Service Forest Health program specialists. Activities will follow the Emerald Ash Borer Biological Control Program 5-Year Implementation Strategy (FY2010-2014), October, 2009,

(http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/downloads/eab-biocontrol-5yr-plan.pdf) and the Emerald Ash Borer Biological Control Release Guidelines published in 2010 by USDA APHIS, ARS and Forest Service, (http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/downloads/EAB-FieldRelease-Guidelines.pdf)

6. **Conduct and collaborate on insecticide research/trials/applications** with USDA APHIS, USFS, Cornell Cooperative Extension, academic researchers, community governments and land or homeowners to protect high-value, individual landscape ash trees. Provide outreach, information and education on available insecticides, techniques and decision-criteria to homeowners, communities, arborists and applicators. Latest insecticide options, criteria and protocols may be found on the EAB info website and in a 2009 publications from Herms, DA, McCullough DG, Smitley DR, Sadof C, Williamson RC and Nixon PL. 2009. Insecticide options for protecting ash trees from emerald ash borer. North Central IPM Center Bulletin, 12 pp.

7. **Participate in National Ash Tree Seed conservation initiatives.** The USDA NRCS Rose Lake Plant Materials Center leads a cooperative "National Ash Tree Seed Collection Initiative" that involves USDA Natural Resources Conservation Service, USDA Forest Service, USDA Agricultural Research Service and other partners across the North American ash range. We will collaborate with this national effort to collect store ash seed for conservation purposes. NYSDEC will develop a program, following National guidelines, using staff and volunteers to collect, process and store seed at our Saratoga Tree Nursery and share our resources, capabilities and seed with the NRCS Rose Lake Plant Materials Center and the USFS National Seed Laboratory, which also is pursuing their own "Ash Genetic Conservation Plan" including seed collection and conservation.

8. **Annually evaluate and report on all activities** in writing, distributed to all partners and stakeholders, through electronic media, and through a stakeholder conference (dependent upon funding).

D. Outreach and Education

Continue public and stakeholder outreach and education. There are a great many organizations who have, or want to have authority and responsibility (and funding) for public and stakeholder outreach and education, addressing the needs of a wide range of audiences. It will be critical for all partners and players to work collaboratively to increase public awareness, observation, detection, reporting, regulatory compliance and appropriate voluntary landowner and ash tree-owner management responses. DEC has organized an EAB Outreach Team under its EAB Multi-Agency Coordinating Committee. This would be the appropriate place for all interested parties to come together to develop plans,

coordinate outreach efforts, develop budgets and funding requests, jointly advocate for additional funding and staffing and share resources. Numerous outreach and education initiatives are already underway, both specific to EAB and peripherally related through our on-going "don't' move firewood" and firewood regulation outreach. Cornell (Mark Whitmore) has an outreach grant from USDA APHIS that is supporting workshops and development of a Community Response Plan handbook. NYSDAM and the NY Chapter of The Nature Conservancy are partnering in an EAB awareness and outreach project, also funded by USDA APHIS, that includes community workshops, declaration of August as "Forest Pest Awareness Month", and training of citizen volunteers to aid in EAB surveying and reporting. NYSDEC has an on-going program focusing on our firewood regulation (DEC-funded) and EAB-specific outreach focusing on campers, private campground owners, firewood dealers, forest owners, homeowners and the general public (with USDA APHIS and USF funding). Various County Cooperative Extension agencies are also involved in local EAB outreach activities and the State's new Partnerships for Regional Invasive Species Management, or PRISMs, are also becoming more engaged in EAB outreach efforts targeting a variety of audiences.

E. Quarantine Enforcement

Quarantines to restrict the human-assisted movement of EAB on ash material and products are an important element of the overall State and Federal response to EAB and complement to the Bureau of Private Land Services' EAB management response plan. Three agencies, USDA APHIS, NYSDAM and NYSDEC, each have regulatory authority and have imposed parallel quarantines that regulate the interstate (APHIS) and intra-state movement (NYSDAM and NYSDEC) of "regulated articles", including EAB itself, ash logs, green (not kiln-dried) ash lumber, ash nursery stock and firewood, of all species. Each of these agencies has committed to enforcing the EAB quarantine regulations and have agreed to cooperate and coordinate their enforcement efforts.

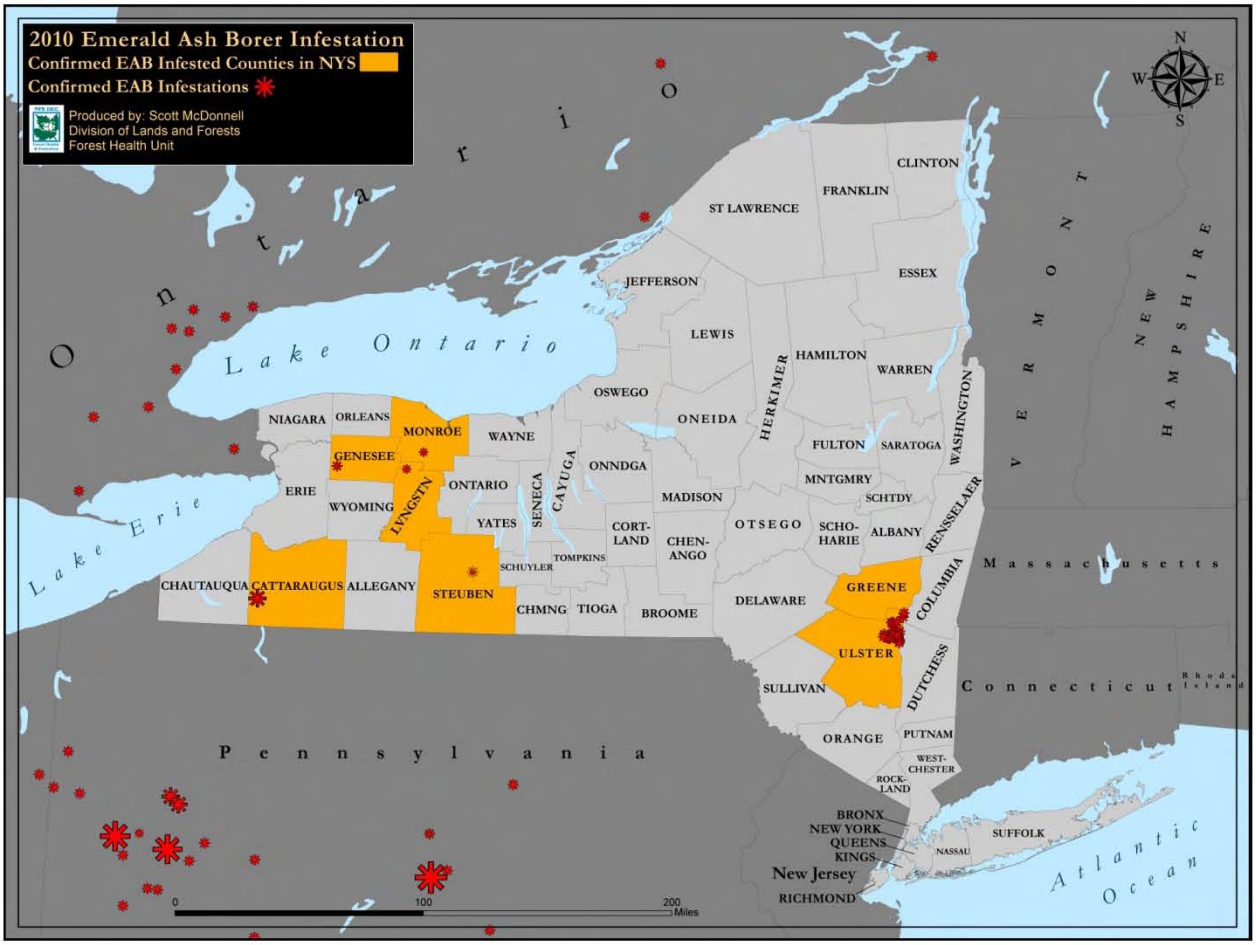
In addition to the expanded EAB quarantines, NYSDEC adopted regulations on the import and movement of firewood 2 ½ years ago which complement and support the EAB regulations. DEC's firewood regulations prohibit the movement of untreated firewood into the State, mandate source-identification and labeling of untreated, NYS-produced firewood, and limit the movement of NYS-produced, untreated firewood to no more than 50-miles from its declared source. The regulation also established treating standards for firewood, requiring it be heat-treated to a core temperature of 71C (160F) for 75 minutes.

The Bureau of Private Land Services is not a law enforcement program and does not have enforcement authority. Therefore, it does not have any direct role in organizing, staffing or conducting enforcement actions. However, The Bureau and Division are committed to supporting Law Enforcement actions to enforce

the EAB quarantine and DEC firewood regulations, and works closely with DEC Law Enforcement to provide training office and field staff support and resources (such as trailers to handle confiscated firewood) to support enforcement efforts. The bureau will continue to work with all Law Enforcement and regulatory authorities to pursue and assist, as appropriate, with enforcement actions that support our EAB and firewood regulations, and serve our goal of keeping as many ash trees alive as possible, in as much of New York State as possible, for as long as possible.

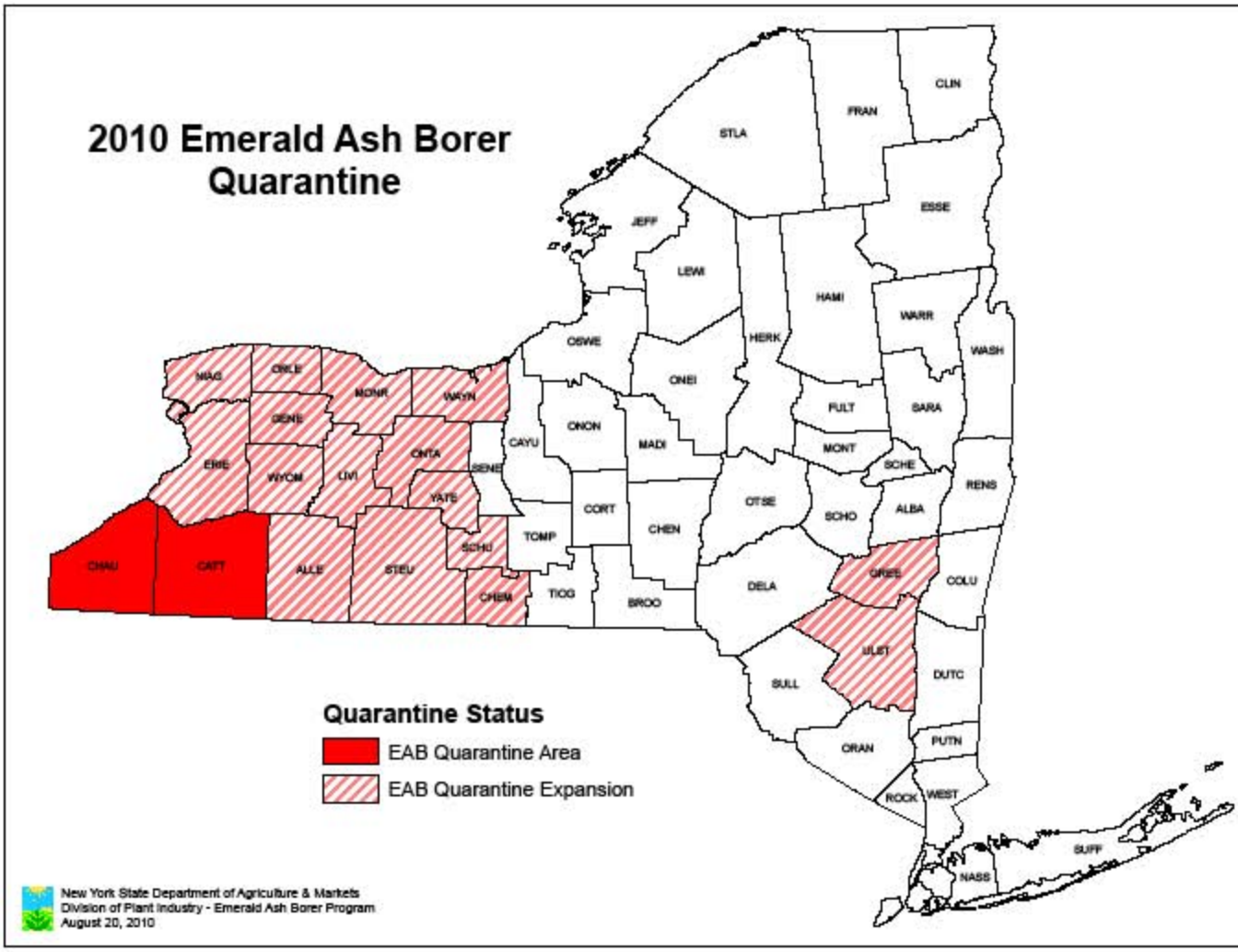
Appendix B.

Location of detected EAB occurrences in New York as of September 17, 2010.



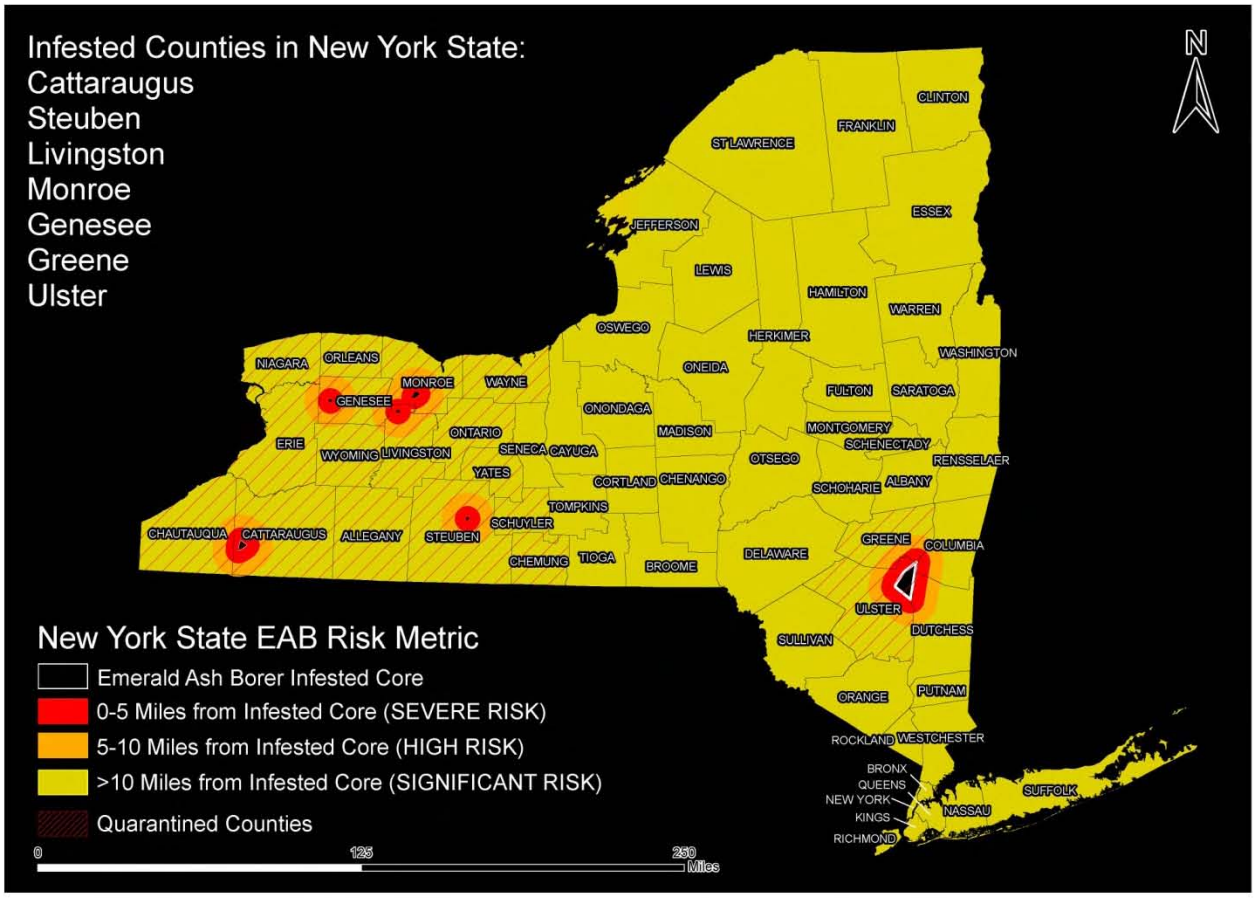
Appendix C.

NYSDEC and NYSDAM EAB quarantine areas, imposed in September, 2010.



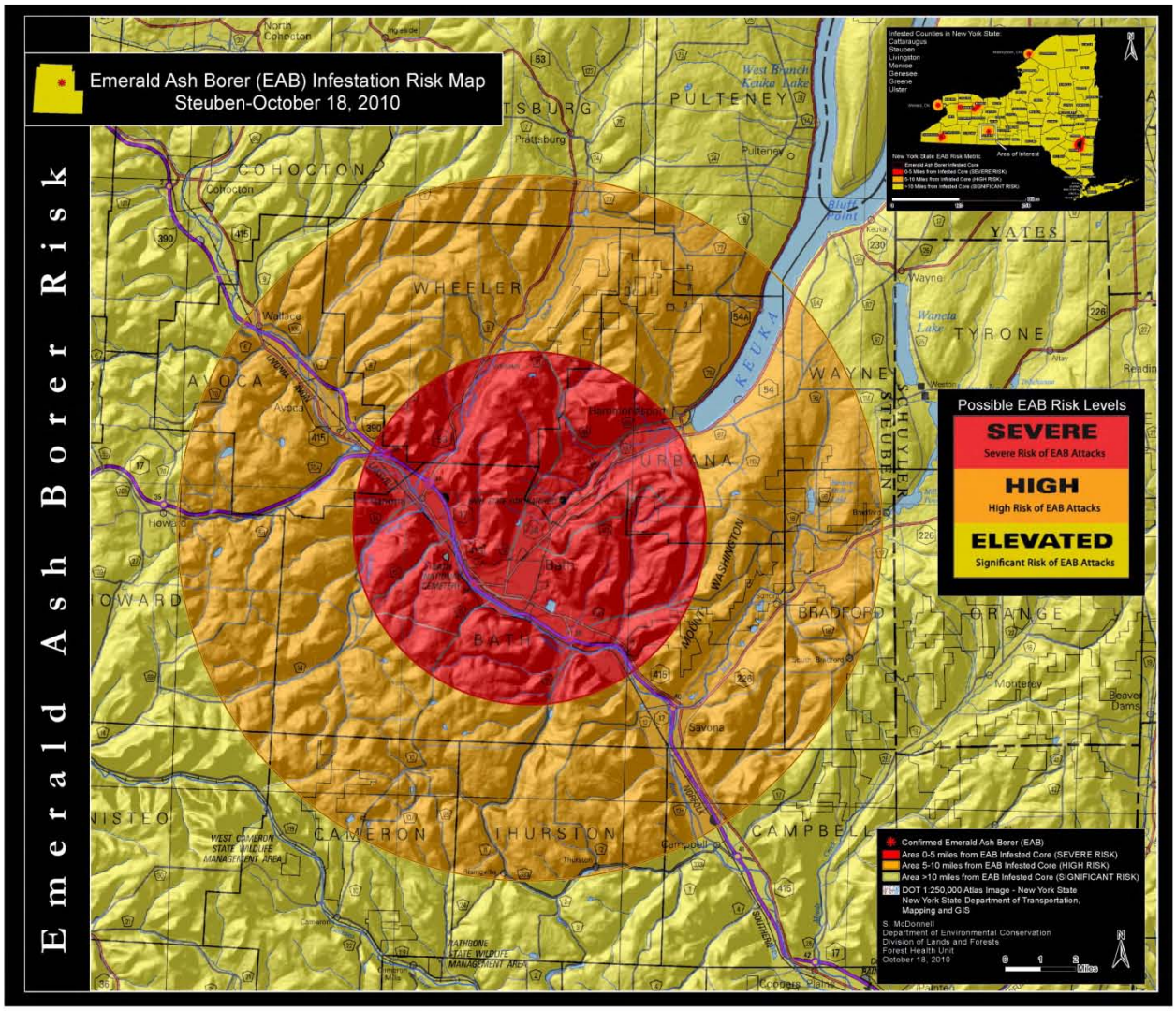
Appendix D.

Detected and delimited EAB occurrences in NYS, as of 10/1/10

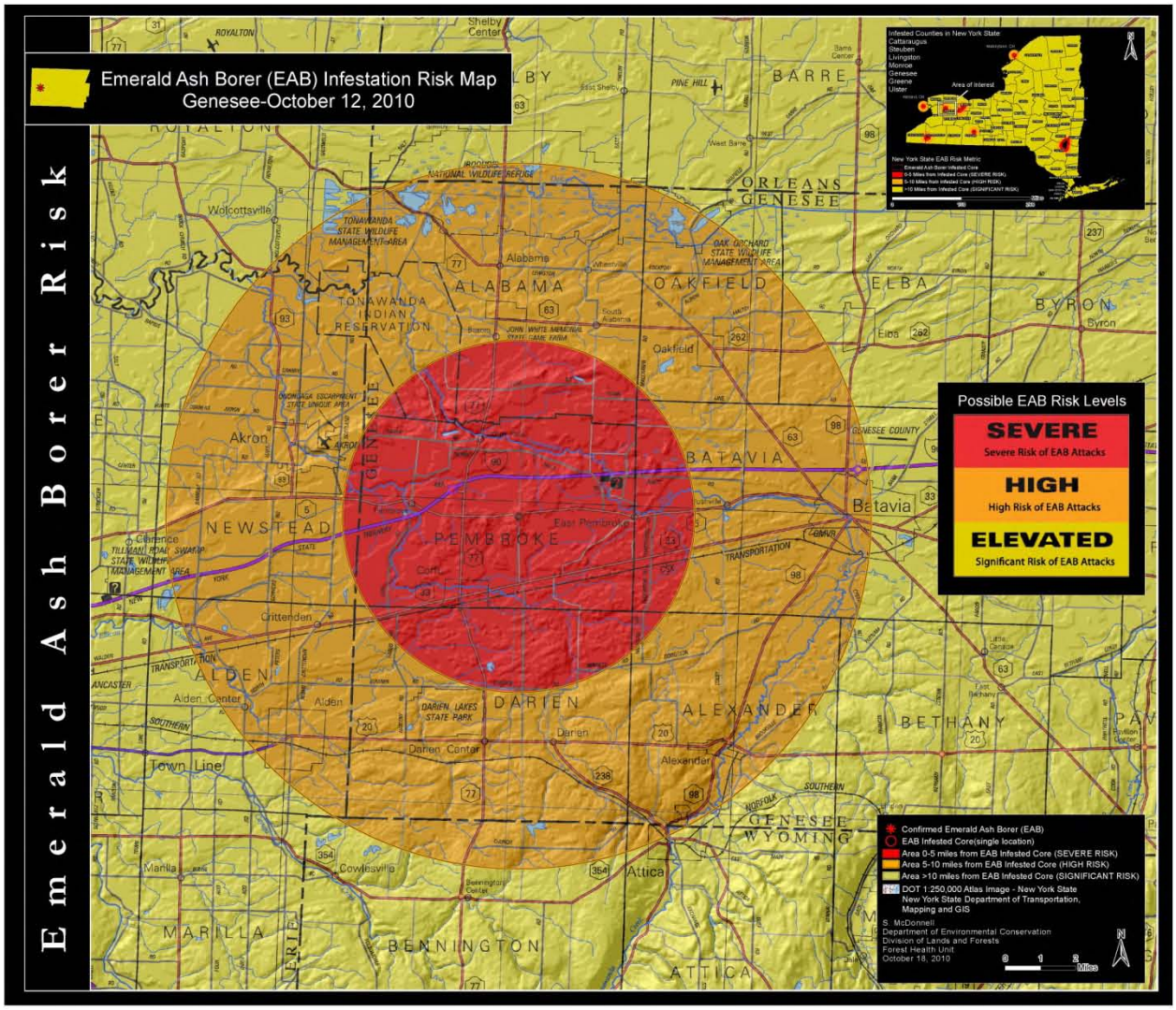


Appendix E.

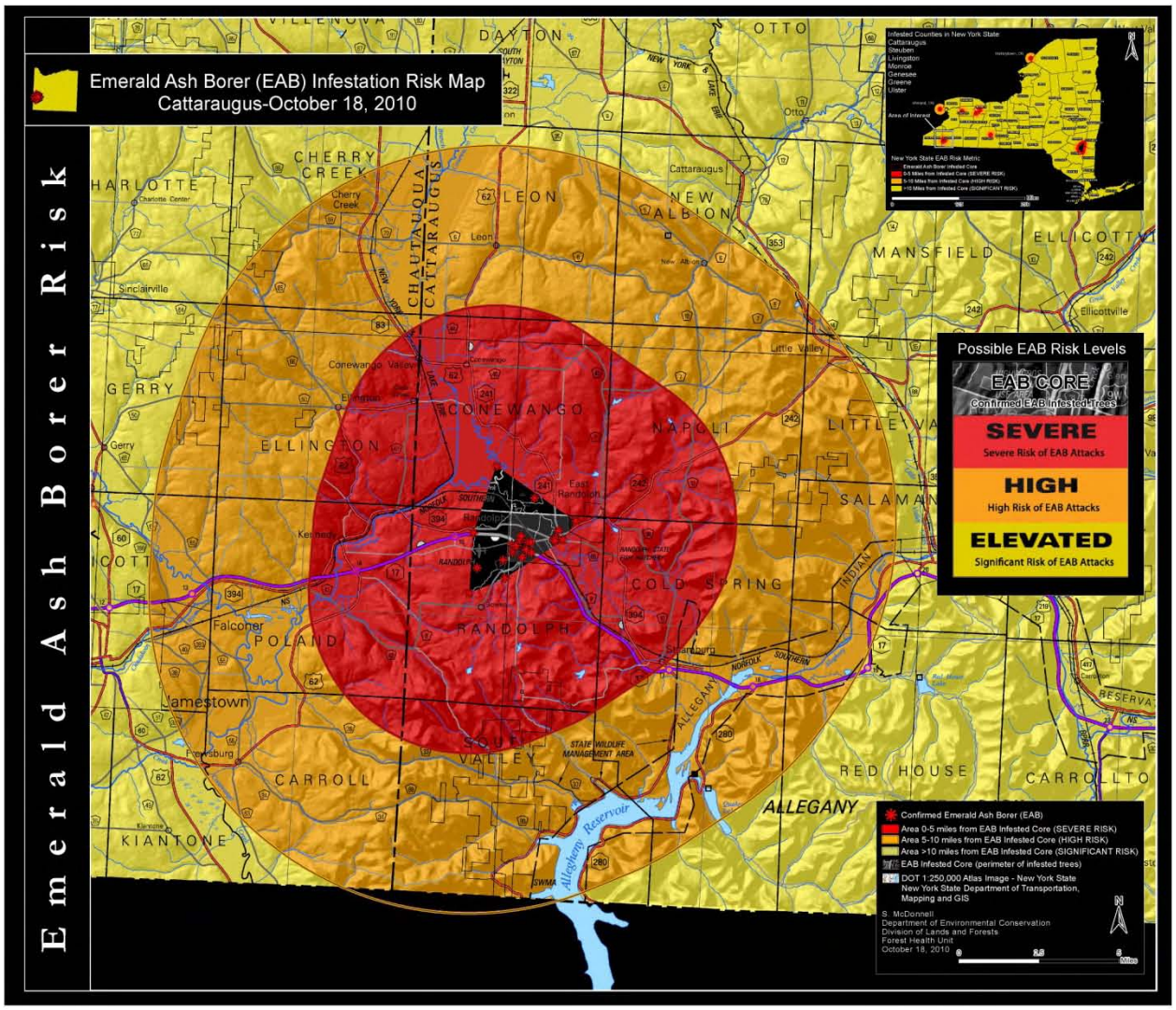
Steuben County EAB satellite occurrence, Tier 1



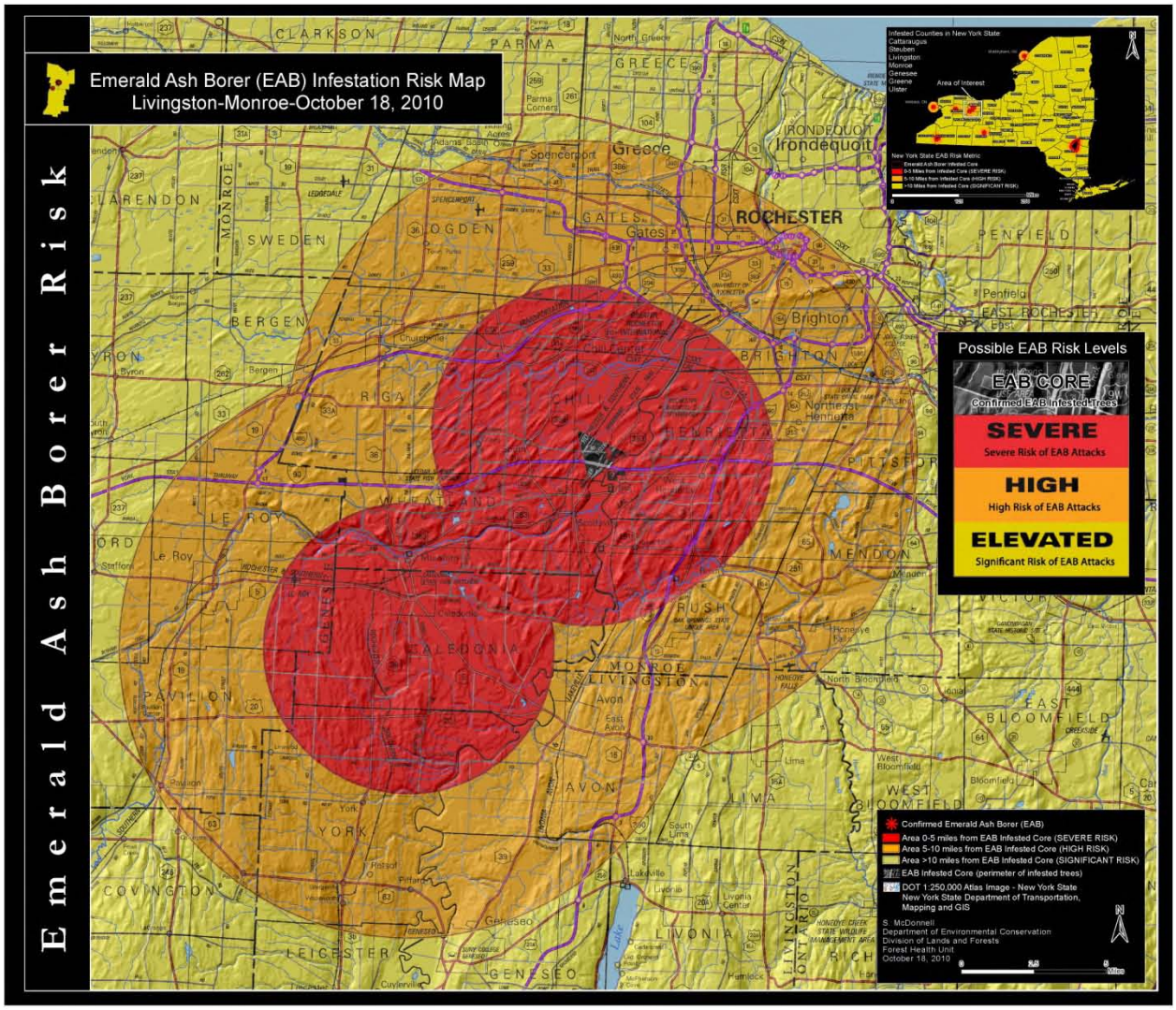
Genesee County EAB satellite occurrence, Tier 1



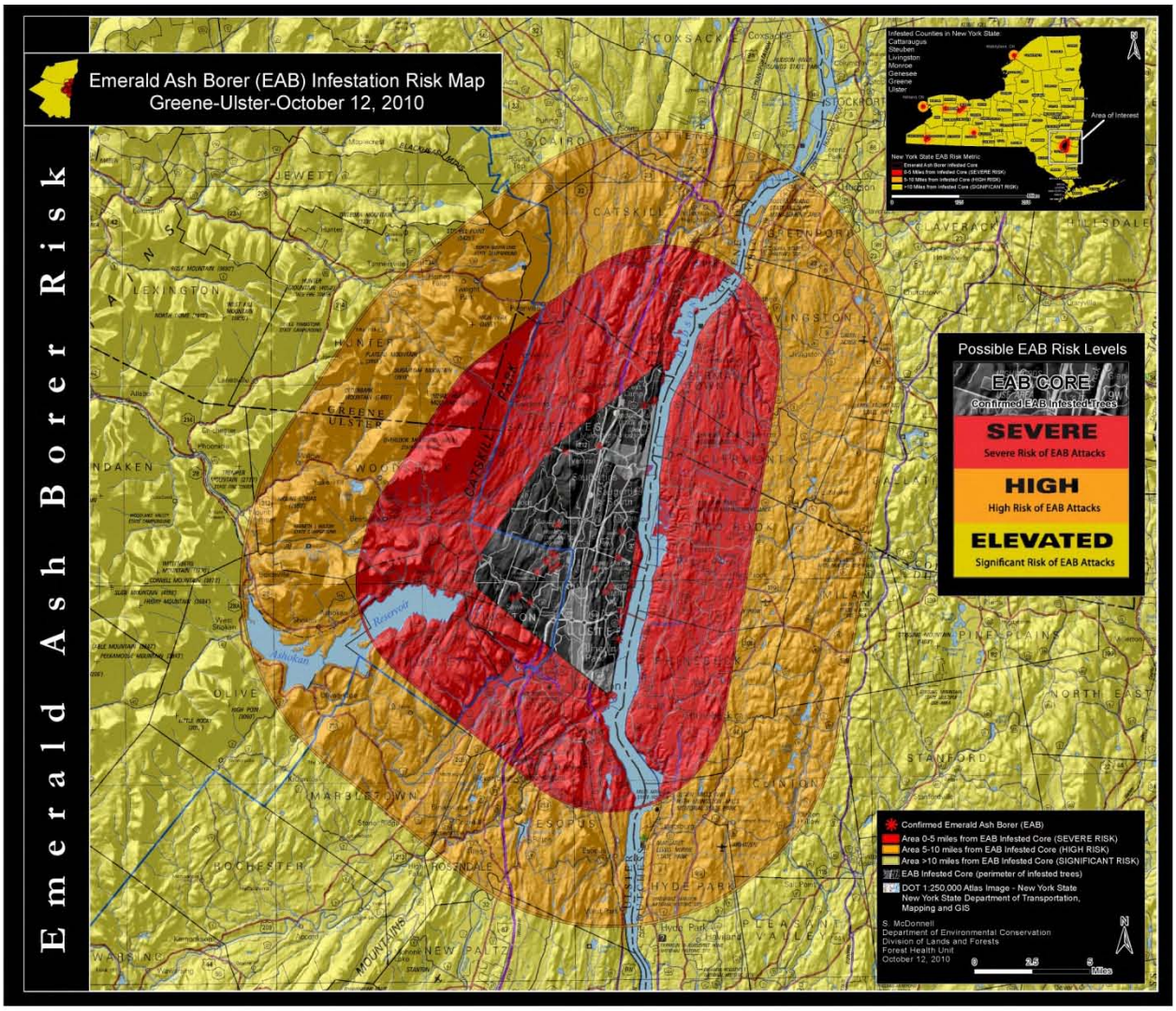
Cattaraugus County EAB satellite occurrence, Tier 2



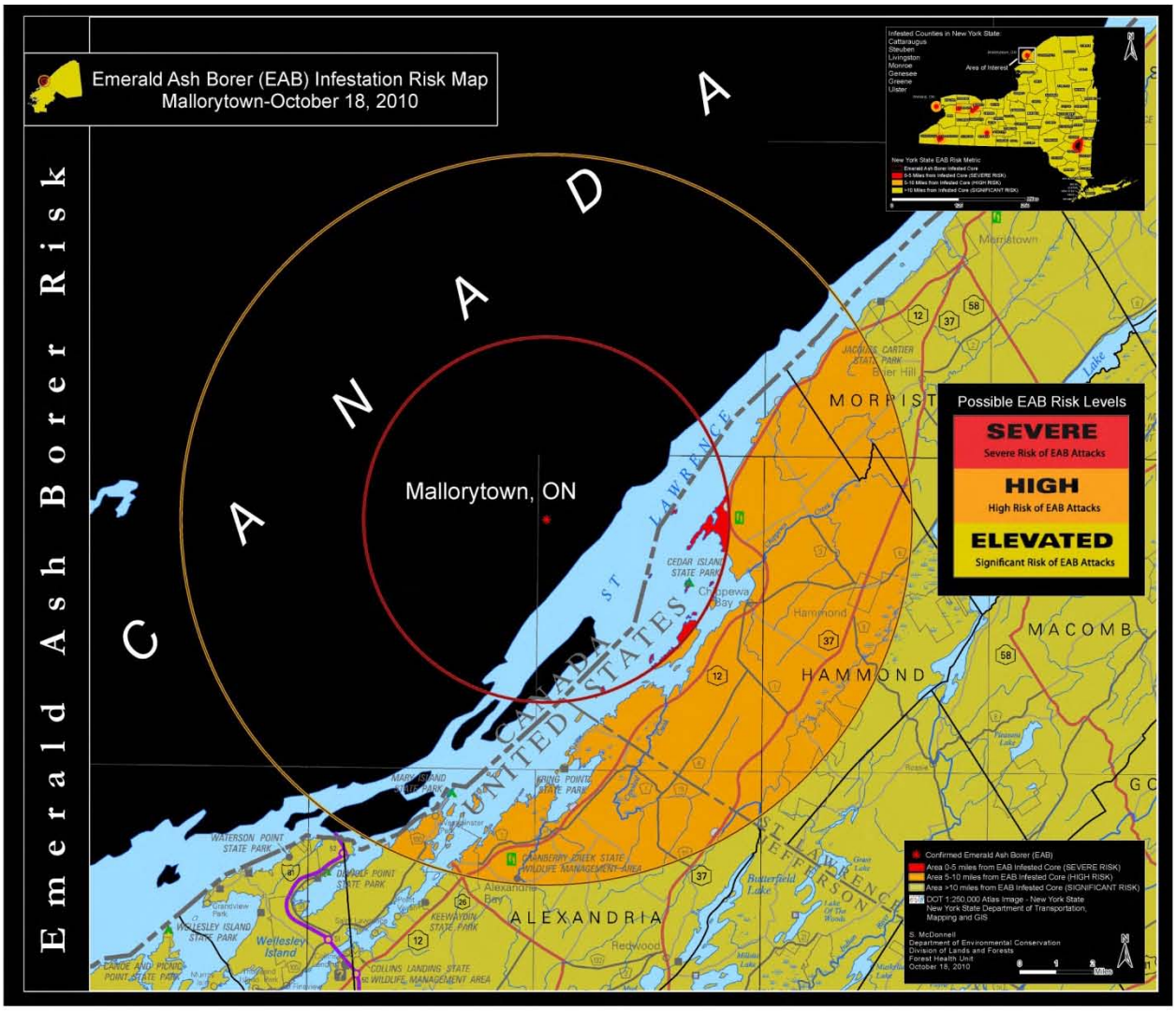
Livingston/Monroe EAB satellite occurrence(s), Tier 2



Ulster Greene EAB satellite occurrence (Tier 3)



Mallorytown, Ontario, Canada EAB detection (Tier unknown, presented as Tier 1)



Welland, Ontario, Canada detection (Tier unknown, presented as Tier 1)