Summary
"Proposal to Create the Minnesota Ash Tree Preservation Program"

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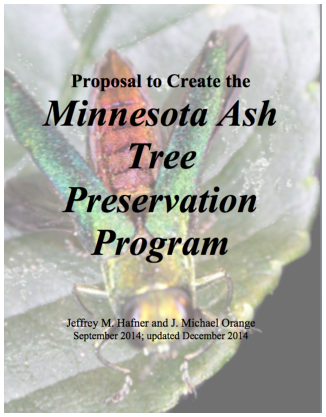
August 2016 (full report available upon request)[1]

Introduction: In the spring of 2013, Dr. Robert Haight, an economist at the St. Paul office of the U.S. Forest Service, and three other scientists published a seminal report regarding the management of the invasive species, the emerald ash borer (EAB), which threatens every one of the billion ash trees in Minnesota. Their peer-reviewed analysis, known as the Kovacs Study,[2] concluded that a regional or landscape-based management and funding strategy would more effectively control the infestation in urban forests than an inconsistent, city-by-city response, or no response. Early in 2014, Jeffrey M. Hafner and J. Michael Orange worked with Dr. Haight to take the Kovacs Study conclusions a step further. They prepared a cost-benefit analysis of a statewide EAB management program they called the Minnesota Ash Tree Preservation (ATP) Program. The ATP Program they propose would include state-funded loans and grants for public entities that manage urban forests to enable them to develop and implement landscape-based EAB management plans for public ash trees.



Synopsis of the report: The proposal has three parts. The first part examines the approximately 880,000 public ash trees that are in the urbanized areas of the seven-county Twin Cities region because reliable data was available. The cost-benefit analysis covers a 20-year study period and includes two primary scenarios—a Base Case that relies exclusively on removal and replacement of all ash trees, and a second scenario called the Ash Tree Preservation (ATP) Plan. The ATP Plan includes pesticide treatments using trunk-injected emamectin benzoate to inoculate high-quality ash trees located on public property. The second part of the analysis uses the regional results to generate statewide estimates for the two scenarios. In order to provide a sense of scale of the potential costs and benefits of the proposed state-funded ATP Program, the third part of the analysis includes reasonable assumptions about city participation rates (75% of cities with populations 3,000 or larger), state matching grant rates (approximately 50% of total EAB management costs), and program administrative costs.

The Base Case assumes that new trees will replace all public ash trees in the urban forests of participating cities throughout the State. The ATP Plan scenario assumes participating cities will preserve their healthy public ash trees (approximately 570,000 trees statewide), and they will plant new trees for low-quality ash trees as they succumb to EAB. The following summarizes the findings:

Minnesota ATP Program costs: 20-year total ($246 million), average annual ($12.3 million).
Average annual benefits: The following estimates list the average annual benefits over the 20-year study period provided by the trees in the ATP Program compared to the trees in the Base Case scenario:

- **Overall economic value of preserved ash trees and new replacement trees:** $177 million more.
- **Increased property value:** $28 million more.
- **Increased stormwater interception:** 1.8 billion additional gallons.

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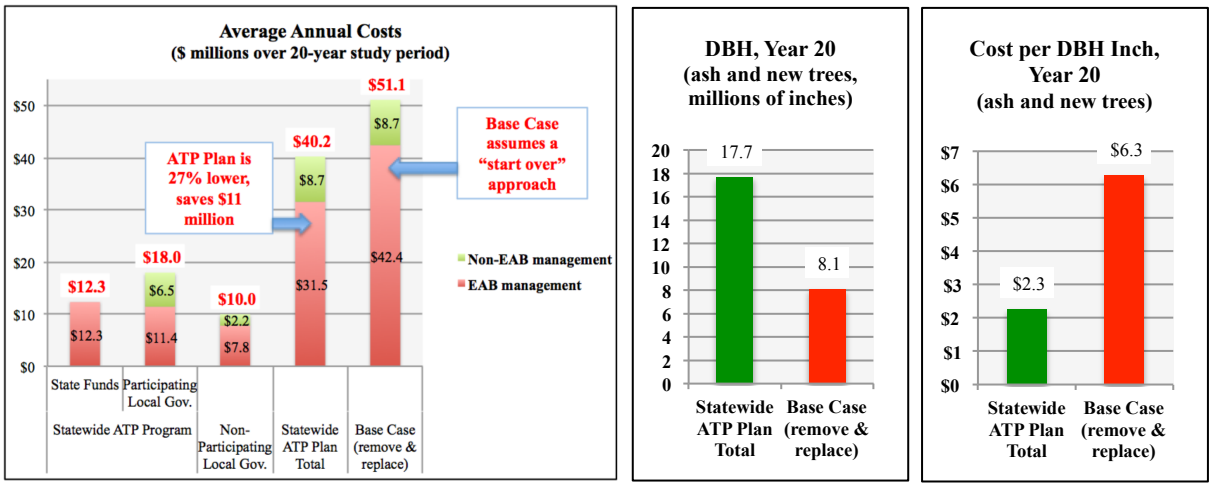
[2] Kovacs, Kent. F.; Haight, Robert G.; Mercader, Rodrigo J.; McCullough, Deborah G.; "A bioeconomic analysis of an emerald ash borer invasion of an urban forest with multiple jurisdictions." *Resource Energy Econ*. (2013), http://dx.doi.org/10.1016/j.reseneeco.2013.04.008

- **Household offsets of energy consumption:** The additional energy conservation from the trees in the ATP Plan scenario is equivalent to the average annual energy consumption of 17,500 Minnesota households.
- **CO_2 reduction:** The additional CO_2 reduction from the trees in the ATP Plan scenario is equivalent to the average annual CO_2 emissions from 2,100 Minnesota households.
- **Reduced heath care costs:** $800,000 more in reduced costs.

Cost-Benefit comparison: The following figures compare the average annual benefits for every dollar of cost for the ATP Program over the 20-year study period:

- **Increased property value:** $4
- **Stormwater interception:** .....140 gal., $5
- **Energy conservation:** $4
- **Air quality improvement:** $0.70
- **CO_2 reduction:** .....33 lbs., $0.50
- **Overall economic value:** $14

Charts: The below-left chart compares the average annual costs for the statewide management of public ash trees in urban forests. The first two bars on the left show that State funds ($12.3 million) plus local matching funds ($11.4 million) would be needed to manage the infestation for the cities that participate in the proposed ATP Program. Local governments would spend an additional $6.5 million on other urban forest expenses. The 25% of cities that are assumed to not participate in the ATP Program (the third bar) would spend about $10 million on their urban forests (including EAB management). The fourth bar shows the total amounts for these three bars—$40.2 million annually for statewide urban forest management in the ATP Program (which also includes the costs for the non-participating cities). The rightmost bar is the Base Case scenario ($51.1 million), which assumes a "start-over" approach for the pubic ash trees. The chart shows that the public costs (local and state) for the ATP Program is 27% lower and saves about $11 million annually compared to the Base Case (which is 100% local). The middle chart illustrates tree canopy as indicated by trunk size or DBH (diameter at breast height)[3] for all trees in Year 20. The ATP Plan would result in more than twice as much tree canopy compared to the Base Case. The final chart combines costs and tree canopy and shows that the Base Case costs almost three times as much as the ATP Plan on a per-inch basis.



[3] DBH is used here as a surrogate for tree canopy.