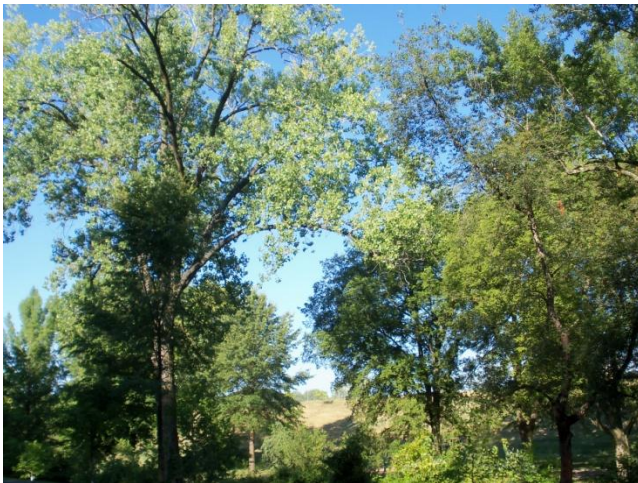


TREE MANAGEMENT PLAN



**City of Washington
Parks and Recreation Department
2013**

INTRODUCTION

One of the missions of the City should be to maintain public policies that address tree management within its jurisdiction. In order to consistently carry out its mission and serve the needs of the people, the City has developed this “Tree Management Plan” to provide overall direction to the City in the management of trees. This Plan strives to balance the duality of providing for parks and recreation in all park areas while responsibly managing natural resources such as vegetation, soil, and water. The “Tree Management Plan” will provide sound direction in the maintenance of parks and public trees to ensure optimum benefits to the environment and the community.

Trees provide a multitude of benefits that enhance the quality of our lives. The maintenance and management of these valuable resources is essential for the long term welfare of Washington and its citizens. The health of the urban forest is a major indicator of the health of our ecosystem.

BACKGROUND

The parks and recreation system manages thousands of trees that cover parks, natural areas, and public facilities. Trees and forests are long-term investments to the urban society that must be managed with the same skill and diligence as any city asset.

Public trees and forests in Washington can be classified into three categories:

- **Street/Public Trees:** These trees require the greatest level of maintenance and have the highest level of tree/people interaction. Because of the constrained and difficult growing conditions, these trees are most likely to suffer from mechanical damage, biotic and abiotic disorders and vandalism. The management of the street tree population directly affects the adjacent property owners and the character of the community.
- **Formal Park Areas:** These trees require frequent maintenance and have a high likelihood of tree/people interaction. These trees also have a potential for mechanical injury and demand a high level of care and consideration during design and construction activities.
- **Periphery of Formal Park Areas/Natural Areas:** These trees require the least amount of maintenance because of their often remote and sheltered locations. The trees in these areas are managed not as individual trees, but rather as stands of trees linked to the associated plants and sites on which they reside.

These trees can come in conflict with people when they occur along property lines, adjacent to man-made structures or near gathering places.

DESIGN

Selection

Selecting trees that adapt well to their site and fulfill their landscape function is extremely important to the success and maintenance of a planting. The quality of young plants is also crucial. A plant species should be selected on the basis of its functional uses, its adaptation to the site, and the amount of care it will require.

Landscape Functions

There are four main functions to consider when selecting trees to include in the landscape design.

- **Architectural features:** privacy, view enhancement, and space articulation.
- **Engineering:** reduce glare, direct traffic, filter air, reduce soil erosion, and attenuate noise.
- **Climatic influences:** transpirational cooling; interception of solar radiation, reflection, and re-radiation; and modification of rain, fog and snow deposition.
- **Aesthetic uses:** form, color, and texture.

Site Adaptation

It is important to plant the right tree in the right place. The intended landscape use and nature of a site should be considered when selecting for growth habit and ultimate size. Mature size is an important consideration. The tree should not outgrow its allotted space given such constraints as vistas and power-lines. The following table may be used as a guide in selecting the right tree:

Tree Selection Factors

FEATURE	BENEFIT
Rate of Growth	Fast-growing trees tolerate difficult sites, are usually weak-wooded and subject to limb breakage; and generally are shorter lived. The opposite is generally true for slow-growing trees.
Wood Strength	When a tree decays or weakens, it can become a hazard to the surrounding area. Strength is based on the trees ability to withstand wind loads, snow bearing loads, water saturation or drought, and its adaptability to its surroundings.
Rooting	Roots are what keep the tree anchored in the ground. Through them pass nutrients and water that nourish and support the tree. Stressors such as drought, flooding, disturbance, disease, or damage can greatly affect tree roots and the health of the tree.
Plant Features	<ul style="list-style-type: none"> • Leaves: Color, size, persistence • Thorns and prickly foliage: Enhanced security vs. maintenance problems • Flowers and fruit: Aesthetic consideration, wildlife habitat. Potentially increased maintenance.
Climatic Adaptation	<ul style="list-style-type: none"> • Plant hardiness and local minimum temperatures. • Moisture-natural or irrigated. • Light – reflect or allow for winter heating. • Wind – deflect or channel wind patterns.
Soils	Poor soils can cause failure of planting. Amendment not desirable or feasible. Match plant to soil condition.
Air pollution	Choose trees with appropriate tolerance level.
Pest Resistance	Resistant plant material will reduce maintenance.
Native Plants	Native or indigenous plants may not perform as well as exotic or non-native species. Most urban landscape sites are no longer “native”. Soils, microclimates and water regimes have changed.
Selecting Quality Stock	Selection of quality planting stock is as important to success as selection of proper species, planting and maintenance. Root and shoot quality can determine not only performance but also survival.
Roots and defects	Kink roots, girdling (circling roots) can eventually “choke” a tree.
Top & Trunk Characteristics	<ul style="list-style-type: none"> • Height-to-Caliper ratio • Crown configuration • Branching pattern

BEST MANAGEMENT PRACTICES (BMP's)

The management and maintenance of trees by the City of Washington Parks and Recreation Department consists of a number of practices. The practices are covered in the following section and include: planting, pruning, removal, inventory and routine inspections, irrigation, fertilization and pest management.

Street and Park Tree Planting

- All plant material shall be nursery grown under climate conditions similar to or hardier than at the site and meet or exceed The American Standards for Nursery Stock (ANSI Z60. 1-1996).
- Ideal planting hole should be 2 to 5 times the diameter of the root spread or root ball.
- Minimum planting hole shall be 12 inches wider in diameter than root spread or root ball.
- The hole shall be no deeper than the ball and the ball shall sit firmly on undisturbed subsoil.
- Native soil shall be used to backfill the planting hole except in situations where the existing soil is contaminated or filled with rubble or pure clay.
- Ball-and-burlapped (B&B) trees shall be placed in the hole and plumbed vertically. All rope shall be removed from around the trunk of the tree and the top ½ of the burlap shall be folded back down into the hole. Whenever possible, remove the top 1/2 of burlap by cutting it away with a sharp knife. Trees in wire baskets shall have the top ½ of the basket removed, using bolt cutters, to expose the top 18 inches of the ball.
- B&B packaging material shall not be removed until the tree is placed in the hole and securely plumbed into its final position. No false balls shall be used.
- Soil should be backfilled in lifts of 4 to 6 inches at a time with compaction of each layer. Do not compact saturated soil. Water thoroughly after backfilling to settle the soil, eliminate air pockets and re-wet the root system.
- Trees planted in sandy or loamy soil should have a 3 – inch high berm erected just past the perimeter of the planting hole to funnel water to the root ball and wet the hole or sidewall interface. Berms should not be constructed in clay soils or on heavily compacted sites.
- All trees shall be mulched with 3 to 4 inches of shredded hardwood or died brown mulch immediately after backfilling. Maintain 3 to 4 inches of mulch annually.
- Mulch shall extend past the diameter of the tree planting pit at least 6 inches.

- Mulch shall be kept away from the tree trunk. Mulch shall taper from the 3-inch depth back to grade right at the trunk to avoid decay of bark tissues.
- Newly planted trees shall be watered weekly through the first three growing seasons.
- Tree shall receive approximately 1 inch of water per week including rainfall.
- Weeds should be suppressed within the mulch ring to eliminate competition and for aesthetics in formal parks and along streets.
- Weeds and/or turf grass shall not be allowed to grow up to the tree trunk at any time. This increases the likelihood of mechanical trunk injury.
- Ideal months for planting are October through April, as long as the ground is unfrozen.
- Stake only in situations where normal planting procedures do not provide a stable plant. Otherwise, staking is generally not required.
- Stakes and ties shall be removed at the end of the first year.
- Root flare shall be at, or slightly above, grade to allow for slight settling.
- Tree trunks shall not be wrapped.
- Tree trunk wrapping materials, tags, and all ties shall be removed at time of planting.

Natural Area Planting

- All plant material shall be nursery grown under climate conditions similar to or hardier than at the site and meet or exceed The American Standards for Nursery Stock (ANSI Z60. 1-1996).
- A 5-by-5 foot area should be free of competing vegetation for 3 years.
- Staking of newly planted trees is not generally necessary.
- New trees shall be watered bi-weekly during summer drought stress periods for the first two to three establishment seasons.

Container/Bare Root Planting

- All plant material shall be nursery grown under climate conditions similar to or hardier than at the site and meet or exceed The American Standards for Nursery Stock (ANSI Z60. 1-1996).
- Tease pot bound roots with hands or tools prior to final placement in planting pit.
- Bare root plants shall be protected from root drying prior to and immediately after planting.
- Cleanly prune exceptionally long roots to create a uniform root mass.
- Plant bare root stock at the same grade as grown in the nursery.

Tree Removal

Due to the economic, environmental and social benefits of trees, their removal must be well thought out and documented. At times, trees may be removed for new park construction, access or other issues not related to tree viability:

Hazard Trees

- Tree hazard assessments shall be performed by qualified personnel to the standards established by the international Society of Arboriculture.
- Hazard trees that cannot be made safe or functional by appropriate mitigation shall be candidates for removal.
- Hazard rating shall be the first determining factor in removal decisions.

Transplanting

If trees are smaller than 10 to 12 inches in diameter, it is possible to transplant them with an appropriately-sized tree-spade. The cost of transplanting should be weighed against the cost of replacing the tree with a new smaller caliper tree. Establishment of large trees is often less successful than planting a new one. The value of the tree to be transplanted should also be taken into account when deciding on removal or replacement rather than transplanting.

Irrigation

- In general, established trees do not require supplemental irrigation, as site conditions such as soil type and slope, exposure and moisture requirements of trees dictate both frequency and duration of application.
- Valuable specimen trees may be irrigated during periods of extreme drought.
- Turf grass irrigation around established trees needs to be modified to accommodate the water requirements of the trees.
- Consider pedestrian access, park usage, and available personnel when establishing irrigation schedules.
- Visually test and monitor the system weekly.

Pruning

Pruning is sometimes necessary for young street trees. Branches that grow into a right-of-way or too close to power-lines can be very dangerous. Usually, branches that grow 8 feet above a sidewalk or below 12 feet above a street shall be cut back.

Dead braches should be pruned to restore vigor to a tree. All pruning shall be performed to current ANSI Z133 standards.

Learning the proper method is important as you can seriously wound or even kill a tree. The best time to prune living branches is late in the dormant season or very early in spring before leaves form. Dead dying branches can be pruned anytime. Use clean sharp tools and make clean cuts.

Do Not:

- Leave living or dead stubs.
- Injure or remove the branch collar
- Paint cuts

Topping is prohibited.

Liability Tree Monitoring

Once a tree is designated as a liability tree it shall become the burden of the staff at hand. Although it may be easier and less complicated to simply remove all liabilities, the conservation of trees is something that must be considered until the tree can either be replaced or the tree becomes too great of a liability and must be removed.

INTEGRATED PEST MANAGEMENT (IPM)

Trees are an integral part of most landscapes, whether formal or natural, and are considered an asset. They provide shade, clean the air of pollutants, modify both micro and macro climates, and provide visual relief to the urban environment. Because trees are often very large and tall, accessing and managing insects and disease can be quite difficult and costly.

1. Pest Tolerance Thresholds

- In general, insect and disease pests in trees are tolerated.
- Insect or disease pests in selected, high-value specimen trees may be subject to control measures.

2. Pest Management Strategies

- **Physical Damage to Trees** – Physical damage to trees can be a major factor in overall loss of trees. This damage most often occurs in one of two ways. One is when trees are repeatedly struck by mowing equipment. A second form of injury is by string trimmers, which can damage bark leading ultimately to tree loss. Many trees are also lost to lack of appropriate care during construction projects within existing parks.
 - Removing turf from around the tree base to create tree mulch rings 3 to 4 feet in diameter can substantially reduce damage caused by mowers and trimmers. With tree mulch rings, a mower or trimmer never has to come close enough to the tree to cause damage. The tree mulch ring will need to be kept free of grass and weeds.
 - Construction Site Management substantially reduces or eliminates damage from construction activities.
 - All pruning for tree health reasons and for hazard reduction will be done in conformance with the International Society of Arboriculture standards.
- **Insect Control** – The Parks & Recreation Department does not actively control insect pests in trees. This is particularly true of large trees where the control of the pest might require the use of large aerial spray equipment, which carries with it a high probability of the insecticide, applied leaving the area due to wind drift. When insect pests are controlled in trees, the following measures are used:
 - Trees that are highly susceptible to specific insect pests may be removed from the landscape and replaced with resistant species.
 - When possible, the portion of the tree affected by the insect can be physically removed, eliminating the pest.
 - An insecticide may be applied to control a specific insect pest in very selected situations. These situations include pests on specimen quality trees at special gardens or in high visibility locations where the presence of the pest

- threatens the life of the tree. In these situations, general foliar applications will not be made unless the potential for product drift can be controlled.
- New injection technology may allow for systemic control of certain insect pests with minimal or no impact to human or environmental health. The Parks & Recreation Department will continue to explore this technology as a potential control in the future for insect pests that may threaten the health of valuable park trees.
- **Disease Control** – Most diseases are tolerated in trees, unless they lead to a tree becoming a hazard to the surrounding environment. As with insecticides, it is unlikely that the Parks & Recreation Department will subscribe to general foliar applications of fungicides or similar pesticide products to control disease pests in trees. The following are control measures that can be performed:
 - Trees that are susceptible to particular disease pathogens may be removed from the landscape and replaced with resistant varieties.
 - When possible, parts of trees affected by disease should be pruned out and properly disposed to stop the spread of disease within the tree and to adjacent trees.
 - An appropriate fungicide may be applied to control a specific disease pathogen in very selected situations. These cases include specimen quality trees in special gardens or in high-visibility park locations where the presence of the disease threaten the life of the tree. In these situations, general foliar applications will not be made unless the potential for product drift can be controlled.
 - New “injection” technology may allow for systemic control of certain disease in trees pests with minimal or no impact of human or environmental health. The Parks & Recreation Department will continue to explore this technology as a potential control for disease pests that may threaten valuable trees in City parks.

TRAINING

- All park maintenance field staff should have training in basic tree management.
- All park maintenance field staff should have a knowledge and understanding of accepted ISA Standards.

Appendix A

TREE GUIDE

I. INTRODUCTION

The City of Washington is pleased to present these updated lists of recommended trees for enhancing Washington's streets, avenues, boulevards, parking lots, parks, public facilities, businesses and private properties. Development of this composite list is the result of significant research, incorporating the advice from professionals including arborists, urban foresters, nurserymen, horticulturalists, professors, park planners and landscape architects. The intention of this effort is to provide urban planners, architects, landscape architects, city employees, developers, and Washington businesses and residents with a list of trees appropriate for planting in specific areas, tailored to the Washington environment. Since the world of living plants is quite dynamic, these lists will be reviewed periodically by the Community Forestry Manager and updated if deemed necessary after reviewing the results of current urban forestry research.

The Community Forestry Manager completed the most recent review and update of the City's current list of recommended trees as of February, 2013. The Community Forestry Manager's primary intention associated with development of this researched document is to provide Washington citizens and staff with state-of-the-art tree recommendations as the community continues to enhance Washington's urban forest.

II. STREET TREES

These trees require the greatest level of maintenance and have the highest level of tree/people interaction. Because of the constrained and difficult growing conditions, these trees are most likely to suffer from mechanical damage, biotic and abiotic disorders and vandalism. The management of the street tree population directly affects the adjacent property owners and the character of the community.

While many tree species are quite applicable and adaptable for Washington's challenging urban streetscape, there are a variety of trees not appropriate for use within the streetscape environment. Primary reasons for discouraging the use of these undesirable tree species include:

- Size (height, and width) and shape.
- Root system.
- Soil type.

- Heat and/or cold tolerance.
- Drought tolerance.
- Salt tolerance.
- Weak branching habit, resulting in frequent release of fallen branches.
- Producer of messy fruit, seeds, acorns etc.
- Prone to damage by insects, diseases and nutrient deficiencies.
- Leaf scorch and mildew.
- Poor transplantation

Tree selection when planting near a sidewalk, trail or parking lot, etc. is critical to having long term success. The amount of space available should be used to determine the size of the tree being planted. The following chart illustrates this information:

<u>Tree Lawn Width</u>	<u>Mature Tree Height</u>	<u>Mature Tee Width</u>
0-3 feet	10-30 feet	10-20 feet
3-5 feet	10-30 feet	10-20 feet
5-7 feet	30-40 feet	10-20 feet
7-9 feet	40-50 feet	10-20 feet
9-11feet	50 feet or taller	20-25 feet
12 feet or wider	50 feet or taller	25 feet or wider

Another source indicates that the walk should be further away than three times the trunk diameter at maturity. Trees that have shallow roots should be avoided near sidewalks, trails and parking lots.

A. SMALL COLUMNAR STREET TREES (Less than 20' Width)

The following list of small columnar street trees are acceptable for planting in bump outs, small and/or narrow islands and medians, close to sidewalks and buildings.

1. **Pyramidal European Hornbeam** – *Carpinus betulus* "Fastigiata"
2. **Ginko biloba** – *Princeton Sentry Maidenhair* "Princeton Sentry"
3. **Thornless Honeylocust** – *Gleditsia tricanthos var. inermis* "Skycole"
4. **Crimson Spire Oak** – *Quercus alba x Q robur* "Crimschmidt"

5. **Oak** – *Quercus* x “Regal Prince”
6. **Magnolia** – *Magnolia stellate* “Magnolia Star”
7. **Maple** – *Acer tataricum* “Tatarian”
8. **Redbud** - *Cercis* “*Eastern Redbud”, “Forest Pansy”, “Oklahoma”, “Plena” and “Ruby Atkinson”.

B. MEDIUM TO LARGE COLUMNAR STREET TREES (21’ Width or greater)

The following list of medium to large columnar street trees are acceptable for planting in medium to large islands and medians.

1. **Red Maple** – *Acer rubrum* “Bowhall” and “Scarlet Sentinel”
2. **Sugar Maple** – *Acer saccharum* “Steeple”
3. **European Beech** – *Fagus sylvatica* “Dawyck Purple”

C. NON-COLUMNAR AND MEDIUM TO LARGE STREET TREES (30’ or greater in height and greater than 25’ in width)

The following list of non-columnar and medium to large street trees are acceptable for planting in large lawn and/or wide islands/medians.

1. **Hedge Maple** – *Acer Campestre* “Queen Elizabeth”
2. ***Bur Oak** – *Quercus macrocarpa*
3. ***Baldcypress** – *Taxodium distichum* “Shawnee Brave”
4. **Littleleaf Linden** – *Tilia Cordata* “Greenspire”
5. **Japanese Zelkova** – *Zelkova serrate*
6. **Red Oak** – *Acer x freemanii* “Jeffersred” “Autumn Blaze”
7. **Black Maple** – *Acer nigrum* “Greencolumn”

8. **Amur Cork** – *Phellodendron amurense* “Macho”
9. ***American Beech** – *Fagus grandifolia*
10. ***White Ash** – *Fraxinus Americana* “Autumn Applause”, “Autumn Purple”, Champaign County”, “Rosehill” and “Skyline”.
11. **American Linden** – *Tilia Americana* “Redmond” and “Legend”.
12. **Black Maple** – *Acer nigrum* “Greencolumn”
13. **Maple** – *Acer buergeranum* “Trident”

III. FORMAL TREES

These trees require frequent maintenance and have a high likelihood of tree/people interaction. These trees also have a potential for mechanical injury and demand a high level of care and consideration during design and construction activities. These trees generally, do not produce nuts, fruits, etc.

CONIFERS

1. ***Baldcypress** – *Taxodium distichum* “Shawnee Brave”
2. **White Fir, Concolor Fir** – *Abies concolor*
3. ***American Holly** – *ilex opaca*
4. ***Eastern Redcedar** – *Juniperus virginiana*
5. **Colorado Spruce, Blue Spruce** – *Picea pungens*
6. **Norway Spruce** – *Picea abies*
7. **White Spruce** – *Picea glauca*
8. **Douglas Fir** – *Pseudotsuga menziesii*
9. **Canadian Hemlock** – *Tsuga canadensis*

10. **Chinese Juniper** – *Juniperus chinensis*
11. **Japanese Black Pine** – *Pinus thunbergiana*
12. **Japanese Red Pine** – *Pinus densiflora*
13. **Limber Pine** – *Pinus flexilis*
14. **Red Pine** – *Pinus resinosa*
15. **Eastern White Pine** – *Pinus strobus*

SMALL TREES & FLOWERING TREES (under 30' in height)

1. **Yellowwood**- *Cladrastis kentuckea*
2. ***Flowering Dogwood** – *Cornus florida* “Cherokee Chief”, “Cherokee Princess” and “Cloud 9”
3. **Saucer Magnolia** – *Magnolia x soulangiana*
4. **Magnolia** – *Magnolia stellate* “Magnolia Star”
5. **Southern Magnolia** – *Magnolia grandiflora*
6. **Sweetbay Magnolia** – *Magnolia virginiana* “
7. **Japanese Snowbell** – *Styrax japonicas*
8. **Maple, Tatarian** – *Acer tataricum*
9. ***Eastern Redbud** - *Cercis* “Forest Pansy”, “Oklahoma”, “Plena” and “Ruby Atkins”.

MEDIUM TREES (30' to 60' in height)

1. **Ginko biloba** – *Princeton Sentry Maidenhair* “Princeton Sentry”
2. **Thornless Honeylocust** – *Gleditsia tricanthos var. inermis* “Shademaster”
“Skycole” and “Moraine”
3. **Crimson Spire Oak** – *Quercus alba x Q robur* “Crimschmidt”
4. **Oak** – *Quercus x* “Regal Prince”
5. **Pyramidal European Hornbeam** – *Carpinus betulus* “Fastigiata”
6. ***American Hornbeam** – *Carpinus caroliniana*
7. **Maple** – *Acer buergeranum* “Trident”
8. ***River Birch** – *Betula nigra* “Heritage”
10. ***Paper Birch, Canoe Birch** – *Betula papyrifera*

LARGE TREES (over 60' in height)

1. ***American Basswood** – *Tilia Americana* “Redmond Linden”
2. ***American Beech** – *Fagus gandifolia*
3. **European Beech** – *Fagus sylvatica* “Asplenifolia” , “Atropunicea”, “Purpurea”
“Purpurea Tricolor”, and “Rosea-marginata”
4. **Chinese Elm, Lacebark Elm** – *Ulmus parvifolia*
5. **Littleleaf Linden** – *Tilia Cordata* “Greenspire”
6. **Norway Maple** – *Acer platanoides* “Summershade”, “Emerald Queen” and
“Cleveland”
7. ***Red Maple** – *Acer rubum* “Red Sunset, “ Autumn Flame” and “October Glory”

8. ***Sugar Maple** – *Acer saccharum* “Green Mountain”, “Legacy”, “Bonfire” and “Caddo”
9. ***Northern Red Oak** – *Quercus rubra*
10. ***Scarlet Oak** – *Quercus coccinea*
11. ***Shumard Oak** – *Quercus shumardii*
12. ***Swamp White Oak** – *Quercus bicolor*
13. **Black Oak** – *Quercus velutina*
14. **Tuliptree** – *Liriodendron tulipifera*
15. **Japanese Zelkova** – *Zelkova serrate*
16. **Hedge Maple** – *Acer Campestre* “Queen Elizabeth”
17. ***Baldcypress** – *Taxodium distichum* “Shawnee Brave”
18. **Red Oak** – *Acer x freemanii* “Jeffersred” “Autumn Blaze”
19. **Amur Cork** – *Phellodendron amurense* “Macho”
20. **Ginko biloba** – *Ginko* “Magyar”, “Autumn Gold”, “Lakeview”, “Golden Colenade” and “Shangrila”.
21. **American Linden** – *Tilia Americana* “Redmond” and “Legend”.
22. **Black Maple** – *Acer nigrum* “Greencolumn”
23. ***Sycamore** – *Platanus occidentalis*
24. **Katsura** – *Cercidiphyllum japonicum*

IV. PERIPHERY/NATURAL AREA TREES

These trees require the least amount of maintenance because of their often remote and sheltered locations. The trees in these areas are managed not as individual trees, but rather as stands of trees linked to the associated plants and sites on which they reside. These trees can come in conflict with people when they occur along property lines, adjacent to man-made structures or near gathering places. These trees generally produce some fruit and/or nuts.

SMALL TREES & FLOWERING TREES (under 30' in height)

1. **Ohio Buckeye** – *Aesculus glabra*
2. **Red Buckeye** – *Aesculus pavia*
3. ***Hophornbeam** – *Ostrya virginiana*
4. **Pawpaw** – *Asimina triloba*
5. **Hardy Rubbertree** – *Eucommia ulmoides*
6. ***Sassafras** – *Sassafras albidum*
7. **Yellowwood** – *Cladrastis kentukea*
8. **Flowering Crabapple** – *Malus spp.* “Centurion”, “Harvest Gold”, “Prairie Fire”, “Profesor Sprenger”, “Snowdrift” and “Sugar Tyme”
9. **Japanese Pagodatree** – *Sphora japonica*
10. ***Downey Serviceberry** – *Amelanchier arborea* “Autumn Brilliance”,
11. **Serviceberry** – *Amelanchier x grandiflora* “Autumn Sunset”, “Cumulus”, “Princess Diana”, “Snowcloud” and “Tradition”
12. **Goldenrain Tree** – *Koelreutria paniculata*
13. **Lilac, Japanese Tree** – *Syringa reticulata* “Ivory Silk”, “Regent Japanese” and “Summer Snow”.
14. **American Witch Hazel** – *Hamamelis virginiana*

15. **Sweetbay Magnolia** - *M. virginiana*
16. **Viburnum** – *prunifolium* “Black Haw”
17. **Viburnum** – *rufidulum* “Rusty Black Haw”

MEDIUM - LARGE TREES (30' to over 60' in height)

1. ***American Sycamore** – *Platanus occidentalis* “Bloodgood”, “Columbia” and “Liberty”
2. ***Cucumbertree** – *Magnolia acuminata*
3. **Hickory** – *Carya laciniosa* “Shellbark”
4. ***Hickory** – *Carya ovate* “Shagbark”
5. ***Chestnut Oaks** – *Quercus michauxii* “Swamp Chestnut Oak”
6. **Chestnut Oaks** – *Quercus prinus* “Chesnut Oak”
7. ***Pecan** – *Carya illinoensis* “Hardy Giant”, “Major” and “Colby”
8. **European Alder** – *Alnus glutinosa*
9. ***Blackgum** – *Nyssa sylvatica*
10. ***Kentucky Coffeetree** – *Cymnocladus dioica*
11. ***Common Hackberry** – *Celtis occidentalis* “All Seasons Sugar” and “Prairie Pride”
12. ***Bur Oak** – *Quercus macrocarpa*
13. ***White Oak** – *Quercus alba*
14. ***Overcup Oak** – *Quercus lyrata*
15. ***Post Oak** – *Quercus stellata*

16. **Black Walnut** – *Juglans nigra*
17. **Catalpa** – *Catalpa*
18. **Tuliptree** – *Liriodendron tulipifera*
19. **Swamp White Oak** – *Quercus. bicolor*

V. TREES UNDESIRABLE FOR PLANTING IN THE CITY OF WASHINGTON

While many tree species are quite applicable and adaptable for most environments, the following variety of trees are not appropriate for use within the City of Washington. Primary reasons for discouraging the use of these undesirable tree species include:

- Root system.
- Soil type.
- Heat and/or cold tolerance.
- Drought tolerance.
- Weak branching habit, resulting in frequent release of fallen branches.
- Producer of messy fruit, seeds, acorns etc.
- Prone to damage by insects, diseases and nutrient deficiencies.
- Leaf scorch and mildew.
- Poor Transplantation.

CONIFERS

1. **Austrian Pine** – *Pinus nigra*
2. **Scotch Pine** – *Pinus sylvestris*

SMALL TREES & FLOWERING TREES (under 30' in height)

1. **Mimosa** – *Albizia julibrissin*
2. **Mountainash** - *Sorbus aucuparia*
3. **Russion Olive** – *Elaeagnus angustifolia*

4. **Callery Pear** – *Pyrus calleryana* – “Bradford”, “Aristocrat”, “Capital”, “Redspire” and “Cleveland Select”
5. **Apple** – *Malus*
6. **Crabapple** – *Malus x hybrids*
7. **Mulberry** – *Morus*
8. **Cherry – Plum** – *Prunus*
9. **Pear** – *Pyrus Calleryana*

MEDIUM TO LARGE TREES (30’ to over 60’ in height)

1. **European White Birch** – *Betula pendula*
2. **Boxelder** – *Acer negundo*
3. **Black Cherry** – *Prunus serotina*
4. **Siberian Elm** – *Ulmus pumila*
5. **Black Locust** – *Robinia pseudoacacia*
6. ***Silver Maple** – *Acer saccharinum*
7. **White Mulberry** – *Morus alba*
8. **Red Mulberry** – *Morus rubra*
9. **Osage-orange** – *Maclura pumifera*
10. ***Persimmon** – *Diospyros virginiana*
11. **Eastern Cottonwood Poplar** – *Populus deltoids*
12. **Lombardy Poplar** – *Populus nigra* “Italica”
13. **Tree-of-Heaven** – *Ailanthus altissima*

14. ***Green Ash** – *Fraxinus pennsylvanica*
15. **Horsechestnut** – *Aesculus*
16. ***Washington Hawthorne** – *Crataegus phaenopyrum*
17. ***White Ash**- *Fraxinus Americana*
18. **Ginko biloba** – *Ginko* “Maidenhair Tree” (Female)
19. **Honeylocust** – *Gleditsia triacanthos*
20. ***Sweet Gum** – *Liquidambar styraciflua*
21. ***Poplar; Cottonwood** – *Populus*
22. **Sawtooth Oak** – *Quercus acutissima*
23. ***Shingle Oak** – *Quercus imbricaria*
24. ***Pin Oak** – *Quercus palustis*
25. ***Willow** – *Salix*

Underlined Species = Plants of Merit

* = Trees native to Missouri