

MINNESOTA DEPARTMENT
OF AGRICULTURE

Forest Protection Reserve Appropriation

Final Report



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Executive Summary

The emerald ash borer (EAB) is a destructive wood-boring beetle that has invaded North America and is killing ash trees. Detections of emerald ash borer in the Twin Cities area and southeastern Minnesota, continue to be responded to as a plant health emergency. Various other tree pests (e.g., gypsy moth, Asian longhorned beetle, thousand cankers disease, mountain pine beetle, etc.) also threaten to invade Minnesota and further jeopardize our tree and forest resources. To combat the threat posed by invasive forest pests, the Forest Protection Reserve Appropriation (\$2,000,000) was made to the Minnesota Department of Agriculture (MDA) from the Outdoor Heritage Fund (MN Laws 2009 Chapter 172, Article 1, Section 7). In the appropriation, MDA was directed to make grants to local units of government and other entities and update the state's invasive and exotic tree pest plans.

Two grant programs, totaling \$1,875,000, were created by the MDA. The first grant program, entitled the Incident Response Grants Program, was created to provide funding to enable local units of government and other entities to more effectively respond to documented infestations of the emerald ash borer. The second grant program, entitled the Planning and Preparedness Grants Program, was designed to provide funding to facilitate efforts to plan and prepare for the invasion of emerald ash borer. Incident Response Grants were awarded to three entities and Planning and Preparedness Grants to 15 entities. The types of work being conducted through these funded projects include: conducting ash tree inventories; removing infested ash trees or trees likely to become infested; planting of a diversity of trees to replace removed ash trees; surveying to detect emerald ash borer; changing ordinances to allow for management of emerald ash borer; and, emerald ash borer-related outreach and education projects.

The MDA, in collaboration with the Minnesota Department of Natural Resources (DNR) and the University of Minnesota (U of MN), worked to provide training and the information resources necessary for communities to create and implement community-level emerald ash borer preparedness plans. The following items were created to assist communities in their efforts to prepare for emerald ash borer: Template Community Preparedness and Response Plan for Emerald Ash Borer, 2010 Minnesota Emerald Ash Borer Community Preparedness Manual, Minnesota Emerald Ash Borer Community Preparedness Webpage, and Community Preparedness Workshops.

The grants programs and outreach program were well received by stakeholders and truly assisted Minnesota communities and other entities to prepare for and respond to the invasion of the emerald ash borer and other invasive forest pests.

Based on the experience with the project and interaction with stakeholders and cooperators, the following recommendations are made:

1. It is recommended that the state and its cooperators continue to respond to EAB by using strategies to slow the spread. Such an approach will mitigate the impacts of this pest, buy time for communities that have not been invaded to prepare, and spread out the costs of tree removal, replanting, etc.
2. It is recommended that the importance and urgency for communities to develop and implement emerald ash borer preparedness plans be communicated and stressed.
3. It is recommended that further plans be made for the long-term diversification of urban forests.
4. It is recommended that emerald ash borer be responded to with an integrated pest management approach that utilizes the full complement of tools including cultural, biological, chemical and mechanical management options to reduce pest densities to tolerable levels while minimizing adverse economic, environmental and human health impacts.
5. It is recommended that emphasis be placed on creating and building public awareness and support for general invasive pest threats, and empowering the public with knowledge of what they can do to slow the spread of these pests.

Introduction

To combat the threat posed by invasive forest pests, the Forest Protection Reserve Appropriation (\$2,000,000) was made to the Minnesota Department of Agriculture (MDA) from the Outdoor Heritage Fund (MN Laws 2009 Chapter 172, Article 1, Section 7). In the appropriation, MDA was directed to make grants to local units of government and other entities. Beyond providing funds to establish a grants program, the appropriation also stated, "Up to \$125,000 is available immediately to the commissioner of agriculture to update the state's invasive and exotic tree pest plans by addressing the role of all stakeholders in preventing the introduction or spread of invasive pests, responding to and containing outbreaks, and remediation." To accomplish these requirements, the MDA created two programs, the Forest Protection Reserve Grants Program and the Forest Protection Reserve Outreach Program. The programs' goals are to slow the spread and reduce the impacts of the highly destructive emerald ash borer.

The MDA convened the Forest Protection Reserve Advisory Committee, comprised of various stakeholder groups including state legislators, representatives from the Lessard-Sams Outdoor Heritage Council, federal and state agencies, tribes, local units of government, the University of Minnesota, and industry and non-profit groups to help guide the MDA in accomplishing the tasks associated with the appropriation.

Cumulative expenses against Forest Protection Reserve Appropriation (July 1, 2009 to June 30, 2011)

Budget category	Expense
Full time staff	\$96,184.69
Travel, printing, outreach & supplies	\$9,170.01
Grant payments	\$1,833,734.99
Total	\$1,939,089.69

Background

Incident Command Structure

The emerald ash borer is a destructive wood-boring beetle that has invaded North America and is killing ash trees. Detections of emerald ash borer in the Twin Cities area and southeastern Minnesota continue to be responded to as a plant health emergency. The Incident Command System (ICS) was implemented to respond to this plant health emergency.

"...ICS is the combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure, designed to aid in the management of resources during incidents..." From the Minnesota/National Incident Management System.

Responding agencies and groups are organized in an ICS structure to facilitate coordination and communication during all phases of the response. This structure was designed well before the arrival of EAB in Minnesota - as documented in the "Minnesota Emerald Ash Borer Response Plan" created in 2007 by the Minnesota Emerald Ash Borer Response Team, which was led by the Minnesota Department of Agriculture. The current ICS structure, jointly led by the MDA; USDA, Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ); and, Minnesota Department of Natural Resources (DNR), includes participation from various federal, state, and local entities. The Incident Command System has provided an effective structure for multi-agency response to the emerald ash borer invasion in Minnesota.

"Slow the Spread" versus Eradication

Minnesota has had the privilege of being able to learn from the various federal, state and local responses carried out in other states infested with EAB before Minnesota's discovery in 2009. One lesson learned is that eradication is unlikely to be a feasible goal. Instead of eradication, "slowing the spread" has become the generally accepted approach for dealing with this pest.

Eradication attempts in other states have relied on removal of all ash trees within a 0.5-mile radius of known infested trees. Eradication is not an effective response to this pest for several reasons. It has proven difficult to accurately determine the spatial extent of EAB infestations. The insect lives beneath the bark of ash trees, and infested trees do not show symptoms until after a few years of attack. Based on dendrochronological studies from other infested states, most "new" infestations of EAB have actually been in place for five to ten years prior to discovery. Furthermore, the monitoring tools (i.e., traps and detection trees) used to monitor for EAB are less effective than the monitoring tools for some other pests (e.g., gypsy moth pheromone traps). This combination of factors has left regulatory agencies chasing EAB in eradication attempts. The scenario would play out as follows: Authorities would remove all ash trees from an area, only to find another infestation just outside of that area, so more trees would be removed, only to find another infestation just outside of that area. Only under a very limited set of conditions (e.g., very new infestation with limited to no dispersal of EAB from initial introduction point) might eradication of EAB from an area be feasible.

Rather than spending resources on removing all ash trees from infested areas to try to eradicate EAB, Minnesota has chosen to respond to EAB with a goal of "slowing the spread". Such an approach accepts the fact that it is inevitable that EAB will eventually spread throughout Minnesota and likely destroy a large percentage of the ash resource. However, the "slow-the-spread" approach aims to slow the rate at which spread and its associated damage occur. By slowing the spread of EAB, the magnitude of impacts of the pest is reduced in infested areas by reducing the population levels of the pest. EAB populations can be reduced by destroying known infested trees, chemically treating trees and selectively removing trees from the environment that will have the highest potential to produce the most beetles. This reduction of pest populations in the infested areas will reduce the number of EAB spreading to new areas, which will result in slower rates of spread of the infestation. Actions, such as selective tree removal and chemical treatments, can also be taken in currently uninfested areas to lessen the impacts and slow the spread of EAB when it does arrive. Furthermore, quarantine regulations are utilized to prevent human-assisted spread of EAB to new areas.

Limited Infestations versus Widespread Establishment

As stated before, it is inevitable that EAB will eventually spread throughout Minnesota. This eventual transition from only limited portions of the state being infested to having the entire state infested necessitates differing management strategies and expertise. In Minnesota, these authorities and expertise are housed in two different departments. The MDA is the lead agency while a forest pest has limited distributions and is still threatening to spread. The DNR is the lead agency when a forest pest becomes widely established. As pest populations transition from having limited infestations to being widely spread, the commissioners of the MDA and the DNR negotiate when the DNR takes over responsibility from the MDA.

When infestations are limited and not widespread, the management focus is on trying to contain those existing infestations and to prevent their spread to new areas. The MDA has the authorities and expertise to lead management when forest pest populations are new and not widely distributed. To contain and slow the spread of new pests, the strategies of prevention, early detection and rapid response are utilized. Prevention focuses on preventing the movement of the pest to new areas and relies heavily on education of the public and industry, as well as regulatory authorities. Early detection focuses on trying to find new infestations of the pest soon after they arrive and relies on tactics such as trapping and first detector networks. Rapid response focuses on quickly and effectively responding to new infestations of the pest and relies on quarantine authorities and pest population management tactics aimed at eradication or slowing the spread.

When infestations become widespread, the focus of management shifts to suppressing pest populations to tolerable levels and restoring damaged resources. The DNR has the authorities and expertise to lead management when a forest pest becomes widely established. In this phase of management, the strategies of control/management and restoration are implemented. Control/management focuses on trying to reduce the existing

pest population to levels where environmental and economic harm are minimized. Restoration focuses on trying to restore the invaded environment back to its pre-invaded condition.

The MDA, DNR and other cooperators are working closely together in the Incident Command System to respond to EAB in Minnesota. Having all of these groups already working together will facilitate the transition from prevention, early detection and rapid response to control/management and restoration.

Forest Protection Reserve Appropriation

Forest Protection Reserve Grants Programs

Based on recommendations from the Forest Protection Reserve Advisory Committee, two grant programs were created by the MDA. The first grant program, entitled the Incident Response Grants Program, was created to provide funding to enable local units of government and other entities to more effectively respond to documented infestations of the emerald ash borer. The second grant program, entitled the Planning and Preparedness Grants Program, was designed to provide funding to facilitate efforts to plan and prepare for the invasion of emerald ash borer.

The requests for proposals (RFPs) and applications for the grants were made available on October 7, 2009. To assist potential applicants in the grant application process, MDA created a Grant Application Guidance and Assistance Webpage (<http://www.mda.state.mn.us/grants/grants/rfp-fpr-assist.aspx>) and a Frequently Asked Questions Webpage (<http://www.mda.state.mn.us/grants/grants/rfp-fpr-faq.aspx>). Furthermore, the MDA collaborated with the League of Minnesota Cities and the Minnesota Department of Natural Resources, to offer grants training webinars to all interested applicants at no cost to the applicants. A total of 119 local units of government and other entities requested copies of the RFPs and applications for these grant programs. The deadline for application submission was November 20, 2009. A total of three applications (requesting an estimated total of \$1,431,830) were submitted for the Incident Response Grant Program, and a total of 73 applications (requesting an estimated total of \$4,310,448) were submitted for the Planning and Preparedness Grants Program. Grant applications were reviewed and evaluated by a committee comprised of representatives from MDA, DNR, USDA Forest Service, USDA APHIS PPQ, Minnesota Forest Resources Council and the League of Minnesota Cities. This committee met on December 9, 2009 to discuss the applications and decided upon which applications to recommend to the commissioner of agriculture for funding. On December 15, 2009, the commissioner of agriculture approved the list of awardees suggested by the review committee, and the process was started to draw up grant agreements between each awardee and the MDA. On January 15, 2010, the MDA announced the recipients of Forest Protection Reserve Grants (<http://www.mda.state.mn.us/en/news/releases/2010/nr-2010-01-15-fprgrants.aspx>). Incident Response Grants were awarded to three entities and Planning and Preparedness Grants to 15 entities. The types of work being conducted through these funded projects include: conducting ash tree inventories; removing infested ash trees or trees likely to become infested; planting of a diversity of trees to replace removed ash trees; surveying to detect emerald ash borer; changing ordinances to allow for management of emerald ash borer; and, emerald ash borer-related outreach and education projects.

Awardees of the Forest Protection Reserve Grants were reimbursed for project-related expenses on a quarterly basis after submission and approval of quarterly progress and expense reports. Awardees had until May 30, 2011 to spend the funds, complete the projects, and submit final reports and receipts for reimbursement. All projects were completed and project-related costs reimbursed by June 23, 2011.

Award amounts and amounts reimbursed for Forest Protection Reserve Grants (note: not all grantees requested reimbursement for project-related costs up to the full award amount).

Awardee	Award Amount	Amount reimbursed to awardee
<i>Planning and Preparedness Grants</i>		
City of Blaine	\$71,200.00	\$71,200.00
City of Cottage Grove	\$75,000.00	\$75,000.00

City of Eagan	\$89,000.00	\$84,547.57
City of Minnetonka	\$75,000.00	\$73,309.87
City of New Hope	\$87,300.00	\$87,300.00
City of Oak Park Heights	\$20,000.00	\$20,000.00
City of Oakdale	\$30,600.00	\$30,600.00
City of Red Wing	\$28,000.00	\$28,000.00
City of Rochester	\$50,000.00	\$50,000.00
City of Roseville	\$50,000.00	\$48,962.46
City of St. Louis Park	\$89,800.00	\$89,800.00
East Central Energy	\$50,000.00	\$50,000.00
Minneapolis Park & Recreation	\$98,400.00	\$98,400.00
Minnesota Logger Education Program	\$9,700.00	\$9,700.00
University of Minnesota	\$51,000.00	\$51,000.00
<i>Incident Response Grants</i>		
City of St. Paul	\$722,600.00	\$722,597.38
University of Minnesota	\$200,000.00	\$198,362.20
City of Falcon Heights	\$77,400.00	\$44,955.51
Total	\$1,875,000	\$1,833,734.99

The following is a summary of project-specific objectives and highlights of accomplishments for each grant-funded project.

Incident Response Grants

City of St. Paul

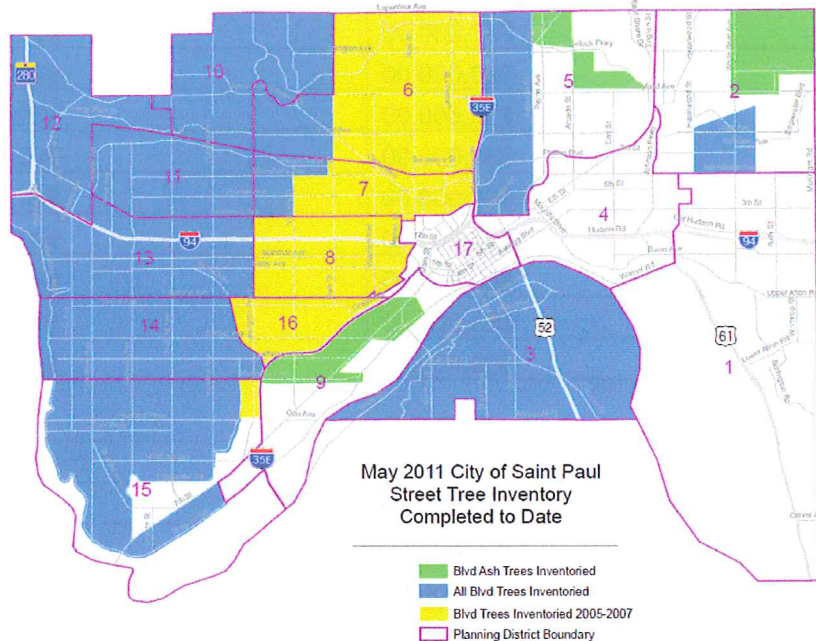
Project Objectives:

1. Aggressively combat the spread of emerald ash borer (EAB) currently in Saint Paul through prompt, rapid and effective management strategies of detection and mitigation, including sanitation and possible pesticide use, thus reducing the threat to the rest of the region and state.
2. Complete the street tree inventory using an already purchased software program to better understand the number and location of ash trees for better EAB management and restoration activities.
3. Pro-actively reduce existing ash trees through "structured removal" by removing close to 2.5 percent of declining boulevard ash trees annually (up to 1,100 trees). Doing so reduces phloem for EAB and helps spread out costs of EAB response over more years.
4. Restore the urban forest lost to EAB by replanting a new tree from a more diverse palette of species for every ash tree removed. Doing so returns the benefits and habitat trees provide.
5. Continue communication and outreach with the public and other stakeholders on the issue of EAB through local media contacts, Parks & Recreation's public information officer, website, neighborhood contacts, face-to-face meetings, and events.

Highlights of Actions Completed:

- Tree removal and site restoration for infested trees to mitigate infestation and non-infested trees to reduce overall ash inventory
 - 2,075 ash trees removed
 - 2,121 stumps removed
 - 1,702 trees planted from a variety of species

- Inventory of city trees completed at different levels in the majority of the city's districts
 - 57,083 tree sites inventoried with this grant project



- Extensive outreach and education on the pest, its impacts, and the response being taken was conducted to residents and businesses within the city. Furthermore, the city participated in cooperative outreach efforts with the state agencies to educate other entities about the pest and responses being taken.
- Collaborated with MDA in establishing and then removing girdled ash trees to help reduce pest population

University of Minnesota

Project Objectives:

1. Slow spread of EAB
2. Diversify tree inventory
3. Improve data gathering capabilities for more cost-effective, long-term management
4. Add to the state's collective knowledge in treating and recovering from EAB infestation
5. Protect public's investment in the university

Highlights of Actions Completed:

- Tree removal and site restoration for infested trees to mitigate infestation and non-infested trees to reduce overall ash inventory
 - 622 ash trees removed
 - 72 stumps removed
 - 83 trees purchased from a variety of species with 17 trees planted by end of grant
- 125 ash trees treated with insecticides
- GIS inventory of campus trees completed (note: Mississippi River Bluff not included due to dangers of working on/hear the cliffs)
- Collaborated with MDA in establishing and then removing girdled ash trees to help reduce pest population

City of Falcon Heights

Project Objectives:

1. Eliminate the city's ash tree population, reduce food source for EAB larvae/phloem reduction,

and slow the spread of EAB

2. Spread out removal and replanting expenses over a seven year period to mitigate costly expenditures in one budget cycle
3. Begin replanting new varieties and allow them to develop so that entire blocks are not replanted at the same time

Highlights of Actions Completed:

- Tree removal and site restoration for non-infested trees to reduce overall ash inventory and spread costs out over time
 - 107 ash trees removed
 - Replacement trees planted from pallet of 15 species
- Educated residents on city's response to EAB

Planning and Preparedness Grants

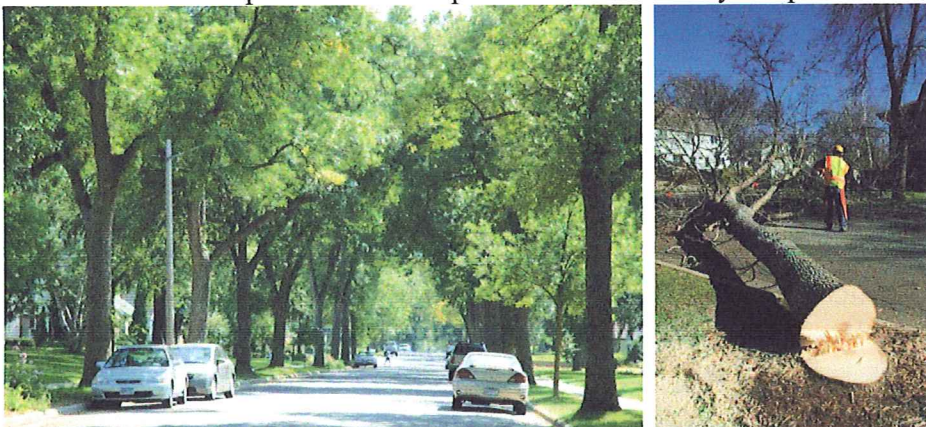
Minneapolis Parks & Recreation Board

Project Objectives:

1. Remove 300 to 400 ash trees that are currently growing on public property within the City of Minneapolis.
2. Grind 300 to 400 stumps that will result from the removal of public ash trees so that new trees may be replanted.
3. Plant 350 to 450 new trees of various species as replacements for the public ash that are removed.
4. Partner with neighborhood organizations regarding the threat posed by EAB and the corresponding need for the Forest Protection Reserve Program.

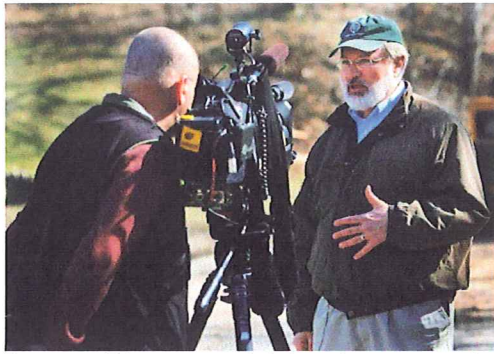
Highlights of Actions Completed:

- Tree removal and site restoration for declining, non-infested ash trees to reduce overall ash inventory and spread costs out over time
 - Approximately 1,500 ash trees removed
 - Over 700 stumps removed and billed to grant - others were removed but not billed
 - Over 680 replacement trees planted from a variety of species



Ash-lined street in Minneapolis and an ash tree being removed in the city

- Conduct public outreach and education



Forestry Director explaining the approach being used to prepare for EAB in Minneapolis

City of St. Louis Park

Project Objectives:

1. Inventory all boulevard and parks ash trees
2. Prioritize boulevard ash tree removals (based on ranked criteria for poor quality and/or most at-risk to least at-risk and affordable removal and replacement)
3. Replant all removed boulevard and parks ash trees with new (native where possible) trees
4. Create a comprehensive EAB management plan that includes prioritized ash identification, removals, and replacement program emphasizing native, diverse trees
5. Educate St. Louis Park constituents on arboricultural best practices, to include but not limited to EAB management, native trees, proper planting methods, and invasive species.

Highlights of Actions Completed:

- Tree removal and site restoration for non-infested trees to reduce overall ash inventory and spread costs out over time
 - 149 ash trees removed
 - Replacement trees planted from a variety of species
- Inventoried a majority of the city's trees
- Created an EAB management plan
- Conduct public outreach and education

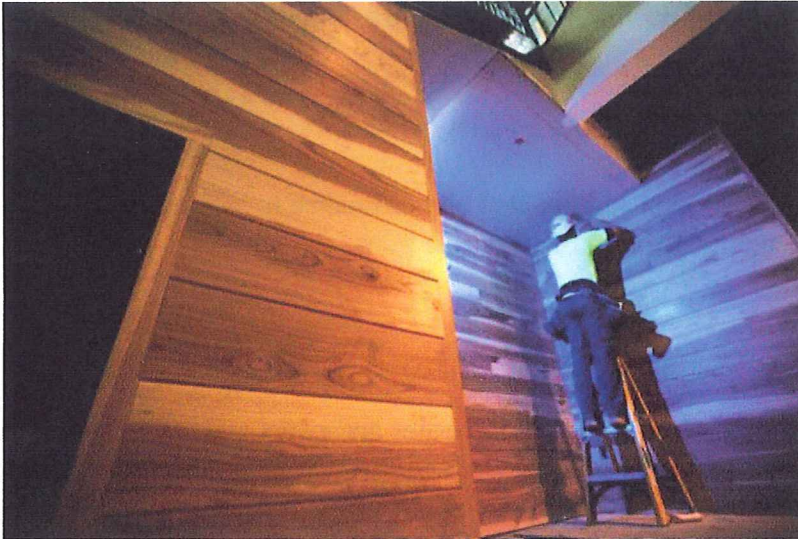
City of Eagan

Project Objectives:

1. Distribute inevitable costs associated with massive ash tree death over a manageable time period
2. Provide EAB education to city staff, commissions and council (Eagan decision makers), and to the general public
3. Conduct systematic removal of prioritized ash trees located in boulevards and parks
4. Provide protective pesticide treatment to high quality ash trees in boulevards and parks
5. Implement canopy replacement through installation of select deciduous tree species in boulevards and parks

Highlights of Actions Completed:

- Tree removal and site restoration for declining, non-infested ash trees to reduce overall ash inventory and spread costs out over time
 - Over 170 ash trees removed
 - Over 130 replacement trees planted from a variety of species
- Felled ash trees were converted into board timber and used in city's new public safety center, and into quality mulch for use in the city



Utilization of wood from felled ash trees in Eagan's Public Safety Center (Photo from Brian Peterson, Star Tribune)

- Over 400 high-value ash trees chemically treated to protect from EAB
- Initiated the recently adopted EAB management plan
- Conducted public outreach and education

City of New Hope

Project Objectives:

1. Increase funding for the removal of boulevard ash trees and our tree replacement program
2. Adopt an EAB emergency preparedness plan
3. Update ordinances to include trees infested with the EAB
4. Update the city's current boulevard street tree inventory and include inventory of trees on public lands, including the city's park system
5. Educate residents about the EAB and the city's program through mailings, website and public meetings

Highlights of Actions Completed:

- Tree removal and site restoration for declining, non-infested ash trees to reduce overall ash inventory and spread costs out over time
 - Over 200 ash trees removed
 - Over 100 replacement trees planted from a variety of species
- Updated city's tree inventory
- Adopted the EAB emergency preparedness plan that has already been drafted
- Revised shade tree ordinance to include EAB and other forest pests
- Conduct public outreach and education

City of Cottage Grove

Project Objectives:

1. Preservation, protection and management of the urban and rural forest
2. Public EAB and urban forestry outreach and education
3. Complete inventory of both urban and rural forest
4. Ash tree removal and replacement plan

Highlights of Actions Completed:

- Tree removal and site restoration for declining, non-infested ash trees to reduce overall ash inventory and spread costs out over time
 - Over 80 ash trees removed
 - Over 80 replacement trees planted from a variety of species
- City's tree resources were inventoried
- Implemented an EAB management plan and updated city ordinance to include EAB
- Assisted MDA in placement and monitoring of 10 purple traps
- Public outreach and education

City of Minnetonka

Project Objectives:

1. Determine the number of ash trees on city owned properties and parks and calculate relative tree species diversity. This objective would be met by conducting a tree inventory in the maintained areas of city owned properties and parks.
2. Improve tracking of ash tree/stump removals and planting spaces. This objective would be met by purchasing a new GIS based data management program to analyze tree inventory data, and generate work orders to remove ash in declining condition.
3. Educate residents about EAB, best management practices to protect water quality, and the city's plans. This objective will be met by publishing a fact sheet, two-color pull-out pages in the city's newsletter, and hosting at least two open houses.
4. Begin scouting for declining ash trees on city-owned properties with structures. This objective will be met by hiring an additional new tree inspector so that 40 hours per week are spent scouting for declining ash, coordinating stump removal and replanting efforts, working on tree inventory, and resident education.
5. Start ash phloem reduction program: remove declining ash trees/stumps and replace with new trees of varying species.

Highlights of Actions Completed:

- Tree removal and site restoration for declining, non-infested ash trees to reduce overall ash inventory and spread costs out over time
 - Over 100 ash trees removed
 - Replacement trees planted from a variety of species



Before and after tree removal and replanting in Minnetonka's parks

- Inventoried city's tree resources and integrated data into new data management software
- Drafted EAB management plan
- Public outreach and education

City of Blaine

Project Objectives:

1. Increase public awareness about EAB
2. Identify and remove ash trees that are most susceptible to attack by EAB
3. Properly dispose of or utilize the ash wood
4. Replace the ash trees that are removed with a tree that is appropriate for the site
5. Increase species diversity

Highlights of Actions Completed:

- Tree removal and site restoration for declining, non-infested ash trees to reduce overall ash inventory and spread costs out over time
 - Over 180 ash trees removed
 - Replacement trees planted from a variety of species
- Public outreach and education

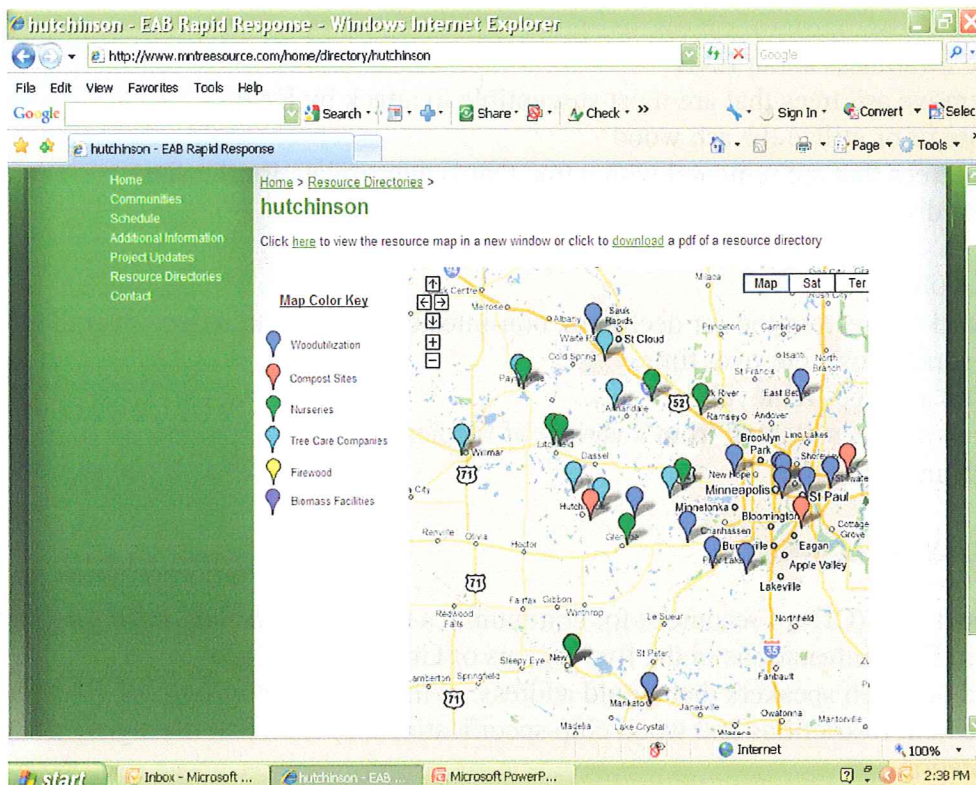
Regents of the University of Minnesota

Project Objectives:

1. Create a compact disk (CD) of resources for communities to use in planning, managing and recovering from EAB infestations in the five regions of Greater Minnesota
2. Provide trained outreach speakers that would address: a) the origin and biology of EAB; b) firewood movement restrictions and wood chip specifications; c) chemical management options; and, d) reforestation
3. Assist with the feasibility and development of regional "shared resources centers" that would include staging areas, wood utilization cooperatives, and shared equipment
4. Development of a model protocol for contracting local nursery stock production for future reforestation
5. Evaluate the effectiveness of the outreach (trained community preparedness volunteer presenters) and the technology transfer (distribution of the regional CDs)

Highlights of Actions Completed:

- The CD of resources for Minnesota communities was completed and distributed to all communities via mail
- Conducted three regional training workshops. A total of 24 volunteers from three regions completed 8.5 hours of training.
- Created regional resource centers and posted them on www.mntreesource.com



Screenshot of a regional resource center, providing locations and information for various resources that will be of use to cities planning and responding to EAB (e.g, wood utilization, compost sites, nurseries, tree care companies, firewood and biomass facilities)

- Evaluated the effectiveness of outreach efforts

East Central Energy

Project Objectives:

1. Eliminate ash trees that have a high likelihood of being removed as hazard trees once EAB infestation occurs, thus limiting the use and potential distribution of infested wood which would establish new infestation centers.
2. Relieve some of the resource burden associated with removal and sanitation efforts when future infestations occur.
3. Provide assistance to cities, school districts, The Minnesota Department of Transportation and other local governments in identifying and planting suitable replacement trees to counteract the loss of ash trees within the landscape near utility lines.
4. Provide another means of early detection of EAB infestation through the use of certified arborists and first detectors in the selection process of target ash trees throughout the service territory.
5. Educate and involve consumers in the prevention of EAB and the long-range solutions to the destructive impacts.

Highlights of Actions Completed:

- Tree removal and site restoration for declining, non-infested ash trees to reduce overall ash inventory and spread costs out over time
 - Over 300 ash trees removed
 - 118 replacement trees planted from a variety of species
- Public outreach and education

City of Rochester

Project Objectives:

1. Defray the future cost of removal of ash trees due to an anticipated EAB infestation
2. Re-establish a diversity of species in parks and park lands where ash trees have been removed by replanting a diversity of trees
3. Remove identified small ash trees and ash trees in poor condition with major defects from boulevards, parks and park lands
4. Boulevard trees will be replanted with trees selected from a variety of species included on the City of Rochester boulevard tree list
5. Implement a community outreach and education program and organize volunteer efforts in coordination with RNeighborWoods (Part of Rochester's Neighborhood Resource Center)

Highlights of Actions Completed:

- Tree removal and site restoration for declining, non-infested ash trees to reduce overall ash inventory and spread costs out over time
 - Over 550 ash trees removed
 - Over 850 replacement trees planted from a variety of species



Ash tree removal in Rochester

- Gained community activism, including >1700 volunteer hours of tree planting and education



Volunteers learning how to plant trees in Rochester

City of Roseville

Project Objectives:

1. Provide advice and education to the residents concerning private ash trees
2. Complete the comprehensive public tree inventory that began in the summer of 2009

3. Complete revisions to the comprehensive public tree master plan and city tree ordinance
4. Begin systematic removal of the poorest quality ash trees
5. Begin reforestation of the urban forest immediately

Highlights of Actions Completed:

- Tree removal and site restoration for declining, non-infested ash trees to reduce overall ash inventory and spread costs out over time
 - Over 38 ash trees removed
 - Over 27 replacement trees planted from a variety of species
- Purchased inventory software and inventoried city's tree resource (data collected on about 6,800 trees)
- Presented new EAB ordinance to city council
- Public outreach and education

City of Oakdale

Project Objectives:

1. Reduce the ash population in maintained areas to minimize liability and to reduce EAB food sources and slow the spread of EAB
2. Replace ash with a diversity of trees and increase representation of desirable, yet under-utilized trees in Oakdale
3. Protect Oakdale's highest condition, highest value ash which are yielding the most environmental benefits
4. Provide EAB information and resources to homeowners to prepare them for the impacts of EAB
5. Extensively monitor for EAB to ensure the earliest possible detection and a rapid response to new EAB infestations

Highlights of Actions Completed:

- Tree removal and site restoration for declining, non-infested ash trees to reduce overall ash inventory and spread costs out over time
 - Over 118 ash trees removed
 - Over 118 replacement trees planted from a variety of species



Tree removal and newly planted trees in Oakdale

- Treated 101 trees with insecticide for protection from EAB



Treatment of ash trees in Oakdale

- Assisted MDA with placement of purple traps to monitor for EAB
- Sampled all ash trees removed for EAB
- Monitored in the canopy of ash trees for signs and symptoms of EAB
- Public outreach and education

City of Red Wing

Project Objectives:

1. Prepare and implement an EAB preparedness plan, including update of tree ordinance
2. Train staff and volunteers for implementing the EAB plan, and a public awareness campaign
3. Identify a marshall yard, develop beetle sinks, cooperate in setting traps
4. Reduce ash phloem by removing 2.5 percent of ash from boulevards and parks, and working with cooperators
5. Replant alternate species in place of ash removed, and identify significant ash for future chemical treatment

Highlights of Actions Completed:

- Tree removal and site restoration for declining, non-infested ash trees to reduce overall ash inventory and spread costs out over time
 - Over 56 ash trees removed
 - Planted 45 replacement trees from a variety of species
- Forest land on city property was put on a harvest schedule
- Prepared and implemented an EAB preparedness plan
- Updated diseased tree ordinance
- Assisted MDA with setting EAB traps



EAB trap being placed in Red Wing

- Public outreach and education
- Identified a marshalling yard to respond to a potential EAB infestation

City of Oak Park Heights

Project Objectives:

1. Remove 8.57 percent of ash on public property in structured removal to reduce EAB habitat and spread out costs
2. Choose trees to be removed on basis of condition, form and location
3. Replant areas where ash are removed using a variety of native deciduous species or cultivated varieties of natives
4. Educate staff and residents about EAB via city newsletter, televised commission/council meetings and seminar
5. Work with residents to identify EAB on private property and make recommendations regarding management to slow spread of EAB

Highlights of Actions Completed:

- Tree removal and site restoration for declining, non-infested ash trees to reduce overall ash inventory and spread costs out over time
 - Over 100 ash trees removed
 - Planted 60 replacement trees from a variety of species
- Public outreach and education

Minnesota Logger Education Program

Project Objectives:

1. Significantly expand the number of eyes in the woods on the lookout for EAB
2. Reduce the spread of EAB with an increased understanding of quarantine restrictions
3. Facilitate EAB and forest management considerations around ash
4. Provide easy access to EAB awareness and response resources, including online content

Highlights of Actions Completed:

- Provided 3- ½ day workshops to loggers, forester and landowners in Minnesota (69 participants)
- Provided a written curriculum, PowerPoint presentation, handouts and other resources
- Create an EAB identification manual
- Provided online resources EAB curricula

The MDA, in collaboration with the Minnesota Department of Natural Resources and the University of Minnesota, worked to provide training and the information resources necessary for communities to create and implement community-level emerald ash borer preparedness plans. The content offered, and the approaches taken to deliver the information, were based on input from the Forest Protection Reserve Advisory Committee (comprised of various stakeholder groups, including state legislators, representatives from the Lessard-Sams Outdoor Heritage Council, federal and state agencies, tribes, local units of government, the University of Minnesota, and industry and non-profit groups) and the results of a survey sent to all communities (cities, counties, townships and tribes) in Minnesota. The following items (all found at:

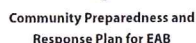
The Template Community Preparedness and Response Plan was modeled after plans developed in Michigan and Ohio. As the name of this document implies, it is a template that communities can use to create their own community-level preparedness plans. This is not a “cookie-cutter” type of plan. The template was designed intentionally to force communities to think critically about the planning aspects, and to choose options that best fit their specific needs, resources, structure and authorities. To assist communities in creating their own plans from the template, the 2010 Minnesota Emerald Ash Borer Community Preparedness Manual was created. This manual compiles numerous resources from throughout the country on topics related to: general emerald ash borer information, managing emerald ash borer, tree inventories and replacement, quarantine and regulation, firewood information, insecticide options, wood utilization, and examples of educational outreach materials that are available. Each item within the template contains specific reference to sections within the manual where communities should turn to for assistance to complete or implement those sections.



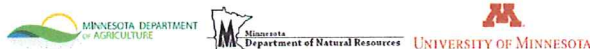
- A document that outlines a municipality's objective and the approaches it will use to meet the current or anticipated impact of the EAB on its urban forest resource.
- A blueprint that administrators and residents can follow with a high degree of confidence, rationality, and order (Ohio DNR).

Why Do You Need an EAB Preparedness and Response Plan?

- ✓ Whether you are in an EAB infested area now or will be at some future time, you need to determine the activities that must be performed to address the threat to your urban forest resource.
- ✓ By developing, communicating, and implementing a management plan, you will be acting in a reasonable and responsible fashion to this crisis (Ohio DNR).
- ✓ By being proactive now, you can spread the costs/loss associated with EAB over a longer period of time, which reduces cost overall and is easier on budgets.
- ✓ It will provide the opportunity for your community to think about coordinating with other neighboring communities and resources that they've shared.



2010 Minnesota Emerald Ash Borer Community Preparedness Manual



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The Community Preparedness Workshops targeted community leaders or other staff that may be responsible for creating preparedness plans. The specific goal of the workshops was to teach these community leaders the importance of and how to create community level preparedness plans. Hard copies of the template and manual were made available to workshop attendees, and the presentations provided during the workshop related specifically to the template and manual content and included a presentation from the City of St. Paul, which has been dealing with emerald ash borer for about one year. Throughout the state, twelve workshops were offered (June 3, 2010: Inver Grove Heights, Rochester and Thief River Falls; June 8: Duluth and Marshall; June 9: St. Cloud, International Falls and Grand Rapids; June 14: North Mankato, Grand Marais and Fergus Falls; and June 16: Roseville). The intent was to have the workshops distributed throughout the state so that almost all communities in Minnesota would be within 60 miles of a workshop. Unfortunately, due to low pre-registration, the workshops in Grand Rapids (2 registrants), International Falls (0 registrants) and Grand Marais (4 registrants) were canceled. All registrants for the canceled workshops were contacted and were informed that they could attend one of the other workshops or wait to view the presentations online, and arrangements were made to send them the workshop content if they were interested.

Two-way live video conferencing technology was utilized to reduce agency costs in conducting the workshops. On dates where workshops were conducted at multiple locations, the presenters would present at one location (i.e., the host location) and the presentations would be broadcasted to the other locations (i.e., the satellite locations) on that date. This technology allowed for participation and interaction among all of the sites. For example, attendees at satellite sites could ask questions of the speakers at the host sites. Three hundred twenty-one people preregistered for the workshops, while the number of attendees who signed in at the workshops was 271. We assume that the actual attendance of the workshops was somewhere in between these two numbers, as some people attended but did not sign in. Among the attendees of the workshops, there were representatives from 103 Minnesota cities, 29 Minnesota counties, 15 Minnesota townships and 10 private companies. Also in attendance were the U.S. Fish and Wildlife Service, Prairie Island Indian Community, Natural Resources Conservation Service, various Soil and Water Conservation Districts, Master Gardeners, Master Naturalists, Minnesota Extension, Minnesota Board of Water and Soil, Minnesota Green Corps, City of Fargo, ND, North Dakota Department of Agriculture, and Manitoba Department of Conservation. The Community Preparedness Workshops were coordinated with Emerald Ash Borer Train-the-Trainer Workshops, and were conducted so that on each workshop date the Train-the-Trainer content was presented in the morning and the Community Preparedness content in the afternoon. The Train-the-Trainer program focused on training community members on how to give presentations about the emerald ash borer.

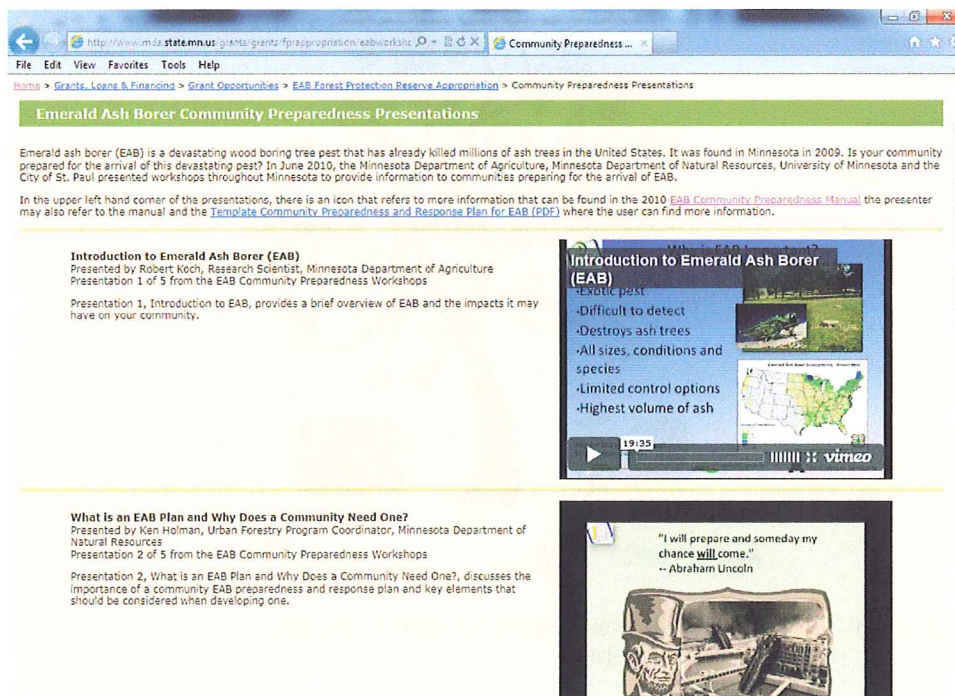


Fig. ??: Recorded presentations with audio from the Emerald Ash Borer Community Preparedness Workshops

Attendees of the workshops were asked to complete an evaluation form. Evaluations of the workshops and content were favorable. Attendees found the workshops to be helpful for their efforts to prepare for emerald ash borer. On a rating scale, including strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree, most respondents (96.6 percent or 143 out of 148) strongly agreed or agreed with the statement that, “the workshop was helpful in providing information and resources to help begin preparations for the arrival of emerald ash borer”. Also, attendees found the content and materials to be easy to use and understand. On a scale from 1 to 5, with 1 being easy to understand/use and 5 being difficult to understand use, the workshop presentations received an average score of 1.58, and Community Preparedness Manual received an average score of 1.54 and the Preparedness Template received a score of 1.67.

Recommendations

Based on the experience with the project and interaction with stakeholders and cooperators, the following recommendations are made:

1. It is recommended that the state and its cooperators continue to respond to EAB by using strategies to slow the spread. Such an approach will mitigate the impacts of this pest, buy time for communities that have not yet been invaded to prepare, and spread out the costs of tree removal, replanting, etc.
2. It is recommended that the importance and urgency for communities to develop and implement emerald ash borer preparedness plans be communicated and stressed.
3. It is recommended that further plans be made for the long-term diversification of urban forests.
4. It is recommended that emerald ash borer be responded to with an integrated pest management approach that utilizes the full complement of tools including cultural, biological, chemical and mechanical management options to reduce pest densities to tolerable levels while minimizing adverse economic, environmental and human health impacts.
5. It is recommended that emphasis be placed on creating and building public awareness and support for general invasive pest threats, and empowering the public with knowledge of what they can do to slow the spread of these pests.

