

Emerald Ash Borer Management Program

For the City of Saint Paul, Minnesota

This Emerald Ash Borer Management Program for the City of Saint Paul was developed by the Department of Parks and Recreation/Forestry, June 12, 2009

PURPOSE

By implementing the provisions in this management program, the City is attempting to mitigate the disruption to its urban forest caused by the infestation of the Emerald Ash Borer (EAB). Taking a proactive approach to this infestation enables the City to address public and private needs in an efficient and effective manner.

The City will attempt to distribute costs associated with certain and massive tree death, based on the history of EAB elsewhere in North America, over a manageable time period, and lessen the social and economic impact that an extensive loss would have on the quality of life in our community.

APPLICABILITY

This program is applicable to all public properties where ash trees are currently growing in the City, on private properties where such trees may negatively impact public right-of-ways, on other private properties or where diseased trees generally threaten the health of the urban forest overall.

ADMINISTRATION

The Natural Resources Manager, through the Department of Parks and Recreation, will be responsible for implementing this program and seeing that program provisions are carried out.

EAB BACKGROUND

The Emerald Ash Borer (EAB) is an exotic beetle that was first discovered in Michigan in July 2002, probably having arrived on solid wood packing material shipped from its native Asia. Without any natural predators or controls in North America, it has spread into nearby states, Canada, and now into Minnesota, having killed millions of ash trees along the way.

Unfortunately, wherever it has been discovered, there has been no stopping its devastation, though millions of dollars have been spent on a variety of prevention methods. The economic impact on states, municipalities, property owners, nursery operators, and forest industries has been overwhelming. Minnesota's estimated 930 million ash trees could be decimated in Saint Paul, the metro area and the entire state.

The Emerald Ash Borer is a bright green, metallic beetle with an elongated, slender body measuring 7.5 to 13.5 mm long. The adult beetles leave a D-shaped exit hole in the bark when they emerge in spring. The adult beetles nibble on ash foliage but cause little damage. The larvae (the immature stage) feed on the inner bark of ash trees, disrupting the tree's ability to transport water and nutrients. This causes severe dieback in the canopy spreading downward and killing an ash tree. Other visible symptoms may include abundant wood pecker damage, epicormic sprouting from the base of the tree

and splitting bark displaying serpentine larval galleries underneath. Unfortunately, all species, sizes and conditions of ash trees native to Minnesota are susceptible to EAB.

SAINT PAUL EAB DISCOVERY

The City received notification of the state's first confirmed discovery of EAB from the Minnesota Department of Agriculture (MDA) on May 14, 2009. It was first noticed by an employee of Rainbow Tree Service checking on a client's trees in the South Saint Anthony neighborhood just north of University and Raymond avenues. The MDA, charged with monitoring pests in the state, confirmed the discovery and immediately began surveying the neighborhood to determine the degree of infestation. A press conference was held that same afternoon announcing the discovery.

Led by the MDA, a de-limiting survey with a two mile radius was performed and by Friday, June 5, had confirmed only 68 trees with EAB, though none outside a half mile radius of the initial find. Saint Paul Forestry, working by emergency orders of the USDA and MDA, and through a joint powers agreement, removed and disposed of all the confirmed trees the week of June 1-5, in hopes of killing any beetles prior to emergence in early to mid-June. Subsequent analysis of removed trees by the United States Department of Agriculture (USDA) estimate that EAB appears to have been present in the Saint Paul trees for possibly 3-4 years, meaning it is also probably more wide-spread than just the South Saint Anthony area; it is just hard to detect at this point. It also means it is likely in Saint Paul permanently.

SAINT PAUL FORESTRY

The City of Saint Paul, Department of Parks and Recreation, Forestry unit is familiar with large scale disease infestation having dealt with Dutch elm disease, which wiped out the majority of American elm trees beginning in the 1970's. To respond to that issue, Forestry crews and resources were more than tripled compared to the size of today's current operation. As time progressed and the disease subsided to a more manageable level, the Forestry unit's resources were also reduced. When considering the potential impact of EAB today, it is important to understand it in context with Forestry's current resources and delivery service.

Within the first three weeks of EAB confirmation in Saint Paul, Forestry expended resources responding to the situation, using budgets that had not anticipated requiring any money for this use. This expenditure precluded, instead, the scheduled and necessary trimming of about 50 trees. For further clarification, Saint Paul Forestry, as currently constituted, does not have the resources to handle another large infestation like EAB. To effectively respond to EAB without added resources is unsustainable and the re-direction of existing resources towards EAB will displace all of the other necessary work of the unit.

Today, Saint Paul has more than 150,000 trees on street right-of-ways (ROW) boulevards that are maintained using funding from ROW assessments to property owners. There are an estimated 300,000 more trees in Saint Paul open spaces, such as parks, golf courses, and natural areas. Added together, publicly owned trees total approximately 450,000 in Saint Paul.

The maintenance of non-ROW trees is by either general fund, or in some cases, special fund budgets in the case of golf courses. In both cases, budgeted funding for tree service is generally lacking allocations necessary to achieve best practices. As a result, many park and natural areas go mostly

unmaintained, but in the case of disease or infestation, this immediate environmental threat cannot be ignored.

Further, it is currently estimated that about 25 percent of all public trees are a variety of ash species meaning over 35,000 ROW trees and as many as 120,000 publicly owned trees in total. These figures do not include trees on private property which are ultimately the responsibility of the property owners. However, in the case of diseased and dangerous trees, the City is also responsible for monitoring, inspecting, and abating nuisance private trees. This could mean approximately 30,000 additional ash trees could be affected by EAB and become a source of added responsibility for Forestry operations.

Because of various factors, Forestry has a current backlog in tree trimming of ROW trees. The industry standard for safe pruning of boulevard trees is once approximately every seven years. Saint Paul's current trimming cycle is measured at more than 12 years. The result of not maintaining an adequate trimming cycle not only includes more incidents of complaints and requests for trimming, but increasingly exposes the public and property to dangerous falling limbs and in some instances entire trees. Not only do incidents of failed trees cause pain and suffering, and potentially fatalities, but it exposes the city to potential litigation and related costs.

As part of a ROW budget analysis recently undertaken, one expected recommendation is to increase the Forestry budget for bringing the trimming cycle closer to seven years. To return the trimming cycle back to a more manageable level would require adding an estimated additional \$1.1 million, a doubling of the current \$1.1 million in 2009 allocated for trimming. However, none of the ROW recommendations to improve Forestry best management practices included or anticipate the work that EAB requirements will inevitably add. For example, it is an assumption that EAB will double or triple the number of trees normally removed in a year, thus requiring more resources to do so.

INCIDENT RESPONSE SYSTEM (ICS)

The introduction of Emerald Ash Borer in Minnesota is a significant event that requires the communication and coordination effort of many agencies. Thus, an Incident Command System (ICS) has been created, and is led by a unified command of the USDA and the MDA. The City of Saint has a major role in the command structure and Forestry is working in close partnership and at the direction of these lead agencies in its overall response to the incident. Currently (June 2009), weekly meetings are held at the MDA with all agencies involved. These meetings not only update members but help in developing and sharing of an Incident Action Plan.

In addition, Saint Paul communicates, cooperates and coordinates activities as needed with multiple other agencies such as the Minnesota Department of Natural Resources, Ramsey County, and neighboring cities such as Minneapolis, and others. Likewise, the Department of Parks and Recreation will work closely with other internal city departments, outside agencies, neighborhood groups and residents to communicate and coordinate response efforts.

EDUCATION and OUTREACH

Ongoing communication, resident education and outreach have been key components of the initial response and those efforts will continue and be expanded upon as more information becomes available. 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. Key updates have

been and will continue to be transmitted via the City and MDA website. Hosting public meetings have also been a successful option for experts to engage City residents with their questions and concerns.

Moving forward, coordinated public information updates between the MDA and the City to the public will be a priority. The City is in the process of producing a video public service announcement that will be available via DVD, on the City's website, and broadcast on the City's cable television station. The public service announcement will aid in the "What can I do?" questions and will be updated as any new key information, such as grant opportunities for re-planting, becomes available.

Additionally, the City will work with the MDA to reach and educate commercial tree services in best management practices, as they play a key role especially in controlling the spread of infestation. Other private sector businesses and entrepreneurs will be sought and engaged to discuss and develop creative alternative utilizations of ash wood. This is a potential opportunity for new wood products and a possible catalyst for job creation.

As EAB activity occurs in neighborhoods, door-to-door contact using fliers will advise residents of specific activity for their boulevard trees and activity on their block. Using existing District Council communication networks will strengthen these specific local efforts.

ORDINANCES and POLICIES

The City has ordinances and policies that affect and outline what actions can and can not be done. These need to be reviewed and updated with EAB in mind:

- Update ordinances related to diseased trees to include EAB, such as the ability to enter private property for inspection, the ability to order removal of diseased trees, and the ability to abate the nuisance upon non-compliance of property owner:
 - *Action: Update Chapter 175 to include EAB in conjunction with Minn. Stat. § 18G. Any revisions will need legislative approval by the City Council. An amended chapter 175 is scheduled to be introduced before the Saint Paul City Council in June 2009.*
- Update/develop a city operating policy on removing ash prior to their EAB infestation. Any such policy adoption is dependent on approved budget authority:
 - *Action: Adopt a proactive "Structured Removal Plan" of ash trees, including removal of ash with greater than 30% decline in areas scheduled for upcoming tree planting; removal of ash with greater than 30% decline in other areas when requested by citizen(s); and removal of selected ash with less than 30% decline as part of structured removal goals to manage EAB. This policy is designed to hopefully slow the spread of EAB by reducing host trees, and by accelerating the inevitable removal of ash will help spread out the program schedule and associated costs.*
- Develop a policy for residents who wish to save a public tree through chemical treatment with EAB pesticides:
 - *Action: Through a City issued permit, allow residents to chemically treat select public ash trees using a City of Saint Paul licensed tree service that is bonded and insured, is a State of Minnesota Licensed Commercial Pesticide Applicator using state approved*

trunk injection pesticides only. Limiting to trunk injections hopefully reduces pesticide exposure to others and the environment overall. (Note: Chemical treatment would not preclude future removal of the tree if deemed necessary.)

- *Cost: Indirect (\$50/per for staff labor and vehicle to check site and issue)*

- Review and alter policy, if needed, for guiding the Street Tree Master Plan:

- *Action: Alter the policy for tree planting by limiting planting of monocultures of a tree species to a continuous stretch of no more than 3 blocks before changing. Doing so retains some consistency in design and character unique to the type of trees planted, e.g., all the same shape, size and color, while reducing the risk of losing large stretches of trees within an area in the event of a fatal disease affecting the particular species.*

Additionally, the city will try in some locations adding diversity by alternating tree species of similar stature and physical dimensions where possible to limit the risk of losing complete blocks or blocks of single specie trees in times of a fatal pests or diseases that may affect a particular species.

MITIGATION

The City of Saint Paul, working at the direction of the USDA and MDA during the initial discovery period, worked to reduce and contain the infestation of EAB to the South Saint Anthony neighborhood. Under a joint powers agreement, Saint Paul Forestry removed all trees confirmed to have EAB from both public and private property during the week of June 1, 2009 (private property removals were done by emergency order of Minn. Stat. § 18.G with the city reimbursed by the USDA/MDA). This was done to remove and destroy as many EAB beetles prior to emergence in early to mid-June. All material was chipped on site before being sent to Environmental Wood Supply at Pigs Eye for further processing, and eventually to District Energy in downtown Saint Paul for energy incineration.

However, if EAB continues to spread uncontrollably as it has elsewhere in North America, at some point Saint Paul will be largely independent in dealing with the infestation. Keeping in mind that the largest populations of ash trees by far are in northern Minnesota, the USDA and MDA will likely be stretched to assist other cities and communities throughout the state. Thus, Saint Paul will need to have its own plan for mitigating EAB. For the purposes of this plan, mitigation is made up of Monitoring, Pesticide Control, Removals, Wood Utilization and Disposal, and Reforestation.

The success of the local response by City of Saint Paul in limiting and delaying the spread of EAB will benefit other communities and their ability to prepare and plan

MONITORING

Monitoring the infestation is the first step to managing it. Though no additional resources have been added thus far to do so, Saint Paul Forestry currently assists in the ongoing survey for EAB, including the sample stripping of bark from any ash tree that is removed for non-EAB reasons. It responds to calls for inspections from residents as well. Residents are directed to call the MDA *Arrest the Pest Hotline* for private tree inspections and/or the City of Saint Paul Forestry for public trees, though Forestry responds to both. In addition, Forestry is helping

MDA to install and monitor both “purple” EAB cardboard traps and girdled trees which are designed to attract adult beetles:

- To survey areas for infestation, public and private trees--120,000 in total, and handle the new calls for inspection regarding EAB, additional trained inspectors are needed:
 - *Recommended Action: Beginning as soon as July 1, 2009, dependent on funding, the city will hire four new inspectors to be trained in EAB detection. These inspectors will work year-round and can also assist in other duties as needed, such as chemical injection if pursued. Each would need a vehicle and lap top computer to survey the city and enter data as needed.*
 - *Cost for 2009: \$100,000*
 - *Cost for 2010 and beyond: \$200,000 annually.*

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 the 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 re-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 are unknown. There is information available, for example, that cites the possible negative non-target effect of pesticides such as Imidacloprid, the key active ingredient in many widely used pesticides for EAB. (See Addendum “A” for more information). Even so, there will be pressure to “save” existing ash trees. While the immediate cost of chemically treating is cheaper than removal and re-planting, it is delaying what has been inevitable tree loss in other communities. As funding is secured for managing EAB, the decision on how best to invest public dollars evaluates removal and reforestation for the future, or a program of attempting to save existing ash trees without any guarantee of success. This management plan directs available resources to reforestation, planting new trees, and diversification of the City’s tree canopy.

- Regarding residents requesting information on applying pesticides to their own private property trees:
 - *Action: The City/Forestry will provide residents available information on EAB pesticides when requested but will remain neutral on whether or not to use.*
 - *Cost: Indirect*
- Regarding residents who request a permit to chemically treat the public boulevard tree near their residence:
 - *Action: The City/Forestry will inform residents of the city policy requiring an annual permit to chemically treat any public ash tree. Staff will then check the tree to see if it is worth pursuing. There is no cost to the citizen for the permit but it will require the hire of a City of Saint Paul licensed tree service that is bonded and insured, is a State of Minnesota Licensed Commercial Pesticide Applicator using state approved trunk injection pesticides only. Limiting to trunk injections hopefully reduces pesticide exposure to others and the*

environment overall. (Note: Chemical treatment would not preclude future removal of said ash tree if deemed necessary.)

- *Cost: Indirect (\$50/per for staff labor and vehicle to check site and issue permit paperwork)*
- Regarding the chemical treatment of public boulevard trees by the City:
 - *Recommended Action: Funding dependent, Saint Paul Forestry will use EAB pesticides on a limited basis for targeted trees only, e.g., when it is determined to be appropriate, i.e., either identified specimens or other ash trees in good condition and location (e.g., not under a power line). Using either a contracted vendor or performing in-house treating 500 public ash trees at \$150 each:*
 - *Cost: \$75,000 annually.*

REMOVALS

Ultimately, North American communities haven't successfully eradicated EAB once found (with one possible exception, a small town in Michigan still under study). EAB typically builds in population and eventually infests and kills all variety of ash trees. Symptoms are slow to appear and once EAB is found it is estimated that it has already been present 3-5 years. Unless a tree is chemically treated with EAB pesticides (see Pesticides above), infected ash trees typically succumb to the disease and are subsequently removed and disposed of (some natural area trees are left to die standing).

Some methods designed to hopefully slow the movement of EAB have prescribed the proactive removal of declining, or even healthy, ash trees that will most certainly become infested anyway. And by accelerating the removal of these trees and re-planting with a different species, the total financial obligation is spread out in a more manageable way over several years. More importantly, where EAB has gotten out of control because of no structured removal plan, ash increasingly die and become dangerous to people and property that are targets for falling limbs and trees.

- The below removal scenarios include total removal and disposal of public trees, along with stump grinding, an average total cost of approximately \$700 per tree. (Note: **Re-planting options and costs are discussed below under its own category.**)
 - *Recommended Action: The city will adopt a “5% Structured Removal Plan” proactively removing 3000 boulevard and park ash trees annually, or about 5% of an estimated 60,000 ash trees citywide (natural areas may be girdled and left to die naturally). This would put the city on a 20 year replacement plan, which is expected to be sufficient for the immediate future but may or may not be sufficient in subsequent years. (If not, future years may require accelerated removals using even more resources.) Removal would begin as soon as possible of all confirmed EAB trees, those with significant decline, and those in areas scheduled for upcoming planting (assuming funds will be available for new trees). Such a plan would require two new removal crews and support staff so as to leave existing duties of trimming, removals of other dead and dangerous trees, storm clean up, etc., unaffected:*

Labor w/fringe

(1) EAB Coordinator	\$85,000
(1) Forestry Supervisor I	\$83,000
(2) Forestry Crew Leader	\$149,000
(9) Tree Worker	\$593,000
(4) EAB Inspectors	\$160,000
(4) Parks Worker I	\$80,000
(1) Office Assistant	\$50,000
(.5) Vehicle Mechanic	\$35,000
Technical and admin support	\$50,000
Central Service Cost	\$110,000
<u>Equipment</u>	
(7) Pick-up truck rent	\$56,000
(2) Clam loader truck rent	\$58,000
(3) Tandem dump truck rent	\$78,000
(1) Roll off dump truck rent	\$35,000
(2) Aerial tower truck rent	\$40,000
(1) 20 inch chipper	\$30,000
(1) Stump grinder	\$20,000
Misc equipment	\$20,000
Tub grinder annual lease	\$20,000
Sub-total	\$1,752,000
Overhead 10%	<u>\$175,200</u>
	\$1,927,200

- Cost for 1/2 of 2009: \$965,000
 - Cost for 2010 and annually beyond: \$1,930,000
- *Rejected Alternative: The city will adopt a “10% Structured Removal Plan” proactively removing **6000 boulevard and park ash trees annually**, or about 10 % of an estimated 60,000 ash trees citywide (natural areas may be girdled and left to die naturally) . This would put the city on a 10 year replacement plan. Removal would begin as soon as possible of all confirmed EAB trees, those with significant decline, and those in areas scheduled for upcoming planting (assuming funds will be available for new trees). Such a plan would require four new removal crews and support staff to not affect existing duties of trimming, removals of other dead and dangerous trees, storm clean up, etc. This scenario essentially doubles the previous:*
- Cost for 1/2 of 2009: \$1,930,000
 - Cost for 2010 and beyond annually: \$3,860,000
- *Rejected Alternative: The city will adopt a “Wait and See” approach where only confirmed EAB ash trees are removed. This approach where used elsewhere has reportedly led to an accelerated spread of the disease to where it eventually becomes unmanageable (unless trees were chemically treated as an alternative). At that point, trees die and become dangerous faster than the local government can respond to their removal. While there is no known formula for how fast the*

disease can spread in this scenario, it is easy to imagine that 100 confirmed EAB trees in 2009 can easily lead to a doubling or tripling each year thereafter (example: 300 in 2010; 900 in 2011; 2700 in 2012; 8100 in 2013; ...). **In this scenario, the city has no allocated resources dedicated to EAB. A rapid spread of the disease would place a huge and immediate liability for the city and is unsustainable to manage. And a failure to do so responsibly could lead to a significant safety issue and expose the city to issues of liability.**

- Cost for 2009 and 2010: \$0.00 but a draw away from exiting tree maintenance work that would lead to other issues, such as deferred tree trimming.
 - Cost for 2011 and thereafter: unpredictable at this point, and possibly spiraling out of control. An increasing re-direction of existing resources to handle EAB will cripple or devastate the normal Forestry work program.
- Rejected Alternative: The city will adopt a limited “Wait and See” approach with a very small response crew provided who can respond minimally to confirmed trees and allows other normal work to continue for the time being. It will include (1) Inspector, (2) Tree Workers, and equipment. (Note: As with the previous option, this scenario may lead to an unmanageable situation and future liability within a few years.)
- Cost 2009: \$100,000
 - Cost 2010: \$200,000
 - Cost 2011 and beyond: The costs may become unbearable as the disease possibly begins to spiral out-of-control of the small token crew.
- For removal of nuisance diseased EAB tree(s) on private property:
- The city will follow the procedures of an updated Chapter 175 on Diseased Trees. In short, once a property owner is ordered to remove a diseased tree and fails to comply within 20 days, the city may abate the nuisance by having it removed and disposed of in the proper way. All associated costs for the abatement will be assessed against the property owner which can be appealed at a hearing with the City Council.
 - Cost: All associated costs will be recovered through assessment
 - At this point, no program has been established to provide private property owners financial assistance for dealing with EAB
- For removal of nuisance dangerous tree(s), such as a dying or dead EAB tree(s) on private property:
- The city will follow the procedures of Chapter 177 on the Removal of Dangerous Trees. In short, once a property owner is ordered to remove a dangerous tree and fails to comply within 10 days, the city may abate the nuisance by having it removed and disposed of in the proper way. All associated costs for the abatement will be assessed against the property owner which can be appealed at a hearing with the City Council.
 - Cost: All associated costs will be recovered through assessment

- *At this point, no program has been established to provide private property owners financial assistance for dealing with EAB*

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 trees.

In the early stages of infestation, care to slow down the spread of EAB is paramount not only for Saint Paul, but to other communities and the state. While both Ramsey and Hennepin Counties are under quarantine restricting the movement of ash wood or other fire wood, only a small part of Saint Paul/Ramsey County has confirmed an EAB infestation to date. The longer it can be contained to this relatively small area, the more time to better successfully manage EAB infestation overall.

The most critical period for movement of confirmed EAB ash trees is the months of June and July. This is the period where adult beetles emerge from trees, begin feeding on foliage, move to even more trees, and lay their eggs. During this period, it is best to leave these trees standing and not chance the possible spread of EAB by transporting beetle infested wood to other areas. After this period, from about August to May each year, EAB trees can be removed and transported so long as they are promptly chipped to the required dimensions, less than 1”x1”x1” in any one dimension, effectively killing any EAB larvae. Other ash trees not found to be infested with EAB can basically be cut and transported at any time, though again, to be safe, they should be promptly processed remembering that while EAB may not be evident, it is difficult to detect at low densities and may be present.

Regarding disposal, Saint Paul is fortunate to have a lease arrangement with Environmental Wood Supply (EWS) that processes all public trees for energy incineration at no charge to the city. EWS is located on city property near Pig’s Eye Lake and the processed chips are trucked to the District Energy plant in downtown Saint Paul. EWS also handles all wood at Ramsey County Yard Waste Disposal sites, the locations where residents bring their tree debris if handled themselves (they are not allowed to bring it to the Pig’s Eye site). Finally, EWS also handles the bulk of any trees cut down by commercial tree services working in the region.

While this wood is put to good use creating energy and saving on other fuels, other possible utilizations should be explored, especially if there is a market that could provide a revenue stream to help finance EAB management. One such possibility is to mill some of the larger tree trunks into cants that could be sold for further products, such as lumber or posts. As long as the bark layers are removed (where the larvae and beetles reside) and chipped, the heartwood is fine for utilization. Other states, such as Michigan, have been successful in creating partnerships with entrepreneurs who have developed products and a market for new products made out of ash wood. Such cases are win-win for everyone involved.

One troublesome issue is the potential of handling clean up from a wind storm damaging EAB confirmed trees during the active period of June and July. Again, in order to avoid further spread of the infestation, all storm damaged trees in a known confirmed area should be chipped within the area before transportation to EWS. This includes, inevitably, the wood cleaned up by home owners or commercial tree services working in the area and looking for a disposal site.

However, Saint Paul Forestry currently does not have a large tub grinding machine to handle a mass amount of public and private wood from a storm; prior to EAB, storm wood was just hauled in bulk to EWS for chipping. Nor does it make sense to purchase such a machine for part time use as most of the year ash wood can safely be trucked to EWS for chipping. Rather, Forestry will explore arrangements with EWS or another company that can bring in a portable tub grinder into the area and set up a marshalling yard for processing.

In a neighborhood such as South Saint Anthony, a marshalling yard may have to be set up by commandeering an available public or private open space. Such use of property would likely be controversial as it would be the source of traffic, noise, dust and debris, it would damage turf and other surfaces--that would then need repair, and it would become unusable for normal programs. However, in the case of an emergency, such a scenario may become necessary. Work to identify and pre-establish processing sites is underway.

Finally, if ever EAB infestation spreads city-wide, chipping of confirmed EAB trees in a particular area to prevent further spread may no longer be required. All ash trees could be removed and transported to EWS where they can be chipped.

In summary, the following issues and actions regarding wood utilization and disposal are:

- Public ash trees confirmed with EAB will be processed in a way to minimize further spread of the disease as long as areas of the city are still free of EAB:
 - *Recommended Action: With the initial discovery period over and removal of EAB confirmed trees completed as of June 5, 2009, the city will leave future confirmed EAB trees in place during the active period of beetle emergence, June and July, each year. They will then be removed and properly disposed of during the non-flight months of August through May.*
 - *Cost: see removals*
 - *Recommended Action: The city will explore and secure emergency marshalling yards—suitable for on-site tub grinding--within areas of EAB confirmed trees that need to be removed in response to an emergency, such as clean up of a wind storm during the months when beetles are active. These yards would be to process all wood in the area, including public, and private from property owners and commercial tree services. The chipped material will then be transported to EWS.*
 - *Cost: to be determined*
 - *Recommended Action: Non-EAB trees will be removed at any time of year and disposed of through the normal process of transporting un-chipped to EWS.*
 - *Cost: see removals*
 - *Recommended Action: The city will work with the State of Minnesota and others to explore other possible utilizations of ash wood, such as milling large trunks into cants that could bring revenue.*
 - *Cost: to be determined in concert with possible revenue*

- Private ash tree disposal is normally handled either by residents disposing at a Ramsey County Yard Waste Facility, or through commercial tree services:
 - *Recommended Action: The city will work in cooperation with Ramsey County to communicate to and educate residents on the availability of compost sites for ash disposal.*
 - *Cost: Indirect*
 - *Recommended Action: Saint Paul Forestry will work with the Department of Safety and Inspections (DSI) to ensure properly licensed commercial tree services, to inform and assist companies regarding rules of EAB, and to help in enforcement when violations become known.*
 - *Cost: Indirect*

REFORESTATION

The future expected loss of over 60,000 boulevard, park and open space ash trees will require a massive reforestation effort. The benefits trees provide is broadly understood and includes cleaning our air, cooling our atmosphere, saving energy through shade and wind breaks, and making our city safer and more pleasant. Re-planting lost trees may be the most important part of the management plan because it will keep Saint Paul the Most Livable City for future generations.

Presently, tree planting is accomplished using Capital Improvement Budget (CIB) and other smaller project funds to plant about 2000 trees per year, most of them 2 inch DBH (diameter at breast height), in balled-and-burlapped form. Ideally, a re-planting program should be designed for the replacement of every tree that is removed the previous year. Thus, if Saint Paul annually loses an additional 3,000 or more ash trees to EAB on top of the normal loss of 2,000 other trees, it will need to increase its planting accordingly. One strategy to increase the number of new trees planted is to choose less expensive 1 ½ to 1 ¾ inch, bare root stock. This is becoming common practice in many communities. Doing so might allow for 2,500 new trees with the same budget, but it is still only half of the 5,000 needed.

The loss of ash trees due to EAB will require an infusion of tree planting money. Additionally, staff will need to be added to assist in the increased planting effort, approximately 1.0 FTE Tree Worker for every 2,000 trees. This staff person is needed to assist the arborist with duties such as determining planting locations, arranging utility locates, troubleshooting problems with the planting contractor, performing first time pruning of newly planted trees, dealing with customers, and updating the tree inventory.

The City plants trees in accordance with the Street Tree Master Plan. Thus, with the impending loss of thousands of trees, consideration should be given to whether these guidelines should be reviewed and retained or altered. Currently, the plan calls for planting monocultures of tree species for up to six blocks. This is done for several reasons, not the least being for design aesthetics. Using the same tree species in an area creates a distinct character based on the trees all having a similar shape, size and color. However, it also subjects the entire area to the possibility of being all wiped out in cases of a fatal disease that targets a specific tree species. This occurred with the loss of American elm trees and now has a chance to do so again in the case of ash trees. An alternative approach would consider more diversity of trees but while this

may guard against a complete loss of trees in an area, it also removes the design aesthetics provided by a monoculture.

As a pro-active measure, the Forestry unit was well aware that with EAB moving from state to state, it was a matter of time before it ended up in Minnesota. Therefore, a decision was made about five years ago to discontinue planting ash trees and begin the process of more diversification. Diversification reduces the chance of losing such a large percentage of trees all at once from a fatal disease targeting a particular species.

- Losing an additional 3,000 trees to EAB will mean the total loss of 5,000 public trees annually:
 - *Recommended Action: The city will **replace 3,000 ash trees** lost to 5% Structured Removal Plan, on top of the 2,000 normally lost trees, using 1 ½ inch bare root stock. Additional labor and materials for these added 3,000 trees include:*

(1) Tree Worker	\$66,000
Central Service Cost	\$5,000
(1) Pick-up truck rent	\$8,000
3000 trees at \$150 ea	<u>\$450,000</u>
Sub-total	\$529,000
Overhead 10%	<u>\$52,900</u>
TOTAL =	\$581,900

- *Cost: 2010 and annually beyond: \$585,000 additional tree planting funds, minus the increasing annual benefits of a growing shade tree.*

- *Rejected Alternative: The city will **replace 6,000 ash trees** lost to 10% Structured Removal Plan, on top of the 2,000 normally lost trees, using 1 ½ inch bare root stock. Additional labor and materials for these added 6,000 trees include:*

(2) Tree Worker	\$132,000
Central Service Cost	\$10,000
(2) Pick-up truck rent	\$16,000
6000 trees at \$150 ea	<u>\$900,000</u>
Sub-total	\$1,058,000
Overhead 10%	<u>\$105,800</u>
TOTAL =	\$1,163,800

- *Cost: 2010 and beyond annually: \$1,165,000 additional tree planting funds, minus the annual benefits of a growing shade tree.*

- *Rejected Alternative: The city will forgo re-placement of any lost ash trees. Doing so will reduce the canopy coverage in Saint Paul and rob it of the many benefits of 3,000 trees lost.*

- *Cost: No additional funds but the loss of approximately \$200 in annual benefits for each 22 inch tree lost in residential Saint Paul, or \$200 x 3,000 ash = (\$600,000) {per the National Tree Benefit Calculator}*
- Residents will want to help replant their city through donations to tree planting. The city will actively promote opportunities to do so, and seek other funding opportunities whenever possible:
 - *Action: The city will actively promote Trees Saint Paul to solicit donations to the replanting effort.*
 - *Action: The city will jointly promote partnerships such as the Friends of Parks and Trails Annual Tree Sale where proceeds assist the city in planting trees in parks.*
 - *Action: Where feasible, Forestry will issue permits and work with residents willing to purchase and plant trees on the boulevard near their residence.*
 - *Action: The city will explore other opportunities such as partnerships with non-profits like Tree Trust on possible tree planting projects in city parks.*
 - *Action: The city will seek Federal and State funding as well as grant opportunities for re-planting.*
 - *Federal funding will be sought working through our local federal delegation*
 - *State funding will be pursued, specifically funds from the Lessard Outdoor Heritage Council, working with our local state delegation. The state has available money dedicated to respond to EAB as an outcome of the 2009 legislative session.*
 - *Action: The city will explore the possibility of creative promotions where residents may be able to purchase a tree at discount pricing to plant in their yard or a local park.*

OTHER

An undertaking as large as the infestation of Emerald Ash Borer will bring about many issues that are hard to predict or articulate, but will need attention as they come more into focus:

- Personnel needs are frequently mentioned above but must not be overlooked. EAB will bring challenges not unlike Dutch elm disease when crews were three to four times the size of today's Forestry staff. If EAB advances as it has in other parts of North America, it will be a matter of a few short years before the city will be facing a crisis of large numbers of dead and dangerous trees that must be addressed, and staff will be required to rise to the challenge.
- Equipment and technology goes hand in hand with personnel. Fortunately, technology has advanced greatly in the last 40 years and should allow for more productivity, but it nevertheless comes with great initial expense purchasing or leasing.

- Facilities to house added personnel and equipment may seem like a minor problem but is very real. The current Forestry facility has little to no room to add an additional two dozen new employees and the required equipment as outlined above. Either the existing facility will need to be modified and expanded, or another site--or added satellite site--may need to be explored. Cost for such a facility is unknown at this juncture.

SUMMARY OF COSTS

Following is a summary of recommended action items requiring additional funding:

<i>Action</i>	<i>2009</i>	<i>2010 and beyond</i>
Monitoring & Inspection	\$100,000	\$200,000
Annual pesticide treatment of up to 500 select public ash trees	\$75,000	\$75,000
Structured Removal Plan for 5% of public ash trees	\$965,000	\$1,930,000
Wood disposal marshalling yards with tub grinder	\$20,000 (est)	\$20,000 (est)
Reforestation of 3000 lost ash trees	\$0 <i>(In addition to the annual \$350,000 CIB planting funds)</i>	\$585,000 <i>(In addition to the annual \$350,000 CIB planting funds)</i>
TOTAL	\$1,160,000	\$2,810,000

ADDENDUM “A”

SCC > Programs > Health & Environment > [Pesticides](#) > Imidacloprid Fact Sheet

Pesticide Fact Sheet

Imidacloprid

1-((6-chloro-3-pyridinyl)methyl)-N-nitro-2-imidazolidinimine

General

Imidacloprid is an insecticide which is the first insecticide of its chemical family, neonicotinoids, which are modelled after nicotine, to be registered for use. Common trade names include Merit™, Admire™, Gaucho™ and Advantage™.

How It Works

Imidacloprid fits into the receptors meant to receive acetylcholine, which carries nerve impulses from one nerve cell to another. By blocking these acetylcholine receptors an excess of acetylcholine accumulates causing paralysis and eventual death.

Acute Health Effects

Effects of exposure to imidacloprid include apathy, difficulty breathing, loss of the ability to move, staggering, trembling and spasms. Studies on rats indicate that the thyroid is particularly sensitive to exposure of imidacloprid causing thyroid lesions.[1]

Chronic Health Effects

There are no publicly available chronic studies of commercial imidacloprid products. This is of concern because the absence of proof by no means indicates the absence of harm. Long term studies should be completed on a pesticide before it comes onto the market and such studies if they exist, they should be publicly available.

We do however know that imidacloprid affects reproduction in a variety of ways. In pregnant rabbits, imidacloprid fed between the sixth and eighteenth days of pregnancy caused an increase in the number of miscarriages and an increase in the number of offspring with abnormal skeletons.[2] Imidacloprid exposed rats gave birth to smaller offspring.

Environmental Effects - Wildlife

Imidacloprid is toxic to birds and wildlife and mildly toxic to fish. Imidacloprid use has been linked to eggshell thinning in birds[3], reduced egg production and reduced hatching success at exposures of 234ppm in food.[4] It is highly toxic to certain species including the house sparrow[5], pigeon, canary and Japanese quail[6].

Environmental Effects – Beneficial Insects

Imidacloprid is an insecticide, so it is not surprising that it is toxic to many beneficial insects such as honey bees to which imidacloprid is highly toxic.[7] Imidacloprid is acutely toxic to earthworms with an LD50 of between 2 and four parts per million in soil.[8] While extremely low doses of 0.2ppm and 0.5ppm have been shown to cause deformed sperm[9] and DNA damage respectively.

Imidacloprid has shown to severely limit the mobility of lady beetles, [10] as well as other predatory

insects such as marid bugs and lacewings.[11] After marigolds were treated with the imidacloprid insecticide Admire, to kill spider mites, spider mite damage increased because the insect natural enemies of the spider mites were killed off by the imidacloprid.[12]

The widespread use of imidacloprid has been linked to colony collapse disorder, a phenomenon described by beekeepers, researchers and government officials when entire hive populations seem to disappear, apparently dying out. France has put restrictions on the use of imidacloprid (GauchoT) since the 1990s over concerns for the bee population.

Canada hasn't restricted use of the product despite warnings that similar impacts on bees were being felt here.

Prince Edward Island beekeepers have reported serious losses of bees which they believe since 1995 is linked to residues from imidacloprid. Potatoes on the island have been treated with soil applications of Admire (imidacloprid) to prevent Colorado potato beetle. It is believed that the rotational clover and canola crops have sublethal residues of imidacloprid in the pollen and nectar which cause slow death of bees in the colony.

Environmental Effects – Water Contamination

Imidacloprid has a high potential of leaching into groundwater. Although its persistence varies from the shortest half life of 107 days to concentrations which didn't begin to decline until over a year after use,[13] there is little question about imidacloprid's tremendous ability to move through soil.[14] Compared with 11 other popular pesticides Imidacloprid moved more quickly through soil than any of the other pesticides tested.[15] The other 10 pesticides tested included diazinon, chlorpyrifos and diuron which are widespread water contaminants.[16] It is classified by the EPA in category I as having the highest leaching potential.

Inerts

Commerical imidacloprid, and many other pesticides have inert ingredients that do not undergo toxicity studies prior to the regulation of the product, and little information is available. However, additives that have been shown to be found in imidacloprid including: two proven carcinogens crystalline quartz silica and naphthalene.[17],[18]

Conclusions

Imidacloprid has been shown to cause acute health effects, including spasms, and thyroid lesions. No chronic toxicity tests have been made available to the public, but we do know that it has effects on mammalian reproduction. The reproductive health of birds is also affected with reduced egg production, and egg thinning. It affects a multitude of beneficial insects, as well as earthworms.