



**A REPORT TO HAMPDEN PARK ON THE MANAGEMENT OF TREES**

UNIVERSITY OF MINNESOTA, DEPT. OF FOREST RESOURCES

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## ***Introduction***

Hampden Park is a small, neighborhood park located at the intersection of Raymond Avenue and Hampden Avenue, Saint Paul, Minnesota. In 2008, the Urban Forest Management: Managing Urban Greenspaces class (FR 4501/5501) from the University of Minnesota's Department of Forest Resources conducted an inventory and risk assessment of the trees within the Park. (Attached: "A Report to the Saint Anthony Park Community Council 2008") Included in this report was an action plan for monitoring and treating the risks posed by existing trees within the Park.

In 2009, the FR 4501/5501 class once again met with representatives from the community and agreed to outline a long-term management plan for Hampden Park's urban forest. Specifically, the class was provided with the following "needs assessment" by the community:

1. A tree maintenance schedule (i.e., pruning cycle, type of pruning)
2. A tree replacement plan that is:
  - a. Consistent with retaining the existing balance of open space and tree cover.
  - b. Consistent with replacing the trees that have been evaluated and determined to be unacceptable risks for a public park.
  - c. Consistent with an evolving park landscape that includes a landscape that is becoming more shady in many areas.
3. Health and safety monitoring protocol (i.e., which trees/species need to be monitored more frequently for problems, and specifically, which problems).
4. General health maintenance, specifically, how to reduce watering requirements and mower/trimmer abuse.
5. Tree care responsibilities that residents can assume in cooperation with the City of St. Paul Forestry.

In 1983, a landscape design for Hampden Park was completed and subsequently installed within two years. This design complemented several existing trees, namely: the large bur oaks, a sliver maple and two large green ash. The remainder of the trees that exist in 2009 are the survivors of that landscape installation of approximately 25 years ago.

## ***State of the Park, 2009***

The relative health of the trees in Hampden Park is acceptable. To date, there are no disease or insect problems that are resulting in significant damage to the different tree species. However, on May 14, 2009, the emerald ash borer was discovered in at least one of the green ash in Hampden Park. The tree is not yet symptomatic.

Stem girdling roots have been identified on several trees, most notably the maples and lindens, and are affecting the health and most important, the structural integrity of said trees (see 2008 report). Some of the trees with stem girdling roots have been assessed as high or unacceptable risks, which is largely a prediction of premature failure due to a defect in the structural integrity of a tree (i.e., a tree's ability to hold together in a wind storm).

There are other health issues that have developed over time, namely the slow decline of the crabapples and Japanese tree lilac. Much of this decline is due to the gradual shading provided by a growing and developing taller tree canopy. Crabapples and lilacs are full-sun plants, and this is slowly becoming a landscape that is no longer suitable for them. In addition to the declining sun exposure, the trunks of those trees have been sadly and badly mutilated by lawn mowing equipment. In fact, all of the trees placed within the turf grass areas are suffering from the same unintentional vandalism of lawn mower and string trimmer stem girdling.

The use of the park is relatively constant during the daylight hours and would be described as light to moderate. During the traditional work/school hours, the park is used by both residents and visitors taking their lunches, relaxing and reading or socializing. In the evenings, the park has a very traditional neighborhood character with the majority of the users being residents of the neighborhood. The majority of the user activities in the park are passive: reading, sunbathing, walking, socializing.

### ***Maintenance of trees - pruning***

The most cost effective pruning cycle that will also have the least negative effect on tree health will be to prune every 2-3 years for newly planted trees for a period of approximately 10 years and every 5 years for established and seasoned trees. More frequent pruning visits to the trees results in smaller pruning wounds and less time spent at each tree, resulting in less tree stress and a reduction in the cost of pruning. ([Miller and Sylvester, 1981.](#))

The reason for the difference in pruning cycles is that smaller trees are vigorous growers and it is essential to establish a central leader early as well as leaving the smallest pruning wound possible. When trees are in the landscape for 10-30 years they still require developmental pruning but pruning will be less intense due to decreased growth rates and an increase in number of scaffold branches (large limbs that branch out from trunk) established from earlier pruning. When trees become seasoned their growth rate will continue to slow thus requiring almost no developmental pruning. The work that will then need to be done will be dead and diseased wood removal as branches are wounded by abiotic agents (such as wind, drought), biotic agents (such as fungal cankers, insect borers) or shaded out.

#### **Newly Planted Trees:** 2-3 year pruning cycle

**Type of pruning:** formative development of central leader and strong branch attachments.

Maintain 60% minimum live crown ratio (LCR) for deciduous trees and maintain 75% minimum LCR for conifers.

**Reference attachment:** [US Forest Service "How to Prune Trees"](#)

#### **Established Trees** (10 years in the landscape): 5 year pruning cycle

**Type of pruning:** developmental pruning for central leader and scaffold branches Strong branch attachments (remove all with included bark). Crown cleaning of dead wood, broken branches. Maintain minimum LCR.

**Seasoned** (30+ years in the landscape): 5 year pruning cycle

**Type of pruning:**

Crown cleaning.

Damaged branch pruning following loading events (storms).

**Reference attachment:** [Penn State Article on Pruning](#)

***Risk Assessment: 3 year cycle***

In 2008, students in the Urban Forest Management course conducted a risk assessment of all trees in Hampden Park. It is recommended that a standard monitoring cycle be established for assessing all trees and shrubs within the park. It is recommended that a formal risk assessment be conducted by the City of St. Paul Forestry Department on a three year cycle.

As a compliment to that cycle, annual monitoring by members of the Hampden Park community should be conducted, subsequently referred to as the "*Community Tree Care Program*." This monitoring would be a formal process of noting a the range of hazardous defects commonly associated with tree failures, completing report forms and submitting them to the St. Paul City Forestry Department. In addition to the formal City Forestry Department risk assessment monitoring cycle and the annual community hazardous defect monitoring, it is also recommended that a practice be established within the community to monitor the trees for damage and tree hazards following any significant storm "loading" events (e.g., wind storms, ice storms).

Identification of hazardous defects should be consistent with the protocol established by the U.S. Forest Service's "Urban Tree Risk Management" manual. Members of the community that are interested in monitoring the safety of the park trees would be required to attend a training workshop on the detection of hazardous defects in trees. See the section on Community Involvement for more information on the training workshops. Monitoring and assessment procedures would focus on the established and mature large trees, and all plant materials that could present safety issues related to blocked sight lines. Trees that were identified as high and unacceptable risks in 2008 should be monitored annually and have risk assessments conducted on the three year cycle.

**Reference attachment:** [Urban Tree Risk Management USDA Forest Service](#)

***Replanting***

To maintain the current levels of tree species and age diversity, a replanting strategy is a good option to ensure a vibrant and healthy park. This is important in order to keep with the current canopy coverage that the community views as one of the most important benefits of Hampden Park.

**Two options** to ensure a healthy canopy coverage:

**Replacement on a 1:1 basis.**

This means that as a tree is removed, it is immediately replaced with another tree of site-suitable species.

**Replacement in anticipation.**

If it has been found that a tree will have to be removed eventually, but not necessarily now, a tree or trees will be planted in advance of the trees' removal in close proximity to the anticipated removal tree.

It is important to consider the reasoning as to why the tree is failing and needs to be removed. If the source of the ailing tree is lack of light, it is important to choose a replacement species that is shade tolerant, and will also provide diversity and seasonal variety. Here are some Small to Medium species to consider:

- European Black Alder (*Alnus glutinosa*)
- Red Bud (*Cercis canadensis* Minnesota strain)
- 3-flowered Maple (*Acer triflorum*)
- Swiss Stone Pine (*Pinus cembra*)
- Blue Beech (*Carpinus caroliniana*)
- Ironwood (*Ostrya virginiana*)
- Other species included in the 2008 report.

Some Medium to Larger species to consider:

- Red maple (*Acer rubrum*) cultivated varieties
- Sugar maple (*Acer saccharum*) "Fall Fiesta"
- Oaks (*Quercus* sp.) including bicolor oak (*Q. bicolor*) and bur (*Q. macrocarpa*).
- American basswood (*Tilia americana*)
- White pine (*Pinus strobus*)
- Balsam fir (*Abies balsamea*)
- Hemlock (*Tsuga Canadensis*)

Trees planted as anticipated replacements should be spaced 12-20 feet on center, depending on the desired effect. No, 12 feet on center is not too close. This is a common plantation forest spacing.

Autumn planting is recommended whenever possible. Plants establish better when planted (and watered and mulched) from late August through late October and are more likely to survive the stressful months of summer.

**General Health Management**

**I. Reduce mower and string trimmer damage.**

Mower and string trimmer damage to the trees in the landscape is inexcusable, very damaging and extensive. If no measures are taken to reduce this type of damage, it is recommended that no new trees or shrubs be added to the park landscape. Potential solutions to the problem:

- A. Beds/Masses vs. Specimens. Whenever possible, plant trees and shrubs in masses that can be maintained as mulched beds. Hardwood shredded mulch, 4 inches thick.
- B. Mulched individual trees/shrubs. Incorporate individual trees and shrubs within mulch "rings" extending a minimum of three feet out from the plant stems.
- C. Herbicide (glyphosate) cleared "rings" around individual trees and shrubs. Herbicide rings extended out two feet from the plant stems.

## **II. Monitor key plant/key problems**

### **Key Plant<sup>1</sup> Key Problem<sup>2</sup> for Hampden Park**

Outside of other deteriorating factors for the trees, such as stem girdling roots and salt damage, the following table outlines specific health problems for the Key Plants located in Hampden Park.

<sup>1</sup>A Key Plant is defined in this plan as any species whose presence is crucial for maintaining the integrity of the park or a tree species that is prevalent in the park.

<sup>2</sup>A Key Problem is defined as any problem that threatens to kill the tree or alter the integrity of the tree in a detrimental way.

Monitoring for these problems involves consulting the references for the biotic problems, learning the life cycles of the potential problems, determining which stages of the life cycles are most damaging and easiest to control (for instance, the larval stage of gypsy moth), and checking the plants at the time of the year those stages are most likely to be present and obvious. As an example with gypsy moth, the egg masses may be found from late summer to late spring. If found, the masses can be scraped off the tree and discarded, preventing any feeding damage on the tree by the hatched larvae.

| <b><u>Key Plant</u></b> | <b><u>Key Problem</u></b>    | <b><u>Cause</u></b> | <b><u>Frequency of Inspection</u></b> | <b><u>References</u></b> |
|-------------------------|------------------------------|---------------------|---------------------------------------|--------------------------|
| <i>Quercus</i>          | Oak Wilt                     | Fungus              | Annually Spring/Summer                | 1                        |
|                         | Two – Lined Chestnut borer   | Insect              | Annually                              | 2                        |
|                         | Gypsy Moth                   | Insect              | Annually                              | 3                        |
|                         | Anthracoese                  | Fungus              | Annually                              | 4                        |
| <i>Fraxinus</i>         | Emerald Ash Borer            | Insect              | Annually                              | 5                        |
|                         | Ash Yellowes                 | Phytoplasma         | Annually                              | 6                        |
|                         | Anthracoese                  | Fungus              | Annually                              | 14                       |
|                         | Verticillium Wilt            | Fungus              | Annually                              | 7                        |
| <i>Acer</i>             | Verticillium Wilt            | Fungus              | Annually                              | 7                        |
|                         | Asian Long Horned Beetle     | Insect              | Annually                              | 8                        |
| <i>Picea</i>            | Rhizosphaera Needle Cast     | Fungus              | Annually                              | 9                        |
|                         | Cytospora Canker             | Fungus              | Annually                              | 10                       |
| <i>Pinus</i>            | Diplodia Tip Blight of Pines | Fungus              | Annually                              | 11                       |
|                         | Other Blights of Pines       | Fungus              | Annually                              | 12                       |
| <i>Pseudotsuga</i>      | Rhizosphaera Needle Cast     | Fungus              | Annually                              | 9                        |
|                         | Rhabdocline Needle Cast      | Fungus              | Annually                              | 13                       |
|                         | Swiss Needle Cast            | Fungus              | Annually                              | 13                       |

### ***References for Key Plant/Key Problems***

1. How to Identify, Control, and Prevent Oak Wilt

[http://www.na.fs.fed.us/spfo/pubs/howtos/ht\\_oakwilt/toc.htm](http://www.na.fs.fed.us/spfo/pubs/howtos/ht_oakwilt/toc.htm)

2. USDA Two – Lined Chestnut Borer

<http://www.na.fs.fed.us/Spfo/pubs/fidls/chestnutborer/chestnutborer.htm>

3. USDA Gypsy Moth

<http://www.na.fs.fed.us/spfo/pubs/fidls/gypsymoth/gypsy.htm>

4. University of Minnesota Extension Anthracnose

<http://www.extension.umn.edu/yardandgarden/ygbriefs/P432oakanthracnose.html>

5. Emerald Ash Borer Response Site USDA Forest Service

<http://www.emeraldashborer.info/identifieab.cfm>

6. USDA Forest Service How to Identify and Manage Ash Yellows in Forest Stands and Home Landscapes

[http://www.na.fs.fed.us/spfo/pubs/howtos/ht\\_ash/ash\\_yell.pdf](http://www.na.fs.fed.us/spfo/pubs/howtos/ht_ash/ash_yell.pdf)

7. University of Minnesota Extension Verticillium Wilt

<http://www.extension.umn.edu/distribution/horticulture/DG1164.html>

8. Asian Longhorned Beetle USDA Forest Service

[http://www.na.fs.fed.us/pubs/palerts/alb/alb\\_pa.pdf](http://www.na.fs.fed.us/pubs/palerts/alb/alb_pa.pdf)

9. Rainbow Treecare Rhizosphaera Needle Cast

<http://www.rainbowtreecare.com/diseases/rhizosphaera.htm>

10. University of Wisconsin Extension Cytospora Canker

<http://www.uwex.edu/ces/wihort/gardenfacts/XHT1003.pdf>

11. Diplodia Blight of Pines USDA Forest Service

<http://www.na.fs.fed.us/spfo/pubs/fidls/diplodia/diplodiafidl.htm>

12. Pocket Guide to Red Pine Diseases and their Management USDA Forest Service

<http://www.na.fs.fed.us/SPFO/pubs/misc/red%20pine%20pocket%20guide/covcontent.htm>

13. How to Identify and Control Rhabdocline and Swiss Needle Cast of Douglas Fir By USDA Forest Service

[http://www.na.fs.fed.us/spfo/pubs/howtos/ht\\_df-ndlcst/ndlcst.htm](http://www.na.fs.fed.us/spfo/pubs/howtos/ht_df-ndlcst/ndlcst.htm)

14. University of Minnesota Extension Ash Anthracnose

<http://www.extension.umn.edu/projects/yardandgarden/ygbriefs/p413ashanthrac.html>

## ***"Community" involvement: Actions & Training***

### **Training**

Members of the Hampden Park neighborhood who wish to become involved in the maintenance of their park would be invited to attend free training sessions conducted by the University of Minnesota in cooperation with St. Paul Forestry.

**Community Tree Care Volunteer** training, provided by the 2010 Urban Forest Management: Managing Urban Greenspaces class (FR 4501/5501).

Training sessions are proposed to be 1/2 day programs on *best planting practices, formative pruning of young trees and recognizing/reporting tree hazards*.

**Best Planting Practices** (UMN Tree Research Nursery, St. Paul campus):

1. Handling, preparing and planting bare-rooted and containerized trees and shrubs.
2. Mulching new plantings.
3. Watering the plants for the first year.
4. Establishment period watering: demonstrate and teach installation watering systems/programs (e.g. ooze tubes), frequency (use of rain gauges) creating Citizen Waterers.  
[How Much Does it Cost to Water This Tree?\(pdf\)](#)

Goals: To assist the City of St. Paul with installation and maintenance of plant materials in Hampden Park.  
To ensure a high survival rate through the establishment period (10 years).

**Formative Pruning of Young Trees** (UMN Tree Research Nursery, St. Paul campus):

Tools: Community volunteers will be trained in the safe use of pruning equipment, to include:  
hand saws  
pole pruners  
hand shears

Goals:  
1. Eliminating multiple leaders  
2. Minimize weak branch attachments  
3. Shrubs pruning maintenance

**Recognizing and Reporting Tree Hazards** (1/2 day training at Hampden Park):

1. Training on recognizing common defects that lead to hazard situations with trees.
2. Filling out hazard report forms.
3. Submit information to the City of St. Paul.

Text: Chapter 2 - [Community Tree Risk Management: Program Planning and Design](#)

**Why involve the Community? A selection of articles on the value of empowering neighborhoods through the use of trained volunteers.**

[Urban Forestry and Volunteer Management by John Ball](#)

[Resident Involvement in inspecting trees for dutch elm disease](#)

[Partnership opportunities in neighborhood tree planting initiatives: building from local knowledge \(pdf\)](#)

[Keeping Trees Watered](#) : An excellent article on community involvement that focuses on keeping trees watered and healthy and keeping the community connected. Some excerpts:

1. A GIS-mapped inventory allows an organization to track which trees need water and mobilize volunteers. Using GIS maps, volunteers can reach more trees in less time.
2. In most jurisdictions, the local government does not have funds for tree maintenance. Developing partnerships with local government to ensure tree care can be a win-win for your organization and the local government.
3. Summer watering programs can be an excellent way of keeping your volunteers engaged throughout the year - not just during planting months.
4. Placing the logos of participating organizations on the Ooze Tubes (or other watering system) provides publicity for the program and for the organizations. (Opportunity to involve sponsors)
5. Interest in the watering program may vary from year to year based on the climatic conditions.

