Emerald Ash Borer Worksheet - Introduction

To: All municipal officials who might be involved with planning or responding to the emerald ash borer infestation in Connecticut.

Regarding: The emerald ash borer.

It is anticipated that all municipalities in the state will have this highly invasive insect within their borders shortly, if they do not have it already. It is also anticipated that the presence of this insect will quickly lead to the death of all or almost all ash trees. Ash trees are a small but important component of the urban forest within the state. In addition to affecting the quality of the urban forest, the loss of these trees represents an increased risk to the public, due to the instability of these trees when dead. They also represent a significant cost to municipalities due to the need to remove or treat these trees.

The purpose of the attached worksheet is to help guide municipalities to an understanding of the extent of this problem in their communities, including an understanding of the number of trees involved and the costs associated with their removal. The intended end result of this worksheet is a plan for the individual municipality regarding its approach to dealing with emerald ash borer.

It is opinion of the DEEP Division of Forestry and of the Connecticut Agricultural Experiment Station that all ash trees within the state are vulnerable to the emerald ash borer. In all likelihood, before this infestation has run its course, all ash trees in the state will succumb to this insect. Exceptions are those ash trees that die for other reasons and those that are treated with an insecticide to combat the emerald ash borer. In addition, it is the experience of municipalities in other parts of the country that ash trees tend to fall apart relatively quickly once dead, increasing the importance of being proactive in dealing with this insect.

Essentially, when public tree managers look at an ash tree, they are encouraged to consider that they face three choices for this tree:

- Cut it down (live trees can be removed pro-actively)
- Have it treated with a proper insecticide to prevent its loss due to the emerald ash borer
- Allow it to succumb to the emerald ash borer and fall apart in place (appropriate when trees are in areas where people and property are not at significant risk)

The Connecticut Urban Forest Council has joined DEEP Forestry and CAES in encouraging the use of this worksheet by municipalities so that cities and towns may get a grasp of the scope of this issue.

For more information on the emerald ash borer, please visit www.ct.gov/deep/eab or www.ct.gov/caes.

If there are any additional questions, please contact:

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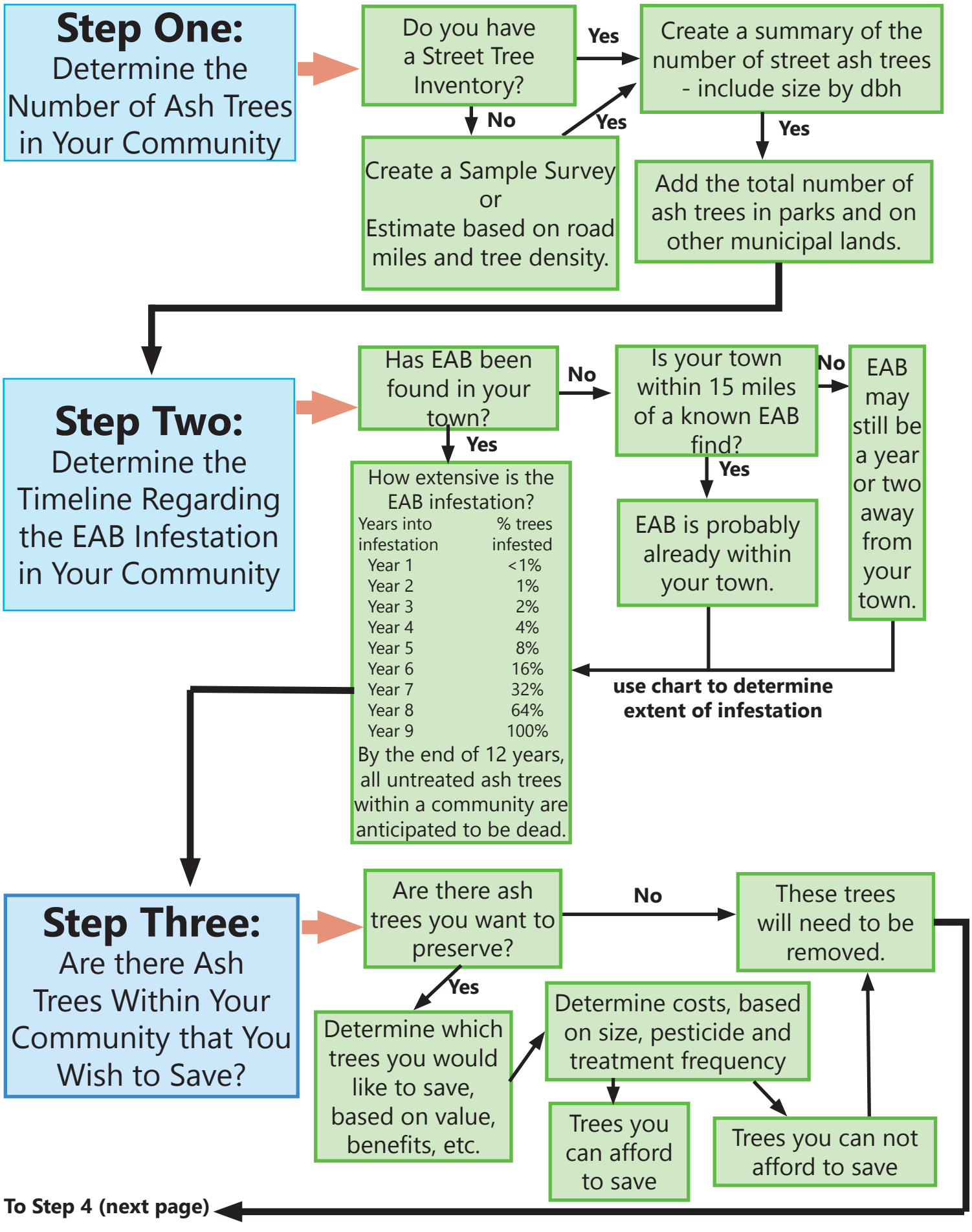
Flowchart for the EAB Worksheet



from Step 3

Step Four:
Calculate What it Will Cost to Remove Ash Trees From Throughout Your Community

Determine what are the costs for removing individual trees - by dbh.

Determine when you will need to remove trees - staggering removals can help control costs.

Set up your budget for tree removal.

Step Five:
Determine Your Options for Disposal of the Wood Generated

Typical wood use options:
- chipped and ground for mulch
- timber or lumber for use by town
- merchantable logs
- firewood (not recommended for infested trees)

Step Six:
Determine Your Replanting Plans

Consider appropriate replacement species, priority planting sites and long-term town forest plans.

Develop a replanting plan that includes costs, benefits of plantings and the public's interests

Step Seven:
Develop Your Emerald Ash Borer Response Plan

List priorities. Priorities might include:
1. Public Safety
2. Environmental Benefits
3. Financial Benefits
4. Social Impacts
5. Demographic or Geographic Priorities

Prepare a Report that Summarizes:
1. Current Conditions
2. Course of Actions
3. Expected Results
4. Individuals or Organizations Responsible for Each Action
5. Specific Time Frames for Each Action

Emerald Ash Borer Worksheet

Step One: Determine how many public ash trees are in your community.

Part One: Street Trees – determine how many ash trees are along your streets using one of the following methods.

Method One: Does your community have either a complete street tree inventory or a partial inventory that applies to the whole community?

If yes – use this inventory to determine the number and size of the ash trees in your community.

Method Two (if your community does not have a street tree inventory):

Conduct a sample survey of your community's street tree population. This can be done by using a tool that will select of 5% of your community's street length, by street segments[1]. These segments can be surveyed using a windshield survey method to determine the number and size of ash trees in these segments. If using a 5% survey, multiply this result by 20 to determine overall number and size of ash trees in your community.

Method Three: Create an estimate of number of ash trees based on road miles, street tree density and the typical percentage of ash among street tree populations in Connecticut.

1. To determine the number of road miles, you can make use of the following DOT document: http://www.ct.gov/dot/LIB/dot/Documents/dpolicy/publicroad/PublicRoadMileage.pdf
2. Create a reasonable estimate of the number of street trees per mile in your town (estimates usually range between 100-200 trees per street mile).
3. Using a reasonable estimate of the percentage of street trees that are ash (usually about 2-3% of the total tree population, but this percentage may be higher or lower locally), multiply
   (*the percentage of ash*) x (*the number of trees per mile*) x (*the number of street miles*)
   to get a rough estimate of the number of ash trees total.
4. If possible, place this number of ash trees into a set of broad size categories (for example '< 12 in dbh', '12-18 in dbh', '18-24 in dbh', '24-36 in dbh', '> 36 in dbh'). This will be helpful in determining costs.

Part Two: Park Trees and other Public Trees

Method: Identify those ash trees that are in the areas of high traffic or are highly visible. These are trees that, if they failed, might endanger people or property or, should they die, would represent a significant loss to the community. Note how many trees fall into either of these groupings. Also take note of the size and accessibility of these trees.

[1] For a discussion of how to create a list of sample street segments, see the i-Tree Tool webpage: http://www.itreetools.org/streets/sample_inv.php. Specific instructions on generating a list of random street segments is included in Appendix 1 of the i-Tree Streets Manual - http://www.itreetools.org/resources/manuals/Streets_Manual_v5.pdf

Emerald Ash Borer Worksheet

Step Two: Determine the timeline regarding the EAB infestation in your town by doing the following:

Part One: Has EAB been found in your town?

If yes, how extensive is the infestation (e.g. – are 1% of ash trees infested? 10%? 50%?)

If EAB has not yet found in your town, has it been found in a town within 15 miles? If so, EAB is probably present.

If EAB has not been found in a town within 15 miles – EAB may still be a year or two away.

Part Two: Determine the likely timeline for the EAB infestation in your town.

Because the spread of EAB is largely unchecked in Connecticut, it is expected that, once EAB enters a community, the number of trees that are infested will double until all trees are infested. Also, a community that is adjacent to an infested town but in which EAB is not yet found is very likely to already have 1% - 2% of its ash trees infested, even though the infestation has not yet been detected.

Use the following chart to help determine where your community might be with regards to the extent of an EAB infestation. Multiply the percentage of trees infested in the chart below times the number of trees as was determined in Step One to learn the number of infested ash trees your community will need to deal with as the infestation progresses.

Years into infestation	Number of Ash Trees Infested with EAB
Year 1	Not noticeable, < 1%
Year 2	1%
Year 3	2%
Year 4	4%
Year 5	8%
Year 6	16%
Year 7	32%
Year 8	64%
Year 9	100%

Assuming in a heavy infestation all infested trees will die within 3 years of becoming infested, by the end of 12 years all untreated ash trees within a community are anticipated to be dead from EAB.

Step Three: Are there ash trees within your community that you wish to save by treating with an insecticide?

Part One: Determine which ash trees in your community you might wish to save. There may be several factors associated with this decision. The factors might include:

- A tree of special value, perhaps due to size, location or historical significance
- The cost of the treatment compared to the cost of removal. Keep in mind, depending on insecticide used, treatments will need to be repeated annually or biennially in order to remain effective.
- Insecticides can also be used to control rate of removal. In other words, the need to remove trees can be postponed by treating individual trees for a limited period of time.
- The benefits of the canopy cover retained by keeping ash trees alive in the landscape.

Part Two: Determine the treatment costs for individual trees. Factors in determining cost include extent of infestation, kind of insecticide used, frequency of treatment (annually vs. biennially) and the size of the tree. Trees that are only lightly infested or that do not yet show signs of being infested can be treated with an insecticide that is less expensive but that might require annual treatment. Trees more heavily infested will require a more expensive treatment. If a tree has suffered more than 30-40% canopy loss, it is probably too late to treat.

Information on treatment options can be found on the CT Agricultural Experiment Station website (Factsheet: Guidelines for Preserving Ash in the Presence of Emerald Ash Borer[2]) and through the publication Insecticide Options for Protecting Ash Trees from Emerald Ash Borer[3]

Current estimates for treatment range from $1-$2 per inch of diameter at breast height (dbh) for imidicloprid to $5-$7 per inch dbh for emamectin benzoate. It would be best to confirm approximate costs with a local arborist before basing calculations on these estimates.

Part Three: Given these considerations, develop a list of trees that are worth saving and that your town can afford to save. Estimate the costs of treatment on a per year basis for each tree to be treated.

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[2] http://www.ct.gov/caes/lib/caes/documents/publications/fact_sheets/valley_laboratory/eab_fact_sheet_2012_cowles_locked.pdf

[3] Available through the Emerald Ash Borer Information Network – www.emeraldashborer.info

Step Four: Calculate what it will cost to remove ash trees from throughout your community.

Part One: Using the information you gathered in Step One and including any decisions you made regarding trees you would like to save, determine the number and sizes of the trees you will need to remove.

Part Two: You may use the timeline you developed in Step Two to help develop a plan for staggering the removals, so that costs of removal can be spread out over a few years. Also, keep in mind, if a decision has been made not to treat a tree, it can be removed preemptively. There is no need to wait for a tree to die to remove it[4]. This should help with planning the removal of those trees.

Part Three: Determine what removing individual trees will cost. Local estimates are preferred. However, an estimate derived by the USDA Forest Service for the Northeast region suggested $18.33 per inch dbh as guide for removal costs plus $6.50 per inch dbh for removal of the stump. (Northeast Community Tree Guide[5])

Step Five: Determine your options for disposal of the wood generated.

Part One: The following are typical options for disposal of the wood generated by removing ash trees. These decisions should be made in light of quantity of wood to be generated. Data from Step Four can be used to help guide that understanding.

Typical Wood Use Options:

a. Chipped and ground for mulch
b. Usable timber made into lumber for use in town (e.g. – work with a local sawmill)
c. Merchantable logs sold (e.g. – work with a local forest products harvester or forester)
d. Firewood only as last resort, as firewood can help spread the insect

Step Six: Determine your replanting plans.

Part One: The removal of ash trees within the community, even if only 2-3% of the total number of trees within the community, will leave a large hole in the town's urban tree canopy. The town should decide how it will replace these trees.

Part Two: Steps for replacing these trees should include a consideration of species are appropriate for replanting, priority planting sites, and a consideration of the long-term urban forest plan for the town. Discussion regarding these planting plans might include consideration of the planting costs, benefits lost due to the tree removals, potential benefits from the new trees to be planted, and the extent of public interest in these decisions.

[4] In forested situations, where trees are not apt to become a hazard, there are good reasons to leave ash trees in place. Dead trees provide important wildlife benefits and some trees might turn out to show resistance to EAB. Leaving resistant trees can benefit the species genome.

[5] https://www.itreetools.org/streets/resources/Streets_CTG/PSW_GTR202_Northeast_CTG.pdf

Step Seven: Develop your Emerald Ash Borer Response Plan.

Part One: Assemble the information that you have gathered through working your way through this worksheet.

Part Two: Develop priorities. Priorities might include:

1. Public safety
2. Environmental benefits gained or lost
3. Financial benefits gained or lost (e.g. – decreased property values)
4. Social impacts of tree loss
5. Demographic or geographic priorities within the town

Part Three: Determine limitations, especially those that relate to available resources.

Part Four: Based on all of these considerations, write a report that summarizes:

1. Current condition, in terms of number of ash trees and costs associated with removing these trees.
2. Course of action to be taken over the next few years to address the needs stemming from the presence of emerald ash borer, and in terms of the identified resources and limitations.
3. Expected results from these actions, both during the course of treatment and at the end of the period of time outlined.
4. Individuals or organizations responsible for each action identified in the report.
5. Specific time frames for all actions to be taken.

Part Five: Submit this report to the DEEP Division of Forestry.

While there is no obligation for any municipality to share their response plan, DEEP Forestry is encouraging that communities do so, both to help DEEP Forestry to better understand response efforts and so that DEEP Forestry can facilitate the sharing of information and ideas among municipalities within the state.

Please submit your Emerald Ash Borer Response Plan to:

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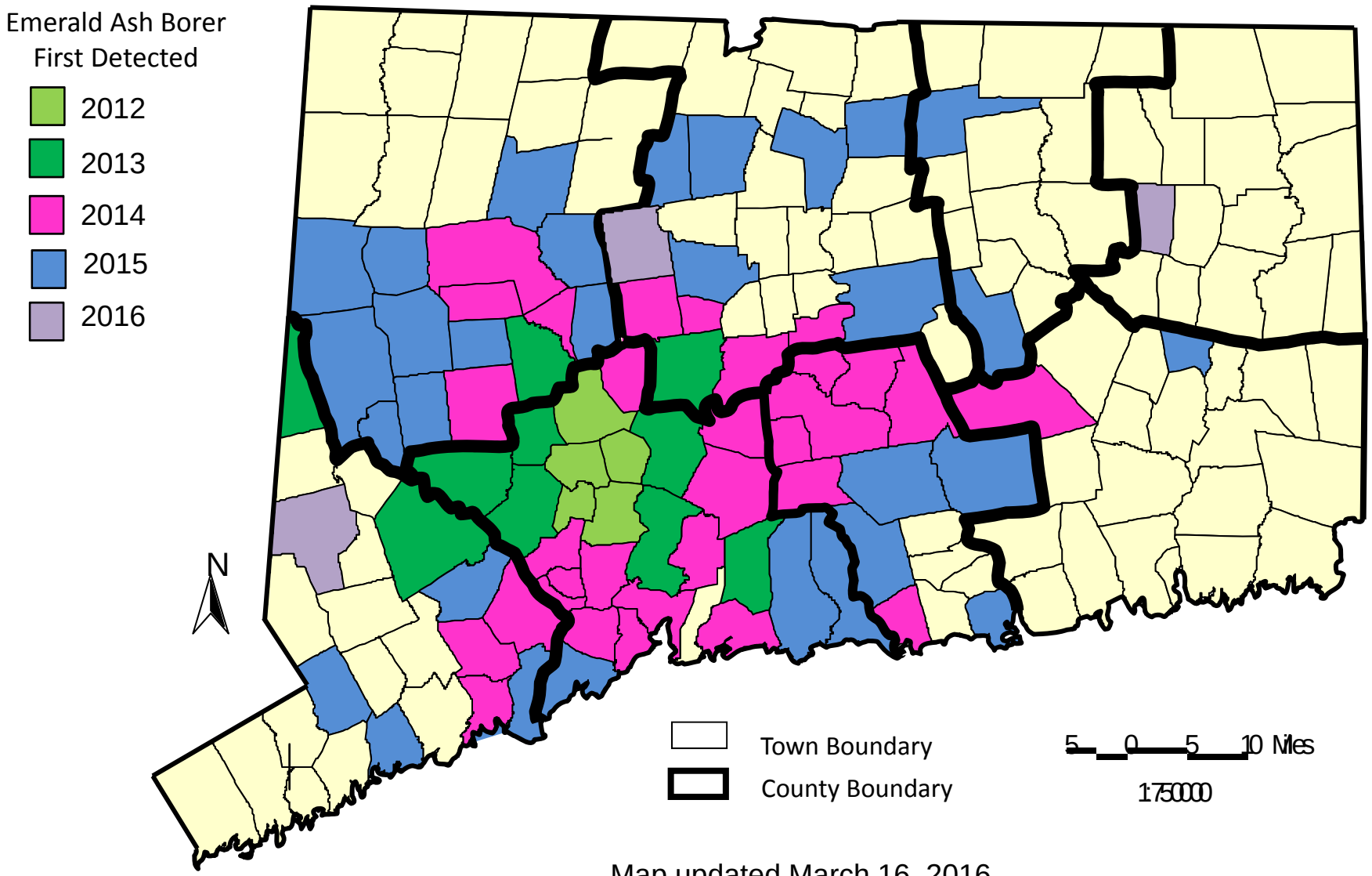

Map updated March 16, 2016

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