

# ***City of Two Rivers Urban Forestry Plan & Tree Inventory Analysis***



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Prepared by:

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# EXECUTIVE SUMMARY

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The urban forest of Two Rivers provides a multitude of aesthetic, economical, and environmental benefits to citizens, businesses, and visitors alike. Beyond shade and beauty, trees also have practical benefits; provide public services and monetary value. Unlike other public infrastructure components, properly planted and maintained trees increase in value over time.

To help ascertain the state of Two Rivers' urban forest, Bluestem Forestry Consulting Inc. completed a public tree inventory along street rights-of-way, as well as at thirteen parks, two cemeteries and the public library during the summer and fall of 2024. This document reports the findings of the tree inventory and makes specific, prioritized recommendations for managing the urban forest resource beginning in 2024 and establishes a routine schedule of maintenance activities beginning in 2026 based upon inventory findings, current staffing, budgets, EAB concerns and tree circumstances. The specific trees and actions to complete per year corresponding to Attachment 1 have been provided to the City in a separate tree inventory database.

Important points of the inventory and current tree management program include:

- *A total of 3,437 trees and 22 stumps were inventoried. 492 trees are located in cemeteries, 62 at Lester Library and 656 trees are growing in parks. 2,227 trees are growing on street rights-of-way.*
- *Two Rivers has experienced ash death and decline due to EAB. They have been working to remove these trees from the public tree population. There are currently 282 ash remaining in the population (8.2% of the total population). Of these, most are recommended for removal, but approximately 30 are being treated to prevent EAB along Mariners Trail. These are specimen trees and should continue to be preserved.*
- *There are 432 trees recommended for removal. As described above, 75 of these are dead or dying ash. The remaining 357 present a safety concern. This is 12.5% of total maintenance needs. A typical first-time inventory averages removals between 3-10%. This number is high due to the ash component, old-age and , heavy utility clearance pruning.*
- *One hundred and twelve trees need pruned for safety reasons or for cleaning/dead branches (3.3% of total inventoried population). A typical inventory averages 3-7% safety prune.*
- *Ideally, the forest should be comprised of not more than 5% of any one species and 10% of any one genus. Two genera are over-represented in Two Rivers' public tree population. These are (in order of population size): maple (56.3% of total population) and ash (8.2%). Similarly to emerald ash borer, limited species distribution could result in a population crash if an insect or disease were to attack any one particular species.*
- *Roughly 51% of all street trees have some sort of overhead utility line above them. The City of Two Rivers Utility Department removes and prunes these trees to within a safe distance from the lines at which point other City Departments will manage the trees.*
- *Staff time dedicated to tree maintenance needs to increase significantly. Due to the large number of removals, 208 staff days are needed in 2024 to properly complete all tasks that are recommended. The average staff time over five years is 115 days.*
- *Based on tasks that need to be contracted, the average annual cost of contracted work/product is increase greatly. It will spike in 2026 to approximately \$71,412 in contracted costs. The average contracted cost over five years is \$54,239 annually.*

# STATEMENT OF PURPOSE AND SCOPE

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The purpose of having an urban forest management plan is to ensure that the citizens and visitors of Two Rivers will enjoy the benefits of trees through proper arboricultural techniques and management practices.

The development of a long-range urban forestry maintenance and management plan based on current research and inventory results will provide the foundation for an ongoing program that will result in a healthier and safer community. A management program can be used to monitor trees for safety risks on a continual basis, will help reduce storm damage, allow work to be executed more efficiently, grow the urban forest and establish and prioritize annual budgets.

This plan focuses on existing conditions that require immediate attention, while developing a routine forestry program that will help protect and preserve the City-managed trees in a cost-effective and efficient manner. City Administration and the Director of Parks and Recreation in addition to assistance from other departments will be responsible for implementing this program, inventory updating and assuring that program provisions are carried out. They are also charged with a plan revision at the end of this five-year plan duration.

## TREE INVENTORY

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The first and most important step in managing a community's urban forest resource is to conduct a tree inventory. A tree inventory is the process of counting, characterizing, and recording information about the public trees that make up the publicly owned urban forest. It is a useful tool that documents important information related to the trees.

Documentation is useful for identifying trees a community is responsible for maintaining. This information can then be used to identify areas of susceptibility (i.e. high boxelder component), low diversity (species and/or age), and future planting opportunities. The information can also be used to document a risk assessment program where trees prone to failure are identified and can be preemptively managed. Additionally, in the case of an accident, being able to produce a risk assessment and work history log indicates the community's active role in maintaining safe trees. The goal of an inventory is to provide information essential for developing a community urban forest management plan that provides direction for urban forestry initiatives.

Bluestem Forestry Consulting Inc. completed a public tree inventory along street rights-of-way, as well as both cemeteries, Lester Library and thirteen city parks during 2023. Wooded, high density park areas and unmaintained street right-of-way areas were not inventoried. Groupings of pine trees received simple inspection and only trees with maintenance needs were individually inventoried in pine stands.

The following data was collected: GPS coordinates, address, street/park name, side street, species, condition, diameter, prioritized maintenance needs, growing space, overhead electric utility, defects, condition percentage, date and miscellaneous comments. A unique ID # was assigned to each tree. A definition of inventory terminology including condition ratings and maintenance recommendations can be found in the following sections. Data was delivered to Two Rivers as an MS Excel database as well as an ArcView shapefile.

## Species Composition and Diversity

Sixty-two different species were identified within the Two Rivers urban forest. This is an excellent number of species. Ideally, the forest should be comprised of not more than 5% of any one species and 10% of any one genus/genera. For illustration, maple is considered a genus and includes each different species of maple. Each type of maple such as sugar maple is considered a species. Limited species distribution could result in a population crash if an insect or disease were to attack any one particular species. Two genus' and four specific species were over these recommended limits.

Similar to Dutch elm disease which destroyed American elms in the 1970-1980's, the emerald ash borer (EAB) is fatal to ash trees. The inventory identified 282 ash trees (8.2% of its public tree population). These figures do not include private ash trees. Two Rivers has been removing public ash trees over the past several years and many of the remaining trees are declining due to EAB. There are approximately 30 ash on Mariners Trail near the rest area that are in outstanding condition and are large that Two Rivers has been treating to prevent EAB. These trees should continue to receive treatment. They are critically important to the park and benefit everyone who visits this area. Aside from these trees, Two Rivers anticipates removing the remaining public ash trees.

The Asian Longhorned beetle (ALB) is a threat to America's hardwood trees and particularly maple. There is no cure or treatment for ALB and it currently infests areas in Massachusetts, New York and Ohio. Maple comprises 56.3% of all public trees in Two Rivers and ALB is another reason to diversify the forest. Maple are very popular species for planting, but until the population of maple is more in line with recommendations, maple should only be planted in unique situations.

The most common trees growing in Two Rivers are:

TOP TEN SPECIES SUMMARY TABLE		
Species and/or Cultivar	Count	Percentage of Total Population
Norway Maple	1342	39.0%
Green Ash	249	7.2%
Autumn Blaze Maple	182	5.3%
Sugar Maple	171	5.0%
Japanese Tree Lilac	138	4.0%
Hybrid Elm	119	3.5%
Honeylocust	116	3.4%
Silver Maple	111	3.2%
Crabapple	110	3.2%
Colorado Blue Spruce	102	3.0%
Other (51 Other Species )	797	23.2%

Genus and species that are over the 10% genus and 5% species recommendations are:

SPECIES/GENUS OVER RECOMMENDED LIMITS		
5% of any one species, 10% of any one family		
Species/Family	Count	Percentage of Total Population
Maple Genus ( <i>Acer</i> )	1934	56.3%
Norway Maple	1342	39.0%
Autumn Blaze Maple	182	5.3%
Sugar Maple	171	5.0%
Ash ( <i>Fraxinus</i> )	282	8.2%
Green Ash	249	7.2%

### Size Distribution

To optimize the value and benefit of the urban forest, an uneven-aged population is desired to allow allocation of annual maintenance costs uniformly over many years and to assure continuity in the overall tree canopy. A desirable distribution in a community’s forest is to have a high proportion of young trees to offset establishment and age-related mortality, as the percentage of older trees declines with age. This ideal, uneven distribution suggests the largest fraction of trees (40% of the total) should be young, with diameters less than 8” in DBH, while only 10% should be in the large diameter classes (>25” DBH). As the table below illustrates, Two Rivers’ size distribution is heavily weighted to large diameter trees. This is one of the contributing factors for the number of recommended removals. Trees do not live forever and as they grow they tend to experience problems such as decay, dieback and decline that would be a cause to recommend removal.

The chart below illustrates the current tree size distribution in Two Rivers:

SIZE DISTRIBUTION		
<u>Existing</u>	<u>dbh*</u>	<u>Ideal**</u>
28.7%	0-8"	40.0%
33.2%	9-16"	30.0%
28.2%	17-24"	20.0%
9.9%	25+"	10.0%
*diameter at breast height (4.5' above ground)		
** based on recommendations from 2011 Minnesota Shade Tree Short Course		

### Condition Distribution

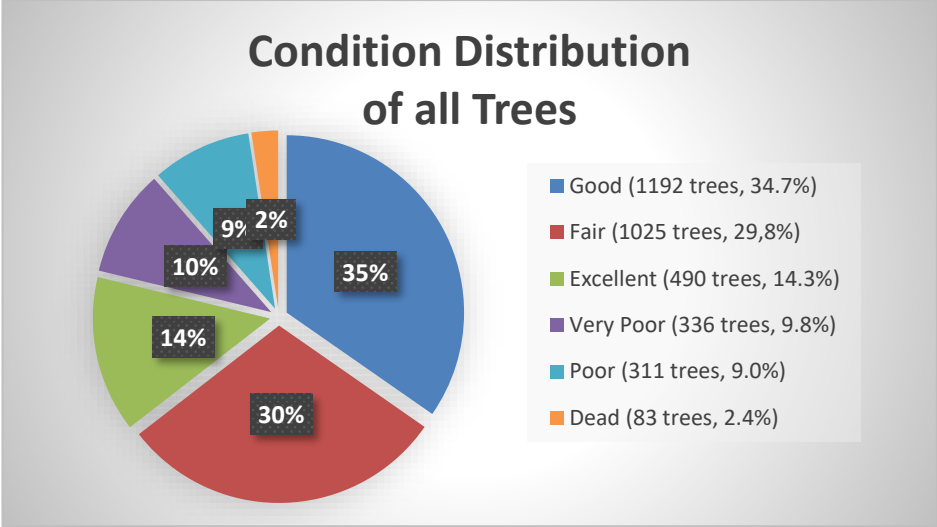
A condition rating helps to assess overall tree health and to evaluate a species structure and performance. For the 2023 inventory, Bluestem Forestry Consulting Inc. used criteria adapted from the International Society of Arboriculture

Valuation of Landscape Trees, Shrubs and Other Plants: A Guide to the Methods and Procedures for Appraising Amenity Plants (Ninth Edition) as the basis for the field condition rating.

At least seven factors were examined and rated to determine the condition of a tree. These factors are crown development, trunk, major branch structure, twig growth rate, foliage health, insects/diseases and roots. General descriptions of the criteria used to categorize each condition are in the following table.

Rating	Description
Excellent	A tree in excellent condition has no visible defects and appears to be in perfect health. The tree will exhibit all the characteristics typical of its species. An excellent tree can be expected to live well into the future.
Good	A tree in good condition has a sound trunk and full canopy and has only minor mechanical injuries such as minor trunk scarring is likely to eventually heal. The tree will exhibit most of the characteristics associated with this species and can be expected to live for many years.
Fair	A tree in fair condition will be exhibiting minor to moderate defects. Some situations that warrant a fair rating include: a thinning canopy, twig growth may only be 1/2 of the expected rate, significant mechanical injury such as scarring on the trunk, insects or disease may be present but are controllable and the crown may be lacking the natural or desired symmetry characteristic to the species. If given routine maintenance such as pruning and mulching a tree that is graded fair will contribute to the forest for years.
Poor	A poor tree will be exhibiting low vigor and significant decline as evidenced by branch dieback, abnormal leaf size, early fall coloration, trunk decay due to injury or canker, or the production of new branches on the main stem. A tree in poor condition will most likely require removal, but may be improved with priority pruning.
Very Poor	A tree in very poor condition is on the verge of dying or presents a risk that must be eliminated via removal. Dieback is likely severe. Trunk or crown cavities or decay, severe crack or severe root problems may also be present. Removal for safety is required.
Dead	A tree in dead condition is a dead standing tree.

The tree inventory results show that most City trees (78.8%) are in fair, good or excellent condition. Dead trees make up 2.4%. P o o r and very poor trees total 18.8%. The goal for Two Rivers should be no tree in less than fair condition. The number of trees in poor and very poor condition is primarily due to older trees that have begun to decline and ash trees infested with EAB. The chart below is a graphic representation of condition distribution:



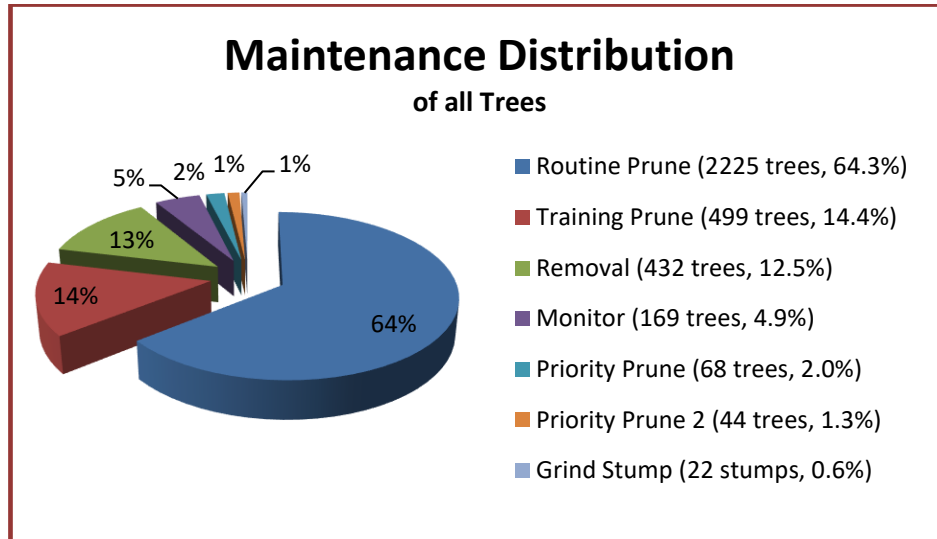
### Maintenance Distribution

Each tree inventoried was assigned a maintenance category. Field judgments were made from the ground based on observation and hazard estimation. Criteria were adapted from two sources: A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas (Second Edition) by Nelda Matheny & James Clark and from a Minnesota Department of Natural Resources Publication How to Detect, Assess and Correct Hazard Trees in Recreational Areas. The following are the definitions of the maintenance categories:

Rating	Description
Removal	Trees designated as a removal are either dead or have one or more defects that cannot be remedied. These trees will most likely have a severe trunk defect such as a cavity or extensive decay, have severe cracks associated with weak unions or have a large percentage of crown death and are safety risks. These trees must be removed immediately.
Prune Priority	These trees have severe deadwood, hangers or broken branches that require remediation as soon as possible. Trees with unattached hanging branches or dead attached branches will be listed in this maintenance category. Overall re-evaluation of the tree while pruning may result in removal of the tree if more extensive problems are noted. Prune Priority 1 have a larger or more serious defect than Prune Priority 2.
Monitor	These trees are experiencing decline or some other defect and need monitoring to be sure that they do not continue to fail and need removal.
Routine Prune	All trees need to be placed on a cycle of trimming to correct structural problems or growth patterns that will eventually affect the tree adversely. Routine pruning will result in a healthier, more vigorous tree and will extend the life of most trees. A routine pruning cycle of once every 5-8 years is ideal.
Training Prune	Training pruning is the structural pruning of all trees 10 years of age or younger. Removing poorly attached co-dominant, crossing and competing limbs while the tree is young, resulting in small cuts and wounds will produce a well-balanced mature crown. This is the most cost-effective form of all maintenance.
Grind Stump	Existing stumps.



The following chart shows the breakdown of trees by maintenance need:



## Parks

Thirteen parks, two cemeteries and Lester Library were inventoried in Two Rivers. A total of 1,210 trees or stumps were inventoried in these areas. This represents 35.0% of the total public tree population. Below is a breakdown of the tree counts per park/municipal area.

COUNT OF TREES/SITES PER AREA	
Park Name	Count of Trees
Central Park & City Hall	59
Coast Guard Park	12
Harbor View Park	6
Lester Library	62
Mariner's Trail	107
Neshotah Park & Beach	194
Paddlers Park	2
Riverside Park	42
Taylor Park	5
Veteran's Park	11
Vietnam Veteran's Memorial Park	32
Walsh Field	18
Washington Park	90
Zander Park (Dog Park)	78
Forestview Cemetery	364
Pioneer Rest Cemetery	128
<b>TOTAL COUNT</b>	<b>1,210</b>

# **Emerald Ash Borer Planning & Other Pests**

The Emerald Ash Borer (*Agrilus planipennis*) is an exotic pest native to Asia that was identified in southeastern Michigan near Detroit in the summer of 2002. The adult beetles munch on ash foliage but cause little damage. The real damage is caused by the EAB larvae that feed on the inner bark of ash trees, disrupting the tree's ability to transport water and nutrients. It is suspected that the insect was initially introduced to the United States via solid wood packing material carried in cargo ships or airplanes originating in its native Asia. Once infested with EAB, ash trees typically decline and die over a period of 2-3 years depending upon insect volume. The burden of dealing with volumes of dead and dying trees within a short period of time can place an enormous strain on community budgets, personnel and resources.

Two Rivers has been removing their ash trees over time as funding and time allows. There are currently 282 ash remaining in the public tree population. Of these, most are likely infested. As an example, nearly all the ash in Zander Park appear to have EAB. There are approximately 30 ash on Mariners Trail near the rest area that are in outstanding condition and are large that Two Rivers has been treating to prevent EAB. These trees should continue to receive treatment. They are critically important to the park and benefit everyone who visits this area. Aside from these trees, Two Rivers anticipates and this plan recommends removing the remaining public ash trees.

## **Marshalling yard/wood utilization**

The City of Two Rivers takes their wood waste to the Forestview Cemetery yard site for chipping and then it is made available to the public. Grinding wood waste is really a win-win for the City and residents and a great way to recycle waste. This is encouraged in future years. If the City would want to consider alternative uses for wood waste, contact Collin Buntrock, WI DNR Forest Products Staff, [Collin.Buntrock@wisconsin.gov](mailto:Collin.Buntrock@wisconsin.gov), phone 608-261-0754. The non-profit Wisconsin Urban Wood (WUW) may also be of assistance utilizing dead, risk or ash tree that have been removed.

## **Community Outreach and Education**

Education and outreach play a key role in communicating the effects of EAB on the City's urban forest and increasing public awareness, understanding, and support for the City's Urban Forest and Management Plan. Increasing public awareness of the City's plan for EAB will also enhance the effectiveness their program. Two Rivers has done a good job with EAB education and public information on this inventory process.

Provide information to residents assisting with identification of ash on their properties and provide information on treatment options or the removal option. Be sure to stress that ash deteriorate very quickly and the longer the tree deteriorates, the more expensive removal costs will be.

- Educate citizens about EAB, the tree management guidelines presented in this plan, and proper wood utilization methods.
- Find the latest Factsheets from UWEX and the WI DNR at [http://labs.russell.wisc.edu/eab/eab-news-and-resources/#Management\\_Factsheets](http://labs.russell.wisc.edu/eab/eab-news-and-resources/#Management_Factsheets).
- Educate and inform all municipal leaders and officials through presentations and written reports as needed.
- Inform the community on EAB through local media outlets, direct or indirect mailing (tax and utility bills), newsletters, fliers, public meetings, neighborhood associations, and local garden clubs.

## Other Insects for Consideration

### Asian Longhorned Beetle (ALB)

ALB is an invasive insect originally from China that has become a serious problem to trees in certain parts of the United States. The beetle's larvae creates tunnels by girdling stems and branches on trees. The insect has been reported to have entered the United States via wood packing materials originating from China.

Although ALB seems to prefer maple species (*Acer* spp.) in the United States, it has also been found in horsechestnut/buckeye species (*Aesculus* spp.), alder species (*Alnus* spp.), birch species (*Betula* spp.), poplar species (*Populus* spp.), willow species (*Salix* spp.), and elm species (*Ulmus* spp.). This list is not conclusive since a complete list of host trees in the U.S. has not been determined.

The adult beetles are persistent from July to October but can be found later in the fall if temperatures remain warm. After adults emerge from their larvae tunnels, they bore another tunnel through wood, creating a round exit hole in the tree bark. Adults generally remain on or around the trees they originated from, only traveling short distances to feed and reproduce.

At the present ALB has not been found in Wisconsin. For more information on the identification and management of ALB please refer to <http://asianlonghornedbeetle.com/>.

## Other Diseases for Consideration

### Oak Wilt (OW)

The disease is caused by the fungi *Ceratocystis fagacearum*, which attacks the water-conducting (vascular) system of trees. A tree responds by blocking its vascular system to contain the disease and, in doing so, cuts off the water supply to its leaves. While bur and white oak tend to be less susceptible to oak wilt than red/black oaks, all oaks should be planted carefully and cared for at the proper time of year because of the risk from oak wilt.

Oak wilt can be spread by insects that carry the pathogen on their bodies from an infected tree to an uninfected tree. It also spreads via the vascular system of grafted roots of adjacent trees. If the disease is allowed to progress, it will spread to healthy oaks that are connected by the roots (root grafts) to the diseased trees. In forested areas where oak is common and root grafting is widespread, an ever-widening pocket of dead oaks will form. Where oak is mixed with other species and is a minor part of the forest, oak wilt will spread slower and may actually stop where roots are not grafted. New pockets of dead oak may also be formed by sap-feeding beetles spreading oak wilt above ground.

In urban areas oak trees are most easily infected by overland spread in the springtime, from bud swelling until two to three weeks past full leaf development. The Wisconsin Department of Natural Resources recommends that you avoid pruning, cutting, or wounding oak trees April through July (April, May, June, and July) in urban areas. Observations and unpublished research have shown that overland infection can occur after July, yet these mid-summer through early fall infections are not common. To take a very cautious approach, do not prune or otherwise wound oaks from April to October. In some years, spring comes much earlier. If daytime temperatures begin to reach the 60-degree mark, stop pruning oak at that time, even if it is still the middle of March.

The first signs of OW occurs when leaves in the upper crown turn a dull green, bronze, or tan beginning at the leaf margin. Soon after, the leaves will drop off with various degrees of discoloration. Brown streaks develop in the new

sapwood. Trees in the red oak group are not known to recover once infected. The white oak group varies in species resistance to OW, but they usually die slowly over a period of several years.

## STAFFING, EQUIPMENT AND TRAINING

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Two Rivers is stymied by both staffing and equipment. The City does not have adequate staff or equipment to care for trees that are very large in size. The table below illustrates their current capabilities based on staffing and equipment:

In-House
<b>Removals:</b> Park, Cemetery, Library trees Street trees 0-8" dbh Boles of trees that have been topped by Utility
<b>Training Prunes:</b> All
<b>Plantings:</b> All
<b>Grind Stumps:</b> All

Work contracted:
<b>Removals:</b> Street trees >8" dbh
<b>Routine Prunes:</b> All trees

Two Rivers Power & Light:
<b>Removals:</b> Will remove to a safe distance under utility lines
<b>Routine Prunes:</b> Will prune if utility lines present

*\*This is an estimated size cut off based on existing equipment. Each tree should be individually evaluated for safety of in-house removal.*

Because so many forestry activities are contracted out and because of the high number of removals in the next few years, costs are high and staff time will also need to increase dramatically. But, once immediate needs are addressed, the costs to maintain a routine program including routine pruning and tree plantings is reasonable. A full list of responsibilities and the time required to complete them can be found as Attachment 1: Schedule of Activities 2024-2027.

Each year, staff should receive training on some facet of tree care to continually expand their capabilities. The DNR has an urban forestry training page that is in real time and lists all upcoming training opportunities. This page can be found at: <http://dnr.wi.gov/topic/UrbanForests/events.html>. The Wisconsin Arborist Association also has training opportunities and information can be found at: [www.waa-isa.org/events-programs/](http://www.waa-isa.org/events-programs/). A figure has been included in the budget for staff training.

# TREE MAINTENANCE TIMELINE

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This inventory provides an overall look at Two Rivers urban forestry maintenance needs. To simplify the order of activities, the following summary has been provided by year. A further description of activities and their associated costs can be located in Attachment 1: Schedule of Activities. Administration is strongly encouraged to support the following activities:

## **Activities to be Completed in 2024:**

Complete removals 0-10% condition rating (250 trees)  
 Complete priority prune 1 (68 trees)  
 Grind in-house removal stumps (201 stumps)  
 Treat ash for preservation on Mariners Trail  
 Inspect monitor and very poor, poor trees (approximately 300 trees)  
 Receive chainsaw safety training/tree felling training and or similar

## **Activities to be Completed in 2025:**

Complete removals ≥15% condition rating (182 trees)  
 Grind existing stumps + in-house removal stumps (161 stumps)  
 Complete priority prune 2 (44 trees)  
 Plant trees (50 trees)  
 Inspect monitor and very poor, poor trees (approximately 300 trees)  
 Receive training on a variety of topics

## **Activities to be Completed in 2026 :**

Remove ash trees in poor & fair condition (112 trees) -  
 Grind in-house removal stumps (87 stumps) -  
 Treat ash for preservation on Mariners Trail -  
 Plant trees (50 trees)  
 Inspect monitor and very poor, poor trees (approximately 300 trees)  
 Receive training on a variety of topics  
 Complete routine prunes on 1/7 of population (358 trees)  
 Complete young tree training prunes (250 trees)

## **Activities to be Completed in 2027 :**

Remove remaining ash not receiving treatment (80 trees) -  
 Grind in-house removal stumps (55 stumps) -  
 Plant trees (50 trees)  
 Inspect monitor and very poor, poor trees (approximately 300 trees)  
 Receive training on a variety of topics  
 Complete routine prunes on 1/7 of population (358 trees)  
 Complete young tree training prunes (250 trees)

**Activities to be Completed in 2028 :**

- Treat ash for preservation on Mariners Trail -
- Plant trees (50 trees)
- Inspect monitor and very poor, poor trees (approximately 300 trees)
- Receive training on a variety of topics
- Complete routine prunes on 1/7 of population (358 trees)
- Complete young tree training prunes (250 trees)

## URBAN FORESTRY GOALS

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This inventory was the first step towards establishing a defined, efficient forestry program to maximize benefits and minimize costs for the City of Two Rivers. The next step is to identify goals and begin the process of implementation. The primary goals and objectives that have been identified to establish a management program in order of priority are:

GOAL 1: ELIMINATE HIGH RISK SITUATIONS.

- Objective A: Remove high-risk trees.
- Objective B: Prune high risk branches.
- Objective C: Monitor and inspect trees

GOAL 2: ESTABLISH A ROUTINE, COMPREHENSIVE URBAN FORESTRY PROGRAM FOR A HEALTHY FOREST

- Objective A: Perform yearly tree inspections/Evaluate risk management program.
- Objective B: Perform training prunes.
- Objective C: Perform routine pruning and removals.
- Objective D: Plant high quality trees with low maintenance requirements.
- Objective E: Inventory updating.

### GOAL 1: Eliminate high-risk situations.

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The first and foremost objective of any municipality entrusted with the responsibility of an urban forest is the safety of its residents and visitors. Until a safe environment has been attained, no other objectives can be tackled. The following is a prioritized list of actions that need to be taken to eliminate the high-risk situations identified during the inventory:

1. Remove trees identified as Removals.
2. Prune trees identified as Prune Priority.

A complete listing of activities and their costs can be found as Attachment 1: Schedule of Activities.

## **Objective A: Remove High Risk Trees**

Tree removals are an integral part of a sound forest management program. Removals are as necessary to the urban forest's life cycle as are tree plantings and maintenance. Removals do, at times, stimulate a public reaction because people grow attached to the trees in the vicinity of their homes. Nevertheless, a successful urban forestry program demands that a removal policy be adopted and applied uniformly throughout the City. A clear policy provides coherent guidelines to enable City officials and crews to make informed, defensible, consistent removal decisions. Furthermore, such a policy can help allay public concerns about tree removals. The City's potential losses from liability claims are also reduced due to healthier and lower risk trees.

The goal of a removal plan is to develop a comprehensive risk reduction program that will guarantee the timely removal of high risk or potentially high-risk trees as well as to heighten awareness of hazard abatement procedures.

There are three important reasons for establishing a strong removal policy. The first is to maintain safe public areas by reducing potentially high-risk trees and the liability associated with them. Secondly, the removal of dead and declining trees allows the urban forest manager to make room for new, diverse plantings which in turn increases the overall health of the community forest. Thirdly, it is more cost effective to maintain healthy trees rather than senescing, over mature trees.

In Wisconsin, municipal governments have a legal duty to exercise reasonable care to protect the public from foreseeable hazards. To minimize the liability associated with trees in high use areas, such as urban streets and parks, land managers must demonstrate reasonable care in maintaining these trees. Political pressure, inadequate time, untrained staff and inadequate funding are not valid reasons for inaction and may potentially leave the City liable should there be no designated risk tree removal program showing the effort to reduce the number of these trees.

Based on the inventory data, Bluestem estimates that 432 trees should be immediately removed from the existing tree population. Once this initial group of trees is removed, the City's removal program should stabilize at approximately 30 trees annually (1.0% of the total population).

Each tree was given a condition rating when it was inventoried. This number is used to calculate the appraised replacement dollar value of each tree but is also used to prioritize removals. Ratings range from a low of 0% to a high of 100% in 5% increments. For example, a specimen tree in perfect condition received a 100%. A dead standing tree received a 0%. Most removals fall between 0-25%. Removals should start with condition ratings of 0% and continue until they are all removed. This work should begin immediately.

Several factors can assist with prioritizing tree removals and management:

1. Utilize the Risk Management Guide (attachment 2). This guide is a step-by-step system for evaluating risk within the population. This guide was utilized during the inventory fieldwork and is a good guide for the City to use for day-to-day duties. For example, several steps are listed for tree evaluation. One step is to 'Identify Problematic Conditions'. The inventory identified a condition rating for each tree inventoried. A tree was assigned one of six ratings: excellent, good, fair, poor, very poor or dead. Very poor and dead trees need to be prioritized for removal. Other steps include identifying problematic species, diameters and defects. Some problematic species include willow and boxelder. These trees are

typically weak wooded and tend to fail more often than other species such as oak. Problematic diameters include larger diameter trees. A 2" dbh dead tree poses minimal risk, while a 30" dead or very poor condition tree poses a very high risk. Additionally, certain defects should be red flagged for action. Cavities, decay, and excessive dieback are some of the more severe defects noted during the inventory. All this data can be found within the inventory database. Target and location are also important factors to consider when prioritizing removals. Playgrounds and busy streets where pedestrians and vehicles frequent should receive higher priority than streets with wooded/naturalized rights-of-way. The combination of these factors should be used to determine the order in which trees need to be removed.

2. Prioritizing Staff Time & Funding. The safety risk of failing trees cannot be over-stressed. Staff time and funding needs to be prioritized to maximize public safety and reduce tree-related liability. The frequency of other non-safety tasks should be reduced so that staff can dedicate more time to pruning and removals. Will a reduced mowing schedule endanger residents? Will a 32" silver maple with a trunk cavity endanger residents?

One of the primary purposes of the inventory was to identify risks. The City can reduce these risks and increase safety for its residents through prompt implementation of the inventory-based pruning and removal recommendations in this plan.

A "high risk" is any tree or tree part that demonstrates a high risk of failure or fractures which would result in damage or injury to people or property. Usually, high-risk trees demonstrate visible defects.

There are two distinct aspects to the definition of a high-risk tree: 1) a physical defect within a tree that increases its potential for failure, and 2) the proximity of the tree to people or property that increases the likelihood of personal injury or property damage. A decaying tree in the middle of the Chequamegon National Forest may have a potential for failure, but the chance that tree will cause personal injury is remote. However, that same tree located at the little league fields or anywhere in Two Rivers, should be considered a high risk because of its urban location.

One task of the urban forest manager is to anticipate tree failures before they occur. There are no absolutes in determining risks - only sound judgment based on experience at recognizing structurally unsound trees.

The number of trees marked for removal within a given year further describes a forest system's health, although in some instances trees need to be removed for reasons unrelated to health. The objective is to eventually have no City trees with a condition rating lower than fair.

The risk assessment that Two Rivers should use to evaluate trees was created by the International Society of Arboriculture. It is titled [A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas, 2nd Edition](#) by Nelda Matheny and James R. Clark. This can be purchased at Amazon.com and through other sources. Additional resources include the US Forest Service's "Urban Tree Risk Management" guide. This is available at no charge from the WI DNR regional urban forester.

When a tree has been identified for removal or priority pruning, it may indicate an underlying deficiency. For this reason, all trees scheduled for removal along with trees in need of priority pruning need to receive a thorough inspection twice a year (once with the leaves on and once without the leaves) until the tree has been removed or the hazard has been eliminated. Likewise, all trees identified as in need of monitoring, poor or very poor or dead should also receive a similar inspection.



Trees that need to be regularly and frequently inspected were identified as ‘Monitors.’ These trees may have a problem developing such as dieback or may have old storm damage that warrants attention. A list of these trees can be found in the inventory database.

City policy should require tree pruning and removal in accordance with national industry standards. Standards-based specification are commonly used when municipalities hire a contractor or purchases materials, but should also be applied to all work completed by staff. Industry standards and specifications include current editions of:

~ American National Standard for Safety in Tree Care Operations, ANSI Z133 (current revision). Can be purchased at: [http://www.treecareindustry.org/public/gov\\_standards\\_z133.htm](http://www.treecareindustry.org/public/gov_standards_z133.htm)

~ American National Standard for Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance - Standard Practices, ANSI A300 (current revision). Can be purchased at: <http://www.tcia.org/standards/A300.htm>

## **Objective B: Prune High-risk Branches**

A total of 112 trees are in need of priority pruning.

Priority prune trees have obvious risks such as branch cavities, hangers or significantly sized deadwood. These trees should be pruned immediately, in conjunction with the initial high-risk removals beginning in 2024 and continuing in 2025.

The tree inventory was a ground visual only survey and was not intended to substitute for a thorough hazard tree survey and as such the trees have not been aurally inspected. Additional defects may be noted from an aerial inspection. It is important that while trees are being pruned from an aerial bucket truck that their condition be re-evaluated. If the pruner feels they would not benefit from being pruned, they should be removed.

## **Objective C: Monitor and Inspect Trees.**

Trees that were identified as in poor or very poor condition are in need of monitoring or ‘Monitors.’ These trees may have a problem developing such as dieback or may have old storm damage that warrants attention. A list of these trees can be found in the inventory database. There are 169 of these trees.

The risk assessment that Rhinelander should use to evaluate trees was created by the International Society of Arboriculture. It is titled [A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas, 2nd Edition](#) by Nelda Matheny and James R. Clark. This can be purchased at Amazon.com and through other sources. Additional resources include the US Forest Service’s “Urban Tree Risk Management” guide. This is available at no charge from the WI DNR regional urban forester.

When a tree has been identified for removal or in need of monitoring, it may indicate an underlying deficiency. For this reason, all trees scheduled for removal and all trees in poor condition need to receive a thorough inspection twice a year (once with the leaves on and once without the leaves) until the tree has been removed or the hazard has been eliminated.

## GOAL 2: Establish a routine, comprehensive urban forestry program for a healthy forest.

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Systematic maintenance of existing trees is important for three reasons: safety, cost savings and aesthetics. Maintained trees have a greater lifespan and provide greater canopy benefits than trees that are not maintained. Proper maintenance can also reduce removal and replanting costs. With limited budgets and time, it is necessary to prioritize actions. High-risk tree situations should always be eliminated first (Goal 1) and then routine maintenance should proceed. The following routine objectives are listed from highest to lowest priority.

### Objective A: Perform Yearly Tree Inspections & Evaluate the Risk Management Program

It is important that *all* of the public trees in the City get a yearly inspection. Trees that have been identified during the inventory as needing priority pruning, monitoring or removal need a hazard inspection at least *twice* yearly. Complete this inspection once with leaf cover and once without until the hazard has been eliminated or the situation resolved. Additionally, all large diameter trees need an extra inspection after storms. If any hazards are identified, the situations need to be corrected immediately, and then continue with the list of routine maintenance.

It is important that an ISA Certified Arborist complete all tree inspections (greater than 6" in diameter).

Seven factors should be considered when evaluating trees:

Factor	Considerations
Crown Development	Characteristic of species and well balanced Branching throughout entire upper 2/3 of trunk area Lacking full crown
Trunk	One central leader is desired No defects Missing sections of bark Extensive decay or hollow
Major branch structure	Evenly distributed braches Structurally important branches not dead or broken
Twig growth rate	Typical for species and age Growth rate reduced
Foliage	Normal size and color Small leaves with deficiencies
Insects & Disease	No apparent problems Severe infestation
Roots	Extensive root loss Stem girdling roots present Trunk flare present indicating proper planting depth

An excellent resource guide is “How to Recognize Hazardous Defects in Trees” published by the USDA Forest Service (Guide # NA-FR-01-96). This can be found at: [http://www.na.fs.fed.us/spfo/pubs/howtos/ht\\_haz/ht\\_haz.htm](http://www.na.fs.fed.us/spfo/pubs/howtos/ht_haz/ht_haz.htm)

To reduce high-risk situations within Two Rivers, The City Administrator and Director of Parks and Recreation should evaluate the risk management program annually. The evaluation can be accomplished by following the Risk Management Guide (Attachment 2). This inventory and management plan represents the first comprehensive inventory but is not a substitute for a hazard tree evaluation. This management plan is the first phase of the risk management program.

## **Objective B: Perform Young Tree Train Prunes**

Training pruning is the structural pruning of all trees 10 years of age or younger. Some benefits of training pruning include:

- *Pruning 2-3 times in the first ten years of a tree's life will reduce 90% of the structural problems the tree will ever have resulting in a healthier and more storm resistant tree that costs less to maintain and has fewer employee call-outs.*
- *This is the easiest pruning to perform due to the small size of the trees.*
- *Increased safety to both the tree and public due to elimination of sight obstructing branches and less branch breakage from car/truck strikes.*
- *Training pruning is the most cost effective pruning because it reduces long-term routine pruning costs.*
- *It is the most economical pruning because an in-house crew can complete it quickly and efficiently.*

Trees that are structurally pruned at this stage require much less care as they mature. This plan recommends completing training prunes every other year. This results in cost savings and still adequately prunes the tree. This equates to approximately 250 training prunes per year annually and more as trees are planted. As trees are planted, this number will increase. All the training prunes can be completed until they are unable to be reached from the ground or are older than 10 years planted, and then they will be scheduled for routine pruning.

## **Objective C: Perform Routine Pruning & Removals**

One of the most beneficial and noticeable activities performed in the urban forest is routine pruning. Routine pruning is the cycle of pruning all trees on a rotating basis. Once all of the safety issues have been addressed, all trees 10 years of age or over (approximately 6" or over) need to be placed on a routine pruning cycle. Some benefits of routine pruning include:

- Increased health and viability of trees.
- Fewer tree mortalities and fewer structural deficiencies.
- Reduced liability from potential tree-related injuries or damages to property.
- Increased property values.
- Enhanced aesthetic value.
- Fewer complaints/requests.
- Increased longevity of tree.

- Reduced future costs associated with hazardous limbs and decay.
- Improved cost effectiveness of tree maintenance reducing the need for on-demand pruning and associated staff overtime.

An excellent resource on proper pruning can be found at:

<https://dnr.wi.gov/topic/forestmanagement/documents/pub/FR-256.pdf>

A feasible routine pruning cycle needs to be established. Industry guidelines are to prune each tree over 6" dbh once every 5-8 years. A seven-year cycle is recommended. Essentially, the City is already broken into seven zones and a different zone has work completed in a particular year. For example, routine pruning in 2025 will occur in zone 1, zone 2 in 2026, etc. Taking into consideration Two Rivers current level of stocking, the above-mentioned routine pruning cycle of seven years will result in approximately 358 trees pruned annually.

If a tree is pruned properly (throughout the entire canopy) and is on a routine pruning cycle, no limb over 4" in diameter should need to be removed. The best time of year to prune is when the leaves are off the trees. If pruning does occur while the trees have their leaves on, it should be after the leaves have fully expanded and not when they are in the process of forming. Pruning should also be avoided when the leaves are turning colors in the fall and in the process of dropping. All American elms and oaks should be pruned during dormancy.

Another facet of routine maintenance includes 'routine' tree removals. Any given City can expect approximately 1-2% of trees will need to be removed per year due to high-risk situations that develop naturally as the tree population matures. This is in addition to the initial safety removals.

### **Objective D: Plant high quality trees with low maintenance needs**

Trees provide huge benefits and planting needs to occur on an annual basis to assure that trees are growing for future generations and age diversity remains to lessen maintenance spikes. This plan recommends planting 50 trees annually beginning in 2025.

Vacant sites should be chosen based upon several factors. These include:

- Width of boulevard – If the site had a sidewalk, the distance between the sidewalk and curb needs to be a minimum of 5 feet. Anything less that this causes poor growth and may eventually lead to gridling roots and heaving walks.
- Distance to nearby structures/trees – For a tree to be healthy, it needs to be able to grow unimpeded by other trees or structures such as buildings. Planting sites were only identified when the trees planted will have time to spread their branches and will not interfere with the growth of other trees or touch structures.
- Overhead utilities – It is acceptable to plant when overhead utilities are present, and these sites were identified as such and small trees only are recommended in these areas. Some small trees tend to grow very widely. Be sure that the height AND width of the mature tree is taken into consideration when planting.
- Parks are always suitable for tree planting and are outstanding locations for new tree plantings.

To continue enjoying and increase the varied benefits of trees, trees must be planted. Certain planting policies can be applied. As always, no planting should take place until all of the high-risk safety situations identified have been alleviated. Then, the order of priority for tree planting should be:

1. Trees lost within the past year.
2. Trees lost within the past three years.
3. Appropriate sites within the current work zone.
4. Homeowner requests.

Beginning in Year 2025, 50 plantings have been included in the budget annually (see Attachment 1: Schedule of Activities). Re-planting of removals should occur first (assuming there is sufficient spacing) and then move on to filling existing vacant planting sites. Plantings have traditionally be contracted out.

Two Rivers is a Zone 4b climate and types allow for some good street and park tree planting selections. The list below is a quick general list for review.

Good **large** selections include:

- swamp white oak (*Quercus bicolor*) \*
- hackberry (*Celtis occidentalis*)
- bur oak (*Quercus macrocarpa*) \*
- elm (*Ulmus* spp.) – ‘New Horizon’, ‘Accolade’, ‘Cathedral’ \*
- American Liberty elm (*Ulmus americana* ‘Liberty’)
- Kentucky coffeetree (*Gymnocladus dioica*) – ‘Espresso’, ‘Macho’ and other male cultivars do not produce seed pods.
- ginkgo (*Ginkgo biloba*) – Male cultivars only as the female produces fruit which has a very unpleasant odor.
- Turkish filbert (*Corylus columna*)

Good **medium** selections include:

- river birch (*Betula nigra*)
- amur chokecherry (*Prunus maackii*)
- horsechestnuts (*Aesculus* spp.)
- amur maackia (*Maackia amurensis*)

**Smaller** sites can be filled with:

- Japanese tree lilac (*Syringa reticulata*)
- serviceberry (*Amelanchier x grandiflora*)
- hophornbeam (*Ostrya virginiana*)
- American hornbeam (*Carpinus caroliniana*)
- Hawthorn (*Crateagus* spp.)

It is important to diversify the urban forest as much as possible. Every effort should be made to continue diversification. Planting many different species and varieties keeps the urban forest healthy and attractive. Ideally, no more than 5% of any one species and 10% of any one genus should comprise the City’s trees. It is recommended at present and into the future (next 10 years) that planting of maples should not occur or be very limited due to this genus representing a quarter of the current public tree population.

Many excellent tree planting resources can be found online. A newer publication developed by the WI DNR division of

forestry can be found at [dnr.wi.gov/forestry/publications/newtreeplanting.pdf](http://dnr.wi.gov/forestry/publications/newtreeplanting.pdf). An additional valuable planting resource from the WI DNR can be found at: <https://dnr.wisconsin.gov/topic/urbanforests/treeplantingresources>

All plant quality should follow the American National Standard for Nursery Stock; ANSI Z60 (current revision) should be used when purchasing plant material. Can be found at: [http://www.isa-arbor.com/education/onlineResources/cad/resources/educ\\_CAD\\_DevelopingPlantingSpecifications.pdf](http://www.isa-arbor.com/education/onlineResources/cad/resources/educ_CAD_DevelopingPlantingSpecifications.pdf)

Two Rivers may want to consider entering into “Growing Agreements” with nurseries. These are agreements between communities and nurseries where trees are specifically grown for that community. This is being done by several communities throughout Wisconsin to assure that the community will receive a diverse supply of trees of specific sizes at known times for a known price. The agreements are set up several years in advance and require the community to pay a small up-front fee. But it provides for a better quality of tree on the dates required. Two Rivers may want to partner with other communities (Cumberland, Rice Lake, Hayward, etc.) to jointly order trees. The use of gravel beds are also an option and more information on those can be found at: <http://www.mntreesource.com/gravel-beds.html>

### **Objective E: Inventory Maintenance and Updating**

The inventory database has been provided to the City of Two Rivers in ArcMap and MS Excel. Staff should complete work orders and input the completed work into the inventory on a continuing basis. Without continual updating in this way, the inventory quickly becomes obsolete.

This management plan contains provisions for five years, beginning in 2024. Typically, a complete re-inventory should be completed every 5 years. When the inventory expires in 2027, a qualified, experienced forester should thoroughly evaluate all of the trees on an individual basis again. It is beneficial for an experienced eye outside the City perform an inventory due to changing tree conditions and factors.

# **ATTACHMENT 1:**

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## *2024-2027 Schedule of Activities*

## 2024 Activities

Activity	In-House or Contract	# of Trees	Contract Cost or Staff Hours Required	Misc. Comments
Tree Removals - 0-10% Condition - Located in parks, cemeteries or library	In-house	136	45 days for a 3 person crew	Crew averages 3 daily (excluding stump). Avg diameter = 18.8"
Tree Removals - 0-10% Condition - Located on streets WITH overhead utilities	Utility Co. (to below lines) In-house (remaining bole)	65	11 days for a 3 person crew	Crew averages 6 daily (excluding stump). Avg diameter = 21.2"
Tree Removals - 0-10% Condition - Located on streets WITHOUT overhead utilities	Contractor	49	\$23,520	Avg dbh = 19.2" Est. \$25/diameter inch Includes stump grinding
Grind Stumps from in-house Removals	In-house	201	20 days for a 2 person crew	Crew averages 10 daily. Avg dbh = 18.9"
Priority Prune 1 WITH utilities	Utility Co.	29	n/a	Avg dbh = 22.7"
Priority Prune 1 WITHOUT utilities	Contract	39	\$6,435	Avg dbh = 16.5" Est. \$10/diameter inch
Treat designated ash on Mariners Trail	Contract	16	\$2,500	Continue with existing treatments
Inspect Monitor, Very Poor and Poor Trees	ISA Certified Arborist	approximately 300	\$2,500	4 days for Arborist
Training (tree pruning, tree planting, training prunes)	Contract	n/a	\$1,000	Contract with consultant or DNR Training

**TOTAL STAFF TIME**

**208 days**

**TOTAL CONTRACT COST**

**\$35,955**

~ Equipment costs not included.

~Trees under/around utility lines should be completed/cleared to a safe distance by utility organization.



# 2025 Activities

Activity	In-House or Contract	# of Trees	Contract Cost or Staff Hours Required	Misc. Comments
Tree Removals - ≥15% Condition - Located in parks, cemeteries or library	In-house	90	30 days for a 3 person crew	Crew averages 3 daily (excluding stump). Avg diameter = 16.2"
Tree Removals - ≥15% Condition - Located on streets WITH overhead utilities	Utility Co. (to below lines) In-house (remaining bole)	49	8 days for a 3 person crew	Crew averages 6 daily (excluding stump). Avg diameter = 16.2"
Tree Removals - ≥15% Condition - Located on streets WITHOUT overhead utilities ≥8" dbh	Contractor	39	\$18,428	Avg dbh = 18.9" Est. \$25/diameter inch Includes stump grinding
Tree Removals - ≥15% Condition - Located on streets WITHOUT overhead utilities <8" dbh	In-house	4	1 day for 2 person crew	Crew averages 6 daily (including pulling stump). Avg diameter = 5.5"
Grind Stumps from in-house removals + existing stumps	In-house	161	14 days for a 2 person crew	Crew averages 10 daily. Avg dbh = 17.8"
Priority Prune 2 WITH utilities	Utility Co.	19	n/a	Avg dbh = 17.6"
Priority Prune 2 WITHOUT utilities	Contract	25	\$4,825	Avg dbh = 19.3" Est. \$10/diameter inch
Plant Trees**	In-house	50	\$8,750 + 5 days for a 2 person crew	Cost is \$175/tree + Crew averages 10 daily
Inspect Monitor, Very Poor and Poor Trees	ISA Certified Arborist	approximately 300	\$2,500	4 days for Arborist
Training (tree pruning, tree planting, training prunes)	Contract	n/a	\$1,000	Contract with consultant or DNR Training

<b>TOTAL STAFF TIME</b>	<b>153 days</b>
<b>TOTAL CONTRACT COST</b>	<b>\$35,503</b>

~ Equipment costs not included.

~Expect to purchase a 1.5-2.0" caliper tree for this price.

~Trees under/around utility lines should be completed/cleared to a safe distance by utility organization.

# 2026 Activities

Activity	In-House or Contract	# of Trees	Contract Cost or Staff Hours Required	Misc. Comments
Ash Removals - Poor or Fair Condition - Located in parks, cemeteries or library	In-house	61	20 days for a 3 person crew	Crew averages 3 daily (excluding stump). Avg diameter = 19.2"
Ash Removals - Poor or Fair Condition - Located on streets WITH overhead utilities	Utility Co. (to below lines) In-house (remaining bole)	26	4 days for a 3 person crew	Crew averages 6 daily (excluding stump). Avg diameter = 15.5"
Ash Removals - Poor or Fair Condition - Located on streets WITHOUT overhead utilities	Contractor	25	\$11,062	Avg dbh = 17.7" Est. \$25/diameter inch Includes stump grinding
Grind Stumps from in-house Removals	In-house	87	9 days for a 2 person crew	Crew averages 10 daily. Avg dbh = 18.1"
Treat designated ash on Mariners Trail	Contract	16	\$2,500	Continue with existing treatments
Plant Trees**	In-house	50	\$8,750 + 5 days for a 2 person crew	Cost is \$175/tree + Crew averages 10 daily
Inspect Monitor, Very Poor and Poor Trees	ISA Certified Arborist	approximately 300	\$2,500	4 days for Arborist
Training (tree pruning, tree planting, training prunes)	Contract	n/a	\$1,000	Contract with consultant or DNR Training
Training Prunes (1/2 of trees 1-6" DBH)	In-house	250	17 days for a 1 person crew	Crew averages 15 daily
Routine Prune Zone 1 (1/7th of population) WITH utilities - dbh ≥7"	Utility Co.	118	n/a	Avg dbh = 19.0"
Routine Prune Zone 1 (1/7th of population) WITHOUT utilities - dbh ≥7"	Contract	240	\$45,600	Avg dbh = 19.0" Est. \$10/diameter inch

<b>TOTAL STAFF TIME</b>	<b>117 days</b>
<b>TOTAL CONTRACT COST</b>	<b>\$71,412</b>

~ Equipment costs not included.

~Expect to purchase a 1.5-2.0" caliper tree for this price.

~Trees under/around utility lines should be completed/cleared to a safe distance by utility organization.

# 2027 Activities

Activity	In-House or Contract	# of Trees	Contract Cost or Staff Hours Required	Misc. Comments
Remaining Ash Removals - Excluding treated - Located in parks, cemeteries or library	In-house	31	10 days for a 3 person crew	Crew averages 3 daily (excluding stump). Avg diameter = 17.2"
Remaining Ash Removals - Excluding treated - Located on streets WITH overhead utilities	Utility Co. (to below lines) In-house (remaining bole)	24	4 days for a 3 person crew	Crew averages 6 daily (excluding stump). Avg diameter = 15.4"
Remaining Ash Removals - Excluding treated - Located on streets WITHOUT overhead utilities	Contractor	25	\$10,125	Avg dbh = 16.2" Est. \$25/diameter inch Includes stump grinding
Grind Stumps from in-house Removals	In-house	55	6 days for a 2 person crew	Crew averages 10 daily. Avg dbh = 16.4"
Plant Trees**	In-house	50	\$8,750 + 5 days for a 2 person crew	Cost is \$175/tree + Crew averages 10 daily
Inspect Monitor, Very Poor and Poor Trees	ISA Certified Arborist	approximately 300	\$2,500	4 days for Arborist
Training (tree pruning, tree planting, training prunes)	Contract	n/a	\$1,000	Contract with consultant or DNR Training
Training Prunes (1/2 of trees 1-6" DBH)	In-house	250	17 days for a 1 person crew	Crew averages 15 daily
Routine Prune Zone 1 (1/7th of population) WITH utilities - dbh ≥7"	Utility Co.	118	n/a	Avg dbh = 19.0"
Routine Prune Zone 1 (1/7th of population) WITHOUT utilities - dbh ≥7"	Contract	240	\$45,600	Avg dbh = 19.0" Est. \$10/diameter inch

**TOTAL STAFF TIME**

**81 days**

**TOTAL CONTRACT COST**

**\$67,975**

~ Equipment costs not included.

~Expect to purchase a 1.5-2.0" caliper tree for this price.

~Trees under/around utility lines should be completed/cleared to a safe distance by utility organization.

# 2028 Activities

Activity	In-House or Contract	# of Trees	Contract Cost or Staff Hours Required	Misc. Comments
Treat designated ash on Mariners Trail	Contract	16	\$2,500	Continue with existing treatments
Plant Trees**	In-house	50	\$8,750 + 5 days for a 2 person crew	Cost is \$175/tree + Crew averages 10 daily
Inspect Monitor, Very Poor and Poor Trees	ISA Certified Arborist	approximately 300	\$2,500	4 days for Arborist
Training (tree pruning, tree planting, training prunes)	Contract	n/a	\$1,000	Contract with consultant or DNR Training
Training Prunes (1/2 of trees 1-6" DBH)	In-house	250	17 days for a 1 person crew	Crew averages 15 daily
Routine Prune Zone 1 (1/7th of population) WITH utilities - dbh ≥7"	Utility Co.	118	n/a	Avg dbh = 19.0"
Routine Prune Zone 1 (1/7th of population) WITHOUT utilities - dbh ≥7"	Contract	240	\$45,600	Avg dbh = 19.0" Est. \$10/diameter inch

<b>TOTAL STAFF TIME</b>	<b>17 days</b>
<b>TOTAL CONTRACT COST</b>	<b>\$60,350</b>

~ Equipment costs not included.

~Expect to purchase a 1.5-2.0" caliper tree for this price.

~Trees under/around utility lines should be completed/cleared to a safe distance by utility organization.

# ATTACHMENT 2:

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## *Risk Management Guide*

### RISK MANAGEMENT

Risk: is the potential for suffering harm or loss

Risk Management: is the ability to minimize the potential for harm or loss from occurring by implementing a sound risk reduction strategy.

#### Types of Risk

- Financial
- Physical harm

#### A Risk-Reduction Strategy for Trees

- Evaluate the natural resource being managed
- Evaluate the resources available to you (fiscal, staff, equipment, etc.)
- Develop a policy statement
- Develop an action plan
- Periodic review of all four components

### EVALUATE THE NATURAL RESOURCES BEING MANAGED

#### Evaluate the Entire Population

An understanding of the entire population allows you to identify the key problem areas within the population.

- Species distribution
- Diameter distribution
- Condition distribution
- Defects
- Locations and targets

#### Identify Problematic Species

Identify the species that, based on your knowledge and experience, pose the greatest physical threat.

- High history of failure
- High storm damage potential
- Prone to high-risk structural defects

#### Identify Problematic Diameters

Identify the diameters that, based on your knowledge and experience, pose the greatest problem in your population.

- Large diameter trees

### Identify Problematic Conditions

Identify the conditions that, based on your knowledge and experience, pose the greatest problem in your population.

- Very poor trees
- Poor trees

### Identify Problematic Defects

Identify the defects that, based on your knowledge and experience, pose the greatest problem in your population.

- Basal decay and cavities
- Major dieback
- Poor branch attachments

### Identify Locations and Targets

Identify the locations and targets that, based on your knowledge and experience, pose the greatest physical threat in your population.

- Busy streets
- Playground areas

## EVALUATE THE RESOURCES AVAILABLE TO MANAGE

### Staffing

- Number
- Training
- Work load

### Equipment

- Diagnostic
- Capabilities/limitations
- Availability

### Fiscal

## CREATE A TREE RISK MANAGEMENT POLICY STATEMENT

### Components of a Policy Statement

- State your agency's understanding of its responsibility to maintain a safe public area.
- Identify the manager of the risk reduction program.
- List any general constraints on managing hazard trees such as financial or personnel.

The following is an example of a Hazard Tree Policy Statement:

The City of Metropolis has an active policy to maintain the safety of public lands from potentially hazardous trees. The City will strive to eliminate, in a timely fashion, any tree deemed hazardous. When available fiscal and human resources limit the ability of the City to remove high-risk trees,

priority shall be placed on trees deemed to carry the highest risk. The standard for rating the potential risk of a tree will be the International Society of Arboriculture's twelve point hazard evaluation system. The Director of Parks, Recreation and Forestry will administer this program and have final judgment in all matters concerning the mitigation measures taken for any tree deemed hazardous.

#### Benefits of a Policy Statement

- It defines for staff the overall mission of the company or agency as it relates to high-risk trees.
- Minimizes political influence
- Allows staff to do their job

#### DEVELOP AND IMPLEMENT AN ACTION PLAN

##### Goal

After evaluating your resources, define problem areas and broad solutions to those problems. View this as a wish list.

##### Objectives

Define clear objectives that address the general goals you have established. The details should be more specific. A good objective defines what is going to be done and in what timeline.

##### Actions

A series of actions should be identified that address each objective defined

#### PERIODIC REVIEW OF ALL FOUR COMPONENTS

Review all four components of your risk management plan frequently.