A Report to the Saint Anthony Park Community Council, District 12, City of Saint Paul, MN

Date: May 7, 2008
From: University of Minnesota, Forest Resources 4501/5501 class on Managing Greenspaces in Urban Areas.
Re: Risk Assessment of existing tree resource in Hampden Park and a Management Plan based on the assessment.

Caveats:

This assessment and management plan based on an interpretation of the inventory and assessment of said park was the product of an impromptu classroom exercise by the students in FR 4501/5501, University of Minnesota, Department of Forest Resources. The exercise was intended to provide a local "outdoor" laboratory experience for learning and to help the St. Anthony Park Community Council evaluate its Hampden Park resource. This product is an overview of the levels of risk that the tree resource present to users of the park, a species and age distribution analysis of the park, and a general management plan for managing identified risks. Responsibility for the accuracy of the analysis is not assumed by the University of Minnesota, Department of Forest Resources, FR 4501.5501 class.

Acknowledgements:

The Forest Resources 4501/5501 class (Managing Greenspaces in Urban Environments) is grateful to the City of Saint Paul Department of Forestry, and the Saint Anthony Park Community Council for the opportunity to evaluate the status of the Hampden Park tree resource as a classroom exercise.

Background:

The University of Minnesota, Department of Forest Resources was approached by the Saint Anthony Park Community Council with the request to assist with a management plan for Hampden Park. In 1983, the planting plan was developed and installed (assumed) in that year. Along with the new planting plan, the park did have several existing semi- to mature trees. In 2007, the Metropolitan Design Center submitted three conceptual planting plans for a redesign/planting of Hampden Park.

Hampden Park is both a neighborhood park and a point of destination for some people seeking recreation, opportunities to take lunch outside, or for socialization. To that end, public safety is paramount and precedes design preferences. Tree risk assessment was conducted using criteria common to professional arboriculture (care and management of trees, shrubs and vines). Strength Loss Determination was conducted using a version of Wagener's 1963 formula for assessing strength loss due to decay on softwood trees. This formula was modified by Bartlett Tree Research Laboratories (Fraedrich, 1999) to its current version. Root Collar Examinations were conducted using protocol developed at the University of Minnesota, Department of Forest Resources (Hauer and Johnson, 2000). All information collected during April and May, 2008 was field recorded on a customized Inventory sheet (ATTACHMENT 1).

Results

I. **Inventory and Assessment.** (ATTACHMENT 2 for raw data)

A. Diversity in Park (ATTACHMENT 3)
27 species
15 genera
5 genera comprising the majority of individuals in the park
Very diverse park

Age Diversity (ATTACHMENT 4)
(Figure 2 in notes) Breakdown of age classes by 5 main genera.

B. Health/Risk assessment by species/genera

Norway maples- High risk. All but one tree fell into moderate or unacceptable risk categories due to:

1. Codominant leaders with included bark. Some had early symptoms of failure, with cracks developing in branch unions.
2. SGR on majority of trees (12 trees). An SGR examination was conducted on one tree and it had greater than 50% constriction (pass a recommended threshold).
3. Half ranked a 2 on stem condition. One tree was ranked a 1 and is at a high risk level (intense stem decay)

Silver maple- low risk to moderate risk, depending on extent of decay in main leader.

Sugar maples- low risk.
One is dead in need of removal.
Others in relatively good condition.

Ohio Buckeye- low risk.
Healthy.
Low codominants (no cracking).

River Birch- low risk
One has a low codominant

Green Ash- low to moderate risk potentials.
Significant deadwood in all but one ash. Dead wood in canopy poses risk of falling branches.
One large ash has large crack in the main stem

Honey locusts- low risk.
Healthy.
Minor deadwood in canopy.

Walnut- low risk
Healthy.

Crab Apples- low risk
Lawn mower damage to stems is common.
Profuse suckering on several specimens.

Cork Tree- one tree low risk, one moderate.
The moderate risk tree has a strength loss of 48% (moderate because of short stature)

Picea- low risk.
Very healthy trees in good condition, doing well in the park.

Pinus- low risk.
Scott pines are declining in health (moderate woodpecker damage on stems).
Other pines are healthy (some are being shaded).

Psuedotsuga- low risk.
Healthy trees in good condition.

Bur oaks- low to moderate risk.
Moderate dead wood in canopy poses risk.

Red/Pin oak- low risk.
Healthy trees in good condition.

Tree lilac- Low risk.
SGRs on two, but short in stature.
Shaded out by taller trees.

Tilia- moderate to high to unacceptable risk
One is unacceptable risk with large crack at codominants attachment.
Many codominants on the majority of them.
Majority has or are suspect of SGR.
Stem conditions range from 1-3.

II. Management Recommendations.

A. Tree/Shrub Resource.

1. Risk Management:
    - High priority removal: Dead sugar maple, Norway maples and lindens with unacceptable risks.
    - Crown cleaning of all ash, maples, oaks and others with identified dead wood or hangers.
    - Removal of codominant leaders, especially on Norway maples and Lindens.
    - Cabling trees with identified codominant leader and included bark situations but only those that have not developed cracks in the branch unions, in particular the Norway maples, lindens, the one river birch, green ash.
    - Perform root collar exams on all suspect Norway maples and lindens.
    - Perform strength loss exam on large green ash in middle of park, sugar maple on south side near the path entrance and the large silver maple on the north central perimeter.

2. Species Replacement/Replanting.

    - What is the ultimate goal?
        Arboretum – wide diversity of species in small numbers?
        Traditional park – lower diversity with a more standard or more formal layout?
    - Replace trees as they are removed to retain original design elements?

    - As the Scot's pine are beginning to decline in health, they may become a vector for the pine bark beetle, which could then move on to the healthy pine trees in the park. The Scot's pine should be monitored closely for the presence of the beetle as long as they remain standing.

    - Interplant between mature trees to provide for replacement trees as mature trees fail? Consider interplanting in one line or in staggered lines.

    - **Replacement trees**

      Consider species that are currently performing well on site:
      River birch, honeylocust, walnut, Ohio buckeye, oak, Douglas fir, Austrian and ponderosa pine, Colorado blue spruce.

Consider additional species for variety
Catalpa, Princeton elm, red maple, yellow birch, Japanese pagoda tree (Sophora), bitternut, hemlock, Kentucky coffeetree.

Consider replanting linden, but monitor the planting to ensure proper planting depth, consider maintenance needs when selecting varieties, and consult with the city arborist for suggestions.

Consider current and future sun exposure and use shade tolerant species as replacements/amendment.

- **Small Trees and Large Shrubs**
  Understory species – We are recommending the replacement of Japanese tree lilac, Amur cork (48% strength loss), crabapple, and Scot's pine. Large, mature trees surround these small trees. Consider replanting with shade-tolerant, small trees or large shrubs.

  Species to consider:
  Speckled alder, red bud (Cercis) , sterile crabapple varieties, 3-flowered maple, Freedom honeysuckle, Swiss stone pine, wayfaring tree Viburnum, American hazelnut (Corylus), gray dogwood (Cornus), redosier dogwood, Eastern wahoo (Euonymus), blue beech (Carpinus), ironwood (Ostrya).

  Choose species to provide diversity and seasonal variety.

  Trees and shrubs planted in groupings can provide visual interest, break up large spaces and provide songbird habitat. Groupings should be entirely mulched to avoid lawnmower conflict.

B. Raingardens.

- Raingarden installation is quite invasive and typically requires the removal of up to two feet of native soil. As the majority of a tree's roots are within the first foot of soil, and a tree's root system typically extends outward, 2 – 3 times the diameter of the crown, root damage is almost inevitable. To minimize tree damage and root severance, consider placing raingardens in voids created by tree failure or removal.
- Avoid the critical root zone (CRZ) of trees during construction. The CRZ is 1 – 1.5 times the dbh expressed in feet. (A tree with a

dbh of 10" has a CRZ of 10 – 15 feet extending outward from the trunk.)

- Consider trenching construction boundaries with a vibratory plow or ditch witch to minimize tree root damage.
- Install chain-link fencing to protect trees and minimize site disturbance during construction activities. Compacting the soil above tree roots, or suffocating tree roots by piling soil on top of them is just as destructive as root severance.
- Insist on a percolation test prior to raingarden installation to determine the requirements for over-excavation and the need for soil amendments.
- Insist that the raingardens are excavated with an excavator or by hand. Avoid equipment such as a skidsteer that have to enter the basin, as compaction by this equipment will cause the raingarden to fail.
- Reconsider the concept of an aspen raingarden. Aspen grow quickly, sucker profusely, and fail often. Rethink this concept using a specimen tree or two and focus on shrubs or herbaceous plants.
- Design the raingardens so maintenance is straightforward. The city does not have the resources available to perform all of the necessary maintenance. Volunteer involvement is crucial in maintaining a beautiful and functional raingarden. Start with large container plants (1 gallon grasses and 3.5" forbs) so weed competition is not an overwhelming factor and the plants are easily identifiable. Plant species in groupings so identification is easy. Plant a low diversity of species so it does not take a botanist to weed the planting. Choose species with seasonal appeal so it can be enjoyed year-round.

C. Butterfly gardens

- Safety – avoid planting butterfly gardens in areas where children play and park visitors eat. Flowers not only attract butterflies, they attract bees as well. Bee allergies can be life threatening.
- Spend time in the park watching visitor use patterns. Avoid planning a garden, planting a tree, or installing a path in an open area used for active recreation. Remember that this is a city park that should allow for multiple uses.
- As with raingardens, consider simplifying the design of a butterfly garden to allow for straightforward maintenance by volunteers.

D. Trails

- The existing trail system appears to provide full access to the site. No compacted "deer paths" are visible.

- As mentioned previously, construction activities are damaging to trees and tree roots. We recommend minimizing the construction of new paths to avoid tree injury.
- The installation of pervious pavers results in identical damage to tree roots as traditional paving systems. Pervious pavers do not allow for equal access to all park visitors, for example, in-line skaters.

E. Volunteers

- Maintenance – By design, a garden requires a gardener. Remember that for every garden on site, be it a raingarden or butterfly garden, somebody (or some bodies) will have to assume ownership and maintain the space. Volunteers come and go, so the gardens need to be manageable in size and design.
- Mulch – One activity that requires very little skill, but is great for volunteers is mulching trees. Tree mulching helps to maintain soil moisture and moderate soil temperatures. Best of all, it keeps lawnmowers and weed whips at bay, which decreases trunk damage.
- Fundraising – The city is currently on a 10-year, tree trimming cycle. In an effort to increase the trimming cycle at Hampden Park, the community could raise funds to have city crews visit the park on a more frequent basis so any new trees are properly maintained early in their development. Fundraising could also offset the city's costs for procedures such as cabling and strength loss examinations, making them a more feasible option.

F. Community input

You are strongly encouraged to perform direct mailings to the residences most directly impacted by the proposed project work. The more you try to connect with the adjacent landowners, and the more you work toward a common goal, the more pride and ownership the community will absorb in the process.

References

Fraedrich, B.R. 1999. Tree Risk Management – Hazard Trees. Bartlett Tree Research Laboratories, Charlotte, NC.

Hauer, Richard and Gary Johnson. 2000. A Practitioner's Guide to Stem Girdling Roots. USFS Northeastern Area, and the University of Minnesota Extension Service.

Hayes, Ed. 2001. Evaluating Tree Defects, 2nd Edition. Safetrees, Rochester, MN.

Wagener, W.W. 1963. Judging Hazards from Native Trees in California Recreational Areas: A Guide for Professional Foresters. USFS Research Paper PSW-P1.

ATTACHMENT 1

Hampden Park Tree Management Inventory

Species Diversity.

Inventory Data for: (Genus)_____(species) _____

Age (size) Distribution:
- <6 " d.b.h.:
- 6-12" d.b.h.:
- 12-18" d.b.h.:
- 18-24" d.b.h.:
- >24" d.b.h.:

Condition: (number of trees that fall into the category)

Stem:	4:
	3:
	2:
	1:
	0:
Canopy:	4:
	3:
	2:
	1:
	0:

Risk Assessment: (number of trees that fall into the category)
- Low:
- Moderate:
- High:
- Unacceptable:

Maintenance/Removals:
- Crown Cleaning:
- Crown Raising:
- Crown Reduction:
- Cabling: If yes, which one/s:
- Removal: If yes, which one/s:

Replacements:
- Replacement with same species:
- Replacement with different species:
  - Which species for replacement:

ATTACHMENT 2

Hampden Park Inventory and Assessment

Species diversity:

3	Abies balsamea
13	Acer platanoides
1	Acer saccharinum
4	Acer saccharum (1 species, 3 “Green Mountain”)
4	Aesculus glabra
2	Betula nigra
19	Fraxinus pennsylvanica
4	Gleditsia triacanthos “Skyline” and “Sunburst” (2 and 2)
1	Juglans nigra
6	Malus varieties
2	Phellodendron amurense
35	Picea species: pungens, glauca densata
10	Pinus species: ponderosa, nigra
1	Pinus strobus
3	Pinus sylvestris
13	Pseudotsuga menziesii
1	Quercus bicolor
3	Quercus macrocarpa
2	Quercus species: palustris, rubra
3	Syringa japonica
5	Tilia cordata (?)

Genera diversity:

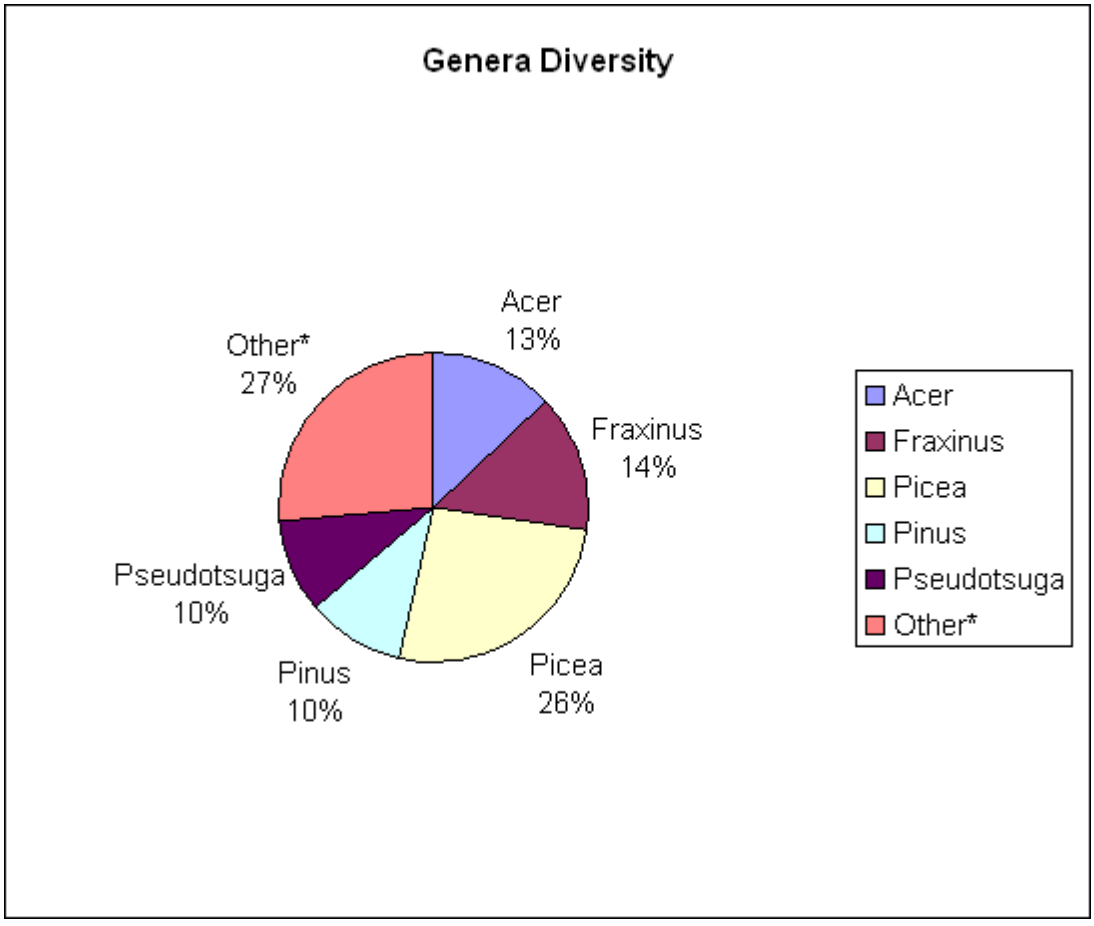
3	Abies
18	Acer
4	Aesculus
2	Betula
19	Fraxinus
4	Gleditsia
1	Juglans
6	Malus
2	Phellodendron
35	Picea
14	Pinus
13	Pseudotsuga
6	Quercus
3	Syringa
5	Tilia

ATTACHMENT 3

Genera Diversity in Hampden Park

Genus	# of Trees	%
Acer	18	13
Fraxinus	19	14
Picea	35	26
Pinus	14	10
Pseudotsuga	13	10
Other*	36	27

*Other includes, Abies, Aesculus, Betula, Gleditsia, Juglans, Malus, Phellodendron, Quercus, Syringa, and Tilia.



ATTACHMENT 4

Age-Class Diversity by Genera

Genus	Size	Number
Abies	6-12”	3
Acer	6-12”	1
	12-18”	6
	18-24”	10
	>24”	1
Aesculus	<6”	1
	6-12”	3
Betula	6-12”	2
Fraxinus	6-12”	3
	12-18”	12
	18-24”	1
	>24”	3
Gleditsia	6-12”	4
Juglans	6-12”	1
Malus	<6”	2
	6-12”	3
	12-18”	1
Phellodendron	6-12”	1
	12-18”	1
Picea	<6”	8
	6-12”	23
	12-18”	4
Pinus	<6”	2
	6-12”	11
	12-18”	1
Pseudotsuga	<6”	2
	6-12”	11
Quercus	<6”	2
	6-12”	1
	18-24”	1
	>24”	2
Syringa	<6”	1
	6-12”	2
Tilia	12-18”	1
	18-24”	1
	>24	3