CITY OF BISMARCK

EMERALD ASH BORER RESPONSE PLAN

INTRODUCTION

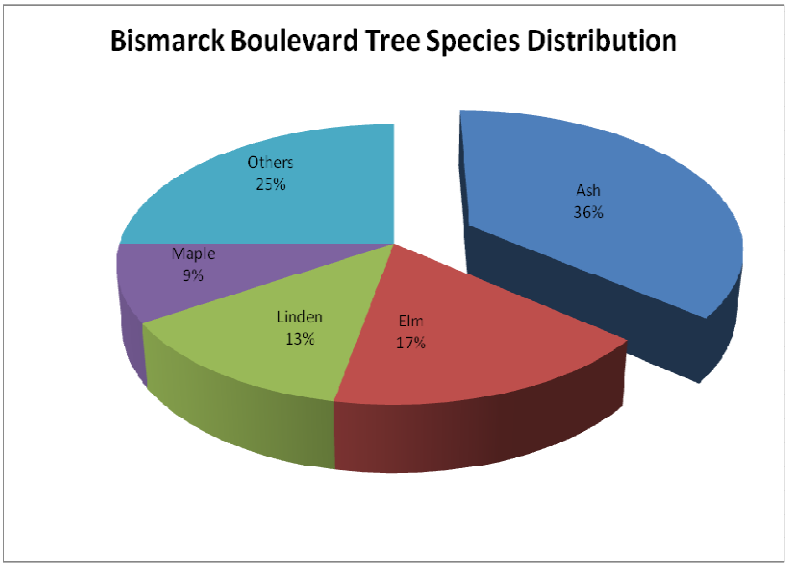
Purpose: By implementing this plan, the City is attempting to lessen the impact and disruption to its urban forestry program caused when Emerald Ash Borer (EAB) is introduced to Bismarck and the surrounding area. Taking a proactive approach to this threat enables the City to address public and private needs in an efficient and effective manner.

The plan is based on the most recent scientific studies and recommendations from key partners and multiple state and federal agencies. **As this is a living document, updates to this plan will be made as new information and recommendations are released**. **These updates will be reviewed by the Forestry Advisory Board and brought to the City Commission for review and adoption.**

The Public Works – Forestry Division will be responsible for implementing this plan and seeing that its provisions are carried out.

Brief History: EAB is an exotic wood boring beetle that attacks all ash species and its cultivated varieties. Since its discovery in the United States in 2002, the insect has emerged in the states of Michigan, Ohio, Indiana, Illinois, Kentucky, Maryland, Pennsylvania, West Virginia, Wisconsin, Minnesota, New York, Quebec, Canada and Ontario, Canada. This pest has killed millions of ash trees along the way.

Scope of Emerald Ash Borer on Bismarck: Ash is one of the most important and abundant species in the City of Bismarck and the surrounding area. Ash composes nearly 36% of all street trees (7,393 street trees, all of these ash trees will be impacted by EAB) in Bismarck. This does not take into account park property and private trees in Bismarck. Once introduced to Bismarck and the



surrounding area, it is likely that every ash tree will be impacted by EAB.

In 2009, the Forestry Division surveyed a few local tree services and nurseries to develop the estimates presented in this plan. By the time EAB arrives in Bismarck these cost estimates may change, the cost estimates presented here represent 2009 dollars. Removal and stump grinding of a medium sized tree could cost $400-500 per tree. Replanting a 2" caliper tree would cost anywhere from $250-350 per tree. Taking a conservative approach, the City would be spending 2.9 million dollars for removals and citizens could spend 1.8 million dollars replanting lost ash trees. This does not account for the lost economic benefits that these trees provide to the City and the residents such as; more rainwater would work its way into the storm water systems without the trees to intercept the rainwater, household cooling cost would increase due to the lost shade provided by the trees, winter heating cost would increase without these trees blocking the harsh winter winds.

This plan applies throughout the City on all public properties where ash trees are currently growing as well as private properties where such trees may negatively impact public rights-of-way or other public properties. This impact would have an enormous economic, social and ecological impact to the City.

Monitoring: The City has partnered with the ND Department of Agriculture (Dept of Ag) for the last two years to place and monitor purple EAB traps. Bismarck Forestry staff have placed these traps throughout the city and monitored them for the Dept of Ag. Any insect resembling EAB has been packaged and sent to them for identification. The City should continue to work with the Dept of Ag if they continue to fund this effort.

As the Forestry crews remove ash trees, they will be looking for signs of EAB on trees that decline quickly. Discussions have begun with the Dept of Ag to conduct a "hands-on" workshop with Bismarck and other city forestry departments to educate crews on what they should be looking for in EAB. This "First Responders Training" has been scheduled for April 2010.

Information shall be placed on the City Website and on the local media outlets to educate the public as to how to identify an ash tree and what to look for regarding infestation. (D shaped exit holes, top-down die off, increased woodpecker activity, etc.)

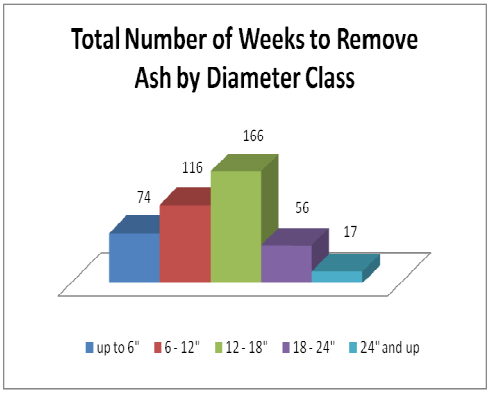
Based on tree inventory information, the Forestry's Dutch Elm Disease (DED) crew will assume more duties and inspect for outward signs of EAB infestation. Any ash tree determined to be of suspicious health will be reported to the City Forester for further inspection.

As EAB moves into North Dakota, the City will be including ash firewood into its elm firewood inspections. Inspection of ash firewood could be a useful EAB detection opportunity as ash that have been cut down could have died due to EAB. If they are infested the firewood would be a source of emerging adult beetles.

Inventory: The City has a complete tree inventory of its boulevard trees. This assists in giving solid numbers to calculate the hours needed, manpower needed and cost estimates needed to address the removal issue for when EAB arrives in Bismarck.

Bismarck has an incomplete picture of the number of ash trees that exists in the City Parks and private yards. We can assume that the number of ash in these areas would double or triple the number of ash in the City. Currently, the City's Forestry Division is inventorying the Parks and Recreation properties. This will take at least one year before all of the parks are inventoried.

The North Dakota Forest Service (NDFS) completed sample plot inventories for riparian areas outside the city limits in 2009. It was found that on the north side of Bismarck there is approximately 46% ash in the riparian area, this comes out to about 365 trees per acre. On the south side of Bismarck there is approximately 83% ash, this comes out to about 620 trees per acre. The ash trees on the north side average 10" DBH (diameter at breast height) and the trees on the south side average 6.9" DBH. The City should coordinate efforts with the County on EAB Management.



Using the Society of Municipal Arborists standards for tree removal, it would take the four person City Forestry crew 4 years to remove all the ash trees on the boulevards in Bismarck, if we devote 100% of our forestry crews' activities towards EAB ash tree removal.

Park trees will be an issue that resolution needs to be reached before EAB arrives in Bismarck. Current staffing levels for the Forestry Division will not allow us to address park trees in a timely fashion.

Solutions to address Park trees when EAB arrives in Bismarck:

1. City can hire additional staff and buy additional equipment to remove ash trees in parks.
2. Parks & Recreation contract with licensed tree service(s) to remove ash affected by EAB.

Education and Outreach: Ongoing communication, resident education and outreach have been key components to preparing the public for the impact of EAB. These efforts will continue and be expanded as more information becomes available on tools to manage EAB. Continued coordinated public information dissemination to residents and the media from both the state and local level ensure key information reaches the public as quickly as possible.

Ordinances and Policies: The City has ordinances and policies that affect the City's urban forest. The City Forester does have the authority to abate "nuisance" trees on private property,

13-01-01 (16). Definitions.
"Public nuisance" means any dangerous or unsafe trees or portions thereof; any trees encroaching on public sidewalks or impeding vehicular travel on the streets in violation of standards set by the City Forester pursuant to Section 13-02-01(3); any trees located in the sight triangle in violation of Section 14-03-05(3); and any tree harboring insect or disease organisms of a contagious and fatal nature which pose a serious threat to surrounding trees if not immediately removed and disposed of, or treated with proper arboricultural procedure.

13-02-08 (4). Removal, Planting and Replacement.
"If any part or the whole of any tree on private premises is found after proper investigation to be dangerous or unsafe, or otherwise constitute a public nuisance, the city forester shall declare the tree or portion thereof a public nuisance and cause the nuisance to be abated pursuant to Section 13-02-14."

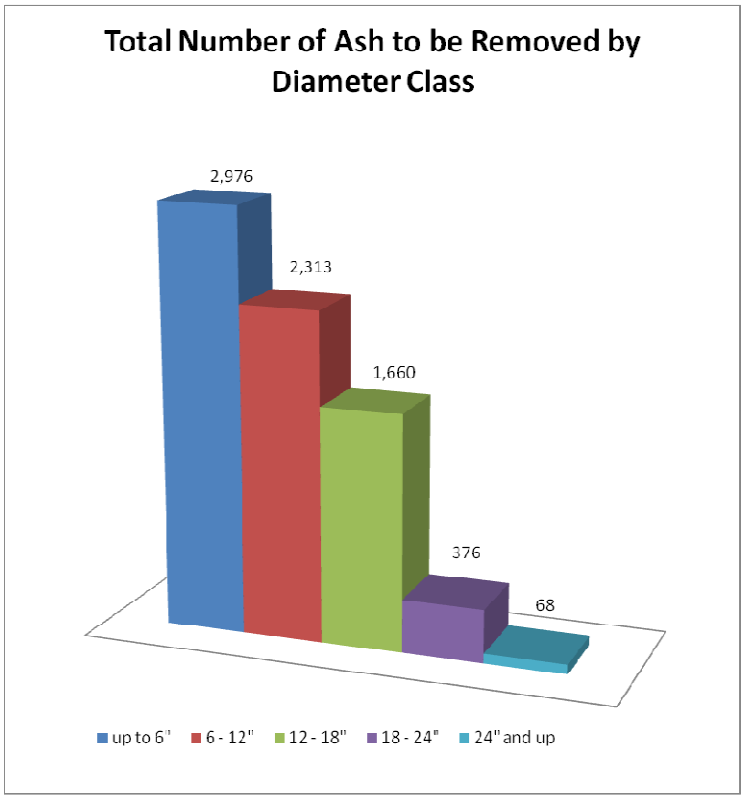
The Forestry Advisory Board (FAB) made a motion and approved to include EAB into this "nuisance" tree category at the February 2010 meeting.

The Forestry Advisory Board also approved a "Structured Removal Plan". This will address removal of ash trees that are in the "poor and severe decline" condition class, ash trees impacted by water service construction projects, or needing cabling and bracing before EAB arrives. This proactive removal approach will start by removing 170 ash trees in 2010 in anticipation of the larger loss of the entire ash population. The intent is to slow the spread of EAB by reducing host trees, and gaining time in future removals.

Another policy that was approved by the FAB was the adaption of prohibiting the planting of any ash on boulevards or any public property. The City has been promoting and educating the residents about the importance of diversifying the urban forest population. Diversification will be the key to limiting the effects of EAB and future forest pests.

Agency Cooperation: Once EAB arrives in the area, State and Federal agencies will be involved with the local government to combat this new threat. The two agencies the City will most likely be working with will be: ND Dept of Ag and the United States Department of Agriculture (USDA). Introduction of EAB to Bismarck will be a significant event that will require communication and coordination efforts with many agencies. It is recommended that an Incident Command Structure (ICS) be established for this pest outbreak. At the outbreak of the event, Forestry will need to work closely with the partnering agencies and at the direction of the lead agencies in its overall response to the incident. Another entity that Bismarck Forestry will be in communication is the ND EAB Response Committee which includes the North Dakota Forest Service, ND State University, Dept of Ag and ND Urban & Community Forestry Association.

Prioritization and Removal of Public Trees: With the large number of ash trees on the public right-of-way and public lands, the removal of these trees will be a huge under taking for the Forestry Division. It is estimated that with a four person forestry crew and over 7,000 ash trees, it will take 4 years to remove all the ash trees on the boulevard. These four years dedicated specifically to the removal of the 7,000 ash trees impacted by EAB would detract from other important forestry activities. Potentially this could lower our emphasis on Dutch Elm Disease management, limit our rotational pruning, detract from special planting projects and reduce stump grinding.



Ash trees that would have normally been cabled and braced in the past will now be removed. Cabling and Bracing is a practice that places steel cables and bolts into the tree to add

additional support to trees that have weak branch unions or are split. With EAB on the approach, the City would not be gaining any benefit from this timely and costly practice to prolong the life of these ash trees. If anything, the additional hardware complicates the removal process. The Arborists would have to take extra precautions to avoid the hardware that was installed into the tree.

For private property, the City will need to keep up with its inspection of the ash population in private yards. The City currently has a two person DED crew that inspects for declining elms that may have DED or pose a breeding ground for the elm bark beetle. This additional workload will be more than our current staffing levels could handle in a timely fashion. The City will need to look at possibly adding two new seasonal staff to keep up on private inspections. Once identified the City will use its current abatement process to ensure the trees are being removed in a timely manner. The abatement process will also add pressures to the office staff at Public Works and require additional seasonal staff.

Pesticide Control: Pesticides known to control EAB, at least in the short term, are available. They may be a good alternative for individual trees such as in case of a home owner with one special tree. However, using pesticide treatments on a large scale basis is evaluated as cost prohibitive considering they need to be applied annually or bi-annually for the life of the tree. Also, scientific research is inconclusive as to the long term survivability from using pesticides, and negative environmental impacts of introducing EAB pesticides on a large scale into the environment are unknown. Injection of pesticides directly into the tree has the lowest danger to the environment and public.

Wood Utilization and Disposal: The probable loss of thousands of ash trees creates several challenges for the City in regards to public trees as well as residents and commercial tree services dealing with private property and Park trees. This wood debris will add to the annual wood waste that is put into the City's landfill.

Currently the City grinds wood debris and turns it into wood chips to sell as mulch or double grinds it for wood chips for the Bio-mass heating system. The City also sells wood for fire wood. If ash is to be sold as firewood we will need to remove the bark layer off the logs and destroy the bark to remove the habitat for the larva. To do this the City will need to purchase, lease or contract for a portable saw mill or purchase or lease a log de-barker.

The City Forester has been visiting with other states and city foresters that have dealt with EAB and questioned them on how they have been dealing with the wood waste. Many cities in

Michigan have developed successful partnerships with entrepreneurs in creating products and markets for new wood products made out of ash. Further research is needed to determine if there is a market for ash and other trees removed from the City. Finding markets for this wood waste would help to offset the cost for removals.

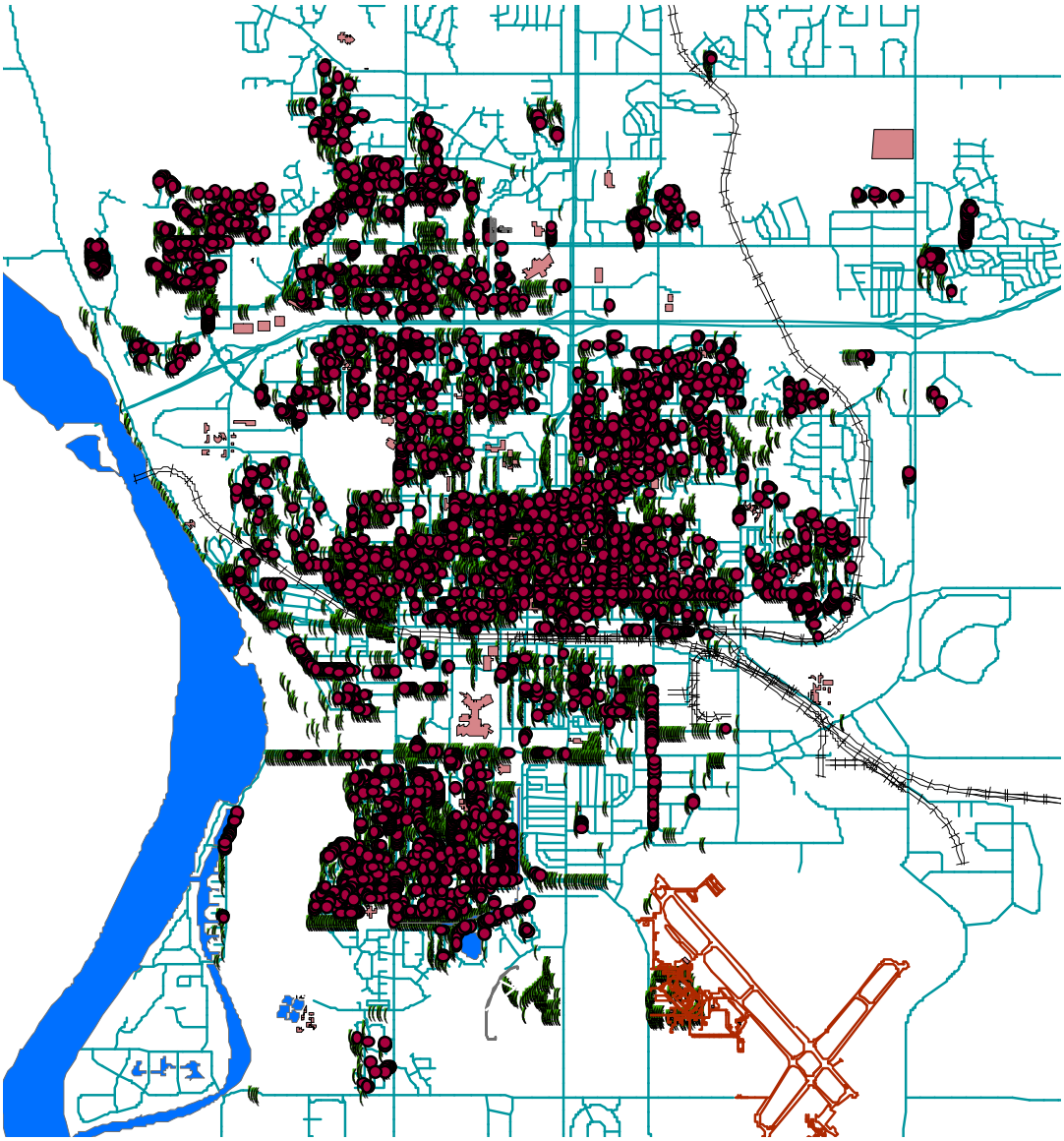
Some cities have purchased a portable saw mill and milled some of the larger tree trunks into cants that are sold for lumber, pallets or posts. Once EAB arrives, Federal and State agencies will become involved with the EAB issue in Bismarck. One of the first things they may do is set up a quarantine for the area. Once this happens, shipment of ash material out of the quarantine area will need to follow strict regulations on how the material is treated and processed.

Replanting: The removal of 36% of the City's urban forest will create large areas devoid of trees. It will be important to start replanting a diversity of species to replace the removed trees.

Ideally, a re-planting program should be designed for the replacement of every tree that is removed from EAB. One strategy to keep costs low is to plant 1 ½ to 1 ¾ inch bare root stock with a variety of species to further improve upon species diversity in the urban forest.

Conclusion: Our urban forest is a valuable and under-utilized resource that can be "put to work" to positively impact storm water problems, air pollution, and energy savings on heating and cooling costs. We need to protect what we have while planning and replanting for a sustainable, pest resistant urban forest in the City of Bismarck. The support, cooperation and commitment of the City leaders and residents of Bismarck will determine whether we can preserve the quality of life and our environment in Bismarck.

The map below represent all the trees on the boulevards, green dots = all trees, red dots = ash trees.



March 3, 2010