EMERALD ASH BORER: 2016 WISCONSIN STATE PROGRAM SUMMARY

Background

EAB was first identified in Detroit in 2002. It is generally thought to have arrived in solid wood packing material from western Asia, where it is native. Thousands of dead and dying ash trees were infested indicating that EAB had been introduced several years prior to 2002. Before it was detected, EAB spread to several other states unchecked by regulation or control. Once EAB was identified, scientists began to learn about its biology and the potential for effective control methods. Efforts to eradicate this pest have been unsuccessful in part because infestations are usually well established before they are detected.

To date no North American ash species have been found to be resistant to EAB. Nearly all infested ash trees die within a few years of infestation. About 20 % of Wisconsin's urban trees are ash, about 5 million trees, and there are over 770 million ash trees in our rural forests. Nurseries have already discontinued offering ash stock due to loss in demand. Affected communities face removal and replacement costs and loss of environmental services such as stormwater management. Homeowners also face removal and replacement costs plus declining property values and rising costs for air conditioning and water use. In Wisconsin's lowland and wet forests, black ash and green ash are dominant species. The loss of ash in these areas is likely to have significant ecological effects. Additionally, the loss of black ash is culturally important to Native American communities.

Most of the counties south of highway 29 are under a quarantine that restricts the movement of certain products, such as hardwood firewood, that could transport the pest (Fig. 1, yellow counties). However, EAB is only commonly found throughout the southeastern counties and the corridors between Milwaukee, Madison and Janesville. In most of the quarantined area, EAB has only been found at scattered sites.

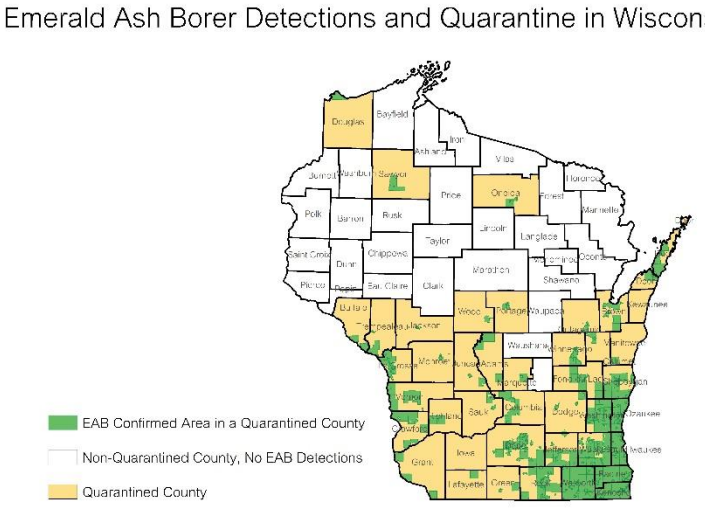

Figure 1. Map of communities where EAB has been confirmed and counties that are quarantined for the pest.

Survey

Detection. Detecting EAB as soon as possible after it has become established is important to prevent further spread from the new site and provide communities and land managers the maximum amount of time before their ash start dying to implement actions to mitigate losses. Current detection efforts are a multi-agency effort with participation by staff from the DNR, Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP), University of Wisconsin Extension, USDA Forest Service and USDA Animal and Plant Health Inspection Service (APHIS) (Fig. 2).

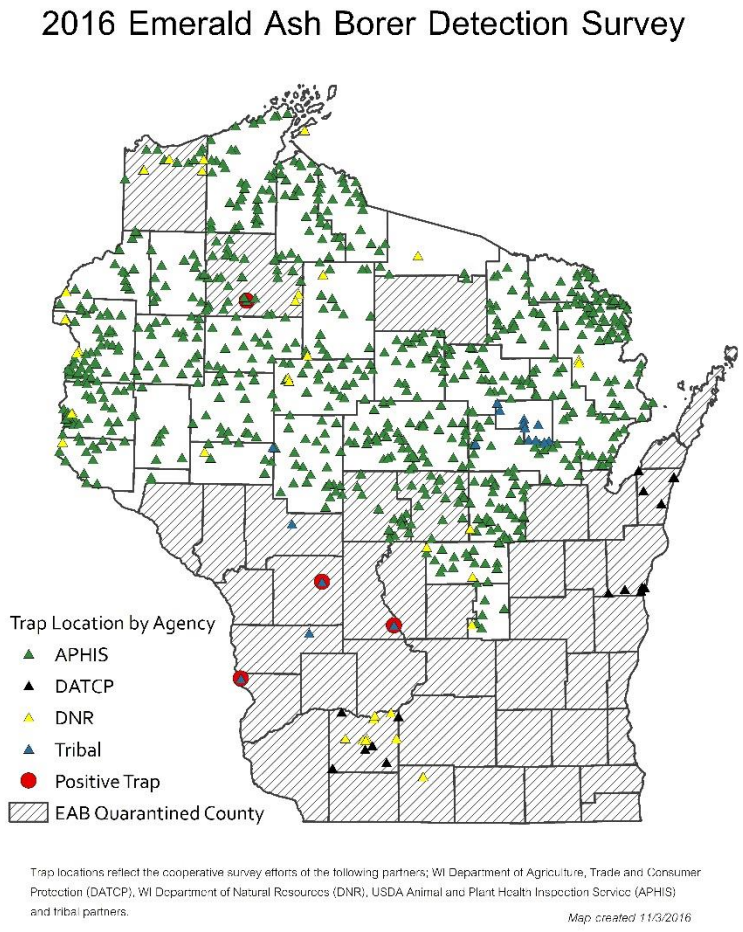

Fig. 2. 2016 EAB detection survey, trap locations

APHIS sets traps in non-quarantined counties; a county is added to the quarantine if even a single EAB is caught. APHIS detection trap placement is pre-determined using an EAB Risk Assessment model. APHIS also has a project monitoring buprestid beetles captured by native, non-stinging *Cerceris* wasps in counties not quarantined for EAB, in which volunteers from the UW Extension First Detectors program assist in collecting specimens.

DATCP detection trapping is targeted at sites with a high risk of introduction and establishment in counties which are quarantined but where EAB has not yet been confirmed. In 2016, these counties were

Manitowoc, Kewaunee, Iowa and Juneau. As of October 2016, EAB had been confirmed in Juneau and Manitowoc counties.

DNR sets double decker purple prism traps to detect EAB in state campgrounds at high risk of introduction of EAB and where EAB has not been confirmed in the county. These traps are placed in high use areas of the parks and do double duty as a public education tool stimulating conversations about EAB and how campers can help prevent its spread.

DATCP and DNR maintain an EAB information line (1-800-462-2803) and an interactive map where the public can report possible finds of EAB. Reports from non-quarantined counties are investigated by DATCP staff with assistance from DNR staff as requested. Reports from quarantined areas are followed up on by DNR staff in forest health and urban forestry and by UW Extension staff. Municipalities where EAB has been confirmed are recorded and added to the map of detections (Fig. 1). This information is used by communities and individuals in planning and implementing pesticide treatment and removal and replacement of their ash to other tree species. By making clear that EAB is not found throughout the quarantined area, this map helps encourage business and individuals to take precautions to not spread EAB when utilizing potentially infested ash wood. Within the quarantine, these precautions are voluntary but are encouraged as a good neighbor, good business practice.

Documenting damage from EAB. DNR forest health specialists map areas where EAB is causing decline or mortality of ash. This information on the progress and location of forest canopy loss is used by landowners and wood industry business to plan salvage harvest and regeneration of ash dominated forests. Working with Forest Service GIS specialists, DNR staff developed a more accurate method of mapping damage and mortality of ash from EAB which had previously been under reported due to difficulties in mapping host specific damage in diverse forests.

Regulation

DATCP regulatory staff work with saw mills, portable saw mill owners, paper manufacturers, firewood producers and kiln operators to meet compliance standards to prevent spread of EAB out of quarantined counties during utilization of potentially infested wood.

DATCP provides a voluntary firewood certification program for firewood businesses processing their product to kill infesting organisms. Once certified, their firewood may move freely around the state and may enter any state property regardless of how far it has been moved. Firewood remains a focal point of the regulatory efforts. The movement of infested firewood is the most common method for starting new infestations outside the range of the natural spread of EAB. By limiting the movement of infested firewood we can prevent new infestations from occurring and provide time for EAB specific management options to be developed.

Firewood that may enter DNR-owned property has been regulated since 2006, when out of state wood was first prohibited. In 2007, wood originating more than 50 miles from the destination property was added to the prohibition. In 2010, this allowable distance was decreased to 25 miles and in 2014 it was decreased to 10 miles. The allowable distance was reduced in order to maintain a moderate level of risk of introduction of wood borne invasive species into state properties. As some of the species we were most concerned about, including EAB, spread in the state, the allowable distance for wood to travel to a state campground had to decrease to keep the risk of introduction steady. Wood certified as being treated to kill infesting organisms has always been allowed in regardless of origin. This rule applies to wood from any species of tree because while we are very concerned about EAB, there are several other species of invasive pests and diseases moving in firewood in the Lakes States region. This regulation is linked

with public outreach that encourages campers to avoid spreading invasive pests by buying firewood near where they will burn it.

Management and Assistance

Guidance on Management Options. DNR urban forestry staff developed a toolbox of guidance for communities that covers all aspects of management of EAB and the damage that it causes in the urban setting. This is kept current as new options for management develop. Urban forestry sponsors Regional Networking meetings as a forum for community forestry personnel to discuss, compare and learn from each other as well as industry experts (chemical manufacturers, tree care services) regarding EAB detection and management. DNR forest health specialists and silviculturalists developed guidance for woodland owners and managers to minimize the impact and losses from EAB as no treatments are currently available for use at the forest level. They are in the process of updating this guidance and developing a checklist to assist landowners in selecting appropriate management for their woods. DNR urban forestry and forest health staff provide training to arborists and foresters on new developments in management of EAB and ash at conferences and training days throughout the year and around the state.

Support for communities. The DNR's urban forestry grants have been a major source of funding for EAB preparedness and response for Wisconsin communities. In 2015, 51% of the grants awarded were for projects dealing with EAB and the damage that it does to urban forests. In 2016, that proportion was 57% of the grants. Table 1 gives the three primary management activities, number of communities implementing projects using each, and the total funding directed to each activity.

	2015		2016	
Management Activity	Total Funding for the Activity	Number of Communities Implementing the Activity	Total Funding for the Activity	Number of Communities Implementing the Activity
Developing a Management Plan	$17,000	12	$113,000	17
Insecticide Treatment	$107,000	6	$41,000	8
Tree Removal and Replacement	$122,000	10	$160,000	11

Staff from the urban forestry program assisted the Bay- Lake Regional Planning Commission in the application for a Great Lakes Restoration Initiative grant from the federal government. That application was successful and the group received $100,000 that is distributed to communities in EAB quarantined counties of the Lake Michigan and Lake Superior Watershed

Biological control: establishment of natural enemies. EAB arrived in North America without any of the natural enemies that help keep it in check in its native range. Establishing natural enemies specific to EAB could help slow the rate of increase of EAB populations, a management tool known as biological control.

Between 2011 and 2015, DNR forest health staff released specialist parasites of EAB at 12 sites where the likelihood of their establishment and spread was good. *Tetrastichus planipennisi* and *Oobius agrili* were introduced at all sites, *Spathius agrili* was released only at two sites. By 2016, *Tetrastichus planipennisi* had been recovered at the village of Newburg, the cities of Racine and Kenosha, and at Big Foot Beach State Park. For 2016, parasitoids are being released at 15 sites in southeastern counties, Green Bay and

the Door Peninsula. For the first time the more cold-hardy *Spathius galinae,* is being released. Natural enemies are not a silver bullet and we can't expect them to completely control EAB when the host ash trees have little resistance to the pest. However, they will be helpful in slowing the population growth of EAB.

Utilization

DNR Forest Product Services Program and Urban Forestry have created an electronic Urban Wood Utilization Options Directory. Companies and individuals that utilize urban wood, the services provided and desired wood specifications are listed by county. Communities and landowners can use this list to obtain the best use and price for urban wood that would otherwise result in a cost for disposal.

Outreach and education

DNR, DATCP, and UWEx staff keep the Wisconsin Emerald Ash Borer Information Source website current and comprehensive. This is a one-stop site for individuals, communities and business on all aspects of EAB and its management.

DNR and DATCP staff worked with staff from Glacierland Resource Conservation and Development to add all state campgrounds that have firewood for sale and all DATCP certified firewood dealers to Firewood Scout, an interactive list of firewood vendors that provides the public with contact information for firewood vendors within 10 miles of the location they want to use the wood. This information helps the public avoid spreading EAB and other wood borne pests by giving them easy access to local firewood vendors. Firewood Scout is a non-profit cooperative project of state RC&D's, The Nature Conservancy's Don't Move Firewood program, and the Forest Service. Firewood vendors self-list by going to the website and adding their business information.

Research on Firewood movement, a pathway for spread of EAB

Starting when regulation of firewood entering state campgrounds and a linked educational campaign was first implemented in 2006, a series of surveys of campers has been done every two years. Analysis after eight years shows that awareness of EAB and the risk of moving it in firewood increased rapidly in the first two years of the regulation and educational program then stayed at better than 90%. Over the course of the program, there has been a steady increase in camper belief of the threat of invasive pests and the importance of not moving firewood long distances. Compliance with the regulation of firewood entering state campgrounds followed behind awareness but after 4 years reached 90% where it has remained since. Campers also report reducing moving wood in bulk for camping or home use from an average of 55 miles in 2006 to 22 miles in 2016. Education was successful in persuading the public to reduce movement of firewood, a significant pathway for spread of EAB and other pests and diseases of trees.