Emerald Ash Borer Management Plan

Topics To Be Covered

- What is an Ash
- What is Emerald Ash Borer (EAB)
- History of EAB in the U.S.
- Evolution of EAB Management Strategies in the U.S.
- Value and Benefits of Trees
- Status of Wausau Boulevard Ash Trees
- Suggested Management
- Management Procedure
- Benefit Versus Cost
- Questions

What is an Ash?

There are three primary varieties of ash planted as boulevard trees in Wausau (Green, White, and Black)

https://www.minnesotawildflowers.info/udata/r9ndp23q/pd3/fraxinus-pennsylvanica-018.jpg

http://forestry.ohiodnr.gov/portals/forestry/images/trees/ash-green.jpg

Ash become a popular boulevard tree because of their ability to grow in difficult sites
Wausau has not planted ash since 2004

What is an Ash?

Ash was selected as a suitable replacement for American Elm

They establish easily, grow fast, are salt and drought tolerant, have strong wood, and were low cost

http://www.wildelake.org/howard-county-begins-ash-street-tree-project-wilde-lake/

What is Emerald Ash Borer?

Emerald Ash Borer (EAB) is a beetle native to eastern Asia

- Adult emerges via a D shaped exit hole
- Approximately the size of a grain of cooked rice (3/8”-1/2” long)

http://images.universityherald.com/data/images/full/5257/the-emerald-ash-borer.jpg

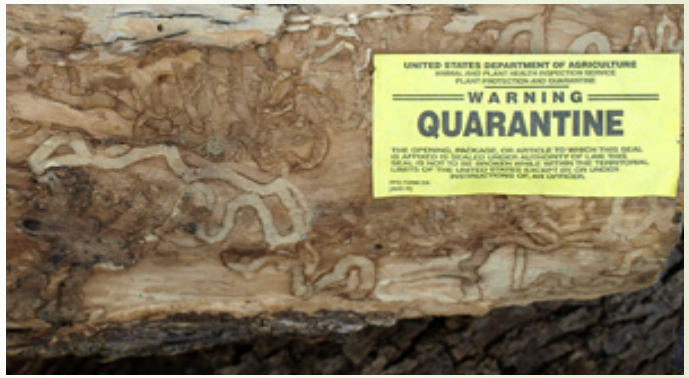
http://www.ojibway.ca/emeraldashborer.jpg

https://bugwoodcloud.org/images/768x512/5147090.jpg

What is Emerald Ash Borer?

Larval life cycle is the most damaging

http://steintree.com



https://www.nps.gov

https://www.thetoddgroupinc.com

Effects of EAB

Signs of EAB

- It is likely you will not see an EAB adult
- Often tree health and appearance indicate insect presence

http://www.ville.ddo.qc.ca/En/img/environnement/agrile-arbre.jpg

Photos courtesy of the City of Toronto

Effects of EAB

Photo by Daniel Herms

https://experiment.com/projects/can-we-save-ash-trees-from-the-invasive-emerald-ash-borer

Effects of EAB

Credit: Jeffrey Hahn

http://eminnetonka.com/community-forestry/shade-tree-disease-control/emerald-ash-borer

Effects of EAB

Toledo, Ohio – Same street between 2006 and 2009

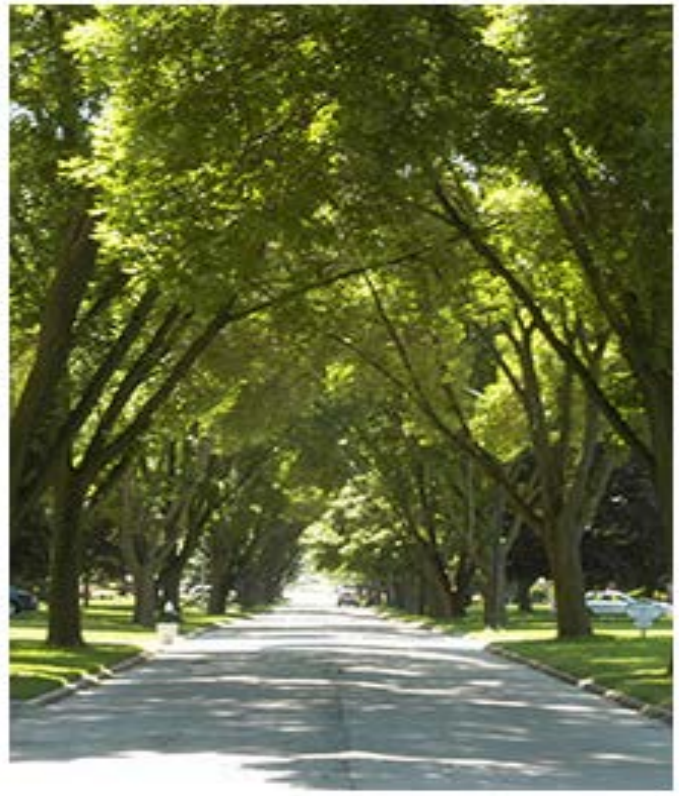


Photo by Daniel Herms

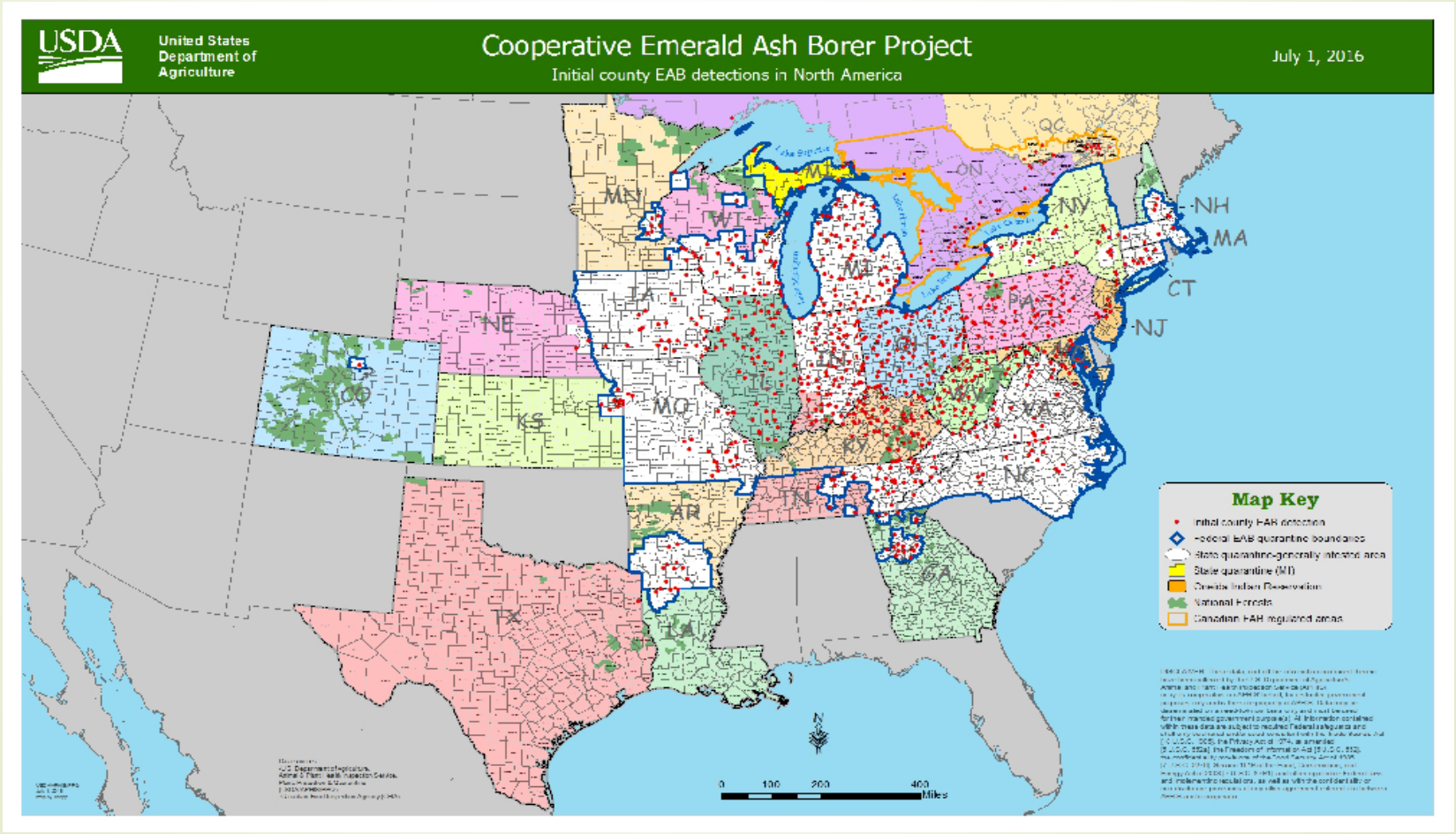
Effects of EAB

http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=16537

History of EAB

- EAB was found in the Detroit area in the summer of 2002
- EAB was likely in the U.S. for up to 10 years prior to detection
- Origin was wood packing crates from Asia
- Found in Wisconsin in 2008
- EAB has been found in 27 states and has killed over 50 million ash
- Cost to municipalities and homeowners is in the hundreds of millions of dollars

History of EAB



http://www.emeraldashborer.info/about-eab.php

History of EAB

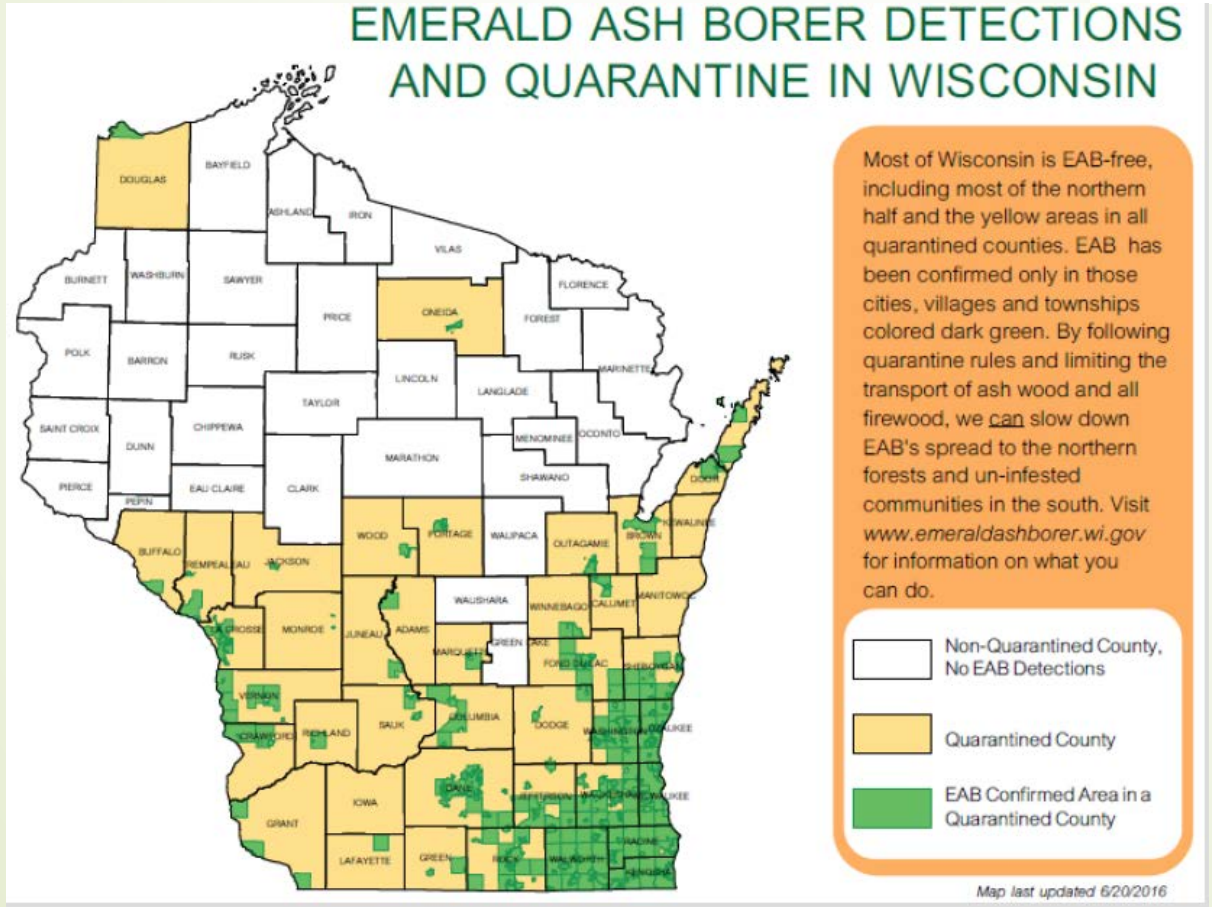


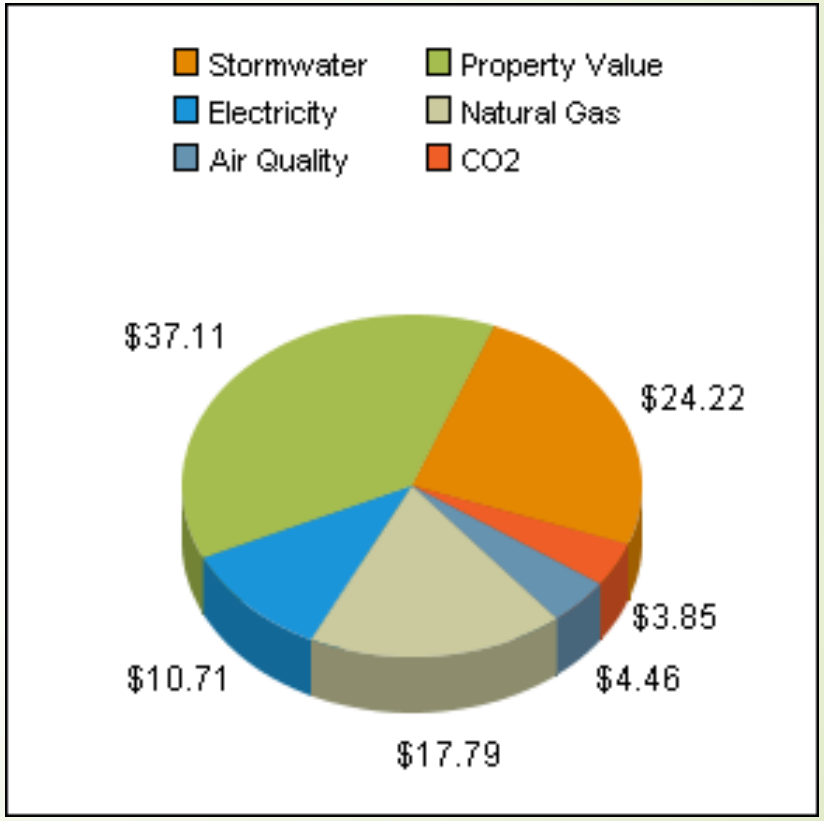
Image courtesy of Wisconsin Department of Natural Resources

Value and Benefits of Trees

The average ash in Wausau is 11.28”.

Total benefit provided per year of a 11” green ash is **$98**

Annual benefit for entire population of ash is approximately **$505,000**



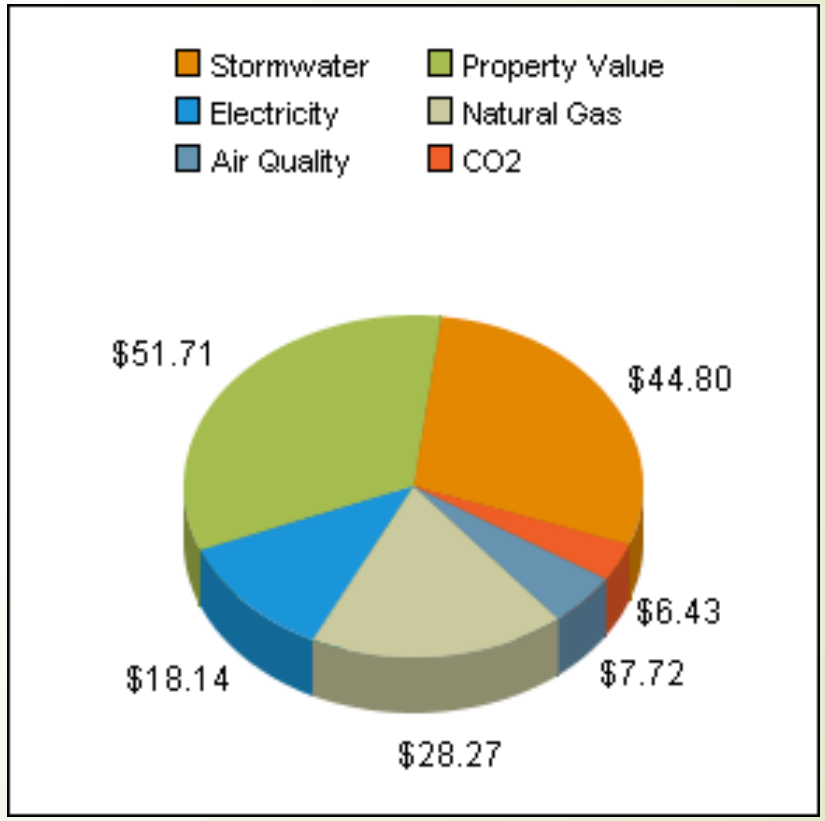
http://treebenefits.com/calculator/ReturnValues.cfm?climatezone=Midwest

Value and Benefits of Trees

If that tree were grown to 16”…

Total benefit provided per year of a 16” green ash is **$157**

Annual benefit for entire population of ash is approximately **$816,400**



http://treebenefits.com/calculator/ReturnValues.cfm?climatezone=Midwest

Value and Benefits of Trees

Additional values trees provide:

- Properly placed trees can reduce cooling costs by 30%
- Increased life of asphalt surfaces
- Moderation of ‘heat island’ effect
- Lower crime rates
- Reduce sound pollution
- Trap dust, pollen, and smoke from the air

Status of Wausau Boulevard Ash Trees

Current ash population is approximately 5200
This represents approximately 20% of all boulevard trees
Of these trees, approximately 70% are in good or better condition
Average diameter is 11.28 inches based on a 50% inventory*

*Wausau is in the process of conducting a tree inventory.
At the time of this presentation, half of the boulevard trees have been inventoried.

Evolution of EAB Management Strategies in the U.S.

- Began with an attempt to create an ‘ash free zone’ by elimination of 150,000 ash
- Remove ash within ½ mile of infection site
- Remove all ash prior to EAB presence
- Remove and replace ash with different species
- Treat high profile trees/remove and replace others
- Treat majority of population in order to conduct removals at a manageable level
- Treat all ash *Milwaukee, WI has chosen this option*

Suggested Management

To this point, we have been replacing ash with several different species:

- Hackberry
- Hybrid Elm
- Oak
- Linden
- Hop Hornbeam
- Honeylocust
- Maple…

Suggested Management

Maple, of all varieties are the most commonly requested replacement…

Species	Percent of Population
Maple (Acer sp.)	44
Ash (Fraxinus sp.)	19.7
Linden (Tilia sp.)	10.7
Crabapple (Malus sp.)	6.1
Lilac (Syringa sp.)	4.3
Hackberry (Celtis sp.)	3.4
Elm (Ulmus sp.)	2.6
Honeylocust (Gleditsia sp.)	2.5
Schubert Cherry (Prunus sp.)	1.6
Oak (Quercus sp.)	1.4
Ginkgo (Ginkgo sp.)	1
Other	2.7

Suggested Management

Due to the proximity of EAB to Wausau, we are suggesting the following over the next seven years:

- Remove poor condition ash annually on a priority basis
- Remove ash that die naturally (approximately 50 per year)
- Remove ash that correspond to street reconstruction projects
  - Total ash removed will amount to 30% of the current population
- Treat the 70% of the population that are in good or better condition
- Continue to replace ash with different varieties of trees

*We suggest this management plan be practiced for seven years, after which time we will re-evaluate and determine the next course of action.

Suggested Management

Wausau Ash Street Tree 7 Year Management Plan

Year	Population	Trees to be Treated	Trees to be Removed	Annual Treatment Cost	Planned Removal/Replacement Cost	Total Cost	Retained Value
0	5200	0	40	0	8010	8010	505680
1	4899	1715	261	151489	53307	204796	510180
2	4640	1624	259	149570	52898	202469	481910
3	4383	1534	257	147039	52490	199528	462112
4	4127	1444	256	143867	52285	196153	476133
5	3873	1356	254	140096	51877	191973	488565
6	3621	1267	252	135733	51468	187202	454815
7	3371	1180	250	130786	51060	181846	458787
				$ 998,581.29	$ 365,385.36	$ 1,363,966.65	

The management objective of this plan is to retain the highest quality 70% of our existing ash street trees through insecticide treatment and remove the lowest quality 30% and replace them with other tree species over a seven year period. This process will keep annual costs more affordable, retain more of the benefits provided by street trees, and give more time for the rapidly evolving science of battling the emerald ash borer time to provide more effective, less costly options.

Management Procedure

There are multiple options for treating ash trees

The best option determined through research and industry standards is:

- Emamectin Benzoate (TREE-äge®)
  - Provides 2 years of coverage
  - Is systemic (product is contained within the tree)
  - Typical application time is 10-15 minutes per tree
  - Is >99% effective in killing EAB larvae in the first two years
    Dependent upon initial condition of tree

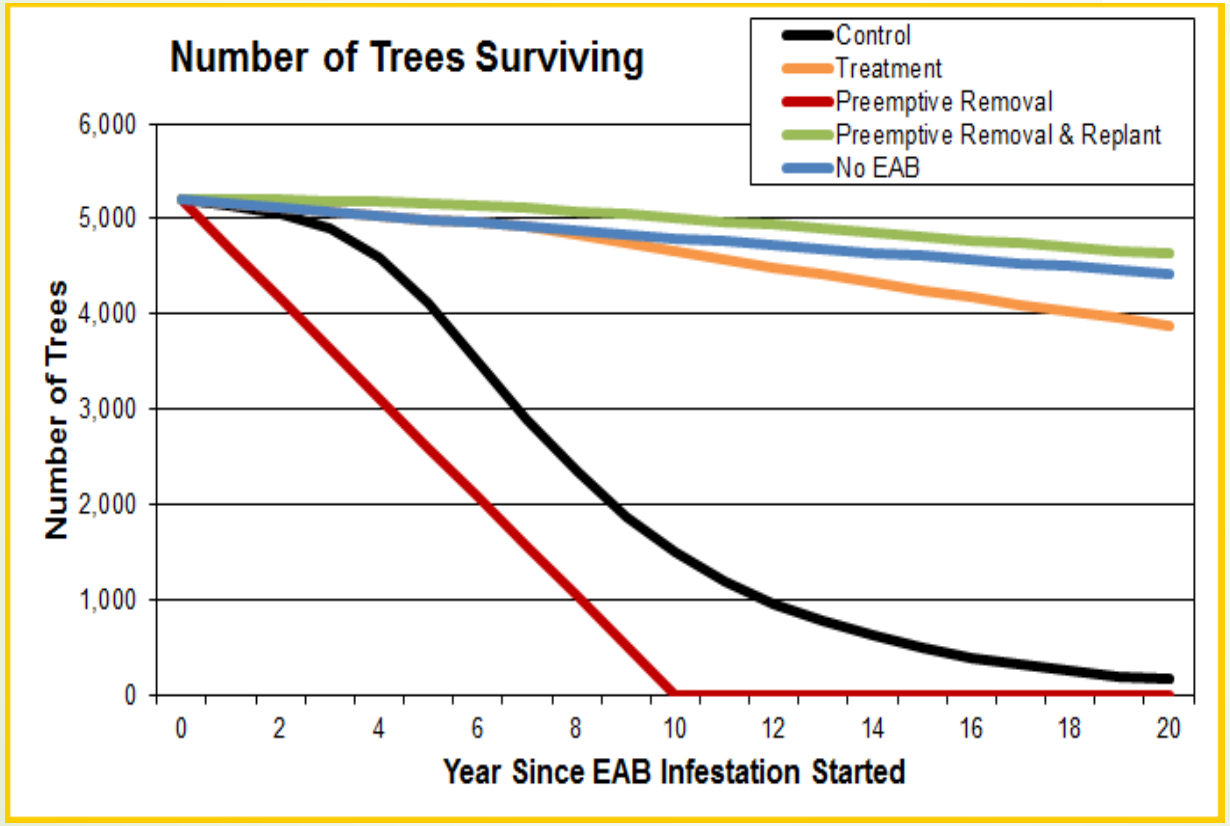
Benefit Versus Cost

Emerald Ash Borer PLANning Simulator (EAB-PLANS©) Version MKE

Developed by Dr. Rich Hauer and Andrew VanNatta (2015).
the University of Wisconsin – Stevens Point

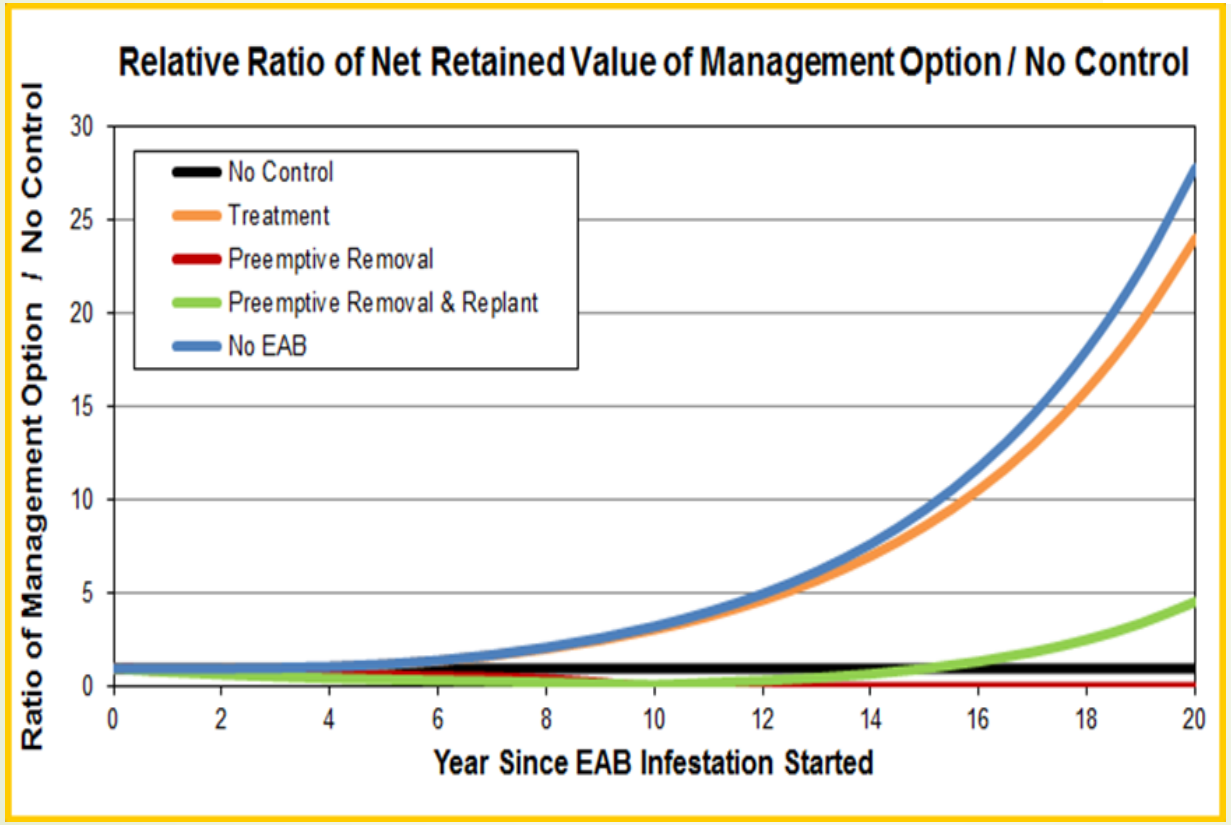
Assists communities in determining the best course of action for EAB management

Benefit Versus Cost



Estimated number of individual ash that are expected to survive EAB over a 20 year time span for each management plan. ***Control refers to "no control" of emerald ash borer.***

Benefit Versus Cost



Estimated ratio of net value retained when comparing management options for no control, treatment, preemptive removal without replanting, preemptive removal with replanting, and no EAB over a 20 year period. A value > 1 suggests that alternative is better than the "No Control" (doing nothing).

*This chart represents a ratio. A value of 2 means the value has doubled and a value of 5 means the value is five times greater.

Questions???

https://www.ag.ndsu.edu/horticulture/emerald-ash-borer-overview-and-background

OR

http://treepicturesonline.com/mountain_ash_tree_pictures.html