



UW-MADISON ARBORETUM MANAGEMENT PLAN for the EMERALD ASH BORER (*Agrilus planipennis*) MARCH 2014

PURPOSE

In 2002, the University of Wisconsin-Madison (UW) developed an action plan outlining the measures to be taken in anticipation of the Emerald Ash Borer (EAB) arriving on campus. In 2012, knowing that EAB has been present in Wisconsin since 2008, the UW began updating their plan and called for the Arboretum to draft their own site-specific policy to be included. With EAB presence recently confirmed in Madison, this plan outlines Arboretum objectives and strategies to deal with the likely possibility that EAB will also be found here in the near future.

What follows is the Arboretum's plan to be included in the UW campus plan. The plan has been compiled by Arboretum staff Michael Hansen (Land Care Manager), Brad Herrick (Ecologist), Molly Fifield-Murray (Outreach Manager) and Ken Zuba (Research Gardener) with helpful input from many others, and it will continue to evolve as necessary.

DESIRED OUTCOMES

1. Understand abundance and extent of ash tree population(s) in Arboretum
2. Ensure safety of Arboretum staff and visitors
3. Mitigate risk to Arboretum and others' property, infrastructure, utilities, etc.
4. Utilize wood generated by tree removal
5. Preserve specimens of important historical, conservation and educational value
6. Identify and explore research opportunities
7. Increase public awareness of EAB and associated issues at the Arboretum and beyond

OBJECTIVES & STRATEGIES

1. Tree Survey

Arboretum staff and volunteers have begun scouting and documenting where ash trees occur. The initial focus has been where potentially hazardous trees are expected to be encountered: along trails, roadsides and parking lots. Roadsides and parking lots were scouted during the 2012 growing season. Scouting of trails and other areas such as property boundaries has begun but will likely take an additional 1-2 years to complete. Ash trees that are identified for removal are to be marked with red flagging tape or red tree-marking paint for easy location by removal crew.

2. Hazard Trees

As mentioned above, ash trees growing along roadsides and parking lots were identified during the 2012 growing season. Removal of potentially hazardous trees began during the winter of 2012–13.

Following removal, small diameter pieces will be chipped and used as mulch in the Arboretum. For larger diameter pieces, an attempt will be made to identify and work with partners (e.g. Urban Tree Alliance, City of Madison, Dane County) to utilize the wood in a productive way. If such a partnership cannot be made, the larger diameter pieces will be left on site and allowed to decompose naturally.

Ash trees along trails and property boundaries will be assessed on a case-by-case basis as they are identified and removed if deemed necessary. In general, the woody materials generated by removal will be handled the same way as described above.

3. Horticultural Areas

Currently there are approximately 20 ash specimens in Longenecker Horticultural Gardens. Approximately 10 specimens of green ash have been removed. Since the primary purpose of the horticultural collections is to test specimens for commercial use and the expectation is that people will no longer be able to use ash in their gardens/yards because of EAB, then there may not be a horticultural reason to keep ash in the Arboretum collections.

The current strategy in Longenecker is to put up no defense and let the EAB infect ash specimens as a way to test those specimens' resistance to infestation. Two specimens in particular, a Siberian ash (native to the EAB's native range) and a Siberian ash x black ash hybrid, are of particular interest. If one of those or any other ash species show promise as being resistant, then it could be retained in the collection and perhaps offered to the commercial sector at some point in the future.

However, there are reasons related to conservation, history and education to preserve two additional specimens.

- 1) The cremated remains of the collection's namesake, William G. Longenecker, are spread under the "Autumn Purple" ash, an important historic fact that deserves special consideration for protecting that particular specimen.
- 2) There is also one blue ash specimen in the collection. Blue ash is uncommon in Wisconsin, listed as a "threatened" species and given a coefficient of conservatism (C-value) of 10 in the Wisconsin Floristic Quality Assessment (values are assigned on a scale of 1–10, with a value of 10 being the highest and 1 being the lowest) (Watermolen and Bernthal 2003).

In addition to the potential historic and conservation importance of these two specimens, their preservation would also have educational benefits, giving students (e.g. horticulture, forestry, etc.) a place to observe uncommon and/or extirpated species.

Protecting the two specimens described above will require an insecticide application every one or two years beginning in 2014. However, more investigation into the different insecticides available, their associated environmental impacts and a cost-benefit analysis will need to be completed prior to deciding if treatment is a viable option.

The ash tree near the Mary Ann Pels memorial bench is currently in decline, so it shall be removed and replaced with a bur oak.

4. Natural Areas

Overall, mature ash species are not abundant nor considered to be of primary importance in any of the Arboretum's natural areas at this time. Aside from green ash in the West and East Lowland Forest units (one could argue green ash is of primary importance there), it is unclear if ash naturally occurred in any of the Arboretum woodlands since most of the woodlands were historically oak savanna. Ash trees are known to have been planted in Arboretum woodlands, however. According to the Arboretum's long range ecological management plan (Kline 1992), numerous white ash and black ash seedlings were planted in Gallistel Woods from 1941–61 and numerous white ash seedlings were planted in Wingra Woods during that same timeframe. Some of those planted seedlings have persisted and can be seen today.

Black ash, although considered more of a northern species, has a high C-value of 8 (Watermolen and Bernthal 2003)—and a C-value of 10 in the Chicago Region Floristic Quality Assessment (Swink and Wilhelm 1994). Blue ash also has a high C-value as described above in #3, but no individuals are known to exist within the Arboretum outside of the one specimen in Longenecker. White ash and green ash have moderate (5) and low (2) C-values, respectively (Watermolen and Bernthal 2003).

Given that ash species are not a major component of Arboretum woodlands and given the impracticality of trying to combat EAB over a large area, no action will be taken to prevent or slow the spread of EAB infestation in Arboretum natural areas (unless related to an appropriate research project).

Salvaging valuable wood from specific trees could be considered on a case-by-case basis. If tree surveys conclude there are not very many ash trees in some or all of the Arboretum's natural areas then preemptively cutting some or all of them down as a way to slow the EAB's spread could also be considered.

5. Research

Monitoring for the arrival of EAB will be the primary research focus. Monitoring ash trees throughout the Arboretum for symptoms of EAB infestation and monitoring for the native wasp, *Cerceris fumipennis*, a predator of EAB, may also help alert us to the arrival of the pest. UW-Madison graduate student Todd Johnson is currently looking at behavioral characteristics of a native generalist parasitic wasp of *Agrilus* sp. (*Spathius*

floridanus) and a non-native specialist wasp (*Spathius agrili*). Research is ongoing in other parts of Wisconsin on the effectiveness of using small, stingless wasps (including *S. agrili*) from China as bio-control. These wasps were released in Newburg, Wisconsin, in 2011 as part of a five-year study by UW, Wisconsin Department of Natural Resources and the United States Department of Agriculture's Animal and Plant Health Inspection Service. Results of this study, may lead to opportunities in the future to use bio-control as a management tool.

6. Outreach

A list of replacement native tree species that the Arboretum endorses for use by the public will be developed in print and digital form. The Arboretum and University policies will be linked to on the Arboretum website and perhaps made into a poster and/or brochures. The Arboretum website will also link to other relevant EAB websites.

REFERENCES

- Kline, V. M. 1992. *Arboretum Ecological Communities Long Range Management Plan*. Available at <http://digicoll.library.wisc.edu/cgi-bin/EcoNatRes/EcoNatRes-idx?id=EcoNatRes.ArbMgmtPlan>
- Swink, F. and G. Wilhem. 1994. *Plants of the Chicago Region*. 4th Edition. Indiana Academy of Science, Indianapolis, IN.
- Watermolen, D. J. and T. W. Bernthal. 2003. "Development of a floristic quality assessment methodology for Wisconsin." Final report to USEPA-RegionV, Wetland Grant # CD975115-01-0. Wisconsin Department of Natural Resources, Bureau of Fisheries Management and Habitat Protection, 101 S. Webster St., Madison, WI.