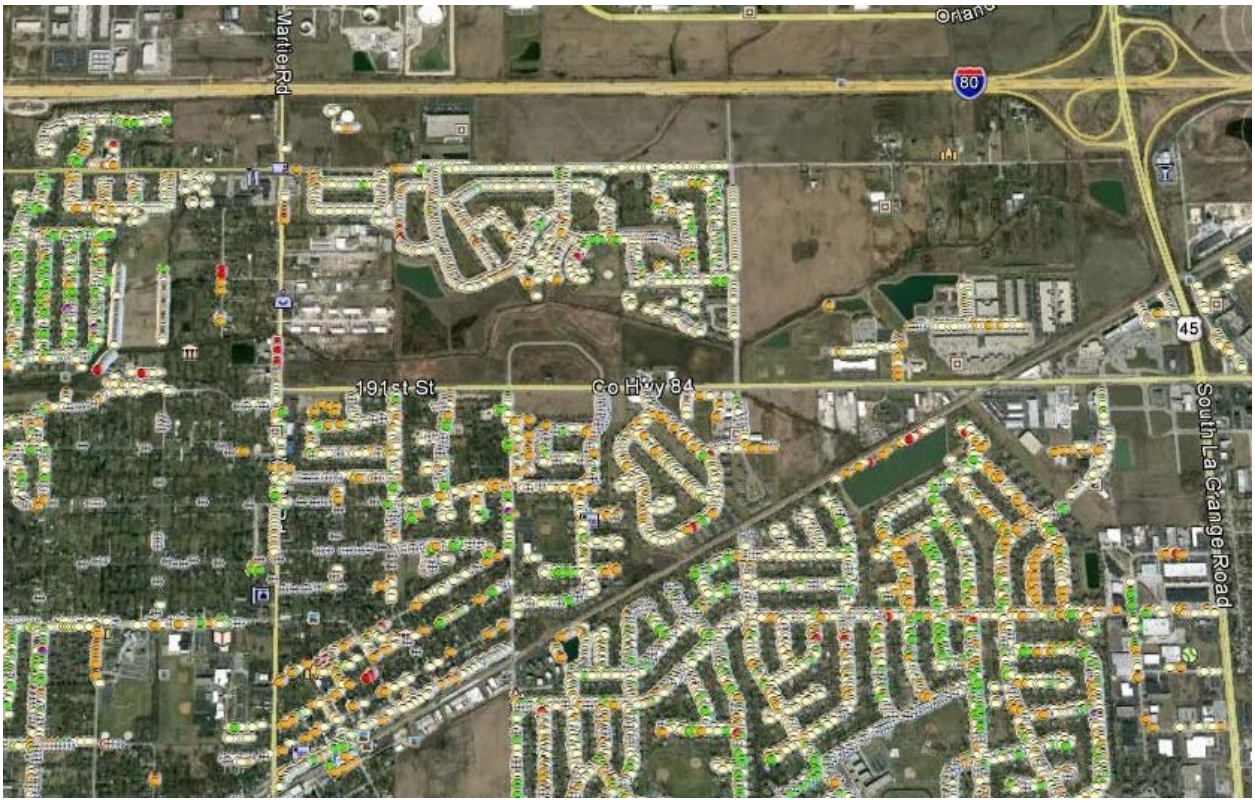
EAB Management Plan Update
November 2013
Village of Mokena, Illinois



Prepared by

Phil Graf, Urban Forestry Consultant, ISA Certified Arborist Municipal Specialist #IL1553-AM
Stephen D. Lane, Ecologist / GIS Coordinator, ISA Certified Arborist #IL 4565- A

Natural Resources Management And GIS

Graf

Mission Statement/Purpose

It is the mission of this document to update the EAB Management Plan from April of 2013, and to analyze and explain clearly the status of the EAB Program in the Village of Mokena. We will accomplish this through a thorough analysis of the Ash data we have reviewed. The goal of this analysis will be to create a comprehensive strategy which will continue to, over the long term, both preserve and enhance the urban forest in a manner that benefits the community the greatest. Specifically, the goals of tree diversity, tree population resilience, and overall aesthetics will be the focus of the analysis presented in this report.

We will present statistical analyses of the change in the Ash tree population over the past 6 months, as well as review the efficacy of the strategy to date. Since managing the EAB problem adaptively is the best strategy, we will also make several new management recommendations based on our field observations and communications with Village staff.

In November of 2012, the Village contracted with Graf Tree Care/Graf Natural Resources Management to map and assess all trees on Village parkways and on Village-owned parcels. This data collection was performed in order to create a comprehensive EAB Management Plan which documented what the optimal allocation of resources would be to combat EAB in terms of both the financial and environmental impacts.

Since that time, the Village has removed a significant proportion of its Ash trees, started a treatment program for those trees which could be conserved, created a reforestation plan, and planted approximately 700 trees. Due to the rapid development and execution of this program, the timetable for Ash tree re-inventory and assessment was accelerated. Originally planned for completion in March, 2014, the reassessment was done in late September/early October of 2013 so that all remaining Ash trees could be assessed during the leaf-on season.

The purpose of this report is to inform the Village of Mokena Board, staff, and residents as to the current status of the EAB Program in Mokena, as well as to advise them going forward as to the next group of policies and actions they should enact to adaptively manage this program and ensure continued success.

Introduction Summary/Abstract

The current number of Ash trees still standing on Village of Mokena parkways and Village-owned properties is 2,945. This is down from the initial 3,691 that were inventoried during the initial winter 2012/2013 project. The change in percent of total Urban Forest Composition went from 26.6% in 2012/2013 down to 22.4% as of this writing. This change in percentage represents a fairly steep drop-off in the Village's Ash tree population over a relatively short period of time.

The Village has realized major successes in the first 6 months of its EAB program, and its commitment to excellence is evident in every facet of the program. There are also some areas where we have learned things over the past several months that have created opportunities for improvements to the program, and some of the finer details of how it operates. We will analyze all of this within the context of this report.

Re-inventory Collection Parameters

All Fields (Standard Data Fields)

The data fields which were updated during this inventory, which were present during the original inventory, have not changed. Please reference the April, 2013 EAB Management Plan or the April, 2013 Tree Inventory Management Report for a full review of these standard data fields and values. All relevant fields were updated per the contract during the Ash tree re-inventory where appropriate. For the sake of brevity, the descriptions of the fields and values have been omitted here, and we have instead detailed the fields which were added to the data in order to reassess the Ash tree population.

Status 2013

Prior to the fieldwork component of the Ash tree re-inventory, all Ash trees were assigned a status to reflect what state they should have been in when we happened upon them in the field. These statuses are detailed below, and were based on whether we should expect the tree to have been removed, still standing, or to be on the Village Treatment Set when we began the actual assessment. These statuses were assigned based on our most up-to-date GIS files of treatments, removals, and standing trees. An additional field was added to denote if the tree had been treated by the homeowner, since we did not have any data on this prior to beginning field work. If we noticed that the status was not accurate during the inventory, we changed it to reflect the ground truth out in the field.

Standing	Ash tree was not on a removal list from the previous year, and was expected to be found still standing on the parkway. Did not include Ash trees in the Village Ash tree treatment program.
Removed 2013	Ash tree had been on the removal list for this calendar year. Many Ash trees were observed during the re-inventory which had been marked for removal but not removed yet. We anticipated they would be removed by year's end. These have been appropriately marked in the data.
Treated-Mokena	Ash tree was in the treatment set established by the Village of Mokena.
Treated-Resident	Ash tree had been found during the reinventory to be showing conclusive signs of treatment (plugs in base of trunk). There were many trees which appeared could have been treated with an over-the-counter soil drench, but we did not include these due to the lack of conclusive evidence of treatment.

Action 2014

These are the recommended actions for the 2014 calendar year based on field observations. The "remove from treatment" and "add to treatment" statuses are recommendations only, and should be reviewed.

Reassess	Ash tree was in fair to good condition and may be reasonably expected to survive at least the next year on the parkway. Also utilized for Ash trees treated by residents.
Replant	This was the listed action for all Ash trees which were confirmed removed in 2013.
Removal 1	Ash tree was dead or nearly so, and we recommend removal within 3-6 months.
Removal 2	Ash tree was in poor condition, and we recommend removal within 6-15 months.
Continue Treatment	Ash trees on Village Treatment Program ONLY which should continue further treatment.
Remove From Treatment	Ash trees which were treated, but which were in such poor condition that we do not recommend treatment. This list should be reviewed prior to final acceptance.
Add to Treatment	Ash trees which were found to be candidates for addition to the treatment set, or substitutions for any failed treatment trees. Purely a recommendation.

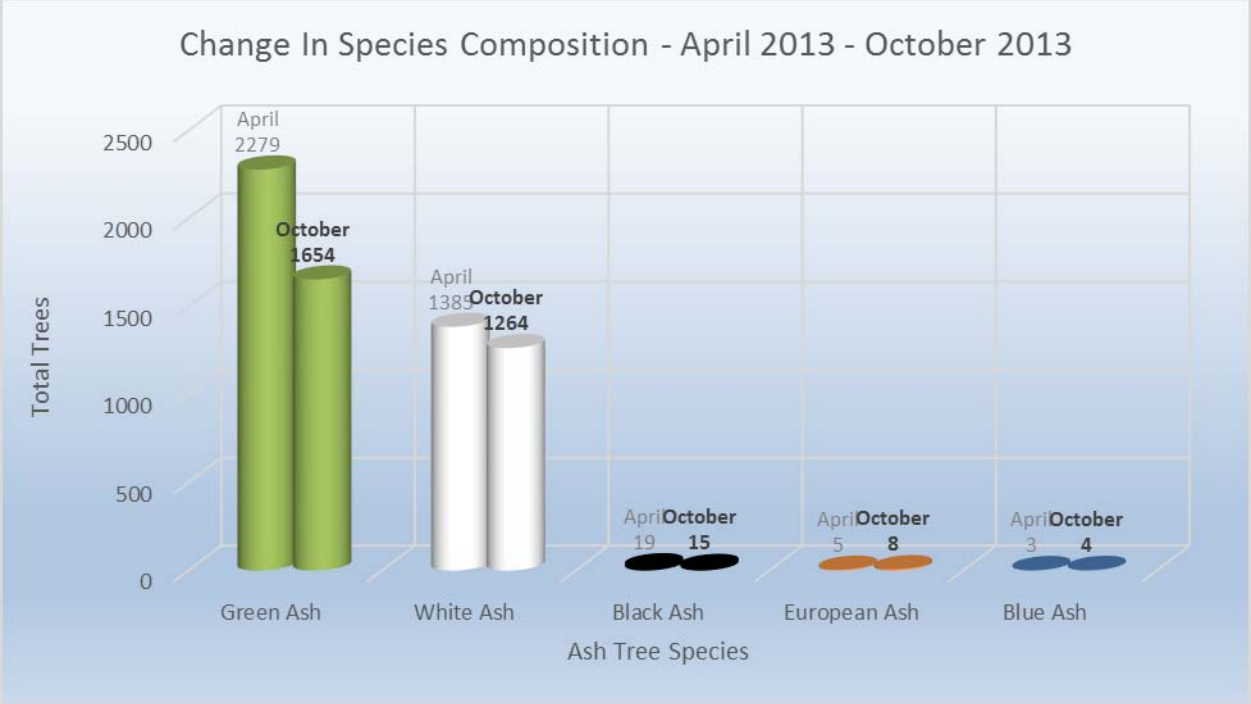
Ash Tree Population Data

Statistics Overview

	April 2013	October 2013
Total Ash trees - Standing	3,691	2,945
Total number of Ash species	5	5
Total diameter inches	31,680”	24,491”
Average Ash tree diameter	8.58”	8.32”
Average Ash tree condition (unweighted - all Ash trees)	3.25 (worse than average)	3.30 (worse than average)
Average Ash tree condition (weighted - 8” and greater)	3.15 (worse than average)	3.29 (worse than average)
Parkway Ash trees	3,536	2,846
Other public property Ash trees	155	99

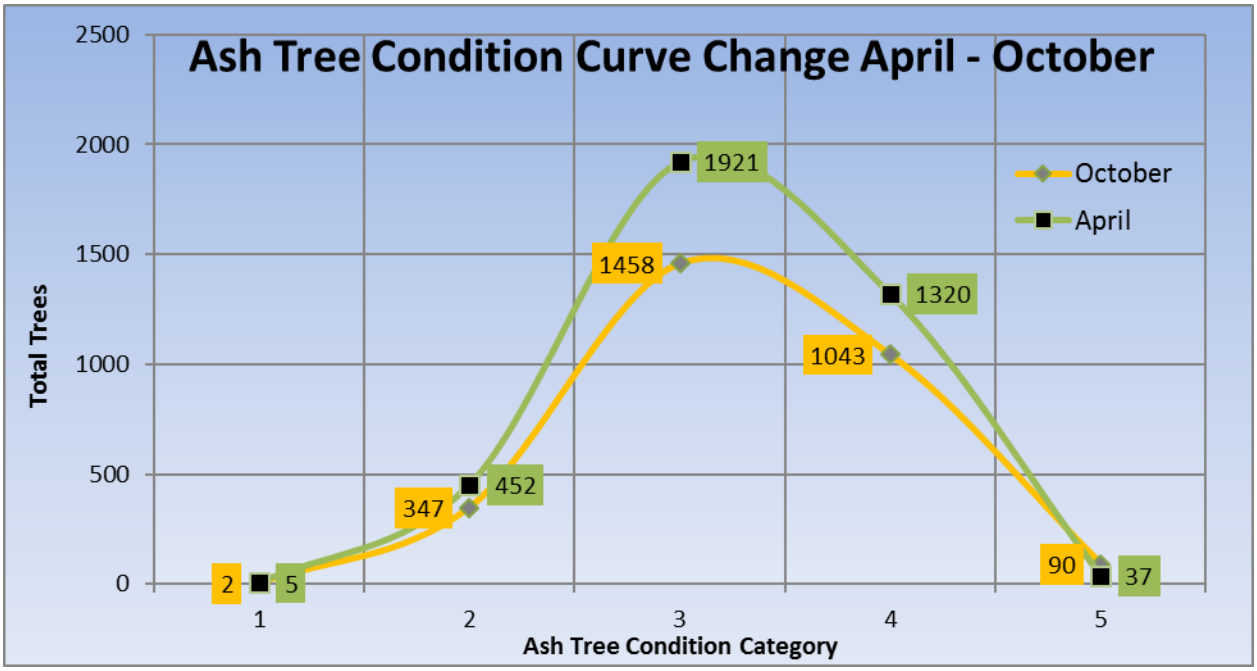
Ash Tree Data and Analysis

Species Breakdown



As can be seen from the chart, there were declines in the 2 major Ash tree species due to tree removal over the past 6 months. As would be predicted, Green Ash suffered the greatest losses due to its greater prevalence in the population and higher susceptibility to EAB infestation. White Ash suffered far less losses, but that was due in part to a large portion of the treatment set being White Ash. Black Ash dropped only a few, whereas European and Blue Ash gained several. This was due to tree identification errors from the initial inventory which were corrected during the re-inventory.

Ash Tree Condition Analysis

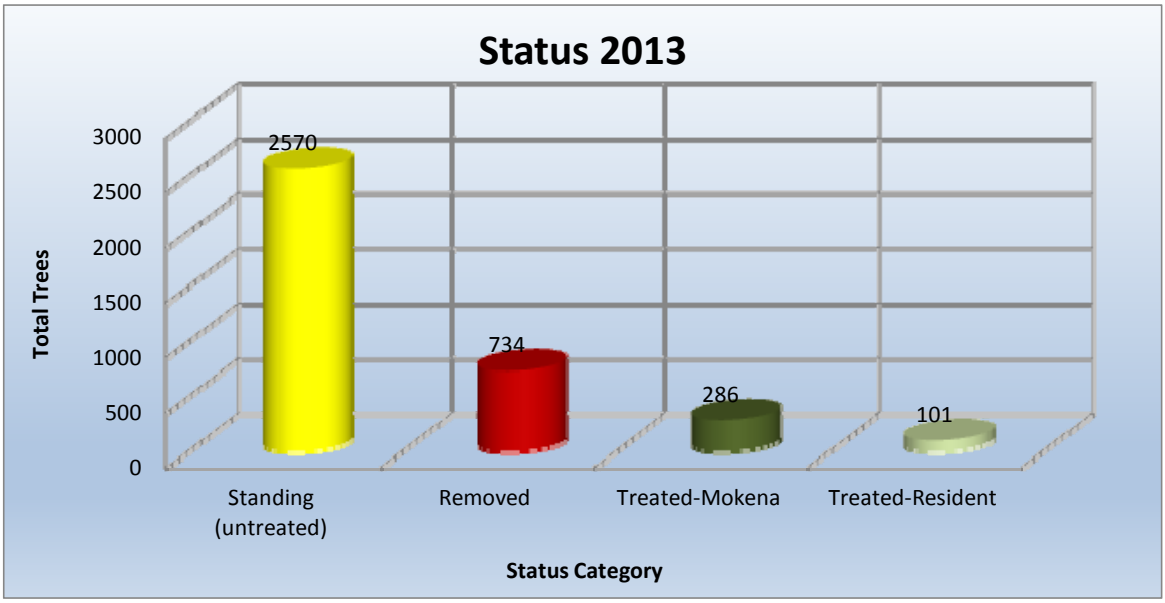


Our inventory operates around a standard distribution, and departures from that distribution tell us about the tree population. This is a time-tested way to look at variance in a population. We have overlaid the curve from the initial inventory with the curve from the recently completed reinventory so that comparisons could be made.

The pattern here is interesting, as the gross numbers of trees in the 2 samples are significantly different, but overall the curve appears much the same. This is indicative of a treatment and removal program that is at least keeping pace with the rate of EAB infestation and Ash tree death. Were the treatments and removals lagging behind the rate of infestation, you would expect to see a curve for October which had its crest skewed further towards the 3.5-4 range, and had a curvature which bisected the April curve somewhere between 4 and 5. Likewise, if removal and treatment (especially treatment) were outpacing the rate of EAB infestation, the crest would occur more towards the 2-2.5 range. Eventually, with the remaining (treated) Ash trees, that is what we would ideally like to see, are 260 or so Ash trees, all with at least condition 2 or 3 ratings.

It might seem insignificant, but this chart is indicative of a very successful program, particularly in a municipality which started at nearly 27% Ash trees, many of which were in monocultures. There is a relatively high number of condition 5 Ash trees evident here, but these are trees that will be among the first to be removed as a part of the 2014 EAB Program.

Status 2013

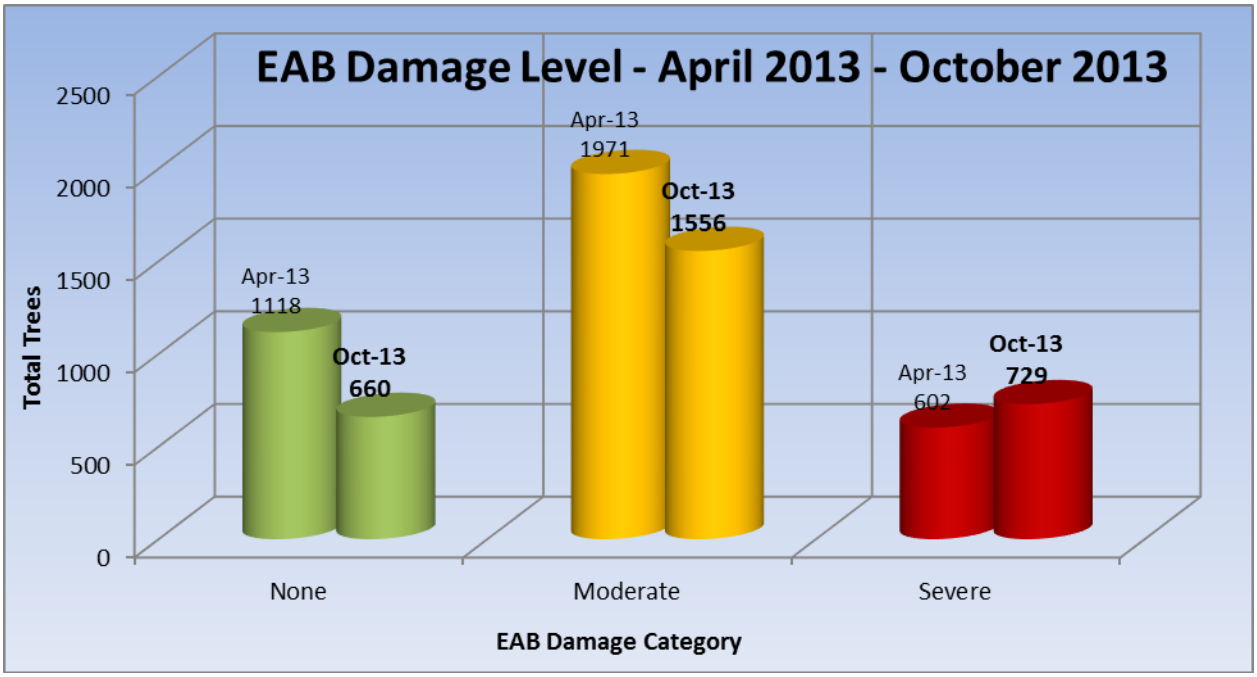


Bear in mind that these status categories were what we found the status to be at present, and do not represent a recommended action. The status categories we observed during the field portion of the reinventory process were right in line with what we expected, for the most part. There was subtle variation introduced from not knowing how many resident-treated trees we would find, some Ash trees which had been removed and replaced already, a small handful of misidentified trees during the initial inventory, several Ash trees which were removed from incorrect locations, or incorrectly marked, but these accounted for less than 2% of the total. The takeaway message here is that over a 6 month period, the various departments, firms, and individuals working together were able to maintain 98% accuracy during a time of very heavy turnover in the population. This would be excellent performance, no matter whether it were Ash trees or a logistics supply chain, and for the first months of starting a new program, it is highly commendable.

There are still 2,570 Ash trees to be removed over the course of the next several years, depending on how aggressively the removals will be pursued. These Ash trees will either be removed, or in rare cases, homeowners or the Village may decide to treat some that aren't already being treated by one or the other. As you will see on the next page, there will be another approximately 885 Ash trees to be removed that have been identified as part of this reinventory process as well as additional data management.

One unexpected bright spot in all of this was the number of homeowners treating trees independently. While evaluating Ash trees during the re-inventory, we looked for evidence of treatment. Likewise, Village staff was keeping records of residents who reached out to the Village to let them know they were treating. Village staff had approximately 60 records, and our field investigation added approximately another 40 to that number. So in the Village of Mokena as a whole, between the Village Treatment Program and independent resident treatments, it is estimated that a stunning 387 parkway Ash trees are currently being treated. This represents approximately 12.5% of the total Ash population.

EAB Damage Level



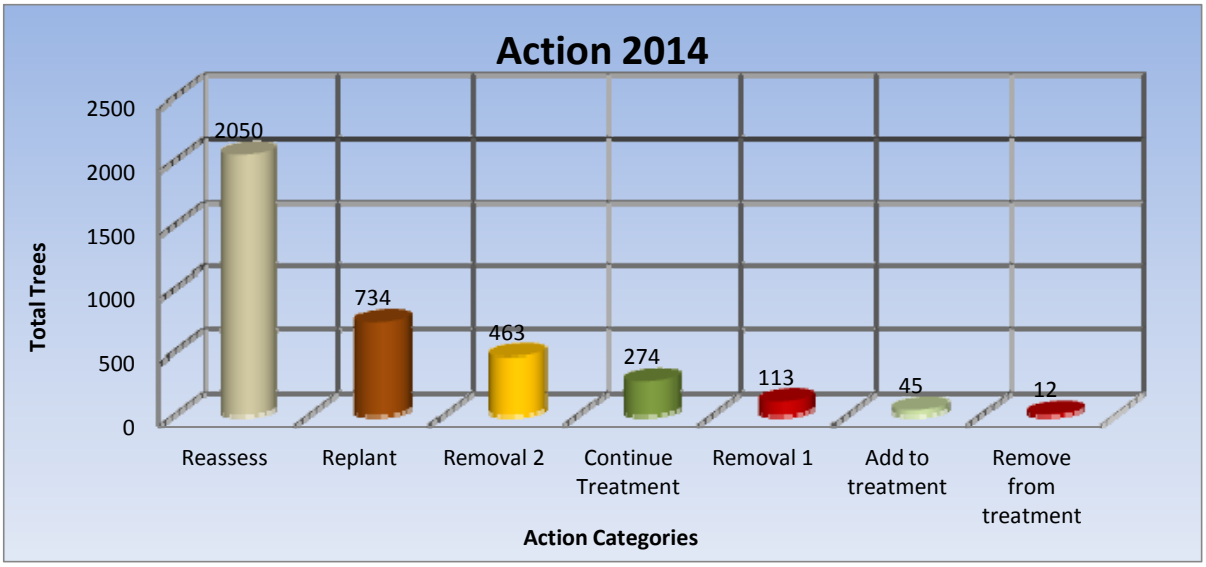
This chart shows us the difference in the number of Ash trees in each category during the past 6 months. Remember, the Ash trees which were removed in the last 6 months are not reflected in this list. The good news here is that the change shows uniformity, much like the change in the condition curves shown previously. There was no rapid pulse of Ash trees into the severe or moderate categories, and no steep drop-off in the "none" category.

In fact, given where Mokena is at in its stage of infestation, even having 660 Ash trees in the "None" category is phenomenal. Of course, as we mentioned above, 387 Ash trees are known to be undergoing treatment by the Village and its residents, but that still leaves another 260 trees that have yet to show signs of EAB infestation.

The "Moderate" category appears as it should, in a sort of stasis. With the number of Ash trees removed during the last cycle, this category essentially remained unchanged, which once again stands as a testament to the work that has been done in the past 6 months.

There was a somewhat dramatic increase in the number of Ash trees falling into the "Severe" category, but with such a large pool of "Moderate" damage trees to draw from, this was inevitable. With all of the attention for this past 6 months having been focused on removal of the severely infested Ash trees from the initial inventory, and the treatment of the best Ash trees, as well as the reforestation efforts, the Ash trees in the middle ground were left to their own defenses. Given the number of larvae that were already in these Ash trees when they were initially surveyed, it is no surprise to see this number of Ash trees where it is. And without all of the effort over the past 6 months, this would have looked much worse.

Action 2014



This chart categorically breaks down the TOTAL Ash tree population, including the sites which have had Ash trees removed, and are ready for replacement. The first category, "reassess", are all of the Ash trees which we believed would likely be able to persist for at least one more year out on the parkways or on Village-owned properties without serious vigor or aesthetic issues. It is important to note that the best trained eye cannot see every inch of a tree's vascular system, and to that end, there may be some Ash trees in this category that may not leaf out next year; however, we did our best to try and avoid this. These Ash trees should be reassessed at approximately the same time next year (September/October).

The "replant" category encompasses all of those sites where Ash trees were removed OR were scheduled to be removed this year. At the time the re-inventory was performed, Village crews and contractor crews were still in the process of removing Ash trees and grinding stumps. Therefore, many Ash trees which had an initial Status 2013 of "Removed 2013" were changed to "Standing", for the benefit of the Village, but there was a note put in the comments field noting that these trees were marked for removal.

The "Removal 2" Ash trees were those in such poor condition that we recommend removal within a 6-15 month period. 15 months was chosen as a timeframe because it represents enough time to get these Ash trees removed by the start of calendar year 2015.

The "Continue Treatment" Ash trees were those which were on the treatment set for this year, and which were still in good condition. These Ash trees should continue to be treated. As seen below, even though it's a short time frame, there is a 96% success rate thus far.

The "Removal 1" Ash trees were those which were so badly infested that we recommend "immediate" removal, which we will define as between 3-6 months after completion of this report.

The "Add to Treatment" and "Remove from Treatment" Ash trees were those we saw out in the field which we believed could be added to, or should be dropped from the treatment set. The Village will have final say, but it is good to know there are backup Ash trees available for treatment.

Updated EAB Management Strategy - 2014

Tree Removal

As can be seen from the above chart, if the Removal 1 and Removal 2 Ash trees are combined together, this yields a total of 576 Ash trees which should be removed within the next 3-15 months. Based on initial calculations and communications with Village staff, we estimated that approximately 680 trees per year should be removed. However, as budget figures were re-examined, this number has been accelerated to a 3-year, 860 (+/-) Ash tree per year removal figure. We therefore went back into the data to seek out additional trees to meet this aggressive quota, and were able to analyze the data in order to identify an additional 181 immediate removals, and an additional 128 secondary removals, for a total of 885 trees to be removed in 2014.

In discussions with the Village recently, we have suggested that a biannual removal and reforestation effort be implemented, in which a Spring Planting and a Fall Planting are done within a calendar year. This would allow for planting of species at their optimal times, as well as allow for a phased removal approach that would enable such an aggressive schedule to be met. For 2014, we strongly recommend that the 113 Removal 1 trees be removed immediately (no later than March 31). In addition, we have identified another 181 trees which should be removed during this critical phase. These were Ash trees which during the initial survey were marked for removal for reasons other than EAB. Village crews will continue to remove Ash trees that are 12" DBH and less, while the Ash trees 13" DBH and over will be removed by a contractor.

The second phase of the removals is to begin immediately after the first phase "Removal 1" is complete. We initially identified 463 trees during the reinventory process that our field crews believed needed to be removed before this time (November) in 2014. In order to meet the new, more aggressive goals, we sought out additional trees in the inventory which had Severe EAB damage that could be removed over the course of the next year, and found an additional 128 trees which met this description. These combine together for a total of 885 trees to be removed this upcoming year.

Reforestation

Currently, the Village is in the process of replacing Ash trees which were removed last year. As of this writing, the Reforestation Program has been successful, but has several areas where there is room for improvement. Initially, a regular annual fall planting, to take place beginning in late September or early October was envisioned. But as the program began to take shape, we rapidly realized that phasing the removals and replacements into 2 annual plantings may very well represent the best opportunity for continued success in the Reforestation Program. Some tree species are better planted in the spring, such as Oaks. That is not to say you cannot plant them in the fall, but their availability is lower in fall due to the fact that nurseries do not dig these trees after springtime. In addition, Ash tree death due to EAB and related environmental stresses can be sudden and somewhat unpredictable. An Ash tree which appeared fine in June may very well be dead by August. Having a 6 month cycle instead of an annual cycle would not only represent Best Management Practice, but would also be more attractive to residents who may have Ash trees die suddenly during the year.

Another issue was that the reforestation effort began with the intent to create a 1 to 1 replacement program for tree removals and replacements. The reason for the reduced number of replacements vs. removals was due to the fact that shortly after the reforestation effort began, we found that the structure of this program as adopted initially was a bit too rigid to accommodate certain field conditions. Among these observed field conditions were the following:

1. Too many trees planted in too small of a growspace on the parkway (i.e., 3 trees originally planted on the parkway where only 2 should have been planted)
2. Trees/planting sites which had such a limited amount of above-ground growing space so as to make planting a new tree impractical
3. Trees planted on parkways that were only 1-3' wide, again making replanting impractical
4. Trees planted by developers or residents in locations inconsistent with Mokena code (i.e., too close to traffic signs, driveways, sidewalks, etc.)
5. Trees planted in sites where utilities were too densely clustered to make reforestation a viable option (for example, between a utility box, gas line, and a lamp post)
6. Trees which represent an extremely low priority (i.e., trees located in detention basins or unmanaged wooded areas)

Upon Village staff reviewing the sites we initially identified as "not suitable planting spaces" due to the reasons cited above, a number of sites in conflict with one or more of the above protocols remained on the planting list for this year. The rationale behind this was that initial precedent had been set that the Village would replace Ash trees on a 1 to 1 basis, and they attempted valiantly to honor this commitment. In light of the field conditions noted above, we recommend that the "1 to 1 replacement" language be repealed from this program for its duration. Circumstances have changed in light of new field evidence, and we find it would be the best decision to strike this language from the EAB Reforestation effort, so that residents have a clear understanding of what the program entails. Planting trees in spots that violate the above protocols do not represent Urban Forestry Best Management Practices, and could even create situations which are suboptimal at best, and potentially hazardous at worst. A clear alternative for this program would be to make use of the nearly 1,500 open planting sites which were identified during the initial tree inventory which have never been planted. 1 to 1 replacement could still be made, with the stipulation that the replant site would generally, but not always, be at the same address the tree was removed from.

Recommended Planting List

Common Name	Botanical Name	Species Rating
Shade Trees:		
Ginkgo (male)	*Ginkgo biloba*	90
Ohio Buckeye	*Aesculus glabra*	70
Tulip Poplar	*Liriodendron tulipifera*	70
Hackberry	*Celtis occidentalis*	80
American Beech	*Fagus grandifolia*	80
Ironwood	*Ostrya virginiana*	80
Swamp White Oak	*Quercus bicolor*	80
Chinqapin Oak	*Quercus muehlenbergii*	80
Shingle Oak	*Quercus imbricaria*	80
English Oak	*Quercus robur*	80
Baldcypress	*Taxodium distichum*	80
American Hornbeam	*Carpinus caroliniana*	70
Bitternut Hickory	*Carya Cordiformis*	70
Pecan Tree	*Carya Illinoensis*	60
Kentucky Coffee Tree	*Gymnocladus dioicus*	80
Hybrid Elms	*Ulmus spp*	80
Sweetgum	*Liquidambar styraciflua*	60

Dawn Redwood	*Metasequoia glyptostroboides*	50
London Planetree	*Platanus x acerifolia*	60
American Larch	*Larix laricinia*	60
Cucumber Magnolia	*Magnolia acuminate*	70
Speckled Alder	*Alnus rugosa*	70

Low growing ornamentals for under utility wires:

Common Name	Botanical Name	Species Rating
Serviceberry	*Amalanchier arborea*	70
Ivory Silk Tree Lilac	*Syringia reticulate*	70
Red Buckeye	*Aesculus x carnea*	60
Star Magnolia	*Magnolia stellate*	70
Thornless Cockspur Hawthorn	*Crataegus crusgalli*	80

With few exceptions, this is a collection of Illinois native trees that have the best chance to thrive and stand up to the environmental stresses of our climate and soil conditions. Parkways can be a challenging environment for a tree, as they are exposed to salt, have limited soils in which to grow (which are typically of low quality), and can suffer readily from root compaction and unpredictable soil moisture regimes. These trees we have recommended all have a proven track record of good performance on parkways. When possible, soil types should match the requirements of the tree being planted at a site. Aside from this, always plant trees in areas which match their correct moisture and light tolerances, and of course, always perform an establishment pruning within the first three years to establish the major and minor branches, and to correct any emerging form defects.

Also taken into consideration is rate of growth. Due to the large number of trees being removed, an expedient canopy recovery will be beneficial. Hybrid Elms and Ivory Silk Lilacs are trees that are extremely fast growing.

Also note the absence of all Maple trees and Honey Locust trees from our recommended species list. This is because these trees currently make up a high percentage of the existing tree population. In the event of the introduction of a new pest or pathogen that affected these groups, trees in these genera or species groups could create another ecological catastrophe for Mokena, which is why they have been omitted. Below is the species breakdown of the parkway trees in the Village:

SPECIES	Total	Avg DBH	Avg Cond	SPECIES	Total	Avg DBH	Avg Cond	SPECIES	Total	Avg DBH	Avg Cond
RED MAPLE	2462	4.67	3.20	CRAB APPLE	327	4.71	3.08	WHITE OAK	61	6.48	3.00
GREEN ASH	1583	9.13	3.53	HACKBERRY	156	3.38	3.33	SERVICEBERRY	60	3.90	3.00
WHITE ASH	1230	7.15	2.99	SUGAR MAPLE	146	6.38	3.18	SWAMP WHITE OAK	57	4.28	2.91
HONEYLOCUST	1191	7.49	2.90	HYBRID ELM	132	3.86	3.05	BURR OAK	49	6.45	3.02
CALLERY PEAR	1112	6.01	2.98	RED OAK	95	5.03	2.92	SIBERIAN ELM	48	22.15	3.48
SILVER MAPLE	807	7.24	3.10	PIN OAK	73	9.95	2.41	TULIPTREE	41	4.59	3.00
NORWAY MAPLE	742	5.03	3.29	HAWTHORN	71	4.73	3.06	GINKGO	39	2.77	3.00
LINDEN	702	5.23	3.10	SPRUCE SPP	70	6.71	2.99	CATALPA	38	6.53	3.08

Maple trees and Honey Locust trees are great urban trees and were found to be good performers in the Mokena parkways; however, we feel they should not be planted again for the next 5-10 years. By using other species for Ash replacements (which we have recommended above), Mokena will have a much better diversity of trees. Over the next ten years, the existing Maples and Honey Locust populations will slowly be brought back in check with our guidelines.

Treatment

Mokena began its treatment program this year by selecting 286 trees for treatment and preservation. These Ash trees were in the best condition of all trees in the population at large, and were treated in June. During the reinventory process, these trees were all examined to evaluate the efficacy of the treatments thus far. We realize that this assessment was performed only 7 months after the initial inventory was complete, and only 4 months after the treatments had been administered, but out of those 286, only 12 were recommended to cease treatment. This is just a bookkeeping designation, and we will wait until the Ash Reinventory of 2014 to truly evaluate the success of the first year of the treatment program.

We also discovered 45 Ash trees during the reinventory process that our field crews deemed in good enough condition that they may be considered for addition to the treatment set. Once again, this is merely a suggestion, but it is good to know that if by next year there are several failed treatments, then we have a number of trees which may be able to be substituted for the failed treatment trees. Furthermore, we were pleasantly surprised to find that an estimated 101 additional trees are being treated by homeowners outside of the Village treatment program. This means that a total of approximately 387 trees are currently undergoing some form of treatment, and hopefully this will help to retain the legacy of Ash trees in Mokena for years to come.

By and large, the treatment program has been the most trouble-free component of Mokena's EAB management strategy to date. It is very manageable in scope, and relatively easy to track changes in. The one area where there may be room for improvement is to communicate more effectively with residents who may be treating their own Ash trees. When we compiled the list of resident-treated Ash trees, the list from our field inventory had about 50 entries, and Village staff had received an additional 50 or so. Knowing exactly what trees are being treated by residents will potentially prevent their inadvertent removal in the future.

Timeline

As successful as Mokena's EAB management strategy has been over the past 8 months, there are several items we have identified above which we believe should be altered for future iterations in order to streamline the program. One area not directly discussed above is timing. Through each phase of removal, treatment, and reforestation, there were activities which were completed slightly behind schedule due to a lack of logistical goals. In order to alleviate these deviations moving forward, we have provided a proposed timeline (see below).

With such an aggressive schedule (3 years) for removal and reforestation of Mokena, any tasks which are not completed by the target completion dates outlined below will negatively impact the effort, and may have downstream consequences. In the chart below, the beginning of each timeline for each task assumes the 1st day of the month in question, and the end of each timeline assumes the last day of that month. We recommend that these tasks be completed according to this timeline, or the stated goals of removing 860 (+/-) trees per year and replacing a similar quantity may be in jeopardy. It is understood, however, that seasonal weather conditions out of the Village's control will undoubtedly impact progress from time to time, and adjustments will necessarily have to be made.

TIMELINE Nov2013 -Dec2014	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Priority Removals/Stump Grinding												
Reforestation Planning/Inspections	Spring			Spring	Spring		Fall	Fall			Fall	Fall
Planting												
Secondary Removals/Stump Grinding												
Ash Tree Reinventory												
Treat Ash Trees												
Update EAB Mgmt Plan / Prep for 2015												

TIMELINE Jan2015-Dec2015	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15
Priority Removals/Stump Grinding												
Reforestation Planning	Spring			Spring	Spring		Fall	Fall			Fall	Fall
Planting												
Secondary Removals/Stump Grinding												
Ash Tree Reinventory												
Treat Ash Trees												
Update EAB Mgmt Plan / Prep for 2016												

TIMELINE Jan2016-Dec2016	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
Priority Removals/Stump Grinding												
Reforestation Planning	Spring			Spring	Spring		Fall	Fall			Fall	Fall
Planting												
Secondary Removals/Stump Grinding												
Ash Tree Reinventory												
Treat Ash Trees												
Update EAB Mgmt Plan / Prep for 2016												

Cost Projections

Below is an updated chart similar to the chart originally presented in the 2013 EAB Management Plan showing cost projections for the four major components of the EAB Program. Data in the chart has been updated based on actual costs incurred during the first year of the EAB Program and incorporates recommendations made previously in this Update including the following: 1) accelerating the program from 5 years to 4 years, 2) increasing the volume of contractual Ash tree removal and stump grinding to ensure the program stays on schedule, and 3) implementing Spring and Fall plantings each year.

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	**TOTAL**
Removal	237,860	200,400	113,200	56,600	NA	NA	**608,060**
Treatment	22,310	11,700	12,300	12,700	13,300	13,800	**86,110**
Reforestation	243,930	241,200	250,250	129,650	NA	NA	**865,030**
Professional services	40,480	34,500	34,500	14,220	5,200	5,200	**134,100**
	544,580	**487,800**	**410,250**	**213,170**	**18,500**	**19,000**	**1,693,300**

Conclusion

As can be seen from the charts, statistics, and narratives above, Mokena has taken a very proactive, aggressive, and largely successful approach to implementing its EAB management strategy. The 3 primary portions of the strategy—removal, replacement, and treatment—have had their own individual successes throughout this first 8 months, and by and large the goals that we set out to accomplish have been accomplished.

There have been several areas where we have identified room for improvement, however. With a project as large, far-reaching, and aggressive as this, we have to be open to adaptive management, and learn from experience so that future iterations of this program operate even more effectively. As mentioned above, there are several areas where even small changes will make for a much more efficient program not only in future years of the EAB Management Program, but also in terms of Mokena's Forestry Program as a whole. The highlights of the adjustments that we recommend for the future of the program are as follows:

1. The establishment of both a Fall and Spring planting. This will allow for optimal plantings of each species involved.
2. Flexibility to plant trees according to Best Management Practices which will not sacrifice long-term stability for short-term compliance.
3. Continued communication with residents concerning which trees are being treated independently of the Village's treatment program
4. Adherence to the timelines listed above, so that improper timing in one portion of the project does not negatively influence other portions.

By continuing to build on its successes and making adaptive adjustments in order to accommodate new knowledge, we believe that Mokena should have no problem accomplishing what is sure to be one of the most aggressive and successful EAB management strategies known to date. The end result of this effort will be the removal and replacement of nearly 3,300 Ash trees over a 4-year period, as well as the treatment and preservation of nearly 400 Ash trees and the establishment of a diverse and resilient Urban Forest.