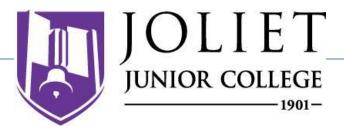
# Urban Forestry Management Plan



**JUNE 2018** 











## JOLIET JUNIOR COLLEGE Urban Forestry Management Plan

#### **JUNE 2018**

The JOLIET JUNIOR COLLEGE Urban Forestry Management Plan was directed and developed by the College's Horticultural Department with assistance from the College's Facility Services Department, Grounds Advisory Committee, Natural Areas Committee, and Ruettiger, Tonelli and Associates. Special recognition to:

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**Lisa Perkins** – JJC Professor, Project Director





This work was made possible through a grant provided by the Urban and Community Forestry program of the United States Department of Agriculture Forest Service, administered by Morton Arboretum.









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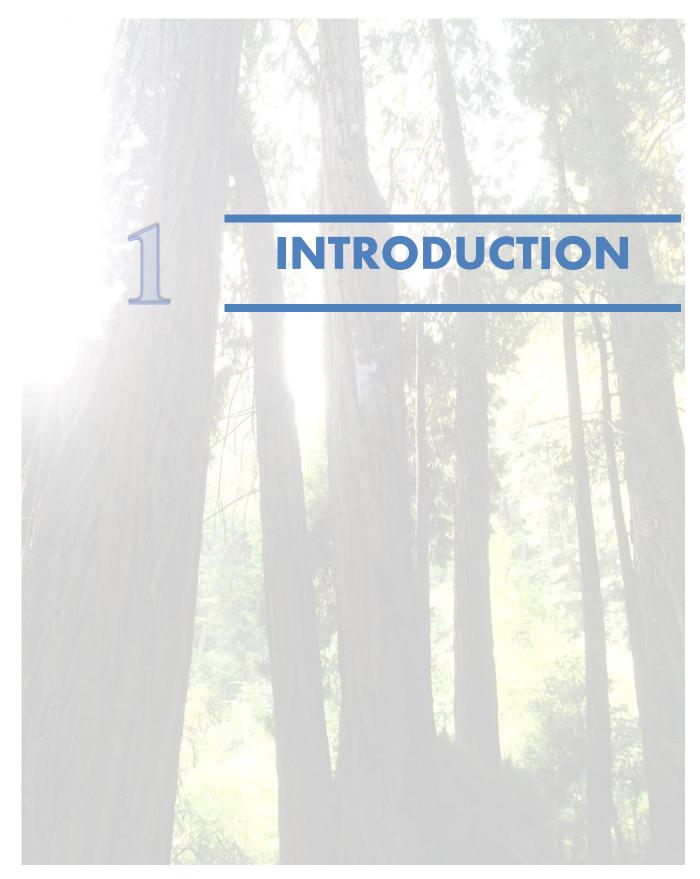
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### **Chapter I: Introduction**

#### **PURPOSE OF THE PLAN**

The Joliet Junior College (JJC) has developed this urban forest management plan to provide clear direction and achievable goals for the preservation, protection and enhancement of the urban forest located within its main campus boundaries. This plan provides the framework to guide decision-makers and support high quality management, planting and care of the College's urban forest.

JJC recognizes the urban forest as a critical infrastructure within the JJC campus. This infrastructure works in conjunction with other infrastructure such as utilities, roads, and stormwater systems. However, trees and other green infrastructure help to improve the environment and reduce impacts from built or "gray" infrastructure. The function and health of green infrastructure directly relates to the overall quality of life. The urban forest provides an interconnected network of services and benefits to the entire campus and surrounding community. These services and benefits include improved air and water quality, reduction in stormwater run-off, increased property values, energy reduction, improved psychological and physical health, and habitat for wildlife.



**Campus Bell Tower** 



#### PLAN PROCESS AND SUPPORT

JJC's urban forest provides many benefits each year to the community, campus, and its students and residents. The Urban Forest Management Plan (UFMP) will provide a framework for the College to effectively manage its trees as a sustainable asset, consistent with the values and needs of the campus.

#### **COORDINATION WITH OTHER PLANS**

The JJC urban forest management plan was developed in large part through coordination and reliance on several other plans important to JJC and the surrounding area. These included:

- JJC Master Plan
- 2016-2019 Strategic Plan
- JJC Facility Services Department Maintenance Guide
- Will County Forest Preserve District Management Plan Guides
- Will County Lowland Conservancy District Ordinance

#### **PLAN STEWARDSHIP**

JJC's Horticultural Department will assume stewardship responsibilities for the UFMP. This will include overseeing on-going tree inventories, coordinating monitoring activities and ensuring that the Plan is updated when changes to zones occur, or as needed.





#### **PROCESS OVERVIEW**

Several steps in the planning process were followed to create this Urban Forest Management Plan. An important first step was to collect and analyze past inventory data and initiate an on-going inventory of key areas. Tree data that was gathered was analyzed to better understand the College's tree resources, its needs and to provide a solid foundation for the development of the UFMP.

Initial review of data and with campus staff identified a number of key issues that formed the basis for management goals, objectives and targets for various identified management zones. These are discussed in greater detail in Chapters 4 and 5. Review of collected information with stakeholders helped refine the plan elements and identify additional guiding principles.

Final steps in the planning process were the identification of adequate staffing and budget to help sustain a quality Urban Forest Management Plan for the College, and the summarization of implementation steps and recommendations to outline priorities, timelines and monitoring requirements.

These steps along with the input and information received during the course of the project have helped create an effective Urban Forest Management Plan for JJC that is both timely and sustainable.

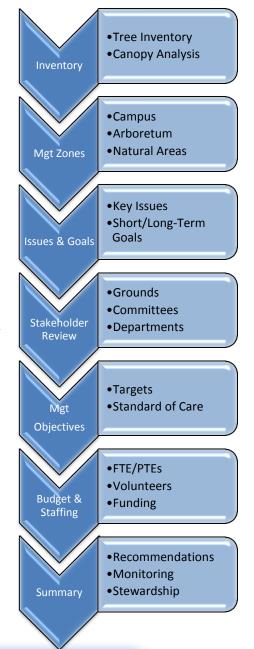




Figure 1. Process Overview



#### **JOLIET JUNIOR COLLEGE MAIN CAMPUS**

Relevant to the purposes of this management plan, JJC's urban forest comprises all of the trees on the College's main campus property. Founded in 1901 as the nation's first public community college, JJC has grown from a small site serving six students, to an area now covering over 400 acres serving over 35,000 students.

#### **SETTING**

The main campus of JJC is situated within the southwest corner of the incorporated limits of Joliet, Illinois. The campus is bordered by residential land uses to the east and west, industrial land uses to the south and County Forest Preserve District lands to the north. A local tributary known as Rock Run Creek separates the campus from the large lot residential land use to the west. The creek corridor is part of the Will County Forest Preserve District. Running through the campus is a small stream tributary to Rock Run Creek. Between 1939 and 1954 a dam was built on the tributary and then raised in 1970 to create a small lake that the campus buildings surround.

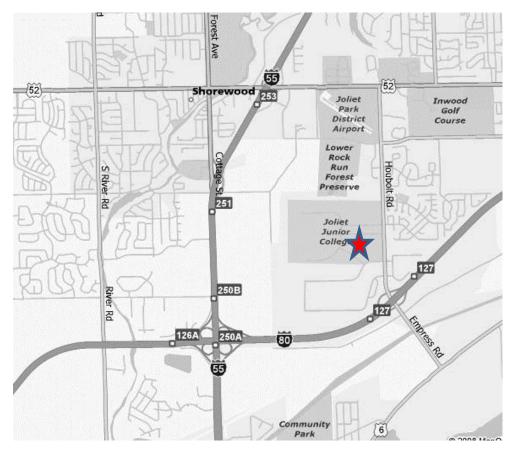


Figure 2. Location Map



#### **HISTORY OF JJC CAMPUS AND ITS TREES**

Joliet Junior College was initially established as an experimental postgraduate high school program in 1901 making it the first public community college in the United States. At the time, JJC held classes in the original Joliet Township High School located in downtown Joliet. Initial enrollment was 6 students! Classes and enrollment continued to grow and by 1967 enrollment had approached 4,000 students.

In 1968 the JJC Board of Trustees selected 368 acres on the west side of Joliet for a new campus. Interim facilities were built and classes began at its current site in 1969. Most of the property consisted of agricultural lands that had ceased farming activity quite sometime in the past, likely as a result of shallow bedrock throughout much of the site. Outcroppings could be seen at the surface in many places. Consequently, as a result of the cessation of farming and pasturing activity, nonnative invasive species, notably common buckthorn, populated much of the future campus property.

As the campus enrollment and facilities expanded so did ancillary features. In 1975 an Arboretum was created, subsequently named the Dr. William M. Zales Arboretum after a prominent biology professor that did much to promote the education and research of the college's natural resources. Later, a Greenhouse was developed to support and compliment the Arboretum.

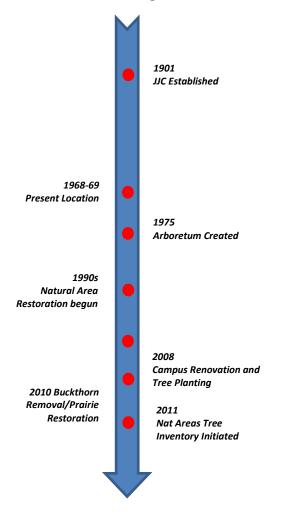
As previously noted, much of the college's undeveloped lands were overgrown with invasive honeysuckle and buckthorn trees. Intermingled

among the buckthorn, however, was an extensive population of native trees. Several large oak trees could be seen reaching above the tops of the buckthorn, providing refuge and habitat for a variety of



fauna and flora. Efforts to restore some of this "undeveloped" area to prairie began in the mid-1990s, culminating in a restored prairie and fen, and the development of a campus Nature Trail dedicated to Dr. Zales in 1999. In 2010 the College decided to expand restoration efforts on much of its "natural areas". The college contracted to remove the extensive European Buckthorn and other invasive species, followed by seeding to restore the areas to native prairie and savanna

Figure 3. Historic Timeline



Current JJC Urban Forest



communities. Restoration efforts continue to be a part of the urban forest management objectives for the College.

The central campus underwent a major development renovation in 2007-2008. Extensive landscaping was a part of this effort, which included planting of ornamental and native trees around buildings, parking and walkways.

In 1998, the College Board of Trustees passed a resolution recognizing the educational, recreational and ecological values of the natural areas existing on campus. These values and their related resources continue to be recognized in JJC's current Master Plan and in the College's 2016-2019 Strategic Plan, which includes sustainability as a core value.

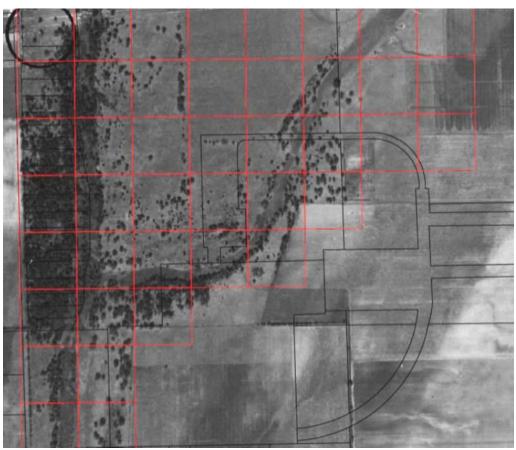


Figure 4. 1939 Aerial of College Campus



#### **JJC CAMPUS TREE MANAGEMENT ZONES**

Joliet Junior College's Main Campus encompasses approximately 423 acres<sup>1</sup>. For the purpose of this management plan, the campus property has been categorized into four different zones, each of which has its own special requirements and purpose. Three of the zones have an extensive tree population. A fourth, Agricultural Areas Zone, has few trees and is utilized principally for crop production and agricultural research. However, it is included herein as it relates to existing and future tree canopy coverage as a percent of the total campus property. Following is a brief discussion of the four campus management zones.



Figure 5. Main Campus Zones

#### A. Central Campus Zone.

The majority of the JJC main campus property is made up of the Central Campus zone. This zone consists of the campus buildings, parking, athletic fields and stormwater management areas. The central campus contains approximately 148 acres of the main campus property or nearly 35 % of the

<sup>&</sup>lt;sup>1</sup> Total acreage includes Centennial Apartments which are not owned by the College but included herein due to their close proximity and association with the College.



property. The Central Campus Zone includes trees that are planted around buildings, parking and walkways to provide canopy coverage and an aesthetically pleasing environment. Many of these trees are ornamental landscape trees planted at 2.5" diameters and are a mix of native and non-native species. The Central Campus Zone includes a number of large, native shade trees located along the edges of the existing campus lake.



#### B. Arboretum / Greenhouse / Entry Zone

The Arboretum/Greenhouse/Entry Zone principal component is the Dr. William M. Zales Arboretum established in 1975. The 16-acre Arboretum includes species arranged phylogenetically according to their evolutionary ancestry and taxonomic relationships. The east end holds the most primitive plants and progress through the most recently evolved plants at the west end of the arboretum. All species in the same genus are grouped together. All genera in the same family are grouped together, and families are arranged in islands in phylogenetic order. The species selected for the arboretum were chosen for three principal reasons:



- they are native this area;
- they are not native, but have become naturalized in the local landscape;
- or they are interesting botanically and represent families, genera or species not normally found in the area.

The plan is to eventually include more than 200 species that belong to more than 100 genera in approximately 50 families (*pers com; V. Piekarski*). In addition to the Arboretum, this zone includes the relatively new Campus Greenhouse and its associated research plot area, entrance area and entry parkway/buffer trees. The Arboretum/GreenHouse/Entry Zone contains approximately 40 acres or nearly 9.5% of the property.

#### C. Natural/Buffer Areas

Located primarily to the north and west are the college's Natural Areas. This area actually includes two sub-zones; a buffer zone that borders the perimeters and until recently has been left largely unmanaged, and a natural area that includes a variety of native and restored ecosystems, including mesic prairies, a fen, savannas and woodlots. The buffer areas consist of approximately 37 acres of





wooded canopy cover that is largely dominated by invasive European Buckthorn Trees. Several acres of these invasive species have been cut due to recent efforts by the College's Natural Areas Committee.

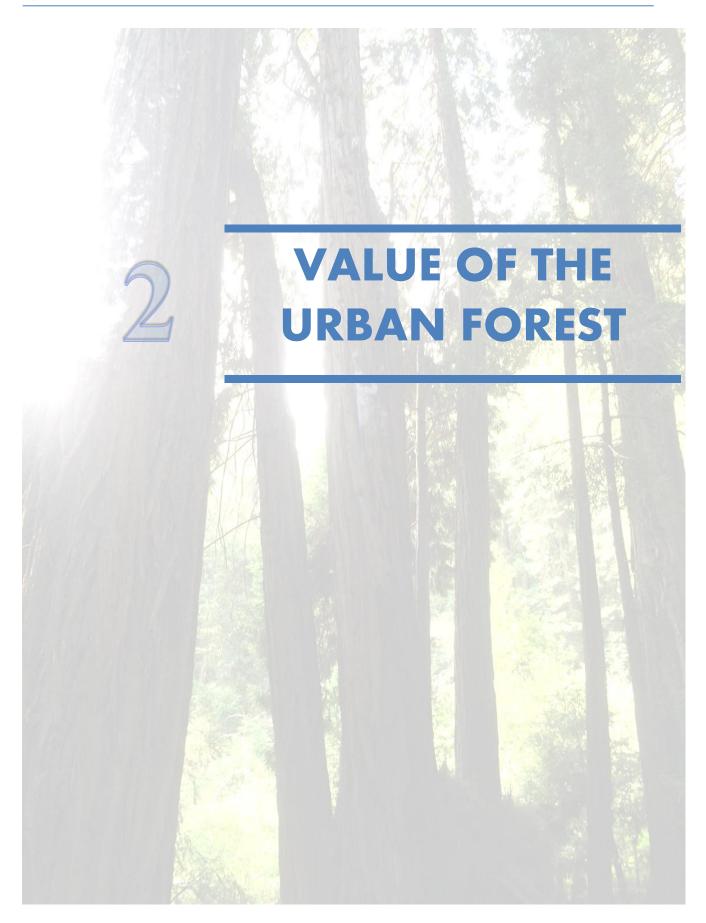
A considerable amount of the remaining natural areas was restored to native prairie in 2010, including the removal of nearly 60 acres of invasive buckthorn. A number of woodlots containing large, native species still exist within its boundaries. Collectively, the Natural/Buffer Areas zone encompasses 127 acres of the campus for 30% of the property.

#### D. Agricultural Areas

As noted earlier the Agricultural Zone contains few trees. While its potential for future tree planting is high from a physiognomic point of view, its pre-eminence for agricultural research make much of the area academically unsuitable for future plantings. Roughly 108 acres of the campus, or 25.5% of the property is relegated to agricultural activity.

JJC uses all four zones as living laboratories where students learn about species, care of trees, plantings, and ecosystem management first-hand on campus grounds.







## **Chapter 2: Value of the Urban Forest**

In the United States, more than 80 percent of the population lives in urban areas. The urban forest provides many benefits and services. Trees are one of the building blocks that define community character and provide quality of life. When trees are properly planted and cared for, they can promote human health, save energy, improve air and water quality, reduce flooding, mitigate the effects of climate change and reduce costs to taxpayers. The benefits provided by trees far outweigh the cost of planting and caring for them. A study in New York City found that trees provide \$5.60 in benefits for every dollar spent on tree planting and care. The study, Urban Trees and Forests of the Chicago region found that the urban forest in the Chicago region provides \$5.2 billion in compensatory benefits.

#### **BENEFITS TO SOCIETY**

The value of trees grows exponentially as trees grow and mature. Due to tough urban growing conditions, the life expectancy of many trees may not be the same as those planted in parks, in natural areas, or on private property. In addition, data across the region shows that mature tree canopy is declining.<sup>2</sup> In order to support our urban trees, so they can provide the most benefits and services, communities need to provide good growing conditions, proper care, proper species selection, and protection as trees mature.

#### **ENVIRONMENTAL BENEFITS**

Trees have a positive impact on air pollution mitigation, flood reduction, heat island mitigation, carbon storage, and provide wildlife habitat. Trees are part of our community infrastructure.

- Trees improve air quality by trapping and removing particulate pollutants, like dust, ash, pollen and smoke, which can damage human lungs.<sup>4</sup>
  - Neighborhoods with greater tree canopy have a reduced rate of childhood asthma<sup>5</sup>.
  - Trees take in carbon dioxide and produce oxygen<sup>6</sup>. A single mature tree can absorb carbon dioxide at a rate of 48 pounds per year and release enough oxygen back into the atmosphere to support 2 human beings.<sup>7</sup>

<sup>&</sup>lt;sup>2</sup> http://vcuf.files.wordpress.com/2012/11/vcuf\_report.pdf

<sup>3</sup> http://www.fs.fed.us/nrs/pubs/rb/rb nrs84.pdf

<sup>&</sup>lt;sup>4</sup> http://www.state.sc.us/forest/urbben.htm

<sup>&</sup>lt;sup>5</sup> http://phys.org/news/2014-09-trees-asthma-respiratory-diseases.html

<sup>&</sup>lt;sup>6</sup> http://www.biology-pages.info/G/GasExchange.html

<sup>&</sup>lt;sup>7</sup> McAliney, Mike. Arguments for Land Conservation: Documentation and Information Sources for Land Resources Protection, Trust for Public Land, Sacramento, CA, December, 1993



- U.S. Forest Service research suggests that urban trees may be 10 times as effective as forest trees for lowering carbon dioxide. Urban pollutants such as ozone, chlorine, fluorine, peroxyacetylnitrate and sulphur dioxide are also all absorbed by trees.<sup>8</sup>
- Trees store carbon reducing greenhouse gases. A single tree stores on average 13 pounds of carbon annually and U.S. forests currently provide the equivalent of \$22 billion in carbon storage.<sup>9</sup> Trees in the Chicago region store 16.9 million tons of carbon at a value of \$183 million every year.<sup>2</sup>
- Trees reduce stormwater runoff and provide a natural, cost-effective alternative to expensive stormwater treatment facilities.
- Trees help to keep pollutants out of our waterways, thereby decreasing the need for costly treatment facilities.
- Trees reduce asphalt temperatures, reduce heat island effect, and reduce ultraviolet radiation levels <sup>10</sup>
- Trees provide habitat for many types of wildlife. Migratory birds depend on these resources for shelter and food.
- Decaying leaves from trees, supports good soil health and provides excellent mulch.<sup>11</sup>

#### **ECONOMIC BENEFITS**

Trees pay us back in many ways. Individual homeowners, commercial property owners, and municipalities all benefit from a large healthy tree canopy.

- Trees reduce the amount of energy needed to heat or cool our buildings. Along with saving money, this service cuts emissions from the fossil-fuel burning power plants that generate electricity.<sup>12</sup>
- Shade from trees can prolong the life of asphalt surfaces and minimizes the heat load of asphalt.
   This can lessen the costs of gray infrastructure.<sup>13</sup>
- Trees increase home values. The presence of larger trees in yards and as street trees can add from 3% to 15% to home values throughout neighborhoods. 14
- Trees are good for the economy and increase foot traffic to local businesses.
- One study evaluated the value and role of urban forest trees (woody ornamental trees) in the United States; the total output of tree production and care services was valued at \$14.55 billion, which translated into \$21.02 billion in total output impacts, 259,224 jobs, and \$14.12 billion in value added.<sup>15</sup>

<sup>8</sup> http://www.na.fs.fed.us/spfo/pubs/uf/techguide/values.htm

<sup>&</sup>lt;sup>9</sup> http://www.naturewithin.info/UF/TreeBenefitsUK.pdf

http://www.sciencedirect.com/science/article/pii/S1618866714000661

<sup>11</sup> http://www.aces.uiuc.edu/vista/html pubs/mulch/MULCH.html

<sup>12</sup> http://www.state.sc.us/forest/urbben.htm

<sup>&</sup>lt;sup>13</sup> McPherson, G. and Muchnick, J. Effects of Street Tree Shade on Asphalt and Concrete Pavement. Journal of Arboriculture 31(6). November 2005. pp. 303-310.

<sup>&</sup>lt;sup>14</sup> Wolf, K.L. 2007 (August). City Trees and Property Values. <u>Arborist News</u> 16, 4:34-36.

<sup>&</sup>lt;sup>15</sup>https://www.researchgate.net/publication/23515715 The Economic Impact of the Green Industry in the U nited States



 When properly harvested, trees supply wood products that can generate revenue. Urban wood utilization is beginning to be a recognized component of LEED building certification.<sup>16</sup>

#### **HEALTH AND SOCIAL BENEFITS**

Developing and maintaining a thriving urban forest is a smart investment for any community. Trees create a sense of community, they are a living legacy, improve our mental and physical health.

- Equal access to trees and green spaces for all residents provides a strong foundation for overcoming environmental, health and economic challenges that plague neglected neighborhoods.
- Trees promote healing. Hospital patients with a room viewing trees and nature heal faster and report needing less pain medication.<sup>17</sup>
- Exposure to trees decreases mental fatigue, lowers blood pressure, and reduces heart rates.
- Trees help keep people healthy. Trees support the fight against obesity by providing attractive, shaded, comfortable spaces that encourage people to get outside and get active. 18
- There is a proven connection between the way a neighborhood looks and feels and public safety. Trees help people feel safe in their community. 19
- Fruits and nuts from trees contain healthful antioxidants and healthy fats that decrease bad cholesterol. Community gardens are opportunity for residents to gather, learn, work together and enjoy fresh food.
- Trees are a part of our history and provide solace, a spiritual connection, and a sense of place. Evidence of trees can be found throughout human history, even a sacred connection to trees.

#### **FUTURE CLIMATE BENEFITS**

Healthy, well-maintained trees and green infrastructure can both mitigate the causes of climate change and help improve communities' resilience to natural disasters.

- Tree roots anchor soil in place preventing erosion.<sup>20</sup>
- Proper selection, spacing and trimming of trees, along with well-planned utilities, will reduce the likelihood of tree failure during major storms. A line of mature trees can provide protection from fragile or isolated trees that fall.<sup>21</sup>

<sup>16</sup> http://www.usgbc.org/content/li-10300

<sup>&</sup>lt;sup>17</sup> Park, S.H., and R.H. Mattson. 2009. Ornamental Indoor Plants in Hospital Rooms Enhanced Health Outcomes of Patients Recovering From Surgery. **Journal of Alternative and Complementary Medicine** 15, 9:975-980.

<sup>&</sup>lt;sup>18</sup> Giles-Corti, B., M.H. Broomhall, M. Knuiman, C. Collins, K. Douglas, K. Ng, A. Lange, and R.J. Donovan. 2005. Increasing Walking: How Important is Distance to, Attractiveness, and Size of Public Open Space? **American Journal of Preventive Medicine** 28:169-176.

<sup>&</sup>lt;sup>19</sup> http://www.groundworkrichmond.org/index.html

http://blog.worldagroforestry.org/index.php/2014/04/16/can-trees-soften-the-blow-of-a-natural-disaster/

<sup>&</sup>lt;sup>21</sup> Burden, D., Walkable Communities, Inc., Glatting Jackson. (2006) Urban Street Trees: 22 Benefits, Specific Applications. http://www.michigan.gov/documents/dnr/22\_benefits\_208084\_7.pdf



#### **COMMUNICATING URBAN FOREST BENEFITS**

Though the benefits of trees and the urban forest are well documented, these facts are meaningless unless they can be presented in a way that resonates with people. For every aspect of urban planning, economic development, and community development, trees can and should be a part of the discussion. While some people need to see the raw numbers, others want to see the human impact. Including urban forestry in all levels of conversation ensures that the message is delivered and received in ways that are relatable to everyone. Examples of different messaging strategies are:

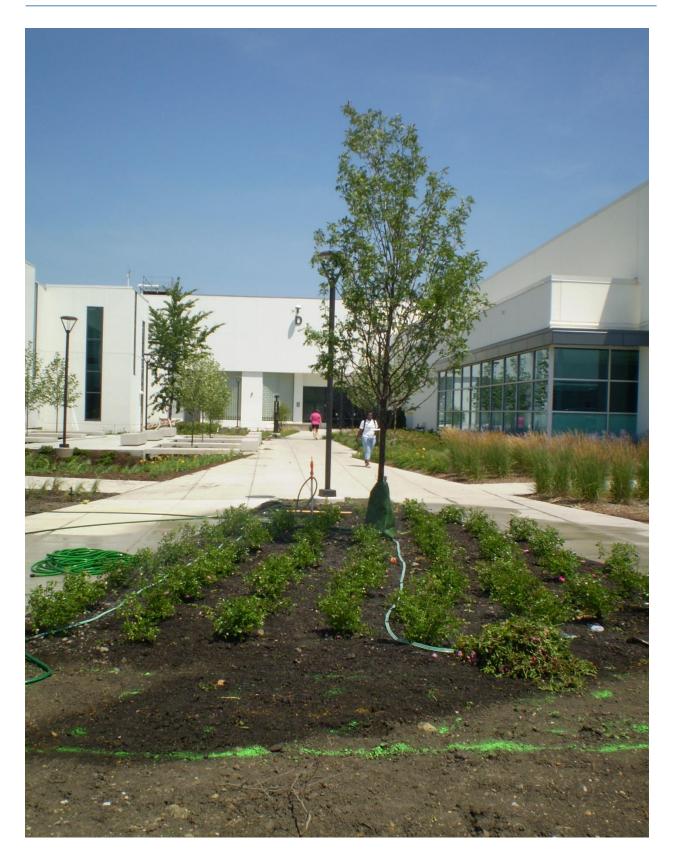
- Conducting an i-Tree assessment<sup>22</sup> and presenting the report findings;
- Holding an Arbor Day celebration with a local grade school;
- Creating layered maps showing community tree canopy along with other valued indicators;
- Creating a historic tree preservation/awareness program;
- Develop a memorial tree walk or arboretum in a park;
- Developing a volunteer board to increase awareness and volunteerism in community;
- Showcasing urban forest benefits and impact on community webpages;
- Engaging youth in urban forestry awareness by creating a local disease and pest scouting group;
- Create pamphlets to share community urban forest data and program news with residents use water bills, library, public works, train stations etc. to distribute;
- Start a community-wide program such as ending volcano mulching, proper watering during summer drought or what trees to plant after ash tree losses;
- Hold a fund raising and awareness event in town centered around a tree theme and use the funds to buy trees for community reforestation.

Environmental education and stewardship have been shown to have profoundly positive social and psychological effects on urban residents.<sup>23</sup> Involving and educating community members at all levels is an important aspect to the success of an urban forest management plan.

<sup>&</sup>lt;sup>22</sup> http://www.itreetools.org/

Wolf, K.L., and EarthCorps. 2007. Trees and Youth in the City: Research on Urban Forest Stewardship & Positive Youth Development. In: Sustaining America's Forests: Proceedings of the Society of American Foresters 2007 National Convention.















### **Chapter 3: Urban Forest Inventory**

#### **CANOPY COVER AND COMPOSITION**

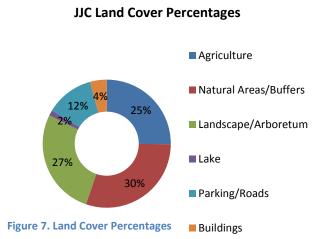
In order to help determine goals for the campus's urban forest it is important to have a baseline of information from which to start. Tree canopy cover and composition is an integral aspect of the forest inventory and overall quality of the urban forest.

#### **BACKGROUND**

The size of the canopy directly relates to the size of the benefits that trees provide. The Chicago Region Trees Initiative (CRTI), with the U.S. Forest Service, and the University of Vermont, conducted an urban tree canopy assessment for the seven county region (Cook, Kane, Kendall, Dupage, Will, Lake and McHenry). This analysis utilized LiDAR imagery and computer modeling to identify seven land cover layers across the region. These layers include trees, vegetation, bare soil, water, buildings, roads/railroads, other paved surfaces. Such information provides a bird's eye view of where the existing urban forest is located and potential planting locations for prioritized planting. When combined with datasets such as on-the-ground tree inventories, U.S. Census data and other important criteria, it provides an effective tool for managing urban forest resources. According to the CRTI, the Will County and Joliet areas currently have an existing tree canopy of 14 percent.

#### JJC LAND COVER COMPOSITION

The JJC main campus is approximately 423 acres in size, consisting of six land cover types as illustrated in Figure 6. Buildings, roads and parking account for slightly over 16% of the property, while landscape areas, which includes the Arboretum accounts for approximately 27% of the campus land cover. The largest amount of coverage (30%) is attributable to the campus's natural areas, which cover much of the northern and western borders of the property. Slightly over 25% of the campus consists of agricultural land cover. These are used as research plots in support of many of the college's academic programs.





#### **JJC CURRENT CANOPY COVER**

Tree canopy coverage is a measure of the portion of the campus that is shaded by trees. An assessment of the campus's tree canopy cover from aerial photography and tree diameter estimates shows that about 90 acres or slightly over 21% of campus lands are covered by tree canopy. Natural areas and buffer zones account for nearly 79% of that coverage.

For comparison, recent studies conducted by the Chicago Region Trees Initiative (CRTI) indicate that tree canopy cover for Will County and the Joliet area is about 14%, with significant potential to increase that coverage.

#### **Campus Tree Coverage By Zone**

As expected, the bulk of the tree canopy coverage lies within the Natural/Buffer Area Zone, which accounts for roughly 79% of the coverage. The numerous planted landscape trees and existing trees along the lake edge pushed the Central Campus Zone to slightly over 12% existing coverage, and the Arboretum Zone was represented with roughly 9% coverage.



Figure 8. Existing Canopy Cover

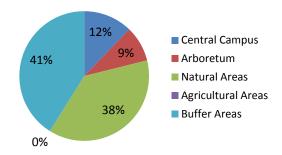


Figure 9. Existing Canopy Cover By Zone

The results of the existing tree canopy coverage analysis will be used to help establish overall canopy coverage goals for the college. It will also be used with an assessment of current conditions to help identify potential areas with low canopy coverage that could be targeted for future tree plantings.



#### JJC TREE INVENTORY

In addition to canopy analysis, an inventory of trees is a critical tool for managing the urban forest. Complete or stratified sample inventories help determine forest composition by providing information on species, age, condition, location, ground cover and other relevant data.

#### **BACKGROUND**

Few tree inventories have been conducted on JJC property; the exception being an inventory of trees over 12 inches in diameter conducted in 2010 within the Natural Areas prior to clearing of buckthorn and other invasive species. Recently, the College received an Urban and Community Forestry grant from the USDA and Morton Arboretum to support the development of this management plan, including a tree inventory. A tree inventory has been initiated to document information about species located within the Arboretum and Central Campus Zones.

#### **Tree Inventory Methodology**

Trees were measured using a tape made for the purpose of measuring DBH. Round, aluminum-numbered tags were attached to trees by an aluminum nail or with aluminum wire. Condition was assessed using a tree condition assessment form (see Appendix E). Data was entered on an ipad computer using an inventory program known as Tree Plotter, which links the data to gps coordinates using Google digital imagery. Inventory started at the east end of the JJC Arboretum and worked west. Individual trees received a tag, large clusters of shrubs received one for the group.

Details of these inventories are summarized by campus zones below. Greater detail and maps can be found in Appendices E and F and through the following Tree Plotter program link to an interactive map: https://pg-cloud.com/JJC/?scenario=JJC-Arboretum-tree-inventory-5-2.

#### **INVENTORY SUMMARY BY ZONES**

Trees are located within all campus zones except the Agricultural Zone (zone D). Zones are summarized below as to current status of tree data inventoried to date.





**Table 1. Central Campus Area Tree Summary** 

Central Campus Area Tree Summary						
Quantity	Specie	s	Size	Avg Condition	% By Zone	
53	Acer rubrum varieties	Red Maple	2"-6"	TBD	11	
43	Celtis spp.	Hackberry	2"-6"	TBD	9	
13	Ginkgo spp.	Ginkgo	2"-6"	TBD	3	
77	Gleditsia spp.	Honey Locust	2"-6"	TBD	16	
30	Quercus rubra	Red Oak	2"-6"	TBD	6	
28	Picea spp.	Spruce	2"-6"	TBD	6	
37	Amelanchier spp.	Service Berry	2"-6"	TBD	8	
19	Cercis canadensis	Red Bud	2"-6"	TBD	4	
60	Crataegus spp.	Hawthorn	2"-6"	TBD	12	
65	Malus spp.	Crabapple	2"-6"	TBD	13	
67	Varied Less than 2%*	Other Trees	2"-6"	TBD	14	
492	TOTAL					
	TBD - To Be Determined * - See Appendix for Detail					
	(inventory/data compiled as of June 2018)					

**Table 2. Natural Areas Tree Inventory Summary** 

Natural Areas Tree Inventory Summary							
Quantity By Avg Size Class							
Specie	es	9- 16"	17- 24"	25"+	Avg Condition	Total	Percentage of Total Trees
Carya ovata	Shagbark Hickory	4	3	3	Good	10	1.70%
Celtis occidentalis	Hackberry	7	7	1	Good	15	2.56%
Fraxinus pennsyvanica	Green Ash	8			Good	8	1.36%
Juglans nigra	Black Walnut	14	2		Good	16	2.73%
Populus deltoides	Cottonwood	3	3	1	Good	7	1.19%
Prunus serotina	Black Cherry	12	9		Fair	21	3.58%
Quercus macrocarpa	Bur Oak	54	200	145	Good-Fair	399	67.97%
Quercus rubra	Red Oak	12	2		Good	14	2.39%
Tilia americana	American Linden	25	20	17	Good-Fair	62	10.56%
Ulmus americana	American Elm	8	2	2	Fair	12	2.04%
Ulmus pumila	Siberian Elm	2	3	1	Fair-Poor	6	1.02%
Varied, Less than 1%	Other Trees*	10	5	2		17	2.90%
					TOTAL	587	
* - See Appendix for details. (inventory/data compiled as of June 2010)							



**Table 3. Arboretum Area Tree Inventory Summary** 

	Quantity By Avg Size Class								0,1
Si	pecies	0- 4"	5- 8"	9- 16"	17- 24"	25"32"	>32"	Total	% of Total Trees
Gleditsia triacanthos v.	Honeylocust	18	24	7	3			52	11.58%
Juniperus virginiana	Eastern redcedar	2	7	33				42	9.35%
Acer rubrum varieties	Red Maple	27	5	3				35	7.80%
Juglans nigra	Black Walnut	4	1	24	4			33	7.35%
Celtis occidentalis	Hackberry	7	14	1	1			23	5.129
Quercus rubra	Red Oak		2	14	4			20	4.45%
Magnolia sps	Magnolia Sps	17	1					18	4.019
Malus sps	Crabapple	11	1	6				18	4.019
Quercus macrocarpa	Bur Oak	6	4	2	1			13	2.909
Gymnocladus dioicus	Kentucky Coffeetree		6	1	2			9	2.009
Cercis canadensis	Eastern redbud	3	1	2	2			8	1.789
Aesculus glabra	Ohio Buckeye	1	2	4				7	1.569
Picea pungens	Blue Spruce	1	6					7	1.56
Pyrus sps	Pear sps			4	2			6	1.34
Acer saccharum	Sugar maple				2	3		5	1.11
Alnus glutinosa	European alder			2	3			5	1.11
Betula nigra	River birch	2	1		1	1		5	1.11
Ginko biloba	Ginko	_	2	2	1	_		5	1.11
Jlmus Spp.	Hybrid Elm	5	_	-	-			5	1.119
Amelanchier canadensis	Serviceberry	3	1					4	0.89
Betula alleganiensis	Yellow Birch	3	1					4	0.89
Betula papyrifera	Paper birch	2	-	2				4	0.89
Carpinus caroliniana	American Hornbeam	3	1	2				4	0.89
Carya cordiformis		4	1					4	0.899
	Bitternut Hickory	4		4					
Catalpa bignonioides	Southern catalpa	2						4	0.899
Crataegus mollis	Downy Hawthorn	2		2		2		4	0.89
Maclura pomifera	Osage orange			2	2	2		4	0.899
Picea abies	Norway Spruce	2	_	2	2			4	0.899
Picea glauca	White spruce	3	1			_	_	4	0.899
Populus alba	White poplar	1			1	1	1	4	0.899
Quercus imbricaria	Shingle oak	1			2	1		4	0.899
īlia americana	American Linden			2		1	1	4	0.899
suga canadensis	Canadian Hemlock		1	3				4	0.899
Acer miyabei	Miyabei maple	3						3	0.679
Acer saccharinium	Silver maple			1			2	3	0.679



			Qı	uantity I	By Avg S	ize Class			% of
Spec	ies	0- 4"	5- 8"	9- 16"	17- 24"	25"32"	>32"	Total	Total Trees
Aesculus hippocastanum	European Horschesnut	3						3	0.67%
Carya illinoinensis	Illinois Pecan	3						3	0.67%
Catalpa speciosa	Northern catalpa	3						3	0.67%
Cladrastis kentukea	American yellowwood			2		1		3	0.67%
Metasequoia glyptostroboides	Dawn Redwood	2			1			3	0.67%
Populus deltoides	Cottonwood			1	2			3	0.67%
Prunus americana	Wild plum		2		1			3	0.67%
Ptelea trifoliata	Wafer Ash	3						3	0.67%
Quercus muehlenbergii	Chinkapin oak		3					3	0.67%
Abies concolor	White Fir		1	1				2	0.45%
Acer campestre	Hedge Maple	2						2	0.45%
Acer ginnala	Amur maple		1	1				2	0.45%
Carya laciniosa	Kingnut	2						2	0.45%
Carya ovata	Shagbark	2						2	0.45%
Carya tomentosa	Mockernut Hickory	2						2	0.45%
Corylus americana	American Filbert	2						2	0.45%
Fraxinus americana	White Ash			1	1			2	0.45%
Liquidambar styraciflua	Sweetgum		1	1				2	0.45%
Liriodendron tulipifera	Tuliptree	1			1			2	0.45%
Morus alba	White mulberry					2		2	0.45%
Picea omorika	Serbian Spruce	2						2	0.45%
Platanus occidentalis	Sycamore			1		1		2	0.45%
Pseudotsuga menziesii	Douglasfir			2				2	0.45%
Quercus bicolor	Swamp White oak	1	1					2	0.45%
Quercus nigra	Black oak		2					2	0.45%
Salix alba	White willow				1		1	2	0.45%
Acer platanoides	Norway maple			1				1	0.22%
Ailanthus altissima	Tree of Heaven			1				1	0.22%
Asimina triloba	Common Paw Paw	1						1	0.22%
Diospyros virginiana	Common Persimmon				1			1	0.22%
Larix decidua	Larch				1			1	0.22%
Ostrya virginiana	American Hophornbeam			1				1	0.22%
Pinus strobus	Eastern white pine				1			1	0.22%
Robinia pseudoacacia	Black locust (grove)	1						1	0.22%
Sassafras albidium	Sassafras	1						1	0.22%
Taxodium distichum	Shawnee Brave Cypress	1						1	0.229
	TOTAL	161	93	136	41	13	5	449	·



#### **Zone A. Central Campus**

Trees within the central campus zone are primarily ornamental landscape trees, planted over varying years as facilities were planned and developed. Until recently, no inventory has been conducted for the trees within the central campus. However, many species and general sizes are known as a result of the planting plan records (see Table 1). Several existing large trees located around the lake were surveyed for location but no record of tree data was included.

Currently, landscape plan summaries indicate nearly 500 trees exist within the Central Campus zone. These have been summarized by species in Table 1 and Figure 10. Future activity should include inventories of these trees noting condition and sizes. Existing large trees on slopes adjacent to the lake should be included.

#### **Central Campus Species Diversity**

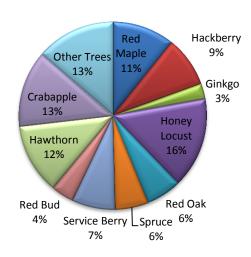


Figure 10. Central Campus Species Diversity

#### Zone B. Arboretum/Greenhouse/Entry



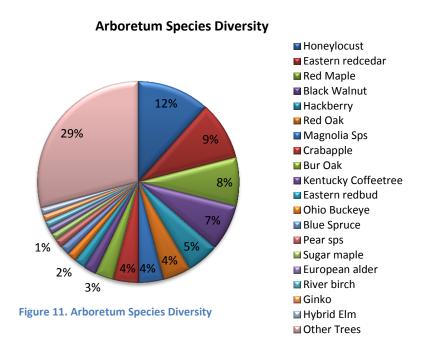
The Dr. William M. Zales Arboretum

JJC's Greenhouse facility was constructed in 2011 to support research and educational opportunities related to the College's various natural resource programs. The 16-acre arboretum was started in 1975 and contains a variety of species classified phylogenetically, according to their evolutionary ancestry and taxonomic relationships. The original list of plants for the Arboretum contained 215 specimens of desired plants. This list has been modified and now numbers some 243 species (pers com; V. Piekarski).

A recent tree survey was conducted, which resulted in 449 trees and roughly 80 species within the entire arboretum/greenhouse/ entry zone. Within this zone, Honeylocust



(*Gleditsia triacanthos*) was the dominant species accounting for nearly 12% of the total tree population. This zone also had a number of species that individually, accounted for less than 1% of the total number of trees. These have been grouped as "other trees" in Figure 11.



#### Zone C. Natural/Buffer Areas

Prior to 2010, the campus's 127 acres of natural area was dominated by European Buckthorn, an undesirable, aggressive non-native species. As part of their commitment to sustainability and green

infrastructure, the College cleared nearly 66 acres of the natural area of buckthorn and other invasives, resulting in a buckthorn reduction of 16% for the JJC campus. Out of this effort over 46 acres of natural prairie was created, including woodland savannas centered around clusterings of oak trees. These actions complemented the savanna, prairie and fen ecosystems which previously existed on campus.

As part of the prairie establishment, a survey was conducted of trees greater than 12 inches. Trees were tagged and summarized as to general condition, size and species (see Appendix F). Over 70 percent of the

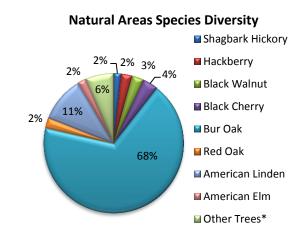


Figure 12. Natural Areas Species Diversity



inventoried trees are oak species, as summarized in the next section. In the future, the buffer areas and trees less than 12 inches in size should be inventoried to help assess species diversity, forest composition, and succession.

#### **Buffer Areas**

Nearly 33 acres of the 127 acre natural areas is classified as buffer areas. These are the locations that border the campus's edges, notably along the north and west sides of the property. These areas have not been inventoried and currently are dominated by buckthorn and other invasive species including honeysuckle shrubs. Recently the College's Natural Areas Committee has begun clearing of parts of this zone. Plans are to continue this for the near future. As clearing activities progress, surveys of existing native species should be conducted.

#### SPECIES COMPOSITION

In order to have a sustainable community forest it is important to have a good understanding of the diversity measures present as a whole. Both age and species diversity are important inventory components. Having an optimum balance of aged trees and a genetically diverse population across the community are key management objectives to a long-term successful forest community.

#### **Tree Diversity**

Typical convention to establish a genetically diverse tree population across a region or community is to follow a 5-10-15% guideline. This implies that not more than 5% of any one species, 10% of any one genus, and 15% of any one family should be planted across a community. A similar but more moderate performance standard is a 10-20-30% ratio of species-to genus-to family makeup, of which for the time being, the College plans to follow.

Due to its "natural" character, JJC's Natural Area Zone is considered exempt from this norm, as is the Arboretum due to its unique phylogenetic approach to tree selection. However, for the Central Campus Zone this guideline should apply. The Central Campus includes over 500 trees. As shown in Figure 10 the Central Campus area has a diversity of tree species. According to the percentage threshold guideline

however, the Central Campus has an overrepresentation of a number of species. Table 4 presents a list of the top 8 species in terms of number and percentage based on the campus inventory completed to date for this zone as summarized from existing campus landscape planting plans.

Table 4. Top Planted Species in Central Campus									
TOP PLA	TOP PLANTED SPECIES IN CENTRAL CAMPUS ZONE								
Species	%	Genera	%	Family	%				
Honeylocust	16	Gleditsia	16	Caesalpiniaceae	14				
Crabapple	13	Malus	12	Rosaceae	23				
Hawthorn	12	Crataegus	12	Rosaceae	23				
Red Maple	11	Acer	11	Aceraceae	9				
Hackberry	9	Celtis	9	Ulmaceae	9				
Serviceberry	8	Amelanchier	9	Rosaceae	23				
Red Oak	6	Quercus	6	Fagaceae	5				
Spruce	6	Picea	6	Pinaceae	18				



According to the table and 10/20/30 threshold guideline, several species listed, notably Honeylocust, Crabapple, Hawthorn and Red Maple, should be avoided or curtailed until the matrix becomes more diverse. This table was based on a current inventory of planted species from campus landscape plans. As the central campus tree inventory becomes more complete, species composition and percentages are likely to change.

#### Size and Age Distribution

Age diversity is another element of urban forestry inventory and management that is often overlooked. Determining the age of tree species is often time consuming and difficult. While no generic size categories match every tree species, for purposes of setting goals and assessing performance, trees are often clumped into age classes keyed to size ranges as follows:

Table 5. Age Diversity Through Size Class Distribution						
AGE DIVERSITY THROUGH SIZE CLASS						
DISTRIB	UTION					
Age Class/Maturity Stage Average Ideal Size (dbh) Distribution						
Juvenile 0-8" 40%						
Semi-mature >8-16" 30%						
Mature >16-24" 20%						
Senescent >24" 10%						
Source: Richards, N.A. 1982/1983. Diversity and stability in a street tree population. Urban Ecology 7, 159-171						

With the exception of the large, existing trees along the lake shore, the age classes of JJC's trees are on the younger side for the Central Campus Zone as a whole (0-8"). In contrast, many of the younger age classes are missing or are very low within the Natural Areas Zone. Although trees less than 12-inches in

diameter were not surveyed within the Natural Area, nor were trees within the buffer zones, ground observation from meander searches through the natural areas supports the fact that few native species seedlings and saplings, notably oak regeneration, are occurring. A number of factors could be the reason for this, including wildlife predation, fires and disease. Of the current inventoried trees within the natural areas, over 44 % are considered in the "mature" age class (size range >16-24"); a surprising 29 % are within the "senescent" maturity stage (>24").

#### **Natural Areas Percent Age Class**

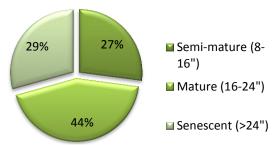


Figure 13. Natural Areas Percentage Age Class



# **LEGACY TREES**

Trees are long lived species. It takes generations for trees to reach maturity. A large, dominant white oak for example, is awe-inspiring to look at and know that it has been there for centuries and likely existed long before the area was settled. The JJC campus has many potential "legacy" trees scattered about its property. A legacy is "something transmitted by or received from an ancestor or predecessor from the past". JJC's large trees are a source of pride within the campus community and a forest legacy worthy of protection. It is important that such trees be identified, preserved and protected so that future generations will have a forest legacy.

A JJC Legacy Tree Program should be developed to help protect and communicate the benefits and importance of such resources. A Legacy Tree Program should include nomination criteria, a process for nomination, recognition in a campus wide publication, mapping of legacy trees and detail regarding their preservation and protection.

## **LEGACY TREE CRITERIA**

Legacy trees don't have to be the largest trees but they should have some significance to the campus and community. For instance, a tree may have been planted to commemorate a special occasion or development. This tree could be designated a legacy tree so that future students, faculty and visitors can come together and reflect on the significance of this prior time and commitment.

A number of criteria may be used to identify legacy trees. The most prevalent include:

- Size: Over 36 inches dbh, or within top 1% of tree size for given species.
- Rare species Typically less than 1% of the community inventory.
- Special Event As nominated.

In order to formally recognize the selection of a legacy tree, the college should establish a procedure that, at a minimum, includes the following steps:

# **Selection Procedure**

- 1. Establish a Tree Advisory Committee.
- 2. Develop a nominating form.
- 3. Identify and submit nomination to Committee.
- 4. Review and approve.
- 5. Inventory and document tree with a plaque or marker.

#### LEGACY TREE SELECTION

JJC has several trees on campus that meet one or more of the criteria noted above. Such trees, once removed, are irreplaceable resources, at least for many generations to come. Many of the potential legacy trees are located within the campus's natural area zone. These trees have been inventoried



previously and consequently their location established. Several other potential legacy trees, located near the lake within the central campus zone have been surveyed as to location and size, but not identified as to species and condition. Legacy trees should be clearly labelled as such on inventory forms and documented by tree management zone.

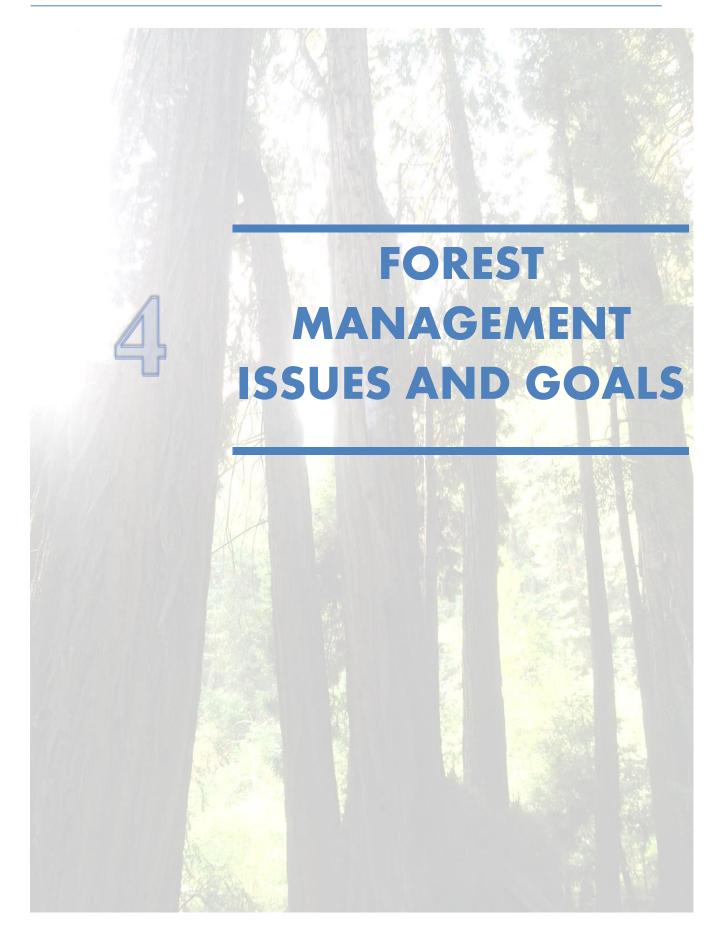
# LEGACY TREE PRESERVATION AND PROTECTION

As much as possible, proposed development or ground-disturbing activities should be planned to avoid areas around designated legacy trees. Prior to any development activity in the area, construction fencing shall be erected around the drip line of the trees. Legacy trees should be inspected by certified arborists every 4 - 6 years. Education and outreach should be provided to maintenance personnel on basic management and care of the legacy trees, pruning needs and tree preservation and protection according to standard practices for tree care (see Appendix A and B) and as noted in ANSI A300 Part5.

Legacy trees should be removed only if dead, dying or deemed dangerous. If legacy trees need to be removed, the tree advisory committee shall be informed and they will formally remove the tree from the legacy tree nominating list and noted on the tree inventory data set.









# **Chapter 4: Issues and Goals**

# **KEY ISSUES**

As part of the initial visioning process for the JJC Urban Forest Management Plan, a number of key issues were identified. These included:

	JJC URBAN FOREST MANAGEMENT PLAN KEY ISSUES
-	Limited Tree Inventory
-	Lack of Age Diversity, Specifically in Natural Areas
-	No Consistent Planting Program
-	Inconsistent Budget Allocations
-	No Management Plan
-	Need Greater Public Outreach and Communication

JJC's key issue identification provided insight for the establishment of a number of goals to guide future actions.

## **GOALS**

Listed below are the strategic goals of the JJC Urban Forest Management Plan. Every attempt was made to make these goals realistic and achievable so they do not place an undue burden on the College or its resources. It is hoped that, in the long-run, realization of these goals will save money and provide greater benefits over time through proactive, as opposed to reactive, management. The Plan is also meant to be adaptive in reacting to change. New concepts, the introduction of new pests or pathogens, or changing climate (both social and meteorological) may all change the way the Urban Forest is viewed. The goals of this document are subject to change based on the discovery of new knowledge, shifting budgets, or other circumstances.

#### OVER-ARCHING GOAL

The Chicago Region Trees Initiative (CRTI) has set a regional goal of building a healthier and more diverse urban forest by 2050. Utilizing this regional goal as a guide, JJC's over-arching goal, of which all other goals and targets support, is as follows:



 Sustainably protect, preserve, maintain and expand JJC's tree canopy and urban community forest.

#### SUPPORTING GOALS

JJC has developed the following supporting goals to guide the implementation of the Urban Forest Management Plan as it relates to trees on campus. Goals are grouped by short -, mid -, and long-term timeframes, which support and build off each other.

# **Long-Term Goals**

JJC has identified the following goals to be completed between 2037 and 2050:

- Achieve campus canopy coverage goal of 25%.
- Achieve a Buckthorn and Honeysuckle reduction goal of 85%.
- Increase age diversity of the oak ecosystem within the Natural Areas.
- Increase species diversity across the campus zones so that no single species represents more than 10% of total tree population, no genus more than 20%, and no family more than 30% (excluding natural area zone).

# **Mid-Term Goals**

JJC has identified the following mid-term goals to be completed within 10-12 years after the short-term goals (2025-2037):

- Reduce Buckthorn and Honeysuckle by 60%.
- Complete a campus-wide tree inventory.
- Increase tree canopy coverage by planting 60% or more of the identified plantable areas.
- Increase age diversity within natural area by planting native species that complement existing species.
- Build and maintain support about the benefits of a sustainable urban forest by developing websites, educational brochures and other media that can be accessed by students and the community.

# **Short-Term Goals**

JJC has identified the following short-term goals to be completed within the next 5-7 years (2018-2025):

- Complete tree inventories for the Arboretum and Central Campus Zones
- Establish a Tree Advisory Committee.
- Develop a Legacy Tree Program.
- Identify and prioritize potential areas to plant trees for canopy cover.
- Increase tree canopy coverage by planting 25-30% of identified planting areas.
- Reduce buckthorn by clearing select buffer areas over the next 5 years.
- Incorporate tree inventory data into College's new GIS/GPS program and curriculum.
- Establish and implement sustainable funding strategies for tree planting and care.
- Establish a procedure for coordinating with the College's Horticultural Department and Arborists regarding tree inventories, care and protection when development impacts are proposed near large trees.



# POTENTIAL CANOPY COVER ANALYSIS

JJC has established that a reasonable canopy cover goal for the future is 25%. This is based on a review of existing canopy cover and discussions regarding planting suitability and sustainability commitments within the various management zones. In order to achieve this goal approximately 16 acres of on-site property will require planting over time.

# **CURRENT AND POTENTIAL CANOPY COVER BY ZONES**

As part of the inventory process, an analysis of existing canopy cover on campus from aerial and GIS assessment helped determine that approximately 21% of the current campus property is in tree cover. As shown in Figure 14, roughly 90 acres of canopy cover currently exists on campus properties. Natural and buffer areas account for nearly 80% of the coverage. Many of the campus zone areas are considered unsuitable for potential tree planting and canopy cover as a result of development or, as in the case of the agricultural zone, academically unsuitable. Notwithstanding many of these "unsuitable" areas, further analysis of campus zones and land cover in conjunction with discussions among various JJC department staff, has resulted in the identification of several potential locations for future tree plantings (see Figure 16).

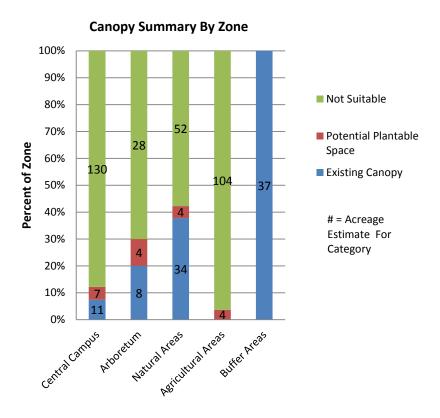


Figure 14. Canopy Summary By Zone



Planting many of these locations to achieve the 2050 goal of 25% canopy cover will result in a shift in zonal canopy coverage as shown in Figure 15.

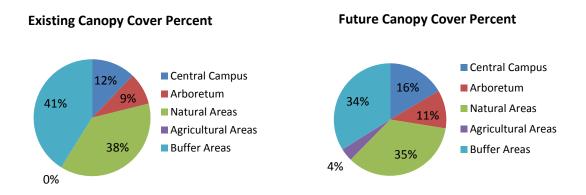


Figure 15. Existing and Future Canopy Cover Percent





# POTENTIAL PLANTING LOCATIONS

Taking stock of current tree inventory and canopy cover through aerial assessment and on-the-ground surveys was an essential first step in determining canopy cover goals. In order to reach these goals, future locations are needed in which to plant trees. The following locations shown on Figure 16 were determined by the college to be physically possible as well as academically preferable. For example, the agricultural zone has considerable acreage that is physically capable of growing trees. However, most of the acreage is not academically acceptable. Some proposed plant locations may require adjustment during the more detailed planting phase. This is particularly true for sites in the Natural Areas zone where bedrock is often near or at the surface.



**Figure 16. Potential Planting Areas** 



# PRIORITY PLANTING LOCATIONS

Plantable locations were reviewed and discussed in-house to determine a hierarchy of sites in which to plant trees on campus properties. While many potential small sites exist within the campus to meet future goal requirements, no rigid priority can be set at this time. However, selection of sites will be based on the following general priorities:

- Along road right-of-ways and parking areas,
- Potential "grove" locations, and
- Within specific zone areas to meet special objectives.

These priorities are considered general in nature, and planting sites could change based on funding opportunities, interests, and needs of the many different programs and departments involved with natural resources on campus.

## TREE SELECTION AND PLANTING GUIDELINES

Selection of trees to plant on campus should include an assessment of the campus zone, physical location and a holistic view of campus species diversity. Broad species diversity is important to reduce impacts from disease and pest infestations such as from the recent ash tree and the emerald ash borer. All trees to be purchased should be in compliance with the American Standard for Nursery Stock, and shall come from an Illinois Department of Agriculture Certified Nursery. This requirement should be stated in all bidding documents.

When considering what species to plant the following guidelines should be considered for each zone:

## **Central Campus Zone**

The College's 10-20-30% guideline should apply to this zone. Species that currently exceed this guideline include:

- Honeylocust
- Hawthorn
- Red Maple
- Crabapple

These species should be avoided or curtailed until the matrix becomes more diverse. As the central campus tree inventory becomes more complete, species composition and percentages are likely to change.

Additionally, invasive species should be avoided. The State of Illinois has lists of plants that have been identified to be invasive species. Similarly, tall growing trees should not be planted under power lines; instead trees that are less than 25 feet at mature height should be selected. Lists of acceptable as well as undesirable tree species are included in Appendix D.



Trees within the Campus zone will generally be larger in size, (2.5"-3" dbh) when planted. However, this may vary depending on constraints of location and design intent. Most of the trees to be planted within this zone will be balled and burlapped. Details on planting specifics can be found in Appendix C.

# Arboretum/Greenhouse/Entry

Trees selected for the Arboretum should be according to its phylogenetic design intent. Trees selected for planting outside the Arboretum but still within the Arboretum zone should adhere to the 10-20-30% rule relevant to current inventory status. Trees planted in the Arboretum should be installed according to the planting specifications and details listed in Appendix C.

# **Natural/Buffer Areas**

Trees to be planted in these zones should be from species sourced locally, within 150 miles of the site. A variety of species should be included, as well as different sizes to help improve age diversity within the zone. While emphasis may be placed on planting of oak species in support of the Chicago Region's Oak Ecosystem Recovery Plan, the planting of Bur Oak (*Quercus* macrocarpa) should be curtailed as current inventory to date for this area indicates that this species accounts for nearly 68% of the trees in this zone. Species that have been identified as invasive according to the Illinois Invasive Species List should not be planted.

Trees planted in the natural area should typically be smaller and bare root stock. This will allow the root system to more readily adapt to the shallow soils found in this area, which consequently improves the chances of survival. Depending on budget constraints, protection fencing should be included for the first few years to help against over grazing from local deer populations.







# **Chapter 5: Management By Zones**

# **BACKGROUND**

JJC's urban forest essentially is infrastructure that provides air and water quality benefits, energy reduction, stormwater reduction and enhancements for wildlife and physical and mental health. This valuable resource therefore, is important to effectively manage in order to sustain its benefits.

As previously described, the JJC campus has been categorized into four urban forest management zones. This chapter details management objectives and maintenance prescriptions pertaining specifically to these zones.

# **FRAMEWORK**

Each management zone is described according to the following three sections:

- 1. Existing Information/statistics
- 2. Principal Targets
- 3. Standard of Care

As inventory updates and additional information become available, zone summaries will be updated. Similarly, as goals are achieved these will be updated to reflect current conditions, as well as new ones added. Standard of care information may change based on collaboration between departments and the need for changes to reflect conditions.

# **COLLABORATION**

Success of the forest management plan for an area, and the JJC campus as a whole, lies in the details and collaboration between college departments and organizations. It is hoped that the structure of this management plan will facilitate the sharing of data among departments and stakeholders. Long-term, the plan will promote the development of tools that will make communication between groups easier and urban forest management more sustainable.

# **JJC URBAN FOREST MANAGEMENT ZONES**

All of the campus management zones, with the exception of the Agricultural Areas zone, which presently includes no trees, are described below with respect to stated targets and standard of care. Each zone includes an aerial map that shows existing trees and future/potential planting locations.



## A. CENTRAL CAMPUS ZONE

The Central Campus Zone includes trees that are planted around buildings, parking, and walkways to provide shade and aesthetically pleasing landscaping. Additionally, this zone includes many mature shade trees along the slopes of the lake that provide canopy cover and relaxing areas for students and staff. Many of these existing large trees have been surveyed as to location, but not identified as to species and condition. Wooded areas along the lake and to the north, but located south of the campus ring road, are managed largely as natural areas, with the exception that trees considered in poor condition or a hazard, will be pruned or removed.

# B. ARBORETUM/GREENHOUSE/ENTRY ZONE

The Arboretum/Greenhouse/Entry Zone includes a mix of special species, buffer trees, street trees and entry landscaping. Areas outside the Arboretum should be managed similar to the objectives noted for the central campus zone, the exception being the existing tree buffers that parallel the entrance roads. These are managed largely as natural areas (i.e. left mostly as is with no pruning, watering or mulching). The Arboretum, as previously noted, is structured along phylogenetic classes of plants. Newly planted trees should be installed according the ANSI standards, mulched and periodically watered. Pruning and mowing are kept to a minimum to allow specimens to form natural clone populations. Specific directives developed in 2004 and modified to improve maintenance of the arboretum include:

- No pruning or shaping trees and shrubs
- If a branch is completely broken off it is ok to pick it up
- If the branch is attached to the tree in anyway Leave it be
- It is ok to remove invasions; buckthorn, mulberry, multiflora roses, amur honeysuckle
- Trees are not to be planted too close to roadways
- Weeds are removed and herbicide can be applied as needed
- Grass is removed from around the plantings and mulch is added around individual trees or within groups of trees to retain moisture and allow for grass cutting around specimens
- Mulch is added as needed
- New plantings are protected with fencing to prevent deer browsing until established
- New plantings are mulched and watered until established
- Visitors are not allowed to drive or park cars in the arboretum. Service Vehicles are allowed with prior approval from JJC Grounds Department and Campus Police.

# C. NATURAL AREA/BUFFER ZONE

The Natural Area/Buffer Zone areas are treated as woodlands and managed collectively as a group. Existing trees receive little care. Dead trees and limbs are typically left in place as snags for perch and habitat for animals and birds. Newly planted trees will initially receive mulch and watering, and then left to nature after that. One action that may be included at the time of planting is to install animal control fencing to help reduce mortality from deer predation and browsing damage.



# D. AGRICULTURAL ZONE

Trees within the Agricultural Zone will be managed and treated according to targets and objectives noted for the Central Campus Zone.



JJC Central Campus – Water Bags on New Trees



# **A: CENTRAL CAMPUS ZONE**

Acreage	Tree Count	Ex Canopy Coverage
148	492	~3%



# **TARGETS:**

Description		Timeline	Resources	Funding/Budgets
1	Increase canopy coverage to ~ 4%	By 2050	Various Depts, Volunteers	
2	Plant trees in identified planting locations	By 2037	Various Depts, Volunteers	Grants, Annual Budget
3	Complete Tree Inventory	By 2027	Horticultural Dept	Annual/Departmental
4	Identify and protect Legacy Trees	By 2023	Various Depts, Volunteers	
5				
6				

#	Item	Detail
1	Planting	According to ANSI A300 & Am Standard for Nursery Stock; per stated planting specifications in Appendix; Typical size ~2.5"dbh;
2	Watering	Weekly during growing season for new trees for 3 years; Periodic watering after and for established trees;
3	Pruning	According to ANSI A300 Part1; Annual routine maintenance; Large limb pruning on inspection.
4	Mulching	Mulch new trees at planting; Annual replenishment.
5	Tree Removal	As determined; Grind stump.
6	Inspection/Protection	Inspect annually; Remove fallen limbs/debris when identified; Remove dead limbs as identified, including trees within natural areas located within inner ring road; Coordinate with inventory update re: removal of dead or poor condition trees; Ensure protection of trees to be saved per ANSI A300 Part5 during construction activities;



# B. ARBORETUM/GREENHOUSE/ENTRY ZONE



# **TARGETS:**

• •	7.11.02.101				
De	Description		Resources	Funding/Budgets	
1	1 Complete Tree Inventory		Hort. Dept.	Grants, Departmental	
2	Plant trees in identified planting locations	By 2037	Hort. Dept., Facility Services	Grants, Annual Budget	
3	Increase canopy coverage to ~3%	By 2037	Addl plantings along roads	Annual/Departmental	
4	Grow oak seedlings in Grnhse to support oak recovery	By 2027	State/Federal agencies	Grants/Departmental	
5	Update signage and brochure	By 2037	Hort Dept.	Grants/Departmental	
6	Add trail system and parking adjacent to arboretum	By 2050	Hort Dept., Facility Services		

#	Item	Detail
1	Planting	According to ANSI A300 & Am Standard for Nursery Stock; per stated planting specifications in Appendix; Typical size ~2.5"dbh roadside; According to phylogenetic class and as specimens die in Arb.
2	Watering	Weekly during growing season for new trees for 3 years; Periodic watering after and for established trees;
3	Pruning	Only as necessary upon inspection and via workorder submitted to Facility Services Dept.
4	Mulching	Mulch newly planted trees; Replenishment annually.
5	Tree Removal	Remove dead or dying trees; Grind stump.
6	Inspection/Protection	Inspect annually; Remove fallen limbs/debris when identified; Coordinate with inventory update re: removal of dead or poor condition trees; Ensure protection of trees to be saved per ANSI A300 Part5 during construction activities;

# C. NATURAL AREAS/BUFFER ZONE

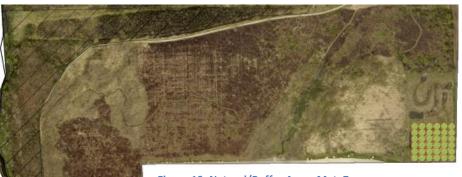


Figure 19. Natural/Buffer Areas Mgt. Zone

Acreage	Tree Count	Ex Canopy Coverage
127	600+	~17%



Buckthorn Removal



Tree Planting Locations



De	Description		Resources	Funding/Budgets
1	Increase canopy cover to 18% by planting native trees	By 2050	Various Depts, Contractors	Annual Budget
2	Coordinate oak/hickory plantings w/ oak ecosystem recovery plan, monitor plantings.	On-going	Natural Areas Committee	Grants, Annual Budget
3	Complete Tree Inventory	By 2027	Hort Dept, Nat Areas	Annual/Departmental
			Committee	
4	Define woodland/prairie boundaries with GPS	By 2027		Annual/Departmental
5	Remove Buckthorn by 85%	By 2037	Nat Areas Comm./	Annual/Departmental
			Volunteers	
6	Protect newly planted trees; inform maintenance	On-going		
	contractors to protect from burn/herbicide actions			
7	Conduct periodic burns to control invasive species	Bi-annual	Contractors	Annual budget

#	Item	Detail	
1	Planting	According to ANSI A300 & Am Standard for Nursery Stock; per stated planting specifications in Appendix; Typical size ~sapling/containers, bare root stock; Mulch after planting. Provide	
		protection fencing as needed.	
2	Watering	Water at initial planting.	
3	Pruning	No pruning, except for natural areas within central campus zone-pruned as necessary for safety	
4	Mulching	At planting	
5	Tree Removal	No tree removal, unless determined otherwise by Natural Area/ Tree Advisory Committees	
6	Inspection/Protection	Inspect newly planted trees annually; Provide protection for minimum of 3 years. Inspect	
		woodlands periodically, including Legacy trees. Ensure that maintenance personnel (including	
		contractors) know locations of newly planted trees.	



# D. AGRICULTURAL ZONE

Acreage	Tree Count	Ex Canopy Coverage
108	~	~%



Tree Planting Locations



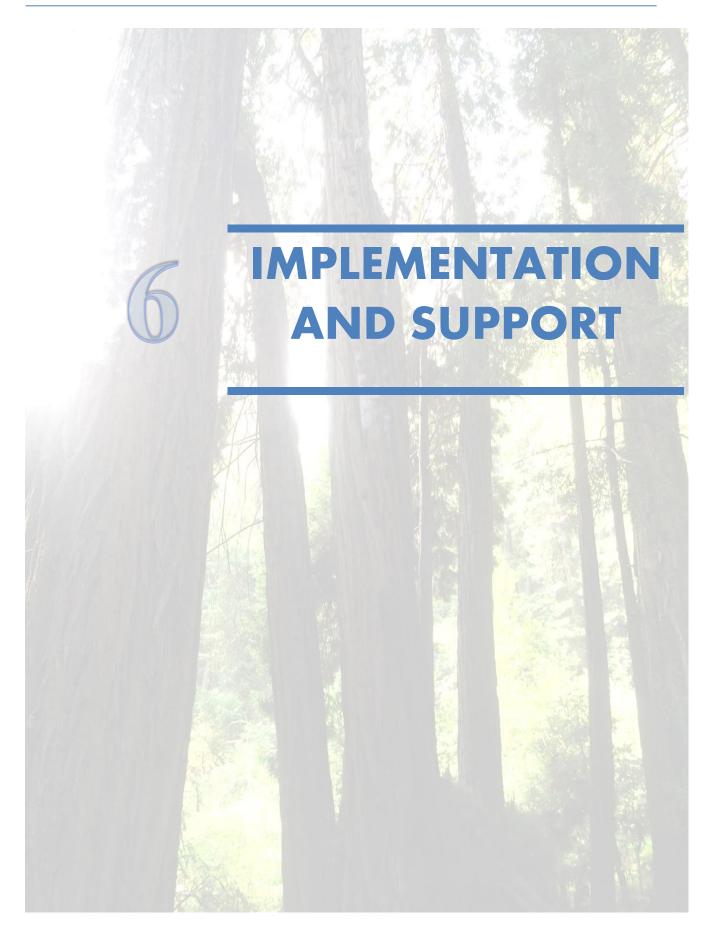
Figure 20. Agricultural Mgt Zone

# **TARGETS:**

De	Description		Resources	Funding/Budgets
1	Increase canopy cover to 1%	By 2050	Various Depts, Volunteers	Grants, Annual Budget
2	Plant trees in identified planting locations	By 2037	Various Depts, Volunteers	Annual Budget
3	Establish a walnut grove(s) for research & silivicultural practices	By 2037	Horticultural Dept.	Grants
4				
5				

#	Item	Detail
1	Planting	According to ANSI A300 & Am Standard for Nursery Stock; per stated planting specifications in Appendix; Typical size ~2.5"dbh;
2	Watering	Weekly during growing season for new trees for 3 years; Periodic watering after and for established trees;
3	Pruning	According to ANSI A300 Part1; Annual routine maintenance; Rotational 3-4 year schedule
4	Mulching	Mulch new trees at planting; Annual replenishment.
5	Tree Removal	As determined
6	Inspection/Protection	Inspect annually; Remove fallen limbs/debris when identified; Coordinate with inventory update re: removal of dead or poor condition trees; Ensure protection of trees to be saved per ANSI A300 Part5 during construction activities;







# Chapter 6: Implementation and Support

# MAINTENANCE, EQUIPMENT AND RESOURCES

Routine maintenance, adequate staffing, equipment, funding and resources are important components of a sustainable urban forest management program. JJC's multi-disciplines and various departments often work closely together to complete tasks and ensure the protection of the college's many special resources.

#### TREE MAINTENANCE AND CARE

The College's Facility Services Department (FSD) staff are responsible for the principal management and maintenance of campus trees, including tree removal, tree planting, stump removal, trimming and pruning. In addition to the FSD, the Horticultural and Natural Sciences Faculty Departments direct many activities associated with the Arboretum and the Natural Areas respectively.

In addition to Department activities and responsibilities, a number of established campus committees work diligently to support the Departments and promote the care and



Construction near the new Facilities Services Building

protection of the forest resource. Three of particular relevance include the Grounds Advisory Committee (GAC), the Sustainability Initiatives committee (SIC), and the Natural Areas committee (NAC). The Grounds Advisory Committee is made up of stakeholders from the campus who are involved in campus grounds care. The SIC is comprised of senior administrators, faculty, staff and students whose mission is to help the College become a leader in the community through the practice and application of sustainable activities and changes. The NAC is comprised largely of natural sciences faculty and staff whose focus is the care and protection of the College's natural areas. Twice yearly, members of the NAC, with the help of the Natural Sciences Club, organizes volunteers to help clear undesirable vegetation from various areas on campus.



## **In-House Care**

The Facilities Department employs a number of full and part-time staff to conduct daily and seasonal tree care activities. The FSD follows a systematic work-order system in which campus areas are divided into sub-zones and routinely inspected and maintained. Special work-orders are prepared for needed actions that fall outside the typical, routine maintenance. With respect to forest management practices, the central campus zones are managed "intensively" or on an individual basis; natural area zones are managed "extensively" or as a group according to silvicultural practices. Campus areas are routinely inspected. Issues or concerns regarding trees are brought to the attention of FSD management, who may bring personnel from other departments, such as arborists from the Horticultural Department, to assess situations. Tree care activity in which the Department engages includes:

- Tree Planting. Includes watering regime, fertilizing, and mulching per standard practices. Tree
  planting in natural areas typically do not include fertilizing or watering past the initial planting,
  and may include protective fencing from deer and other animals.
- Tree Removal. Dead, dying or hazardous trees are removed, including the stump within the central campus zones. The Facilities Department began removing ash trees impacted by the emerald ash borer in 2006 and continues to monitor and remove trees as necessary. Roughly 90% of campus ash trees have been removed and replaced to date (pers. com., R. Rivera, FSD). Trees within designated natural areas are typically not removed when dead, unless necessary due to disease control or hazard potential.
- Tree Mulching. Trees are mulched when initially planted and replenished annually within the "manicured" areas of the central campus and the arboretum. Trees within the natural areas are mulched only at time of planting. Staff are trained in proper mulching practices so as to avoid "volcano" mulching and other detrimental practices.
- Tree Pruning. Within the central campus zones, trees are routinely inspected for damage and hazardous conditions. Minor structural pruning to remove dead or damaged limbs is done annually. Pruning within the natural areas is not done, unless necessary due to hazard potential. No pruning is done within the arboretum unless necessary due to hazardous conditions. Staff conducting the pruning operations are trained in standard pruning practices per ANSI A300 Part 1: ... Standard Practices, Pruning. Additional detail on reasons and methods for pruning can be found in Appendices A and B.
- Wood/Waste Utilization. In support of sustainable practices, JJC chips most of the trees removed on property and reuses the mulch on campus. Products that are not chipped and reused are removed off site or to the campus's onsite compost facility. Larger, quality trees, which could be used for saw timber and higher purposes have not yet been utilized, but may be possible in the future.
- Tree Protection. Prior to any construction activity around trees, proper protection measures, including tree trunk wrapping, construction fencing and the establishment of a tree protection zone are typically enacted. For planned projects involving the campus's large trees, the College's certified arborists within the Horticultural Department should provide input as to inventory conditions, detail on tree protection zones, and maintenance and care of the trees



during the development phase. If necessary the staff Certified Arborists may prepare tree management plans and specifications for tree care during site planning, development and construction.

#### **Contracted Services and Coordination**

JJC utilizes contracted services for landscaping and other development-related activities, including large tree removals and planting. All bid documents and specifications include sections related to planting, tree care and protection, according to ANSI standards. Any planned construction activity around existing trees requires plans to show tree protection measures, and staff ensures this to be installed prior to the start of any activity.

The College campus has many utilities located within its premises. Close coordination with utility companies is initiated for any planned development to help reduce impacts to campus trees and landscaping. This includes coordination with its own in-house utility department, which is currently working to develop a GPS program to accurately identify and locate utilities and facilities on campus.

#### **STAFFING**

The College's Facilities Services Department includes the equivalent of one full-time employee and one part-time employee dedicated to campus tree care activities. In addition, the Department employs approximately five-to-seven seasonal/intern workers. Several of the Department's full time employees possess the technical skills and ability to trim and remove large trees and are generally versed in urban forest practices.

# **Support Staff and Contracted Labor**

An advantage of the College is its ability to pull from a number of departments and cross-disciplines for support. As the need arises the Facilities Services Department may call on certified arborists and horticulturists from the Horticultural Department. The Horticultural Department has been and continues to be involved in the on-going tree inventory. Similarly, various committees provide access to volunteers for tree planting and clearing activities periodically, and grant support for programs is provided by staff in the administrative departments.

To supplement the efforts of the Facility Services Department employees, the College contracts on occasion with private landscape and tree care companies for tree removal, landscape services and general maintenance needs. Beginning in 2010, contractors were utilized to clear and restore the campus's natural areas. Contract services, including herbicide application and prescribed burns, continue as part of the natural areas restoration maintenance efforts. This private service is set up on a three-year contract basis. All contractors are required to have prior experience in natural resource management and care of trees.



# **Staffing Needs**

While the general enrollment of the college and its demands for services has steadily increased over the years, maintenance staffing levels have remained relatively constant. The Facility Services Department continues to meet current demands for services through both proactive and reactionary management objectives. However, several staffing/support needs have been identified which would be desirable in supporting this Urban Forest Management Plan. These include:

- Hiring of one additional full-time employee.
- Training of select personnel in basic urban forest management.
- Establishing an urban forest management coordinator position.
- Training of select personnel in salt-reduction methods and plowing practices to reduce impacts
  of road salt on trees and detention areas.

# **Equipment Needs**

Following is a listing of equipment and resources currently owned by JJC and used to help manage the urban forest.

EQUIPMENT AND SUPPLIES IN SUPPORT OF JJC URBAN FOREST MANAGEMENT ACTIVITIES											
		Approximate									
Qty	Existing Equipment	Value									
1	Pick-up Trucks	\$40,000									
1	Chipper (rent)	\$1,500									
1	Backhoe	\$62,000									
1	Chain saw	\$400									
1	Watering Tank	\$2,500									
10	Shovels	\$200									
6	Hand Pruners	\$100									
6	Hand Saws	\$150									
3	Pole Saws	\$500									
1	GPS/GIS	\$1,500									
	TOTAL	\$108,850									
	Supplies	(annual \$\$)									
	Gloves, eye wear, helmets, etc.	\$200									
	Fertilizer, Herbicides, Pesticides	\$1,000									
	Mulch	\$3,000									

**Table 6. Equipment and Supplies List** 

The value of supplies is an annual expenditure. In addition to the equipment and supplies costs, annual operation and maintenance costs are approximately \$1,200 (upkeep on vehicles is done by the Automotive Technology Department). The FSD replaces larger equipment (trucks) every 7-10 years; smaller equipment is amortized over shorter periods, 5-7 years.

TOTAL

\$4,200



## **EDUCATION AND VOLUNTEER OPPORTUNITIES**

The urban forest is a collective resource and important infrastructure that provides many benefits to a community. Education and outreach programs are an excellent way to pass along the significance and value of protecting trees in the urban environment.

## **VOLUNTEER OPPORTUNTIES**

Working together with volunteers from the college and the community can help stretch "thin" budgets and promote better understanding of the college's goals and values for tree protection and care on its campus. Currently, the Natural Areas Committee and the Natural Sciences Club organizes volunteers twice a year to help in clearing buckthorn trees and other invasive species within the campus's natural areas. As part of the UFMP program other opportunities should be explored for involving and educating

volunteers in the care and value of trees. Following is a list of several opportunities in which volunteers could play an active role in supporting the College's urban forest management plan agenda.

- Invasive species clearing day (currently being done).
- Develop a web page to inform and publicize the benefits and values of campus trees.
- Update natural areas brochure.
- Expand trails.
- Identify and tag Legacy Trees.
- Hold "small oak" planting events.
- Support tree inventory tasks.
- Plant a tree day.
- Collect seed in prairie areas.
- Conduct dormant seed events.



Natural Science Club (Photo by A. Neil, JJC)

As the volunteer program and events expand, the college may consider holding an annual "volunteer recognition" bonfire or event.

# **Tree Steward Program**

A program that has been utilized by other communities and should be considered is developing a JJC Campus Tree Steward Program. The purpose of the program is to train a group of volunteers to assist with urban forestry tasks throughout the college. Volunteers would receive training through a series of classes or workshops focused on topics including tree identification, maintenance, pruning, and hazard



assessment. Each "Tree Steward" would then receive a certificate and be asked to provide a number of hours of volunteer service. The knowledge and service the Tree Stewards receive and provide are aspects they can carry over to their own community neighborhoods.



Photo by A. Neil, JJC

#### COORDINATION AND COOPERATION

JJC's forest resources are not only impacted by college activities, but also at times, by neighboring and outside entities. Some off site activities positively impact the campus community, such as the adjacent property and activities of the Will County Forest Preserve District. In the past the WCFPD has provided stewardship support and volunteers, as well as coordination regarding prairie treatments and burns on their neighboring properties. Some activities can have negative impacts, such as utility construction and maintenance. The College maintains close coordination with area utility companies and other entities whose responsibilities may not be forestry related, but may, on occasion, impact campus resources. Coordination between departments within the college itself also helps to protect forest resources. The recent acquisition of GPS/GIS equipment by the Facility Services Department will help to identify existing and future utilities on campus. Combining this information with future tree inventory data will help reduce impacts to campus trees and other natural resources.



# PLAN UPDATES AND MONITORING

The JJC Urban Forest Management Plan is a document that is to be referenced and updated periodically to stay abreast of changing conditions. Monitoring is a key element of the plan to ensure actions stay current and the campus maintains a sustainable urban forest. While the UFMP document should be updated every five to seven years, other activities, such as inventory, should continue on a more regular basis.

The tree inventory program should continue until all trees within the college campus property are identified and documented. Once this is complete, newly planted trees should be recorded as they occur. Once the initial tree inventory is completed, other monitoring objectives can be achieved, including but not limited to:

- Updating age and species diversity summaries for zones.
- Assessing progress towards canopy goals.
- Evaluating planting program performance.
- Assessing for tree pests and diseases.

Monitoring and plan updating should be directed by the Tree Advisory Committee, which is recommended to be established as part of this management plan. They should be responsible for coordinating efforts between different groups and departments. Monitoring objectives of the UFMP can continue to expand as data is collected and Departments and professors find ways to utilize the information.



Photo by A. Neil, JJC







# **Chapter 7: Budget & Funding**

# **BACKGROUND**

The majority of the tree care activities occurring on the campus are handled by the college's Facility Services Department (FSD). This includes administrative and operational activities for central campus zones and the surrounding natural areas, including contractual services. Budget requests for operations are made annually and submitted to the College Administration for approval. Most of the budget for urban forest management activities is subsumed within the FSD's general operations and maintenance budget, including that for the natural areas, of which the FSD administers. Tree planting activities, including contract services for landscaping of buildings and ancillary facilities, typically comes out of the capital improvements program budget.

# **BUDGET ALLOCATION**

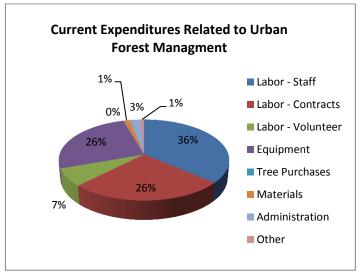
Typically, urban forestry budgets tend to be allocated primarily for maintenance (pruning, removal, fertilizing, mulching), followed by planting, and then management and other (source: J. Kielbaso & V. Cotrone, Michigan State University). JJC's annual budget follows this generalized budget allocation.

#### **DEDICATED ANNUAL EXPENDITURES**

JJC's Facility Services Department dedicates the equivalent of one full time employee, one part time employee, and several seasonal employees to campus landscape needs, including tree maintenance and

care. The FSD currently has no dedicated budget for tree plantings. Instead, it is part of a general landscaping budget that is allocated annually. Much of the current budget related to urban forest management is allocated to routine maintenance items, including pruning, mulching, fertilizing and watering.

Current estimated annual expenditures related to the planting, maintenance and general care of trees on the JJC campus are summarized in Table 7. Expenditures include volunteer efforts. The value of



**Figure 21. Current Expenditures** 



volunteer assistance in 2017, as reported by a number of nonprofit organizations, was estimated roughly at \$24 per hour.

# **Budget Projections**

Table 7 also projects out the current budget to reflect future budgeting to meet urban forest management goals and objectives. The projections are in five-year increments starting with 2023 and ending with 2048. While tree purchases (item E) appear rather low, much of the tree planting and associated costs are included and completed under contracts (item B). Forecasting was done using a 3% increase of the Consumer Price Index. Consequently, forecasts are scalable. These forecasts and the budget items should be adaptively managed and updated frequently by the Tree Advisory Committee as true costs are tracked.

**Table 7. Current and Projected Expenditures** 

#	ltem	Current Budget	5-yr Escalation ~2023		5-yr Escalation ~2028		5-yr Escalation ~2033		5-yr Escalation ~2038		5-yr Escalation ~2043		5-yr Escalation ~2048	
Α	Labor - Staff	\$152,000	\$	176,210	\$	204,275	\$	236,811	\$	274,529	\$	318,254	\$	368,944
В	Labor - Contracts	\$110,000	\$	127,520	\$	147,831	\$	171,376	\$	198,672	\$	230,316	\$	266,999
С	Labor - Volunteer	\$30,000	\$	34,778	\$	40,317	\$	46,739	\$	54,183	\$	62,813	\$	72,818
D	Equipment	\$108,850	\$	126,187	\$	146,285	\$	169,585	\$	196,595	\$	227,908	\$	264,208
Ε	Tree Purchases	\$500	\$	580	\$	672	\$	779	\$	903	\$	1,047	\$	1,214
F	Materials	\$5,400	\$	6,260	\$	7,257	\$	8,413	\$	9,753	\$	11,306	\$	13,107
G	Administration	\$10,000	\$	11,593	\$	13,439	\$	15,580	\$	18,061	\$	20,938	\$	24,273
Н	Other	\$3,000	\$	3,478	\$	4,032	\$	4,674	\$	5,418	\$	6,281	\$	7,282
	TOTAL	\$419,750	\$ 4	486,605	\$	564,109	\$	653,957	\$	758,115	\$	878,863	\$	1,018,843

While the above budgeting amounts reflect expenditures towards urban forest related activities, the college realizes that future changes in fiscal policies and economics may force changes in future budgets and funding.

#### **BUDGET NEEDS**

As a result of the development of this management plan, several items were identified that should be considered in future budgets. These include:

- Allocating additional budget for cutting and clearing of invasives.
- Time for continuing the campus tree inventory, including identification of legacy trees.
- Additional and dedicated budget to expand tree planting to reach future canopy goals.



# **FUNDING GUIDELINES AND SOURCES**

JJC's urban forest community provides numerous environmental, social and economic benefits. Trees are one of the few assets in a community that increases in value over time. Investing in a healthy urban forest can provide greater returns on investment for the College. However, due to many uncertainties, achieving a standard and coordinated level of care can be challenging. Several options and approaches exist for determining the adequacy of a budget and its funding allocation, which are discussed below.

#### **FUNDING GUIDELINES**

While it is generally agreed that there is no national standard for determining a best or most effective urban forest budget allocation, many organizations tie budget allocations to tree inventories. However, since JJC has recently initiated a tree inventory and its completion will be several years away, other guidelines may be used.

# **National Arbor Day Foundation**

The National Arbor Day Foundation recommends that a community forestry program be supported by an annual budget of at least \$2 - \$5 per capita as one qualification for its Tree City, USA program.

JJC's student enrollment is approximately 38,000. Coupled with over 10,000 faculty and staff, an annual expenditure requirement would range between \$96,000 and \$240,000. Based on the current budget allocation noted in the previous section, JJC meets this expectation.

## **Level of Service Approach**

JJC is familiar with and utilizes the "Level of Service" approach when determining annual budgets. The focus of these budget determinations is on getting results rather than determining a single, fixed budget level. Budgets are expressed as the funding amount necessary to provide minimum – to adequate – to high levels of service (also considered as reactive – to routine – to proactive).

JJC considers there service level as "adequate" regarding tree care and urban forest management. This addresses most emergency and request driven work, and also has the resources to begin routine tree maintenance and scheduled planting programs.

## **FUNDING SOURCES**

Most of the tree care and urban forest management operations occurring on the JJC campus are funded through the general operations and capital improvements funds of the college's FSD. Other funding sources have been used by the college to support activities, including the State's Conservation 2000 grant. In the spring of 2004, the JJC Foundation and Alumni Relations and the Natural Areas Committee launched a new project called "Trees for Tomorrow", the purpose of which is to raise funds for the continued development and maintenance of the Arboretum.



Several other funding sources exist to help organizations with the purchase and care of trees. The Community Tree Program through the Morton Arboretum has put together a list of funding sources on their web site, several of which are summarized below.

Illinois Environmental Protection Agency Section 319 Grants are available to local units of government and other organizations to protect water quality in Illinois. Projects must address water quality issues relating directly to non-point source pollution. Funds can be used for the implementation of watershed management plans including the development of information/education programs and for the installation of best management practices. The application deadline is typically August 1.

Illinois Environmental Protection Agency Illinois Green Infrastructure Grant Program for Stormwater Management. Funding opportunities through this grant typically are announced in early fall. This program provides funding for stormwater retention and infiltration and for small projects.

Chicago Metropolitan Agency for Planning Technical Assistance Grants are offered to communities, nonprofits and intergovernmental organizations to address local issues related to transportation, land use, housing, the natural environment, economic growth and community development. The application deadline is typically August 1.

**The Illinois Department of Natural Resources** has a number of grant programs. The college has utilized the State's Conservation 2000 Grant on several occasions. Visit the IDNR website for more information.

**The Illinois Department of Transportation** provides funding for roadway enhancement. The Illinois Transportation Enhancement Program provides funding for cultural, historic, aesthetic and environmental aspects related to transportation. The request for proposals for this funding, when available, is typically in the fall of the year.

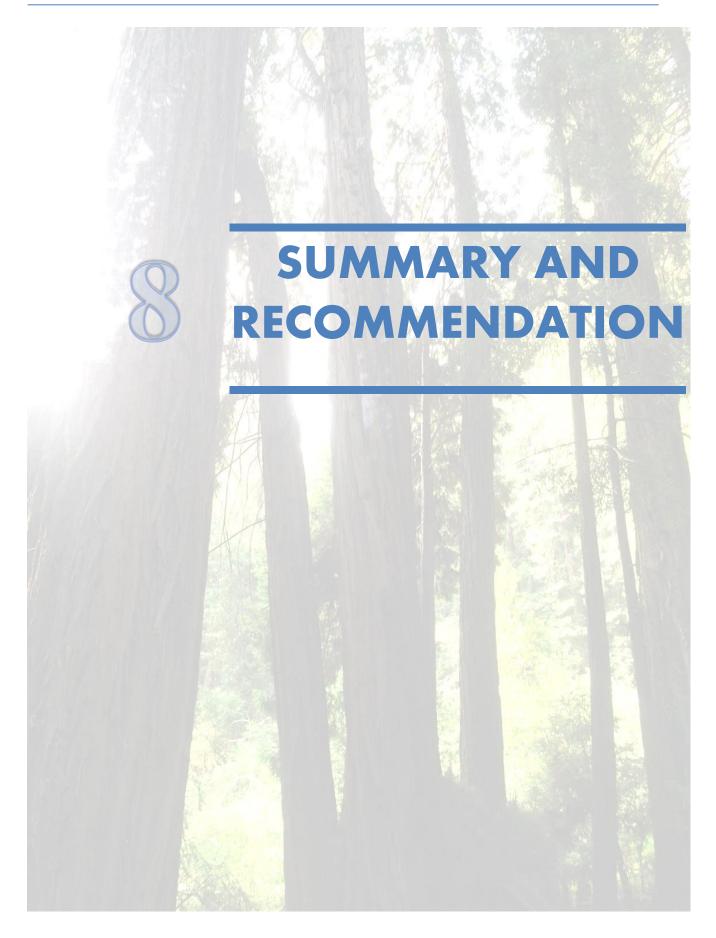
**Illinois Forestry Development Council** provides a small grants program as funding allows for projects that address forestry-related issues in Illinois defined by the Council's mission and function. Applications are typically due between July 1 and August 1.

**Tree Research and Education Endowment Fund (TREE Fund)** promotes research-based tree care for current and future generations. They offer research and education grants in several areas with individual application dates.











# Chapter 8: Summary and Recommendations

Joliet Junior College's urban and community forest is a defining and valued characteristic of the college campus. Campus trees provide valuable ecological and economic benefits ranging from improved air and water quality to energy savings and community greening. Trees increase the College's desirability as a place to work and visit. The goals, objectives and recommendations presented in the UFMP have been created to provide a framework to effectively and sustainably manage it.

#### **KEY RECOMMENDATIONS**

- Pursue a Canopy Cover Goal of 25%. The campus is currently at a respectable 21% canopy cover thanks in large part to its extensive natural areas. Expanding to 25% is realistic and achievable. Planting approximately 320 trees in designated places over the next 25-30 years in addition to replacement and maintenance plantings will achieve this.
- Complete Tree Inventory. Continue to complete the tree inventory including the natural/buffer areas, and then maintain it on a regular basis. This is an important component that factors into many of the other elements of the plan. Incorporating the tree inventory into the college's new GPS/GIS curriculum program will be beneficial.
- Pursue Alternate Funding Sources. Continue to search for and apply for grants, donations and alternate sources of program funding.
- Establish a Tree Advisory Board. Based on previous discussions the Tree Advisory Board (TAB) could be established from within the current Grounds Committee. The TAB will help direct policy and management decisions relative to the plan, including the nomination of Legacy Trees.
- Plant Trees that Support Species and Age Diversity. As the inventory is updated and completed, consideration should be given to planting species that meet the diversity guides for both species and age. This is relevant for all zones, including the natural areas which should support the region's oak restoration programs.
- Establish a dedicated tree planting budget. In order to help reach future canopy cover goals, as well as continued good maintenance practices and support, avenues for establishing a dedicated budget for tree planting for the foreseeable future should be pursued.
- Public/Volunteer Outreach. Look for opportunities to elevate awareness of the importance and benefits of JJC's urban forest resources.

Implementation of the JJC UFMP will take work and additional resources. Its implementation, however, will help ensure that the college's urban forest will continue to be a sustainable and valuable part of the community for generations to come.







# **APPENDICES**





### APPENDIX A: TREE RISK ASSESSMENT

#### LEVELS OF RISK ASSESSMENT

The following Risk Assessment Levels are based on the International Society of Arboriculture (ISA) Tree Risk Assessment Qualification (TRAQ) protocols, as well as the ANSI A300 Part 9 Tree Risk Assessment Standards. The Levels are general guidelines and may be open to a certain degree of interpretation.

#### **Level 1 Assessment**

Also known as "limited visual assessment" which is the typical "tree inventory assessment" of obvious physical defects and condition. During Level 1 assessment, the assessor walks to or drives by the tree, assesses it for defects, evaluates the risk posed by the subject tree and reports the results of the assessment to the tree owner. Often, prior to a recommendation, more detailed, Level 2 or Level 3, assessments are required to gather additional data.





#### **Level 2 Assessment**

A Level 2 assessment, also called a "basic assessment", is a synthesis of the information collected during a detailed visual inspection of the tree and the surrounding site. A Level 2 inspection requires a 360 degree walk around, and may include the use of simple tools, such as binoculars, magnifying lenses, mallets, probes and trowels or shovels. The goal is to get a more complete picture of the tree in its environment.

#### **Level 3 Assessment**

A Level 3 assessment, also called an "advanced assessment," provides detailed information about specific tree parts, targets, and risk associated with each potential interaction. It typically requires specialized training and equipment, such as bucket trucks, resistographs, tomographs and other equipment. This is the most detailed and time-intensive level of assessment.



#### **Reasons for Pruning**

#### **Establishment Pruning**

Establishment pruning is the single most cost-savings measure in tree care as it establishes good form and branch structure for the life of the tree. Establishment pruning of newly planted trees should be performed a minimum of one time prior to the tree reaching six inches in diameter. Once established,



the tree will only require periodic cycle pruning to maintain an appropriate form for the urban forest. As mentioned above, because establishment pruning can be done without the use of dangerous equipment, the use of well-trained volunteers can be an effective means of pruning these young trees.

#### **Cycle Pruning**

As noted above, trees should be pruned on a cyclical basis as preventative maintenance. No tree should go more than five years without proper pruning. Cycle pruning ensures that dead branches, storm damaged limbs, or unsightly growth are removed before becoming hazardous or unsightly. Cyclical pruning also ensures the proper leaf to stem ratio, which provides structural support for the tree. It also ensures that pruning stays relatively inexpensive, as severe issues do not have time to develop.

#### **Emergency / Storm Damage Pruning**

Emergency pruning is nearly always necessary in order to mitigate severe risk, such as limbs which have fallen and are blocking traffic, have impacted a structure, are interfering with a utility, or are hanging and in imminent danger of doing any of the above. Emergency and Storm Damage Pruning shall be conducted at the discretion of the Town, with the best interests of the public in mind. This is the one occasion on which the tenets of this Plan may be abandoned. When life or property are in imminent danger due to conditions associated with a downed tree or tree part, the Town may take whatever remedial action is practical and reasonable to mitigate such imminent risk.

#### **Sanitation Pruning**

When a tree has been diagnosed as having been diseased or infested, sanitation pruning may be employed to maintain the tree while removing the diseased or infested portions. Such a technique is only effective when the host tree is infected/infested with certain pests and pathogens. Generally, removal will be the most cost-effective and safest option to avoid endangering other nearby trees.

#### Removal of High Risk Limbs

At times, a tree as a whole may not pose a high risk, but a single limb may have defects that make it hazardous. At these times, the removal of such limbs or parts may render the tree as low risk again, without causing permanent damage to the tree.

#### **Pest or Pathogen Outbreak**

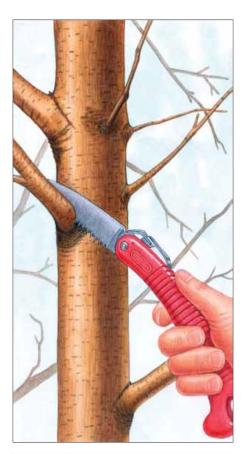
The response to a tree becoming diseased or infested will generally be to remove the tree, or possibly prune the diseased or infested parts of the tree out. These are simply less expensive measures than attempting chemical treatment. Pest or Pathogen outbreak may be a reason for a number of the aforementioned activities, including tree pruning.



## **APPENDIX B: HOW TO PRUNE**

# HOW to

# Prune Trees







NA-FR-01-95

Revised August 2012

# **How to**Prune Trees

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#### Introduction

The objective of pruning is to produce strong, healthy, attractive plants. By understanding how, when and why to prune, and by following a few simple principles, this objective can be achieved.

## Reasons For Pruning

The main reasons for pruning ornamental and shade trees include safety, health, and aesthetics. In addition, pruning can be used to stimulate fruit production and increase the value of timber. Pruning for *safety* (Fig. 1A) involves removing branches that could fall and cause injury or property damage, trimming branches that interfere with lines of sight on streets or driveways, and removing branches that grow into utility lines. Safety pruning can be largely avoided by carefully choosing species that will not grow beyond the space available to them, and have strength and form characteristics that are suited to the site.

Pruning for *health* (Fig. 1B) involves removing diseased or insect-infested wood, thinning the crown to increase airflow and reduce some pest problems, and removing crossing and rubbing branches. Pruning can best be used to encourage trees to develop a strong structure and reduce the likelihood of damage during severe weather. Removing broken or damaged limbs encourages wound closure.



A. Safety



B. Health



C. Aesthetics

Figure 1. Reasons for pruning



Pruning for *aesthetics* (Fig. 1C) involves enhancing the natural form and character of trees or stimulating flower production. Pruning for form can be especially important for open-grown trees that do very little self-pruning.

All woody plants shed branches in response to shading and competition. Branches that do not produce enough carbohydrates from photosynthesis to sustain themselves die and are eventually shed; the resulting wounds are sealed by woundwood (callus). Branches that are poorly attached may be broken off by wind and accumulation of snow and ice. Branches removed by such natural forces often result in large, ragged wounds that rarely seal. Pruning as a cultural practice can be used to supplement or replace these natural processes and increase the strength and longevity of plants.

Trees have many forms, but the most common types are pyramidal (excurrent) or spherical (decurrent). Trees with pyramidal crowns, e.g., most conifers, have a strong central stem and lateral branches that are more or less horizontal and do not compete with the central stem for dominance. Trees with spherical crowns, e.g., most hardwoods, have many lateral branches that may compete for dominance.

To reduce the need for pruning it is best to consider a tree's natural form. It is very difficult to impose an unnatural form on a tree without a commitment to constant maintenance.

Pollarding and topiary are extreme examples of pruning to create a desired, unnatural effect. Pollarding is the practice of pruning trees annually to remove all new growth. The following year, a profusion of new branches is produced at the ends of the branches. Topiary involves pruning trees and shrubs into geometric or animal shapes. Both pollarding and topiary are specialized applications that involve pruning to change the natural form of trees. As topiary demonstrates, given enough care and attention plants can be pruned into nearly any form. Yet just as proper pruning can enhance the form or character of plants, improper pruning can destroy it.

## **Pruning Approaches**

Producing strong structure should be the emphasis when pruning young trees. As trees mature, the aim of pruning will shift to maintaining tree structure, form, health and appearance.

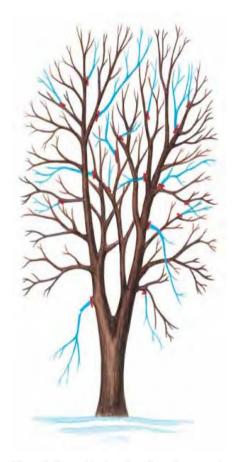
Proper pruning cuts are made at a node, the point at which one branch or twig attaches to another. In the spring of the year growth begins at buds, and twigs grow until a new node is formed. The length of a branch between nodes is called an internode.

The most common types of pruning are:

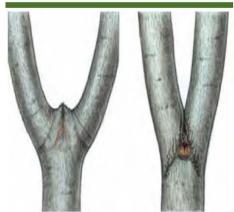
1. Crown Thinning (Fig. 2)

Crown thinning, primarily for hardwoods, is the selective removal of branches to

increase light penetration and air movement throughout the crown of a tree. The intent is to maintain or develop a tree's structure and form. To avoid unnecessary stress and prevent excessive production of epicormic sprouts, no more than one-quarter of the living crown should be removed at a time. If it is necessary to remove more, it should be done over successive years.



**Figure 2.** Crown thinning—branches to be removed are shaded in blue; pruning cuts should be made at the red lines. No more than one-fourth of the living branches should be removed at one time.



A. U-shaped strong union B. V-shaped weak union **Figure 3.** Types of branch unions

Branches with strong U-shaped angles of attachment should be retained (Fig. 3A). Branches with narrow, V-shaped angles of attachment often form included bark and should be removed (Fig. 3B). Included bark forms when two branches grow at sharply acute angles to one another, producing a wedge of inward-rolled bark between them. Included bark prevents strong attachment of branches, often causing a crack at the point below where the branches meet. Codominant stems that are approximately the same size and arise from the same position often form included bark. Removing some of the lateral branches from a codominant stem can reduce its growth enough to allow the other stem to become dominant.

Lateral branches should be no more than one-half to three-quarters of the diameter of the stem at the point of attachment. Avoid producing "lion's tails," tufts of branches and foliage at the ends of branches, caused by removing all inner lateral branches and foliage. Lion's tails can result in sunscalding,



abundant **epicormic sprouts**, and weak branch structure and breakage. Branches that rub or cross another branch should be removed.

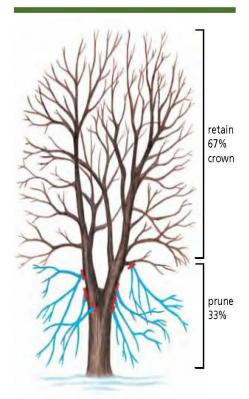
Conifers that have branches in whorls and pyramidal crowns rarely need crown thinning except to restore a dominant leader. Occasionally, the leader of a tree may be damaged and multiple branches may become codominant. Select the strongest leader and remove competing branches to prevent the development of codominant stems.

#### 2. Crown Raising (Fig. 4)

Crown raising is the practice of removing branches from the bottom of the crown of a tree to provide clearance for pedestrians, vehicles, buildings, lines of site, or to develop a clear stem for timber production. Also, removing lower branches on white pines can prevent blister rust. For street trees the minimum clearance is often specified by municipal ordinance. After pruning, the ratio of the living crown to total tree height should be at least two-thirds (e.g., a 12 m tree should have living branches on at least the upper 8 m).

On young trees "temporary" branches may be retained along the stem to encourage taper and protect trees from vandalism and sunscald. Less vigorous shoots should be selected as temporary branches and should be about 10 to 15 cm apart along the stem. They should be pruned annually to slow their growth and should be removed eventually.

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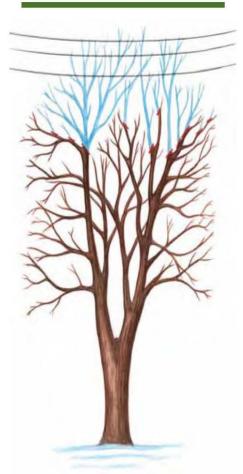


**Figure 4**. Crown raising—branches to be removed are shaded in blue; pruning cuts should be made where indicated with red lines. The ratio of live crown to total tree height should be at least two-thirds.

#### 3. Crown Reduction (Fig. 5)

Crown reduction pruning is most often used when a tree has grown too large for its permitted space. This method, sometimes called **drop crotch pruning**, is preferred to topping because it results in a more natural appearance, increases the time before pruning is needed again, and minimizes stress (see drop crotch cuts in the next section).

Crown reduction pruning, a method of last resort, often results in large pruning wounds



**Figure 5.** Crown reduction—branches to be removed are shaded in blue; pruning cuts should be made where indicated with red lines. To prevent branch dieback, cuts should be made at lateral branches that are at least one-third the diameter of the stem at their union.

to stems that may lead to decay. This method should never be used on a tree with a pyramidal growth form. A better long term solution is to remove the tree and replace it with a tree that will not grow beyond the available space.

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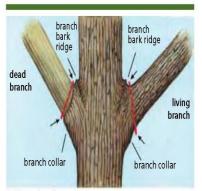
## **Pruning Cuts**

Pruning cuts should be made so that only branch tissue is removed and stem tissue is not damaged. At the point where the branch attaches to the stem, branch and stem tissues remain separate, but are contiguous. If only branch tissues are cut when pruning, the stem tissues of the tree will probably not become decayed, and the wound will seal more effectively.

#### 1. Pruning living branches (Fig. 6)

To find the proper place to cut a branch, look for the branch collar that grows from the stem tissue at the underside of the base of the branch (Fig. 6A). On the upper surface, there is usually a branch bark ridge that runs (more or less) parallel to the branch angle, along the stem of the tree. A proper pruning cut does not damage either the branch bark ridge or the branch collar.

A proper cut begins just outside the branch bark ridge and angles down away from the stem of the tree, avoiding injury to the branch collar (Fig. 6B). Make the cut as close as possible to the stem in the branch axil, but outside the branch bark ridge, so that stem tissue is not injured and the wound can seal in the shortest time possible. If the cut is too far from the stem, leaving a branch stub, the branch tissue usually dies and woundwood forms from the stem tissue. Wound closure is delayed because the woundwood must seal over the stub that was left.



A. Targeting the cut



B. Cutting a small branch C. Cutting a larger branch



D. Crown reduction cut

Figure 6. Pruning cuts

The quality of pruning cuts can be evaluated by examining pruning wounds after one growing season. A concentric ring of woundwood will form from proper pruning cuts (Fig. 6B). Flush cuts made inside the branch bark ridge or branch collar, result in pronounced development of woundwood on the sides of the pruning wounds with very little woundwood forming on the top or bottom (Fig. 7D). As described above, stub cuts result in the death of the remaining branch and woundwood forms around the base from stem tissues.

When pruning small branches with hand pruners, make sure the tools are sharp enough to cut the branches cleanly without tearing. Branches large enough to require saws should be supported with one hand while the cuts are made. If the branch is too large to support, make a three-step pruning cut (Fig. 6C) to prevent bark ripping (Fig. 7C).

- The first cut is a shallow notch made on the underside of the branch, outside the branch collar. This cut will prevent a falling branch from tearing the stem tissue as it pulls away from the tree.
- 2. The second cut should be outside the first cut, all the way through the branch, leaving a short stub.
- The stub is then cut just outside the branch bark ridge/branch collar, completing the operation.

#### 2. Pruning dead branches (Fig. 6)

Prune dead branches in much the same way as live branches. Making the correct cut is usually easy because the branch



collar and the branch bark ridge, can be distinguished from the dead branch, because they continue to grow (Fig. 6A). Make the pruning cut just outside of the ring of woundwood tissue that has formed, being careful not to cause unnecessary injury (Fig. 6C). Large dead branches should be supported with one hand or cut with the three-step method, just as live branches. Cutting large living branches with the three-step method is more critical because of the greater likelihood of bark ripping.

#### 3. Drop Crotch Cuts (Fig. 6D)

A proper cut begins just above the branch bark ridge and extends through the stem parallel to the branch bark ridge. Usually, the stem being removed is too large to be supported with one hand, so the three-cut method should be used.

- With the first cut, make a notch on the side of the stem away from the branch to be retained, well above the branch crotch.
- Begin the second cut inside the branch crotch, staying well above the branch bark ridge, and cut through the stem above the notch.
- Cut the remaining stub just inside the branch bark ridge through the stem parallel to the branch bark ridge.

To prevent the abundant growth of epicormic sprouts on the stem below the cut, or dieback of the stem to a lower lateral branch, make the cut at a lateral branch that is at least one-third of the diameter of the stem at their union.

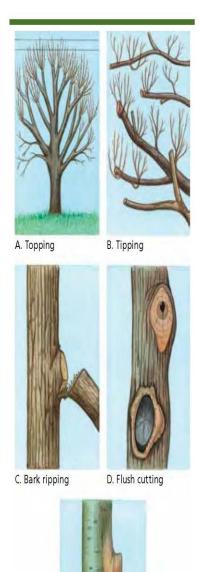
## Pruning Practices That Harm Trees

Topping and tipping (Fig. 7A, 7B) are pruning practices that harm trees and should not be used. Crown reduction pruning (Fig. 5) is the preferred method to reduce the size or height of the crown of a tree, but is rarely needed and should be used infrequently.

Topping, the pruning of large upright branches between nodes, is sometimes done to reduce the height of a tree (Fig. 7A). Tipping is a practice of cutting lateral branches between nodes (Fig. 7B) to reduce crown width.

These practices invariably result in the development of epicormic sprouts, or in the death of the cut branch back to the next lateral branch below. These epicormic sprouts are weakly attached to the stem and eventually will be supported by a decaying branch.

Improper pruning cuts cause unnecessary injury and bark ripping (Fig. 7C). Flush cuts injure stem tissues and can result in decay (Fig. 7D). Stub cuts delay wound closure and can provide entry to canker fungi that kill the cambium, delaying or preventing woundwood formation (Fig. 7E).



E. Stub cutting
Figure 7. Practices that harm trees

## When to Prune

Conifers may be pruned any time of year, but pruning during the dormant season may minimize sap and resin flow from cut branches.

Hardwood trees and shrubs without showy flowers: prune in the dormant season to easily visualize the structure of the tree, to maximize wound closure in the growing season after pruning, to reduce the chance of transmitting disease, and to discourage excessive sap flow from wounds. Recent wounds and the chemical scents they emit can actually attract insects that spread tree disease. In particular, wounded elm wood is known to attract bark beetles that harbor spores of the Dutch elm disease fungus, and open wounds on oaks are known to attract beetles that spread the oak wilt fungus. Take care to prune these trees during the correct time of year to prevent spread of these fatal diseases. Contact your local tree disease specialist to find out when to prune these tree species in your area. Usually, the best time is during the late fall and winter.

Flowering trees and shrubs: these should also be pruned during the dormant season for the same reasons stated above; however, to preserve the current year's flower crop, prune according to the following schedule:

Trees and shrubs that flower in early spring (redbud, dogwood, etc.) should be pruned immediately after



flowering (flower buds arise the year before they flush, and will form on the new growth).

- Many flowering trees are susceptible to fireblight, a bacterial disease that can be spread by pruning. These trees, including many varieties of crabapple, hawthorn, pear, mountain ash, flowering quince and pyracantha, should be pruned during the dormant season. Check with your county extension agent or a horticulturist for additional information.
- Trees and shrubs that flower in the summer or fall always should be pruned during the dormant season (flower buds will form on new twigs during the next growing season, and the flowers will flush normally).

*Dead branches:* can be removed any time of the year.

## **Pruning Tools**

Proper tools are essential for satisfactory pruning (Fig. 6). The choice of which tool to use depends largely on the size of branches to be pruned and the amount of pruning to be done. If possible, test a tool before you buy it to ensure it suits your specific needs. As with most things, higher quality often equates to higher cost.

Generally speaking, the smaller a branch is when pruned, the sooner the wound created will seal. Hand pruners are used to prune small branches (under 2.5 cm diameter) and many different kinds are available. Hand pruners can be grouped into bypass or anvil styles based on the blade configuration. Anvil style pruners have a straight blade that cuts the branch against a small anvil or block as the handles are squeezed. Bypass pruners use a curved cutting blade that slides past a broader lower blade, much like a scissors. To prevent unnecessary tearing or crushing of tissues, it is best to use a bypass style pruner. Left- or right-handed types can be purchased.

Slightly larger branches that cannot be cut with a hand pruner may be cut with small pruning saws (up to 10 cm) or lopping shears (up to 7 cm diameter) with larger cutting surfaces and greater leverage. Lopping shears are also available in bypass and anvil styles.

For branches too large to be cut with a hand pruner or lopping shears, pruning saws must be used. Pruning saws differ greatly in handle styles, the length and shape of the blade, and the layout and type of teeth. Most have tempered metal blades that retain their sharpness for many pruning cuts. Unlike most other saws, pruning saws are often designed to cut on the "pull-stroke."

Chain saws are preferred when pruning branches larger than about 10 cm. Chain saws should be used only by qualified



individuals. To avoid the need to cut branches greater than 10 cm diameter, prune when branches are small.

Pole pruners must be used to cut branches beyond reach. Generally, pruning heads can cut branches up to 4.4 cm diameter and are available in the bypass and anvil styles. Once again, the bypass type is preferred. For cutting larger branches, saw blades can be fastened directly to the pruning head, or a separate saw head can be purchased. Because of the danger of electrocution, pole pruners should not be used near utility lines, except by qualified utility line clearance personnel.

To ensure that satisfactory cuts are made and to reduce fatigue, keep your pruning tools sharp and in good working condition. Hand pruners, lopping shears, and pole pruners should be periodically sharpened with a sharpening stone. Replacement blades are available for many styles. Pruning saws should be professionally sharpened or periodically replaced. To reduce cost, many styles have replaceable blades.

Tools should be clean and sanitized as well as sharp. Although sanitizing tools may be inconvenient and seldom practiced, doing so may prevent the spread of disease from infected to healthy trees on contaminated tools. Tools become contaminated when they come into contact with fungi, bacteria, viruses and other microorganisms that cause disease in trees. Most pathogens need some way of entering the tree to cause disease, and

fresh wounds are perfect places for infections to begin. Microorganisms on tool surfaces are easily introduced into susceptible trees when subsequent cuts are made. The need for sanitizing tools can be greatly reduced by pruning during the dormant season.

If sanitizing is necessary it should be practiced as follows: before each branch is cut, sanitize pruning tools with either 70% denatured alcohol, or with liquid household bleach diluted 1 to 9 with water (1 part bleach, 9 parts water). Tools should be immersed in the solution, preferably for 1-2 minutes, and wood particles should be wiped from all cutting surfaces. Bleach is corrosive to metal surfaces, so tools should be thoroughly cleaned with soap and water after each use.

## **Treating Wounds**

Tree sap, gums, and resins are the natural means by which trees combat invasion by pathogens. Although unsightly, sap flow from pruning wounds is not generally harmful; however, excessive "bleeding" can weaken trees.

When oaks or elms are wounded during a critical time of year (usually spring for oaks, or throughout the growing season for elms) — either from storms, other unforeseen mechanical wounds, or from necessary branch removals — some type of wound dressing should be applied to the wound.



Do this immediately after the wound is created. In most other instances, wound dressings are unnecessary, and may even be detrimental. Wound dressings will not stop decay or cure infectious diseases. They may actually interfere with the protective benefits of tree gums and resins, and prevent wound surfaces from closing as quickly as they might under natural conditions. The only benefit of wound dressings is to prevent introduction of pathogens in the specific cases of Dutch elm disease and oak wilt.

## **Pruning Guidelines**

To encourage the development of a strong, healthy tree, consider the following guidelines when pruning.

#### 1. General

- Prune first for safety, next for health, and finally for aesthetics.
- Never prune trees that are touching or near utility lines; instead consult your local utility company.
- Avoid pruning trees when you might increase susceptibility to important pests (e.g., in areas where oak wilt exists, avoid pruning oaks in the spring and early summer; prune trees susceptible to fireblight only during the dormant season).
- Use the following decision guide for size of branches to be removed:

1) under 5 cm diameter - go ahead, 2) between 5 and 10 cm diameter think twice, and 3) greater than 10 cm diameter - have a good reason.

#### 2. Crown Thinning

- Assess how a tree will be pruned from the top down.
- Favor branches with strong, U-shaped angles of attachment. Remove branches with weak, V-shaped angles of attachment and/or included bark.
- Ideally, lateral branches should be evenly spaced on the main stem of young trees.
- Remove any branches that rub or cross another branch.
- Make sure that lateral branches are no more than one-half to threequarters of the diameter of the stem to discourage the development of co-dominant stems.
- Do not remove more than onequarter of the living crown of a tree at one time. If it is necessary to remove more, do it over successive years.

#### 3. Crown Raising

Always maintain live branches on at least two-thirds of a tree's total height. Removing too many lower branches will hinder the development of a strong stem.



Remove basal sprouts and vigorous epicormic sprouts.

#### 4. Crown Reduction

- Use crown reduction pruning only when absolutely necessary. Make the pruning cut at a lateral branch that is at least one-third the diameter of the stem to be removed.
- ➤ If it is necessary to remove more than half of the foliage from a branch, remove the entire branch.

## Glossary

Branch Axil: the angle formed where a branch joins another branch or stem of a woody plant.

Branch Bark Ridge: a ridge of bark that forms in a branch crotch and partially around the stem resulting from the growth of the stem and branch tissues against one another.

Branch Collar: a "shoulder" or bulge formed at the base of a branch by the annual production of overlapping layers of branch and stem tissues.

Crown Raising: a method of pruning to provide clearance for pedestrians, vehicles, buildings, lines of sight, and vistas by removing lower branches.

Crown Reduction Pruning: a method of pruning used to reduce the height of a tree. Branches are cut back to laterals that are at least one-third the diameter of the limb being removed.

**Crown Thinning:** a method of pruning to increase light penetration and air movement through the crown of a tree by selective removal of branches.

Callus: see woundwood.

Decurrent: a major tree form resulting from weak apical control. Trees with this form have several to many lateral branches that compete with the central stem for dominance resulting in a spherical or globose crown. Most hardwood trees have decurrent forms.

Epicormic Sprout: a shoot that arises from a latent or adventitious bud. Epicormic sprouts are also known as water sprouts that grow from stems and branches, and suckers that are produced from the base of trees. In older wood, epicormic shoots often result from severe defoliation or radical pruning.

Excurrent: a major tree form resulting from strong apical control. Trees with this form have a strong central stem and pyramidal shape. Lateral branches rarely compete for dominance. Most conifers and a few hardwoods, such as sweetgum and tuliptree, have excurrent forms.



Flush Cuts: pruning cuts that originate inside the branch bark ridge or the branch collar, causing unnecessary injury to stem tissues.

**Included Bark:** bark enclosed between branches with narrow angles of attachment, forming a wedge between the branches.

Pollarding: the annual removal of all of the previous year's growth, resulting in a flush of slender shoots and branches each spring.

**Stub Cuts:** pruning cuts made too far outside the branch bark ridge or branch collar, that leave branch tissue attached to the stem.

**Tipping:** a poor maintenance practice used to control the size of tree crowns; involves the cutting of branches at right angles leaving long stubs.

Topping: a poor maintenance practice often used to control the size of trees; involves the indiscriminate cutting of branches and stems at right angles leaving long stubs. Synonyms include rounding-over, heading-back, dehorning, capping and hat-racking. Topping is often improperly referred to as pollarding.

Topiary: the pruning and training of a plant into a desired geometric or animal shape.

Woundwood: lignified, differentiated tissues produced on woody plants as a response to wounding (also known as callus tissue).

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"How to Prune Trees" was written to help people properly prune the trees they care about. If you doubt your ability to safely prune large trees, please hire a professional arborist. Information in this publication can be used to interview and hire a competent arborist.

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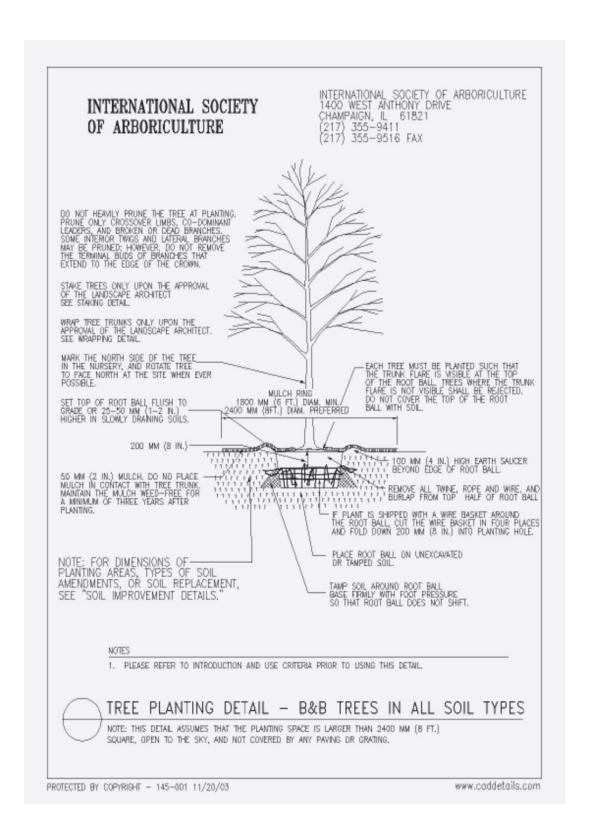
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## **APPENDIX C: TREE PLANTING DETAIL**





## **APPENDIX D: DESIRABLE/UNDESIRABLE TREES**

Species not appearing on this list can be approved or disallowed by consensus of the Tree Advisory Board.

NOT APPROVED	APPRO	OVED SPECIES (ANYW	HERE)
AILANTHUS	Large Trees	Medium Trees	Small Trees
AMUR CORKTREE	BALDCYPRESS	ALDER	AMERICAN REDBUD
ASH-EUROPEAN	BEECH-AMERICAN	AMUR MAACKIA	APPLE-CRAB SPP
ASH-GREEN	BEECH-EUROPEAN	BIRCH-RIVER	BUCKEYE-RED
ASH-WHITE	BLACK LOCUST	BIRCH-WHITE	DOGWOOD-SPP
BOXELDER	BUCKEYE-OHIO	BLACKGUM	HAWTHORN-COCKSPUR
BUCKTHORN	BUCKEYE-YELLOW	ELM-CHINESE	HAWTHORN-SPP
BURNING BUSH	CATALPA	HARDY RUBBER TREE	LILAC-TREE
CHERRY-BLACK/PIN	DAWN REDWOOD	HAZELNUT-TURKISH	ROSE OF SHARON
COTTONWOOD	ELM-HYBRID	HORNBEAM-AMERICAN	SERVICEBERRY-SPP
ELM-AMERICAN	GINKGO	HORNBEAM-EUROPEAN	SMOKETREE
ELM-SIBERIAN	HACKBERRY	IRONWOOD	
HONEYSUCKLE	HICKORY-SPP	KATSURA	
MAPLE-NOR WAY	HONEYLOCUST	MAPLE-HEDGE	
MAPLE-SILVER	HORSECHESTNUT	MAPLE-MIYABEI	
MULBERRY-SPP	KENTUCKY COFFEETREE	MAPLE-PAPERBARK	
POPLAR-SPP	LARCH	MAPLE-RED	
POPLAR-WHITE	LINDEN-AMERICAN	MAPLE-SHANTUNG	
PRINCESSTREE	LINDEN-LITTLELEAF	MAPLE-TRIFLORUM	
RUSSIAN OLIVE	LONDON PLANETREE	OAK-CHINKQUAPIN	
WALNUT-ANY	MAPLE-ARMSTRONG	OAK-ENGLISH	
WILLOW-SPP	MAPLE-AUTUMN BLAZE	OAK-SHINGLE	
	MAPLE-SUGAR	PEAR-CALLERY	
	OAK-BURR	PERSIAN IRONWOOD	
	OAK-PIN	YELLOWWOOD	
	OAK-RED		
	OAK-SWAMP WHITE		Do Not Plant
	OAK-WHITE		
	PAGODATREE		Plant limited quantities
	PERSIMMON		
	SWEETGUM		Plant in a bundance
	SYCAMORE		
	TULIPTREE		
	ZELKOVA		



## APPENDIX E: ARBORETUM/CAMPUS TREE INVENTORY

#### JJC Tree Inventory Form

Tag number Common Name Latin Name Genus DBH Condition

() Excellent

() Very good

() Good

() Fair

() Poor

() Dead

Observation

() Canker

() Cavity Decay

() Crown Dieback

() Frost Cracks

() Girdling Roots

() Grate/Guard

() Hardscape Damage

() Improperly Installed

() Improperly Mulched

() Improperly Pruned

() Mechanical Damage

() Memorial Tree

() Nutrient Deficiency

() Pests

() Poor Location

() Poor Root System

() Poor Structure

() Remove Hardware

() Serious Decline

**Status** 

() Alive

() Dead

() Removed

() Stump

() Proposed Site Large

() Proposed Site Medium

() Proposed Site Small

**Primary Maintenance** 

() None

() Small Tree - routine

() Small Tree - immediate

() Large Tree - routine

() Large Tree - immediate

() Safety Concerns

() Prune

() Plant Tree

() Remove Tree

() Pruning

() Remove Suckers

() Remove Stump

**Maintenance Comments** 



ARBORETU	M/GREEN HOUSE/ENT	RY ZONE TREE INVENTORY - MAY 1	l, 2018						
	Common Name	Latin Name (Genus/Species)	Circum.	DBH	Condition	Observation	Status	Primary Maintenance	Maintenance Comments
			İ						
3001	Walnut	Juglans nigra	57	18.2	Good		Alive	None	Double trunk
3002	Walnut	Juglans nigra	45.5	14.5	Good		Alive	None	
3003	Walnut	Juglans nigra	37.5	11.9	Very good		Alive	None	
3004	Walnut	Juglans nigra	29.5	9.4	Fair	Frost Cracks	Alive	Prune	
3006	Walnut	Juglans nigra	53	16.9	Fair		Alive	Large Tree - routine	Foliage loss
3008	Walnut	Juglans nigra	37	11.8	Good	Canker	Alive	Pruning	
3009	Walnut	Juglans nigra	52.5	16.7	Very good		Alive	None	
3010	Eastern Red Cedar	Juniperus virginiana	14	4.5	Good		Alive	None	
3011	Eastern Red Cedar	Juniperus virginiana	16	5.1	Good		Alive	Small Tree - routine	
3012	Eastern Red Cedar	Juniperus virginiana	17.5	5.6	Good		Alive	Small Tree - routine	
3013	Walnut	Juglans nigra	39.5	12.6	Very good		Alive	None	
3014	Eastern Red Cedar	Juniperus virginiana	27	8.6	Very good		Alive	None	
3015	Eastern Red Cedar	Juniperus virginiana	38	12.1	Very good		Alive	None	
3016	Eastern Red Cedar	Juniperus virginiana	30	9.6	Very good		Alive	None	
3017	Eastern Red Cedar	Juniperus virginiana	32	10.2	Good		Alive	None	
3018	Walnut	Juglans nigra	42.5	13.5	Poor	Serious Decline	Alive	Prune	
3019	Walnut	Juglans nigra	52	16.6	Very good		Alive	None	
3020	Walnut	Juglans nigra	37	11.8	Fair	Serious Decline	Alive	Prune	
3021	Eastern Red Cedar	Juniperus virginiana	28	8.9	Good		Alive	Small Tree - routine	
3022	Walnut	Juglans nigra	46	14.6	Very good		Alive	None	
3023	Eastern Red Cedar	Juniperus virginiana	19	6.1	Very good		Alive	None	
3024	Eastern Red Cedar	Juniperus virginiana	25	8.0	Very good		Alive	None	
3025	Eastern Red Cedar	Juniperus virginiana	36	11.5	Very good		Alive	None	
3026	Eastern Red Cedar	Juniperus virginiana	33	10.5	Very good		Alive	None	
3027	Eastern Red Cedar	Juniperus virginiana	39	12.4	Very good		Alive	None	
3028	Eastern Red Cedar	Juniperus virginiana	31	9.9	Very good			None	
3029	Walnut	Juglans nigra	44	14.0	Very good		Alive	Large Tree - routine	
3030	Oak	Quercus sps	15	4.8	Very good		Alive	None	
3031	Walnut	Juglans nigra	46.5	14.8	Very good		Alive	Large Tree - routine	
3032	Oak	Quercus sps	21	6.7	Very good		Alive	None	
3033	Oak	Quercus sps	28	8.9	Very good		Alive	None	
3034	Redcedar	Juniperus virginiana	24	7.6	Fair	Poor Structure	Alive	None	Main trunk split
3035	Redceader	Juniperus virginiana	30	9.6	Good		Alive	None	
3036	Redcedar	Juniperus virginiana	32.5	10.4	Very good		Alive	None	
3037	Walnut	Juglans nigra	50.5	16.1	Very good		Alive	None	
3038	Redcedar	Juniperus virginiana	27.5	8.8	Good		Alive	None	
3039	Redcedar	Juniperus virginiana		0.0		Explore	Alive	None	
3040	Redcedar	Juniperus virginiana	29	9.2	Good		Alive	None	
3041	Walnut	Juglans nigra	46.5	14.8	Good		Alive	None	
3042	Redcedar	Juniperus virginiana	36.5	11.6	Good		Alive	None	
3043	Redcedar	Juniperus virginiana	36.5	11.6	Good	Hardscape Damage	Alive	Small Tree - routine	



ARBORETU	M/GREEN HOUSE/ENT	RY ZONE TREE INVENTORY - MAY 1	, 2018						
	Common Name	Latin Name (Genus/Species)	Circum.	DBH	Condition	Observation	Status	Primary Maintenance	Maintenance Comments
3044	Redcedar	Juniperus virginiana	24.5	7.8	Good	Serious Decline	Alive	Small Tree - routine	
3045	Burr oak	Quercus macrocarpa	16.5	5.3	Very good		Alive	None	
3046	Burr oak	Quercus macrocarpa	15	4.8	Very good		Alive	None	
3047	Walnut	Juglans nigra		0.0	Very good		Alive	None	Very healthy
3048	Walnut	Juglans nigra	41.5	13.2	Very good		Alive	None	
3049	Redcedar	Juniperus virginiana	34	10.8	Very good	Remove Hardware	Alive	None	Two trunks
3050	Redcedar	Juniperus virginiana	37	11.8	Very good		Alive	None	
3051	Walnut	Juglans nigra	32	10.2	Fair	Serious Decline	Alive	Prune	
3052	Walnut	Juglans nigra	37	11.8	Very good		Alive	None	
3053	Redcedar	Juniperus virginiana	24	7.6	Good		Alive	None	
3054	Redcedar	Juniperus virginiana	32	10.2	Very good		Alive	None	
3055	Walnut	Juglans nigra	28	8.9	Fair	Frost Cracks	Alive	Prune	
3056	Redcedar	Juniperus virginiana	32	10.2	Very good		Alive	None	
3057	Redcedar	Juniperus virginiana	47	15.0	Very good		Alive	None	
3058	Redcedar	Juniperus virginiana	31.5	10.0	Very good		Alive	None	
3059	Walnut	Juglans nigra	28	8.9	Very good	Memorial Tree	Alive	None	
3060	Walnut	Juglans nigra	33.5	10.7	Excellent		Alive	None	
3061	Burr oak	Quercus macrocarpa	18.5	5.9	Very good		Alive	None	
3062	Walnut	Juglans nigra	39	12.4	Very good		Alive	None	
3063	Redcedar	Juniperus virginiana	34	10.8	Very good		Alive	None	
3064	Redcedar	Juniperus virginiana	30.5	9.7	Very good		Alive	None	
3065	Redcedar	Juniperus virginiana	24.5	7.8	Very good		Alive	None	
3066	Walnut	Juglans nigra	26.5	8.4	Very good	Memorial Tree	Alive	None	
3067	Walnut	Juglans nigra	36.5	11.6	Good		Alive	Large Tree - routine	
3068	Osage orange	Maclura pomifera	42.5	13.5	Excellent		Alive	None	
3070	Osage orange	Maclura pomifera	28	8.9	Very good		Alive	None	
3071	Walnut	Juglans nigra	31	9.9	Very good		Alive	None	
3074	Walnut	Juglans nigra	31	9.9	Poor	Serious Decline	Dead	Remove Tree	
3075	Redcedar	Juniperus virginiana	49	15.6	Very good	Canker	Alive	None	
3076	Redcedar	Juniperus virginiana	19.5	6.2	Good		Alive	None	
3077	Eastern redcedar	Juniperus virginiana	33	10.5	Very good			None	
3078	Eastern redcedar	Juniperus virginina	25	8.0	Very good		Alive	None	
3079	Walnut	Juglans nigra	37	11.8	Poor	Serious Decline	Alive	Remove Tree	
3080	Walnut	Juglans nigra	38	12.1	Dead	Frost Cracks	Dead	Remove Tree	
3082	Walnut	Juglans nigra	34	10.8	Good		Alive	None	
3083	Eastern redcedar	Juniperus virginina	38	12.1	Very good		Alive	None	
3084	Walnut	Juglans nigra	45	14.3	Very good		Alive	None	
3085	Eastern redcedar	Juniperus virginina	33	10.5	Very good		Alive	None	
3086	Eastern redcedar	Juniperus virginina	35	11.1	Very good		Alive	None	
3087	Eastern redcedar	Juniperus virginina	37	11.8	Very good		Alive	None	
3088	Dawn Redwood	Metasequoia glyptostroboides	12	3.8	Very good			None	
3089	Dawn Redwood	Metasequoia glyptostroboides	10	3.2	Very good	Memorial Tree	Alive	None	



ARBORETU	M/GREEN HOUSE/ENT	RY ZONE TREE INVENTORY - MAY 1	. 2018						1
	Common Name	Latin Name (Genus/Species)	Circum.	DBH	Condition	Observation	Status	Primary Maintenance	Maintenance Comments
3090	Larch	Larix decidua	52	16.6	Very good	Poor Structure	Alive	Large Tree - routine	
3091	Dawn Redwood	Metasequoia glyptostroboides	60	19.1	Very good		Alive	None	
3092	Blue Spruce	Picea pungens	30	9.6	Very good		Alive	Large Tree - routine	
3093	Norway Spruce	Picea abies	35	11.1	Very good		Alive	None	
3094	Norway Spruce	Picea abies	44	14.0	Good		Alive	None	
3095	Norway Spruce	Picea abies	68	21.7	Very good		Alive	Large Tree - routine	
3096	Blue Spruce	Picea pungens	31	9.9	Good		Alive	Large Tree - routine	
3097	Blue Spruce	Picea pungens	25	8.0	Good		Alive	Small Tree - routine	
3098	Blue spruce	Picea pungens	30	9.6	Very good		Alive	None	
3099	Blue spruce	Picea pungens	33	10.5	Good		Alive	None	
3100	Norway Spruce	Picea abies	72	22.9	Very good		Alive		
3101	White spruce	Picea glauca	22	7.0	Very good		Alive	None	
3102	Black Hills Spruce	Picea 'Black Hills'	6	1.9	Very good		Alive	None	
3103	Black Hills Spruce	Picea 'Black Hills'	6	1.9	Very good		Alive	None	
3104	Black Hills Spruce	Picea 'Black Hills'	7	2.2	Very good	Memorial Tree	Alive	None	
3105	Blue spruce	Picea pungens	38	12.1	Very good		Alive	None	
3106	White Fir	Abies concolor	18	5.7	Very good		Alive	None	
3107	White Fir	Abies concolor	30	9.6	Very good		Alive	None	
3108	Ginko	Ginko biloba	52	16.6	Excellent		Alive	None	
3109	Ginko	Ginko biloba	34	10.8	Very good		Alive	None	
3110	Ginko	Ginko biloba	43.5	13.9	Good	Nutrient Deficiency	Alive	None	
3111	Eastern redcedar	Juniperus virginiana	38	12.1	Very good		Alive	None	
3112	Eastern redcedar	Juniperus virginiana	31	9.9	Very good		Alive	None	
3113	Eastern redcedar	Juniperus virginiana	35	11.1	Very good		Alive	None	
3114	Douglasfir	Pseudotsuga menziesii	36	11.5	Good		Alive	Large Tree - routine	
3115	Canadian Hemlock	Tsuga canadensis	18	5.7	Very good		Alive	None	
3116	Canadian Hemlock	Tsuga canadensis	30	9.6	Very good		Alive	None	
3117	Crabapple	Malus sps	8	2.5	Fair		Alive	None	
3118	Crabapple	Malus sps	8.5	2.7	Poor		Alive	None	
3119	Crabapple	Malus sps	9	2.9	Fair		Alive	None	
3120	Yew	Taxus sps		0.0	Good		Alive	None	
3121	Columnar white poplar	Populus alba 'Columnaris'		0.0	Good		Alive	None	
3122	Douglas fir	Pseudotsuga menziesii	27	8.6	Good		Alive	None	
3123	Canadian hemlock	Tsuga canadensis	30	9.6	Good		Alive	None	
3124	Canadian hemlock	Tsuga canadensis	33.5	10.7	Good		Alive	None	
3125	Eastern white pine	Pinus strobus	54	17.2	Good		Alive	None	
3126	Cottonwood	Populus deltoides	71	22.6	Good		Alive	None	
3127	Cottonwood	Populus deltoides	69	22.0	Good		Alive	None	
3128	White poplar	Populus alba	69	22.0	Good		Alive	None	
3129	Cottonwood	Populus deltoides	36	11.5	Good		Alive	None	
3130	White poplar	Populus alba	96	30.6			Alive	None	
3131	White poplar	Populus alba	170	54.1	Good		Alive	None	



ARBORETU	M/GREEN HOUSE/ENT	TRY ZONE TREE INVENTORY - MAY	l, 2018						
	Common Name	Latin Name (Genus/Species)	Circum.	DBH	Condition	Observation	Status	Primary Maintenance	Maintenance Comments
3133	Walnut	Juglans nigra		0.0					
3134	Walnut	Juglans nigra		0.0					
3135	Walnut	Juglans nigra		0.0					
3136	Shagbark	Carya ovata	9	2.9	Very good		Alive	None	
3137	Shagbark	Carya ovata	11	3.5	Good		Alive	None	
3138	White willow	Salix alba	72	22.9	Good		Alive	None	
3139	White willow	Salix alba	160	51.0	Poor	Split	Alive	Large Tree - immediate	split in half
3140	American Hophornbeam	Ostrya virginiana	36	11.5	Good		Alive	None	
3141	River birch	Betula nigra	17	5.4	Poor		Alive	None	
3142	River birch	Betula nigra	57	18.2	Good		Alive	None	
3143	River birch	Betula nigra	83	26.4	Good		Alive	None	
3144	Paper birch	Betula papyrifera	28	8.9	Fair		Alive	None	
3145	Paper birch	Betula papyrifera	40	12.7	Fair		Alive	None	
3146	European alder	Alnus glutinosa	58	18.5	Fair		Alive	None	
3147	European alder	Alnus glutinosa	66	21.0	Fair		Alive	None	
3148	European alder	Alnus glutinosa	58	18.5	Poor		Alive	Prune	
3149	European alder	Alnus glutinosa	47	15.0	Fair		Alive	None	
3150	European alder	Alnus glutinosa	40	12.7	Fair		Alive	None	
3151	Northern red oak	Quercus rubra	51.5	16.4	Very good		Alive	None	
3152	Northern red oak	Quercus rubra	33	10.5	Good	Frost Cracks	Alive	None	
3153	Northern red oak	Quercus rubra	52	16.6	Good		Alive	None	
3154	Shingle oak	Quercus imbricaria	73	23.2	Good		Alive	None	
3155	Northern red oak	Quercus rubra	52	16.6	Good		Alive	None	
3156	Shingle oak	Quercus imbricaria	71	22.6	Good		Alive	None	
3157	Northern red oak	Quercus rubra	68	21.7	Good		Alive	None	
3158	Northern red oak	Quercus rubra	46	14.6	Good		Alive	None	
3159	Northern red oak	Quercus rubra	52	16.6	Good		Alive	None	
3160	Northern red oak	Quercus rubra	47	15.0	Good		Alive	None	
3161	Northern red oak	Quercus rubra	29	9.2	Good		Alive	None	
3162	Northern red oak	Quercus rubra	33	10.5	Good		Alive	None	
3163	Shingle oak	Quercus imbricaria	81	25.8	Good		Alive	None	
3164	Northern red oak	Quercus rubra	38	12.1	Good		Alive	None	
3165	Northern red oak	Quercus rubra	46	14.6	Good		Alive	None	
3166	Northern red oak	Quercus rubra	46	14.6	Good		Alive	None	
3167	Northern red oak	Quercus rubra	47	15.0	Good		Alive		
3168	Northern red oak	Quercus rubra	28	8.9	Good		Alive	None	
3169	Northern red oak	Quercus rubra	45	14.3	Good		Alive	None	
3170	Northern red oak	Quercus rubra	28	8.9	Good		Alive	None	
3171	Burr oak	Quercus macrocarpa	50	15.9	Good		Alive	None	
3172	Burr oak	Quercus macrocarpa	53	16.9	Good		Alive	None	
3173	Burr oak	Quercus macrocarpa	38	12.1	Good		Alive	None	
3174	Burr oak	Quercus macrocarpa	q	2.9	Good		Alive	None	



ARBORETU	M/GREEN HOUSE/ENT	RY ZONE TREE INVENTORY - MAY 1	l, 2018						
Tag number	Common Name	Latin Name (Genus/Species)	Circum.	DBH	Condition	Observation	Status	Primary Maintenance	Maintenance Comments
3175	Burr oak	Quercus macrocarpa	10	3.2	Good		Alive	None	
3176	Swamp White oak	Quercus bicolor	11	3.5	Good		Alive	None	
3177	Swamp White oak	Quercus bicolor	22	7.0	Good		Alive	None	
3178	Chinkapin oak	Quercus muehlenbergii	20	6.4	Good		Alive	None	
3179	Chinkapin oak	Quercus muehlenbergii	22	7.0	Good		Alive	None	
3180	Chinkapin oak	Quercus muehlenbergii	15	4.8	Good		Alive	None	
3181	Osage orange	Maclura pomifera	84	26.8	Good		Alive	None	
3182	Osage orange	Maclura pomifera	83	26.4	Good		Alive	None	
3183	White mulberry	Morus alba	80.5	25.6	Fair	Frost Cracks	Alive	None	
3184	White mulberry	Morus alba	83	26.4	Fair	Frost Cracks	Alive	None	
3185	Black oak	Quercus nigra	23	7.3	Good		Alive	None	
3186	Black oak	Quercus nigra	15	4.8	Good		Alive	None	
3187	Kentucky Coffeetree	Gymnocladus dioicus	20	6.4	Good		Alive	None	
3188	Kentucky Coffeetree	Gymnocladus dioicus	18	5.7	Good		Alive	None	
3189	Kentucky Coffeetree	Gymnocladus dioicus	25	8.0	Good		Alive	None	
3190	Kentucky Coffeetree	Gymnocladus dioicus	23	7.3	Good		Alive	None	
3191	Kentucky Coffeetree	Gymnocladus dioicus	21	6.7	Good		Alive	None	
3192	Tuliptree	Liriodendron tulipifera	55.5	17.7	Good		Alive	None	
3193	Tree of Heaven	Ailanthus altissima	45	14.3	Good	Suckering Tree	Alive	None	suckers
3194	Little Girl Magnolia	Magnolia sps		0.0	Good	Shrub	Alive	None	
3195	Magnolia 'Elizabeth'	Magnolia 'Elizabeth'	17	5.4	Poor		Alive	None	
3196	Sweetgum	Liquidambar styraciflua	22	7.0	Fair		Alive	None	
3197	Sweetgum	Liquidambar styraciflua	30	9.6	Fair		Alive	None	
3198	Hackberry	Celtis occidentalis	49	15.6	Good		Alive	None	
3199	Hackberry	Celtis occidentalis	55	17.5	Good		Alive	None	
3200	Sycamore	Platanus occidentalis	42.5	13.5	Good		Alive	None	
3201	Sycamore	Platanus occidentalis	91	29.0	Good	Mechanical Damage	Alive	None	split trunk
3202	American yellowwood	Cladrastis kentukea	86.5	27.5	Good		Alive	None	
3203	Kentucky coffeetree	Gymnocladus dioicus	58	18.5	Good	Mechanical Damage	Alive	None	two trunks
3204	Kentucky coffeetree	Gymnocladus dioicus	43	13.7	Good		Alive	None	
3205	American yellowwood	Gymnocladus dioicus	59	18.8	Good		Alive	None	multiple trunks
3206	American yellowwood	Cladrastis kentukea	33	10.5	Good		Alive	None	
3207	Kentucky coffeetree	Cladrastis kentukea	45	14.3	Good		Alive	None	
3208	Honeylocust	Gleditsia triacanthos v. Inermis	47.5	15.1	Good		Alive	None	
3209	Honeylocust	Gleditsia triacanthos v. Inermis	59.5	18.9	Good		Alive	None	
3210	Honeylocust	Gleditsia triacanthos v. Inermis	44.5	14.2	Good		Alive	None	
3211	Honeylocust	Gleditsia triacanthos v. Inermis	58	18.5	Good		Alive	None	
3212	Honeylocust	Gleditsia triacanthos v. Inermis	56	17.8	Good		Alive	None	
3213	Pear sps	Pyrus sps	76.5	24.4	Fair	Poor Structure	Alive	None	split trunk
3214	Pear sps	Pyrus sps	73	23.2	Fair	Poor Structure	Alive	None	split trunk
3215	Eastern redbud	Cercis canadensis	58	18.5	Fair	Poor Structure	Alive	None	split trunk
3216	Eastern redbud	Cercis canadensis	66	21.0	Good		Alive	None	multiple trunks



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	Common Name	Latin Name (Genus/Species)	Circum.	DBH	Condition	Observation	Status	Primary Maintenance	Maintenance Comments
3217	Eastern redbud	Cercis canadensis	45.5	14.5	Good	Poor Structure	Alive	None	split trunk
3218	Eastern redbud	Cercis canadensis	41	13.1	Fair	Poor Structure	Alive	None	split and multiple trunks
3219	Eastern redbud	Cercis canadensis	22	7.0	Good		Alive	None	
3220	Black locust (grove)	Robinia pseudoacacia		0.0	Good	Multiple trees, suckers from	Alive	None	Grove
3221	Wild plum	Prunus americana	52	16.6	Poor		Alive	Prune	
3222	Wild plum	Prunus americana	21	6.7	Poor		Alive	None	
3223	Wild plum	Prunus americana	24	7.6	Good		Alive	None	
3224	Downy Hawthorn	Crataegus mollis	35	11.1	Good		Alive	None	
3225	Downy Hawthorn	Crataegus mollis	47	15.0	Good		Alive	None	
3226	Sugar maple	Acer saccharum	60	19.1	Very good		Alive	None	
3227	Linden	Tilia americana	44	14.0	Good		Alive	None	
3228	Linden	Tilia americana	87	27.7	Good		Alive	None	
3229	Linden	Tilia americana	53	16.9	Good		Alive	None	
3230	Linden	Tilia americana	130	41.4	Good	Poor Structure	Alive	None	Multiple trunk
3231	Northern catalpa	Catalpa speciosa	12	3.8	Good		Alive	None	
3232	Southern catalpa	Catalpa bignonioides	38	12.1	Good		Alive	None	
3233	Southern catalpa	Catalpa bignonioides	39	12.4	Good		Alive	None	
3234	Northern catalpa	Catalpa speciosa	13	4.1	Good		Alive	None	
3235	Northern catalpa	Catalpa speciosa	13	4.1	Good		Alive	None	
3236	Southern catalpa	Catalpa bignonioides	38.5	12.3	Good		Alive	None	
3237	Norway maple	Acer platanoides	27.5	8.8	Good	Canker	Alive	None	
3238	Sugar maple	Acer saccharum	51	16.2	Good		Alive	None	
3239	Silver maple	Acer saccharinium	118.5	37.7	Good		Alive	None	Multiple trunk
3240	Silver maple	Acer saccharinium	39.5	12.6	Good		Alive	None	
3241	Amur maple	Acer ginnala	29	9.2	Good		Alive	None	Multiple trunk
3242	Amur maple	Acer ginnala	24	7.6	Good		Alive	None	Multiple trunks
3243	Silver maple	Acer saccharinium	130	41.4	Good		Alive	None	Multiple trunks
3244	Sugar maple	Acer saccharum	56	17.8	Good		Alive	None	
3245	Sugar Maple	Acer saccharum	50	15.9	Good	Pests	Alive	None	
3246	Sugar Maple	Acer saccharum	52	16.6	Good		Alive	None	
3247	Southern catalpa	Catalpa bignonioides	38	12.1	Good		Alive	None	
3248	Miyabei maple	Acer miyabei	11	3.5	Very good		Alive	None	
3249	Miyabei maple	Acer miyabei	11	3.5	Very good		Alive	None	
3250	Miyabei maple	Acer miyabei	10	3.2	Very good		Alive	None	
3251	Hedge Maple	Acer campestre	5	1.6	Very good		Alive	None	
3252	Hedge Maple	Acer campestre	4.5	1.4	Very good		Alive	None	
3253	Red x Silver Hybrid maple	Acer freemanii	6	1.9	Very good		Alive	None	
3254	Red x Silver Hybrid maple	Acer freemanii	5	1.6	Very good		Alive	None	
3255	Red x Silver Hybrid maple	Acer freemanii	7	2.2	Very good		Alive	None	
3256	Ohio Buckeye	Aesculus glabra		0.0	Very good		Alive	None	Grove
3257	Ohio Buckeye	Aesculus glabra	51	16.2	Very good		Alive	None	
3258	Ohio Buckeye	Aesculus glabra	21	6.7	Very good		Alive	None	



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3259	Ohio Buckeye	Aesculus glabra	17	5.4	Very good		Alive	None	
3260	Common Persimmon	Diospyros virginiana	71.5	22.8	Very good		Alive	None	Multi colored trunk
3261	Ohio Buckeye	Aesculus glabra	35.5	11.3	Excellent		Alive	None	
3262	Ohio Buckeye	Aesculus glabra	30.5	9.7	Excellent		Alive	None	
3263	Ohio Buckeye	Aesculus glabra	32.3	10.3	Very good		Alive	None	
3264	European Horschesnut	Aesculus hippocastanum	10	3.2	Very good		Alive	None	
3265	European Horschesnut	Aesculus hippocastanum	7.5	2.4	Very good		Alive	None	
3266	European Horschesnut	Aesculus hippocastanum	8	2.5	Very good		Alive	None	
3267	Ash	Fraxinus americana	51	16.2				None	
3268	Ash	Fraxinus americana	55	17.5				None	
3279	Shawnee Brave Cypress	Taxodium distichum	3.5	1.1	Very good		Alive	None	
3280	Serbian Spruce	Picea omorika	6.5	2.1	Very good		Alive	None	same as 3103
3281	Serbian Spruce	Picea omorika	7	2.2	Very good		Alive		same as 3103
3282	Blue Spruce	Picea pungens	40.5	12.9	Very good	shru		None	
3283	Mockernut Hickory	Carya tomentosa	2	0.6	Very good	New, fall 2017 - small	Alive	None	
3284	Mockernut Hickory	Carya tomentosa	7	2.2	Very good	New, fall 2017 - small	Alive	None	
3285	Bitternut Hickory	Carya cordiformis	1	0.3	Very good	New, fall 2017 - small	Alive	None	
3286	Bitternut Hickory	Carya cordiformis	1.5	0.5	Very good	New, fall 2017 - small	Alive	None	
3287	Bitternut Hickory	Carya cordiformis	1.5	0.5	Very good	New, fall 2017 - small	Alive	None	
3288	Bitternut Hickory	Carya cordiformis	6	1.9	Very good	New, fall 2017 - small	Alive	None	
3289	Illinois Pecan	Carya illinoinensis	2.5	0.8	Very good	New, fall 2017 - small	Alive	None	
3290	Illinois Pecan	Carya illinoinensis	2	0.6	Very good	New, fall 2017 - small	Alive	None	
3291	Illinois Pecan	Carya illinoinensis	2.5	0.8	Very good	New, fall 2017 - small	Alive	None	
3292	Kingnut	Carya laciniosa	1.5	0.5	Very good	New, fall 2017 - small	Alive	None	
3293	Kingnut	Carya laciniosa	1.5	0.5	Very good	New, fall 2017 - small	Alive	None	
3294	Kingnut	Carya laciniosa	1	0.3	Very good	New, fall 2017 - small	Alive	None	
3295	River Birch	Betula nigra	1.5	0.5	Very good	New 2017	Alive	None	
3296	River Birch	Betula nigra	1.5	0.5	Very good	New 2017	Alive	None	
3297	American Hornbeam	Carpinus caroliniana	8	2.5	Very good	New 2017	Alive	None	
3298	American hornbeam	Carpinus caroliniana	7.5	2.4	Very good	New 2017	Alive	None	
3299	Paper Birch	Betula papyrifera	2	0.6	Very good	New 2017	Alive	None	
3300	Paper Birch	Betula papyrifera	1	0.3	Very good	New 2017	Alive	None	
3301	American Filbert	Corylus americana		0.0	Very good	large suckering shrub	Alive	None	Shrub?
3302	American Filbert	Corylus americana		0.0	Very good	large suckering shrub	Alive	None	Shrub
3303	Yellow Birch	Betula alleganiensis	1	0.3	Very good			None	
3304	Yellow Birch	Betula alleganiensis	1	0.3	Very good		Alive	None	
3305	Kindred Spirit Oak	Quercus 'Kindred Spirit'	6.5	2.1	Very good		Alive	None	
3306	Kindred Spirit Oak	Quercus 'Kindred Spirit'	7	2.2	Very good		Alive	None	
3307	Burr Oak	Quercus macrocarpa	2	0.6	Very good		Alive	None	
3309	Wafer Ash	Ptelea trifoliata		0.0	Poor	Group of 4, shrub	Alive	None	stingray samaras grove
3310	Burr Oak	Quercus macrocarpa		0.0	good	shrub	Alive	None	
3311	Wafer Ash	Ptelea trifoliata		0.0	Poor	shrub	Alive	None	Grove and stingray samaras
3312	Wafer Ash	Ptelea trifoliata		0.0	Poor		Alive	None	Grove



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3313	Accolade Elm	Ulmus 'Accolade'	5	1.6	Very good	- Cosciliation	Alive	None	Widinteriorie Comments
3314	Valley Forge ELm	Ulmus americana 'Valley Forge'	3.5	1.1	Very good		Alive	None	
3315	Valley Forge Elm	Ulmus americana 'Valley Forge'	4	1.3	Very good		Alive	None	
3316	Accolade Elm	Ulmus 'Accolade'	4	1.3	Very good		Alive	None	
3317	Merrill Magnolia	Magnolia x loebneri		0.0	Very good	new fall 2017- small	Alive	None	Shrub
3318	Shingle Oak	Quercus imbricaria	3	1.0	Very good		Alive	None	
3319	Quince	Chaenomeles sps		0.0	Very good	by oaks, group of 6	Alive	None	Shrub grove
3320	Common Sweetshrub	Calycanthus floridus		0.0	Very good	large group of shrubs	Alive	None	shrub grove
3321	Tulip Tree	Liriodendron tulipifera	0.3	0.1	Very good	new, 2017, small	Alive	None	
3323	Common Paw Paw	Asimina triloba		0.0	Good	11 plants-small	Alive	None	Grove
3324	Cucumber tree magnolia	Magnolia acuminata	1	0.3	Very good	New fall 2017 - small	Alive	None	
3325	Cucumber tree magnolia	Magnolia acuminata	1	0.3	Very good	New fall 2017 - small	Alive	None	
3326	Merrill Magnolia	Magnolia x loebneri 'Merrill'		0.0	Very good	New fall 2017- small	Alive	None	Shrub
3327	Merrill magnolia	Magnolia x loebneri 'Merrill'		0.0	Excellent	New fall 2017- small	Alive	None	Shrub
3328	Merrill Magnolia	Magnolia x loebneri 'Merrill'		0.0	Very good	New fall 2017- small	Alive	None	Shrub
3329	Merrill Magnolia	Magnolia x loebneri 'Merrill'		0.0	Very good	New fall 2017- small	Alive	None	Shrub
3330	Leonard Messel Magnolia	Magnolia x loebneri 'Leonard Messel'		0.0	Very good	New fall 2017- small	Alive	None	Shrub
3331	Leonard Messel Magnolia	Magnolia x loebneri 'Leonard Messel'		0.0	Very good	New fall 2017- small	Alive	None	Shrub
3332	Leonard Messel Magnolia	Magnolia x loebneri 'Leonard Messel'		0.0	Excellent	New fall 2017- small	Alive	None	Shrub
3333	Leonard Messel Magnolia	Magnolia x loebneri 'Leonard Messel'		0.0	Very good	New fall 2017- small	Alive	None	Shrub
3334	Leonard Messel Magnolia	Magnolia x loebneri 'Leonard Messel'		0.0	Very good	New fall 2017- small	Alive	None	Shrub
3335	Water Lily Magnolia	Magnolia stellata 'water lily'		0.0	Very good	group of 5 small plants	Alive	None	Grove
3336	Sassafras	Sassafras albidium		0.0	Good	group of small plants	Alive	None	Grove
3337	Cucumber Tree	Magnolia acuminata	1.5	0.5	Very good		Alive	None	
3338	Cucumber Tree	Magnolia acuminata	1	0.3	Very good		Alive	None	
3339	Cucumber Tree	Magnolia acuminata	1	0.3	Very good		Alive	None	
3346	Eastern Red Bud	Cercis canadensis	1.5	0.5	Very good	new 2017	Alive	None	
3347	Eastern Red Bud	Cercis canadensis	2.5	0.8	Very good	new 2017	Alive	None	
3348	Eastern Red Bud	Cercis canadensis	2.5	0.8	Very good	new 2018	Alive	None	
3366	Downy Hawthorn	Crategus mollis	2	0.6	Very good		Alive	None	
3367	Downy Hawthorn	Crategus mollis	1.5	0.5	Very good		Alive	None	
									"A" trees from c-campus
3834	Maple	Acer	9	2.9	Good		Alive	None	
3836	Maple	Acer	2.5	0.8	Fair		Alive	None	
3837	Maple	Acer	2.5	0.8	Good		Alive	None	
3838	Maple	Acer	2.75	0.9	Fair		Alive	None	
3839	Maple	Acer	2.75	0.9	Good		Alive	None	
3840	Maple	Acer	2.5	0.8	Fair		Alive		
3841	Maple	Acer	2.75	0.9	Fair		Alive	None	
3842	Maple	Acer	2.5	0.8	Fair		Alive	Prune	
3844	Maple	Acer	2.5	0.8	Fair		Alive	None	
3846	Maple	Acer	2.25	0.7	Poor		Alive	None	



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3847	Maple	Acer	2.25	0.7	Fair		Alive	Prune	
3848	Maple	Acer	2.75	0.9	Fair		Alive	Prune	
3926	Maple	Acer	8	2.5	Fair		Alive	None	
3928	Maple	Acer	36	11.5	Very good		Alive	None	
3929	Maple	Acer	37	11.8	Very good		Alive	None	
3930	Maple	Acer	38	12.1	Very good		Alive	None	
3931	Maple	Acer	6	1.9	Very good		Alive	None	
3832	Maple	Acer	12	3.8	Good		Alive	None	
3835	Acer	Acer	2.5	0.8	Fair				
3845	Maple	Acer	2.5	0.8	Fair		Alive	Prune	
3797	Red Maple	Acer rubrum	13	4.1	Excellent		Alive	None	
3809	Red Maple	Acer rubrum	12	3.8	Good		Alive	None	
3810	Red Maple	Acer rubrum	13	4.1	Fair	Pests	Alive	None	Deer Damage
3828	Red Maple	Acer rubrum	11	3.5	Fair		Alive	None	
3801	Red Maple	Acer rubrum	12	3.8	Good		Alive	None	
3802	Red Maple	Acer rubrum	12	3.8	Good		Alive	None	
3803	Red Maple	Acer rubrum	12	3.8	Good		Alive	None	
3805	Red Maple	Acer rubrum	13	4.1	Excellent		Alive	None	
3808	Red Maple	Acer rubrum	15	4.8	Poor	Poor Structure	Alive	Prune	Needs pruning
3812	Red Maple	Acer rubrum	20	6.4	Excellent		Alive	Prune	
3826	Red Maple	Acer rubrum	12	3.8	Good		Alive	None	
3827	Red Maple	Acer rubrum	11	3.5	Fair		Alive	None	
3825	Serviceberry	Amelancheir canadensis	6	1.9	Excellent		Alive	None	
3807	Serviceberry	Amelanchier canadensis	12	3.8	Good		Alive	None	Multi stem
3806	Serviceberry	Amelanchier canadensis	10	3.2	Good		Alive	None	Multi stem
3815	Serviceberry	Amelanchier canadensis	14	4.5	Good		Alive	None	Multi stem
3814	Birch	Betula	12	3.8	Poor	Frost Cracks	Alive	None	
3813	Birch	Betula	18	5.7	Good		Alive	None	
3833	American Hornbeam	Carpinus caroliniana	28	8.9	Good		Alive	None	
3843	American Hornbeam	Carpinus Caroliniana		0.0	Fair		Alive	None	
3867	Hackberry	Celtis occidentalis	13	4.1	Very good		Alive	None	
3893	Hackberry	Celtis occidentalis	8	2.5	Excellent		Alive	None	
3900	Hackberry	Celtis occidentalis	18	5.7	Excellent		Alive	None	
3794	Hackberry	Celtis occidentalis	19	6.1	Excellent		Alive	None	
3795	Hackberry	Celtis occidentalis	19	6.1	Excellent		Alive	None	
3804	Hackberry	Celtis occidentalis	12	3.8	Fair		Alive	None	
3821	Hackberry	Celtis occidentalis	4	1.3	Good		Alive	None	
3829	Hackberry	Celtis occidentalis	12	3.8	Fair		Alive	None	
3830	Hackberry	Celtis occidentalis	14	4.5	Excellent		Alive	None	
3857	Hackberry	Celtis occidentalis	12	3.8	Very good		Alive	None	
3858	Hackberry	Celtis occidentalis	13	4.1	Very good		Alive	None	
3866	Hackberry	Celtis occidentalis	13	4.1	Very good		Alive	None	



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3868	Hackberry	Celtis occidentalis	13.5	4.3	Very good		Alive	None	
3878	Hackberry	Celtis occidentalis	18	5.7	Very good	Improperly Mulched	Alive	None	
3879	Hackberry	Celtis occidentalis	15	4.8	Very good		Alive	None	
3892	Hackberry	Celtis occidentalis	10	3.2	Excellent		Alive	None	
3897	Hackberry	Celtis occidentalis	11	3.5	Very good		Alive	None	
3902	Hackberry	Celtis occidentalis	24	7.6	Very good		Alive	None	
3902	Hackberry	Celtis occidentalis	24	7.6	Poor	Serious Decline	Alive	Remove Tree	Possible tree replacement, de
3906	Hackberry	Celtis occidentalis	18	5.7	Very good		Alive	None	
3907	Hackberry	Celtis occidentalis	19	6.1	Excellent		Alive	None	
3909	Hackberry	Celtis occidentalis	16	5.1	Very good		Alive	None	
3909	Hackberry	Celtis occidentalis	20	6.4	Excellent	Pests	Alive	None	
3914	Hackberry	Celtis occidentalis	18	5.7	Very good		Alive	None	
3915	Hackberry	Celtis occidentalis	20	6.4	Very good		Alive	None	
3916	Hackberry	Celtis occidentalis	22	7.0	Very good		Alive	None	
3796	Gingko	Gingko biloba	20	6.4	Excellent		Alive	None	
3850	Honey Locust	Gladitsia triacanthos var. Inermis	2.5	0.8	Fair		Alive	Prune	
3851	Honey Locust	Gladitsia triacanthos var. Inermis	2.25	0.7	Fair		Alive	Prune	
3852	Honey Locust	Gladitsia triacanthos var. Inermis	3.25	1.0	Fair		Alive	None	
3853	Honey Locust	Gladitsia triacanthos var. Inermis	3.75	1.2	Fair		Alive	None	
3854	Honey Locust	Gladitsia triacanthos var. Inermis	3.75	1.2	Poor		Removed	Prune	i think the tree was hit by a ca
3855	Honey Locust	Gladitsia triacanthos var. Inermis	3.75	1.2	Fair		Alive		
3856	Honey Locuat	Gladitsia triacanthos var. Inermis	3.76	1.2	Fair		Alive	None	
3894	Honey Locust	Gleditsia triacanthos	14	4.5	Excellent		Alive	None	
3895	Honey Locust	Gleditsia triacanthos	10	3.2	Excellent		Alive	None	
3896	Honey Locust	Gleditsia triacanthos	10	3.2	Excellent		Alive	None	
3898	Honey Locust	Gleditsia triacanthos	22	7.0	Excellent		Alive	None	
3899	Honey Locust	Gleditsia triacanthos	22	7.0	Very good		Alive	None	
3901	Hackberry	Gleditsia triacanthos	20	6.4	Very good		Alive	None	
3903	Honey Locust	Gleditsia triacanthos	22	7.0	Very good		Alive	None	
3904	Honey Locust	Gleditsia triacanthos	23	7.3	Very good		Alive	None	
3905	Honey Locust	Gleditsia triacanthos	30	9.6	Excellent		Alive	None	
3912	Honey Locust	Gleditsia triacanthos	23	7.3	Very good		Alive	None	
3913	Honey Locust	Gleditsia triacanthos	19	6.1	Very good		Alive	None	
3919	Honey Locust	Gleditsia triacanthos	13	4.1	Very good		Alive	None	
3922	Honey Locust	Gleditsia triacanthos	20	6.4	Very good	Pests	Alive	None	
3923	Honey Locust	Gleditsia triacanthos	19	6.1	Very good		Alive	None	
3924	Honey Locust	Gleditsia triacanthos	18	5.7	Very good		Alive	None	
3942	Honey Locust	Gleditsia triacanthos	27	8.6	Very good		Alive	None	
3943	Honey Locust	Gleditsia triacanthos	28	8.9	Very good		Alive	None	
3944	Honey Locust	Gleditsia triacanthos	24	7.6	Very good		Alive	None	
3945	Honey Locust	Gleditsia triacanthos	30	9.6	Very good		Alive	None	
3946	Honey Locust	Gleditsia triacanthos	34	10.8	Very good		Alive	None	



		RY ZONE TREE INVENTORY - MAY	-	DDII					
Tag number	Common Name	Latin Name (Genus/Species)	Circum.	DBH	Condition	Observation	Status	Primary Maintenance	Maintenance Comments
3948	Honey Locust	Gleditsia triacanthos	13	4.1	Very good		Alive	None	
3949	Honey Locust	Gleditsia triacanthos	12	3.8	Very good		Alive	None	
4000	Honey Locust	Gleditsia triacanthos	14	4.5	Excellent		Alive	None	
4849	Honey Locust	Gleditsia triacanthos	2.75	0.9	Good		Alive	None	
3798	Honey Locust	Gleditsia triacanthos	18	5.7	Excellent	Pests	Alive	None	
3908	Hackberry	Gleditsia triacanthos	12	3.8	Very good		Alive	None	
3911	Honey Locust	Gleditsia triacanthos	21	6.7	Very good		Alive	None	
3917	Honey Locust	Gleditsia triacanthos	17	5.4	Very good		Alive	None	
3918	Honey Locust	Gleditsia triacanthos	15	4.8	Very good		Alive	None	
3920	Honey Locust	Gleditsia triacanthos	20	6.4	Very good		Alive	None	
3921	Honey Locust	Gleditsia triacanthos	18	5.7	Very good		Alive	None	
3815	Honey Locust	Gleditsia triacanthos var. Inermis	11.1	3.5	Excellent		Alive	None	
3817	Honey Locust	Gleditsia triacanthos var. Inermis	8	2.5	Good		Alive	None	
3831	Honey Locust	Gleditsia triacanthos var. Inermis	15	4.8	Good		Alive	None	
3832	Honey Locust	Gleditsia triacanthos var. Inermis	11	3.5	Very good		Alive	None	
3880	Honey Locust	Gleditsia triacanthos var. Inermis	19	6.1	Very good		Alive	None	
3881	Honey Locust	Gleditsia triacanthos var. Inermis	10	3.2	Very good		Alive	None	
3883	Honey Locust	Gleditsia triacanthos var. Inermis	10	3.2	Very good		Alive	None	
3888	Honey Locust	Gleditsia triacanthos var. Inermis	19	6.1	Very good		Alive	None	
3890	Honey Locust	Gleditsia triacanthos var. Inermis	9	2.9	Very good		Alive	None	
3799	Honey Locust	Gleditsia tricanthos	18	5.7	Excellent		Alive	None	
3811	Kentucky Coffee Tree	Gymnocladus dioicus	15	4.8	Fair		Alive	None	
3859	Crabapple	Malus sps.	11	3.5	Very good		Alive	None	
3860	Crabapple	Malus sps.	10.5	3.3	Very good		Alive	None	
3861	Crabapple	Malus sps.	10	3.2	Very good		Alive	None	
3862	Crabapple	Malus sps.	12	3.8	Very good		Alive	None	
3872	Crabapple	Malus sps.	11	3.5	Very good		Alive	None	
3876	Crabapple	Malus sps.	14	4.5	Very good		Alive	None	
3936	Crabapple	Malus sps.	26	8.3	Very good	Pests	Alive	None	
3937	Crabapple	Malus sps.	28	8.9	Very good		Alive	None	
3938	Crabapple	Malus sps.	28	8.9	Very good		Alive	None	
3939	Crabapple	Malus sps.	29	9.2	Very good		Alive	None	
3940	Crabapple	Malus sps.	29	9.2	Very good		Alive	None	
3941	Crabapple	Malus sps.	31	9.9	Very good		Alive	None	
3793	Crabapple	Malus sps.	16	5.1	Excellent		Alive	None	
3873	Crabapple	Malus sps.	11	3.5	Very good		Alive	None	
3875	Crabapple	Malus sps.	12	3.8	Very good		Alive	None	
3877	Crabapple	Malus sps.	11	3.5	Very good		Alive	None	
3932	Bradford Pear	Pyrus calleryana	28	8.9	Very good		Alive	None	
3933	Bradford Pear	Pyrus calleryana	29	9.2	Good		Alive	None	
3934	Bradford Pear	Pyrus calleryana	30	9.6	Very good		Alive	None	
3935	Bradford Pear	Pyrus calleryana	30	9.6	Very good		Alive	None	



ARBORETUM/GREEN HOUSE/ENTRY ZONE TREE INVENTORY - MAY 1, 2018									
Tag number	Common Name	Latin Name (Genus/Species) Circum.		DBH	Condition	Observation	Status	Primary Maintenance	Maintenance Comments
3865	Burr Oak	Quercus macrocarpa	13.5	4.3	Very good		Alive	None	





Inventory Data Compiled with Tree Plotter Program. See following link for interactive maps:

https://pg-cloud.com/JJC/?scenario=JJC-Arboretum-tree-inventory-5-2



## **APPENDIX F: NATURAL AREAS TREE INVENTORY**



0 150 300 Scale in Feet

LEGEND

Hey and Associates, Inc.
Water Resources, Wetlands and Ecology

Water Resources, Wetlands and Ecology

26575 WEST COMMERCE DRIVE, SUITE 601

VOLO, ILLINOIS 60073

OFFICE (847) 740-0888

FAX (847) 740-2888

VOLO @ HEYASSOC.COM

Joliet Junior College

Overall Tree Survey

PROJECT NO:	10011	SHEET NO:
DESIGNED BY	DAC	
DRAWN BY	CFR	
CHECKED BY	DAC	1 1
APPROVED BY		• •
ISSUE DATE	03/15/2010	<i></i>

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Scale in Feet

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Water Resources, Wetlands and Ecology

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Joliet Junior College

Tree Survey - West

PROJECT NO:	10011	SHEET NO:
ESIGNED BY	DAC	
RAWN BY	CFR	
HECKED BY	DAC	フ
PPROVED BY		
SUE DATE	03/15/2010	

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Tree Survey - Southwest

PROJECT NO:	10011	SHEET NO:
SIGNED BY	DAC	
AWN BY	CFR	
ECKED BY	DAC	[3
PROVED BY		
UE DATE	03/15/2010	

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Scale in Feet

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Tree Survey

PROJECT NO:	10011	SHEET NO:
IGNED BY	DAC	
WN BY	CFR	4
CKED BY	DAC	4
ROVED BY		•
E DATE	03/15/2010	

<b>Tag #</b> 501	Common Name Bur Oak	Scientific Name *I  Quercus macrocarpa		n Stem	887 888	Bur Oak Bur Oak	Quercus macrocarpa 25 Quercus macrocarpa 46	good fair	2	1001 1002	Bur Oak Bur Oak	Quercus macrocarpa 22 Quercus macrocarpa 22	good good		1115 1116	Bur Oak Black Walnut	Quercus macrocarpa 3 Juglans nigra 1	J Idii	
502	American Linden		<ul><li>16 good</li><li>17 fair</li></ul>		889	Bur Oak	Quercus macrocarpa 27	good	_	1003	Bur Oak	Quercus macrocarpa 35	fair	2	1117	American Linden	Tilia americana 1	3 fair	3
503	Bur Oak		17 good		890 891	Bur Oak Bur Oak	Quercus macrocarpa 25 Quercus macrocarpa 18	good fair		1004 1005	Bur Oak Bur Oak	Quercus macrocarpa 46 Quercus macrocarpa 47	good	2	1118 1119	American Linden Black Walnut	Tilia americana 1 Juglans nigra 1	4 fair 5 fair	
504 505	Bur Oak Bur Oak	•	<ul><li>poor</li><li>fair</li></ul>		892	Bur Oak	Quercus macrocarpa 13	fair		1005	American Linden	Tilia americana 15	good fair	2	1120	American Linden	Tilia americana 1		2
506	Bur Oak	Quercus macrocarpa	23 good		893	Bur Oak	Quercus macrocarpa 18	fair		1007	Black Walnut	Juglans nigra 12	good	_	1121	Bur Oak	Quercus macrocarpa 4	8 fair	2
507 508	Bur Oak Bur Oak	•	26 good 20 good		894 895	Bur Oak Bur Oak	Quercus macrocarpa 17 Quercus macrocarpa 18	fair fair		1008 1009	American Linden Bur Oak	Tilia americana 12 Quercus macrocarpa 25	fair good	2	1122 1123	Bur Oak Black Walnut	Quercus macrocarpa 2 Juglans nigra 1	6 fair 7 good	
509	Bur Oak	•	21 good		896	Bur Oak	Quercus macrocarpa 20	good		1010	Bur Oak	Quercus macrocarpa 36	poor	2	1124	Black Walnut	Juglans nigra 1	good good	
510	Black Cherry		17 good		897	American Elm Bur Oak	Ulmus americana 12.5 Quercus macrocarpa 26	fair		1011	Bur Oak Bur Oak	Quercus macrocarpa 23 Quercus macrocarpa 45	fair fair	2	1125	Green Ash	Fraxinus pennsylvanica sub. 1	good	
511 512	American Linden American Linden		<ul><li>14 good</li><li>22 good</li></ul>	2	898 899	Bur Oak	Quercus macrocarpa 20	good poor		1012 1013	American Linden	Tilia americana 21	fair	3	1126 1127	Green Ash American Elm	Fraxinus pennsylvanica sub. 1 Ulmus americana 1	3 good 2 poor	
513	Bur Oak	Quercus macrocarpa	16 good	_	900	Bur Oak	Quercus macrocarpa 22	fair		1014	Bur Oak	Quercus macrocarpa 23	good		1128	American Elm	Ulmus americana 1	2 fair	
514 515	Bur Oak Bur Oak	adorodo maorodarpa	15 good		901 902	Bur Oak Bur Oak	Quercus macrocarpa 21 Quercus macrocarpa 26	fair good		1015 1016	Bur Oak Bur Oak	Quercus macrocarpa 28 Quercus macrocarpa 25	good good		1129 1130	Siberian Elm Black Cherry	Ulmus pumila 1 Prunus serotina 1	9 fair 8 good	2
515 516	Bur Oak	•	<ul><li>23 good</li><li>24 good</li></ul>		903	Bur Oak	Quercus macrocarpa 25	good		1017	Bur Oak	Quercus macrocarpa 26	good		1131	Crab Apple	Malus spp. 2	9	3
517	Bur Oak	Quercus macrocarpa	21 fair		904	Bur Oak	Quercus macrocarpa 19	fair		1018	Shagbark Hickory	Carya ovata 15	good		1132	Bur Oak	Quercus macrocarpa 2	9	
518 519	Bur Oak Bur Oak		15 good good		905 906	Bur Oak Bur Oak	Quercus macrocarpa 28 Quercus macrocarpa 19	good fair		1019 1020	Bur Oak Bur Oak	Quercus macrocarpa 24 Quercus macrocarpa 27	fair good		1133 1134	Bur Oak Bur Oak	Quercus macrocarpa 1 Quercus macrocarpa 1	•	
520	Downy Hawthorn	•	13 good	2	907	Bur Oak	Quercus macrocarpa 16	fair		1021	Red Oak	Quercus rubra 13	good		1135	Bur Oak	Quercus macrocarpa 2		
521	Bur Oak	•	30 good		908	Bur Oak	Quercus macrocarpa 22	fair fair		1022	American Linden	Tilia americana 19	fair	3	1136	Bur Oak	Quercus macrocarpa 2	Ü	
522 523	Green Ash Bur Oak	Fraxinus pennsylvanica sub. Quercus macrocarpa	12 good 21 fair		909 910	Bur Oak Bur Oak	Quercus macrocarpa 20 Quercus macrocarpa 16	fair	3	1023 1024	Bur Oak Red Oak	Quercus macrocarpa 19 Quercus rubra 21	good good	2	1137 1138	Bur Oak Bur Oak	Quercus macrocarpa 2 Quercus macrocarpa 2	9	
524	American Linden	•	25 poor	3	911	Bur Oak	Quercus macrocarpa 22	fair		1025	Red Oak	Quercus rubra 13	good		1139	Bur Oak	Quercus macrocarpa 1	4 poor	
525 526	Bur Oak Bur Oak	and the state of t	19 good		912 913	Bur Oak Eastern Cottonwood	Quercus macrocarpa 29 Populus deltoides 17	good good		1026 1027	Bur Oak American Linden	Quercus macrocarpa 22 Tilia americana 14	fair fair	2	1140 1141	Bur Oak Bur Oak	Quercus macrocarpa 1 Quercus macrocarpa 2	2 poor 2 fair	
526 527	American Linden	•	<ul><li>20 good</li><li>14 good</li></ul>		914	Eastern Cottonwood	Populus deltoides 16	fair		1027	Bur Oak	Quercus macrocarpa 23	good	2	1142	Bur Oak Bur Oak	Quercus macrocarpa 2  Quercus macrocarpa 1		
528	White Oak	Quercus alba	13 good		915	Bur Oak	Quercus macrocarpa 20	poor		1029	Red Oak	Quercus rubra 15	good		1143	Bur Oak	Quercus macrocarpa 2	9	
529 530	Bur Oak Slippery Elm	•	30 good	2	916 917	Bur Oak Bur Oak	Quercus macrocarpa 19 Quercus macrocarpa 20	poor good		1030 1031	Bur Oak Bur Oak	Quercus macrocarpa 19 Quercus macrocarpa 28	fair good		1144 1145	Bur Oak Bur Oak	Quercus macrocarpa 1 Quercus macrocarpa 4	7 good 5 good	2
531	White Ash	Fraxinus americana	13 good 19 good	2	918	Bur Oak	Quercus macrocarpa 23	good		1032	Bur Oak	Quercus macrocarpa 24	good		1146	Bur Oak	Quercus macrocarpa 1	~	2
532	Black Walnut	Juglans nigra	15 good		919 920	Bur Oak	Quercus macrocarpa 17 Quercus macrocarpa 20	fair		1033	American Linden	Tilia americana 25	fair	5	1147	Bur Oak	Quercus macrocarpa 2	9	
533 534	Slippery Elm Green Ash	Ulmus rubra Fraxinus pennsylvanica sub.	<ul><li>20 poor</li><li>13 good</li></ul>		920 921	Bur Oak Bur Oak	Quercus macrocarpa 20 Quercus macrocarpa 22	good		1034 1035	Bur Oak Red Oak	Quercus macrocarpa 23 Quercus rubra 12	good good		1148 1149	Bur Oak Black Cherry	Quercus macrocarpa 2 Prunus serotina 1	4 good 3 poor	
535	White Mulberry	Morus alba	12 fair		922	Bur Oak	Quercus macrocarpa 20	fair		1036	Red Oak	Quercus rubra 12	good		1150	Bur Oak	Quercus macrocarpa 2	1 poor	
536	American Elm	Ulmus americana	16 good		923	Bur Oak Bur Oak	Quercus macrocarpa 20 Quercus macrocarpa 20	good		1037	Red Oak	Quercus rubra 16	good	0	1151	Bur Oak	Quercus macrocarpa 2	2 fair O fair	
537 538	Bur Oak Bur Oak		26 good 46 good		924 925	American Linden	Tilia americana 35	good fair	6	1038 1039	Black Cherry Red Oak	Prunus serotina 14 Quercus rubra 12	fair good	2	1152 1153	Bur Oak Bur Oak	Quercus macrocarpa 2 Quercus macrocarpa 1	o tair 2 poor	
539	Bur Oak	•	33 good		926	Bur Oak	Quercus macrocarpa 12	good		1040	Red Oak	Quercus rubra 12	good		1154	Bur Oak	Quercus macrocarpa 2	4 good	
540 544	Black Walnut	Juglans nigra	13 good		927 928	Bur Oak American Linden	Quercus macrocarpa 23 Tilia americana 38	good fair	3	1041 1042	Bur Oak Red Oak	Quercus macrocarpa 21 Quercus rubra 12	good		1155 1156	Bur Oak Bur Oak	Quercus macrocarpa 3 Quercus macrocarpa 1	•	2
541 542	Shagbark Hickory Bur Oak	Carya ovata Quercus macrocarpa	<ul><li>17 good</li><li>30 good</li></ul>		929	Bur Oak	Quercus macrocarpa 22	good	3	1042	Red Oak	Quercus rubra 14	good good		1157	Bur Oak Bur Oak	Quercus macrocarpa 2	7 good 1 good	
543		not recorded	3		930	Bur Oak	Quercus macrocarpa 22	fair		1044	Bur Oak	Quercus macrocarpa 24	good		1158	Bur Oak	Quercus macrocarpa 2		
544 545	Bur Oak Bur Oak	Quercus macrocarpa Quercus macrocarpa	15 good 22 good		931 932	Bur Oak Bur Oak	Quercus macrocarpa 24 Quercus macrocarpa 28	fair good		1045 1046	Bur Oak Bur Oak	Quercus macrocarpa 21 Quercus macrocarpa 22	poor fair		1159 1160	Bur Oak Bur Oak	Quercus macrocarpa 5 Quercus macrocarpa 3	•	4
546	Black Walnut	Juglans nigra	13 good		933	Bur Oak	Quercus macrocarpa 14	poor		1047	American Linden	Tilia americana 23	fair	2	1161	Bur Oak	Quercus macrocarpa 2	good good	
547	Green Ash	Fraxinus pennsylvanica sub.	13 good	2	934	Bur Oak	Quercus macrocarpa 29	good fair		1048	Bur Oak	Quercus macrocarpa 20	good		1162	Bur Oak	Quercus macrocarpa 2	8 fair	
548 549	Black Cherry American Elm	Prunus serotina Ulmus americana	12 poor 18 fair		935 936	Bur Oak Bur Oak	Quercus macrocarpa 15 Quercus macrocarpa 14	fair		1049 1050	Bur Oak American Linden	Quercus macrocarpa 20 Tilia americana 14	good fair	4	1163 1164	Bur Oak Bur Oak	Quercus macrocarpa 2 Quercus macrocarpa 1	9 good 9 good	
550	Bur Oak		30 good		937	Bur Oak	Quercus macrocarpa 26	good		1051	American Linden	Tilia americana 13	good	2	1165	Black Cherry	Prunus serotina 1	•	
551	Bur Oak	•	good		938 939	Bur Oak Bur Oak	Quercus macrocarpa 20 Quercus macrocarpa 19	fair good		1052	Bur Oak	Quercus macrocarpa 22	good		1166 1167	Bur Oak Bur Oak	Quercus macrocarpa 5 Quercus macrocarpa 1		3
552 553	Bur Oak Bur Oak	Quercus macrocarpa Quercus macrocarpa	34 good 20 good		940	Bur Oak	Quercus macrocarpa 20	good		1053 1054	Black Walnut Bur Oak	Juglans nigra 12 Quercus macrocarpa 12	good good		1168	Bur Oak Bur Oak	Quercus macrocarpa 2	5 poor 8 good	
554	Bur Oak	Quercus macrocarpa	21 good		941	Bur Oak	Quercus macrocarpa 26	fair		1055	Bur Oak	Quercus macrocarpa 21	good		1169	American Linden	Tilia americana 3	9	5
555 556	American Elm American Elm	Ulmus americana Ulmus americana	12 fair 12 poor		942 943	Bur Oak Bur Oak	Quercus macrocarpa 21 Quercus macrocarpa 24	good good		1056 1057	Bur Oak American Linden	Quercus macrocarpa 37 Tilia americana 12	good good		1170 1171	Bur Oak Bur Oak	Quercus macrocarpa 2 Quercus macrocarpa 2	5 good 7 fair	
557	American Linden		25 fair	5	944	Bur Oak	Quercus macrocarpa 18	fair		1058	American Linden	Tilia americana 19	good	2	1172	Bur Oak	Quercus macrocarpa 3		
558	Black Cherry	Prunus serotina	18 poor		945 946	Bur Oak	Quercus macrocarpa 16	fair fair	2	1059	American Linden	Tilia americana 17	good	2	1173	Black Cherry	Prunus serotina 1	4 poor	
559 560	Red Oak Bur Oak	40.0.00.0	12 good good		946 947	Downy Hawthorn Bur Oak	Crataegus mollis 12 Quercus macrocarpa 33	good	S	1060 1061	Black Walnut American Linden	Juglans nigra 12 Tilia americana 22	good fair	5	1174 1175	White Oak Slippery Elm	Quercus alba 1 Ulmus rubra 1	3 good 7 poor	
561	Bur Oak	•	24 good		948	American Elm	Ulmus americana 17	poor	3	1062	American Linden	Tilia americana 26	good	6	1176	Slippery Elm	Ulmus rubra 1		
562	American Linden		15 fair	2	949 950	Bur Oak Bur Oak	Quercus macrocarpa 13 Quercus macrocarpa 19	fair good		1063 1064	Black Walnut American Linden	Juglans nigra 12 Tilia americana 23	good	2	1177 1178	American Linden American Linden	Tilia americana 2 Tilia americana 1	6 fair 9 good	4
563 564	Bur Oak Bur Oak	Quercus macrocarpa Quercus macrocarpa	15 poor 23 fair		951	Bur Oak	Quercus macrocarpa 16	good		1065	American Linden	Tilia americana 12	good good	3	1179	American Linden	Tilia americana 3	good fair	
565	Bur Oak	Quercus macrocarpa	16 fair		952	Bur Oak	Quercus macrocarpa 19	fair		1066	American Linden	Tilia americana 16	fair	3	1180	American Linden	Tilia americana 5		5
566 567	Bur Oak Bur Oak	Quercus macrocarpa Quercus macrocarpa	34 good 21 good		953 954	Bur Oak Bur Oak	Quercus macrocarpa 23 Quercus macrocarpa 21	fair good		1067 1068	Bur Oak Bur Oak	Quercus macrocarpa 20 Quercus macrocarpa 40	good fair	2	1181 1182	Bur Oak American Linden	Quercus macrocarpa 4 Tilia americana 1	4 good 3 good	
568		Fraxinus pennsylvanica sub.	12 good		955	Bur Oak	Quercus macrocarpa 16	fair		1069	Bur Oak	Quercus macrocarpa 21	fair	_	1183	American Linden	Tilia americana 2	7 good	
569	Bur Oak	Quercus macrocarpa	26 fair		956 957	Bur Oak Bur Oak	Quercus macrocarpa 16 Quercus macrocarpa 32	good	2	1070	Bur Oak	Quercus macrocarpa 31	good		1184	American Linden	Tilia americana 1	J Idii	
570 571	American Linden Bur Oak	Tilia americana Quercus macrocarpa	18 fair 24 fair	4	957 958	American Linden	Tilia americana 16	good good	2	1071 1072	Shagbark Hickory Bur Oak	Carya ovata 14 Quercus macrocarpa 45	good fair	2	1185 1186	Cottonwood Crack Willow	Populus deltoides 3 Salix fragilis 2	Ü	
572	Bur Oak	Quercus macrocarpa	18 fair		959	Bur Oak	Quercus macrocarpa 12	fair		1073	American Linden	Tilia americana 13	fair		1187	Crack Willow	Salix fragilis 1		
573	Bur Oak	Quercus macrocarpa	16 fair		960 961	Bur Oak Bur Oak	Quercus macrocarpa 30 Quercus macrocarpa 19	good good		1074	Black Walnut	Juglans nigra 12	good		1188 1189	Boxelder Bur Oak	Acer negundo 1  Quercus macrocarpa 2	7 poor	3
574 575	Bur Oak Bur Oak	•	<ul><li>20 good</li><li>18 fair</li></ul>		962	Bur Oak	Quercus macrocarpa 27	good		1075 1076	Bur Oak Bur Oak	Quercus macrocarpa 34 Quercus macrocarpa 28	good good		1190	Bur Oak Bur Oak	Quercus macrocarpa 2 Quercus macrocarpa 2	0 good 2 fair	
576	Bur Oak	Quercus macrocarpa	13 poor		963	Bur Oak	Quercus macrocarpa 17	fair		1077	Bur Oak	Quercus macrocarpa 31	fair		1191	Bur Oak	Quercus macrocarpa 1	7 fair	
577 578	Bur Oak Bur Oak	•	<ul><li>20 good</li><li>23 fair</li></ul>		964 965	Bur Oak Bur Oak	Quercus macrocarpa 30 Quercus macrocarpa 20	good good		1078 1079	Bur Oak Bur Oak	Quercus macrocarpa 22 Quercus macrocarpa 21	good good		1192 1193	Bur Oak Bur Oak	Quercus macrocarpa 1 Quercus macrocarpa 1	7 fair 9 fair	
576 579	Bur Oak	Quercus macrocarpa Quercus macrocarpa	31 good		966	Bur Oak	Quercus macrocarpa 18	good		1080	Bur Oak	Quercus macrocarpa 47	good	3	1194	Bur Oak	Quercus macrocarpa 2	good	
580 581	American Linden		25 poor	3	967 968	American Linden American Linden	Tilia americana 14 Tilia americana 14	good fair	વ	1081 1082	Bur Oak	Quercus macrocarpa 21	good	2	1195 1196	American Linden Bur Oak	Tilia americana 1	9 good 8 fair	
581 582	Bur Oak Bur Oak	-	<ul><li>19 good</li><li>14 fair</li></ul>		969	American Linden American Linden	Tilia americana 14	good	J	1082 1083	Bur Oak Bur Oak	Quercus macrocarpa 27 Quercus macrocarpa 21	poor good	2	1196 1197	Bur Oak American Elm	Quercus macrocarpa 1 Ulmus americana 1	a fair poor	
583	Bur Oak	Quercus macrocarpa	27 good		970	American Linden	Tilia americana 20	good	3	1084	Bur Oak	Quercus macrocarpa 20	good		1198	Bur Oak	Quercus macrocarpa 2	4 good	
584 585	Bur Oak	'	30 good 16 fair	2	971 972	Bur Oak Bur Oak	Quercus macrocarpa 29 Quercus macrocarpa 15	fair good	2	1085 1086	Bur Oak Black Walnut	Quercus macrocarpa 14 Juglans nigra 12	fair good		1199 1200	Bur Oak Bur Oak	Quercus macrocarpa 2 Quercus macrocarpa 1	Ü	
585 586	American Linden American Linden	Tilia americana Tilia americana	<ul><li>16 fair</li><li>16 fair</li></ul>	3	973	Bur Oak	Quercus macrocarpa 17	good		1086 1087	Green Ash	Jugians nigra 12 Fraxinus pennsylvanica sub. 13	good good		1200	Bur Oak Bur Oak	Quercus macrocarpa 1  Quercus macrocarpa 1	good fair	
587	American Linden	Tilia americana	15 fair	2	974 975	Bur Oak	Quercus macrocarpa 37 Quercus macrocarpa 37	good		1088	Bur Oak	Quercus macrocarpa 22	good		1202	Bur Oak	Quercus macrocarpa 1	9	2
588 589	American Linden Green Ash	Tilia americana Fraxinus pennsylvanica sub.	<ul><li>24 fair</li><li>13 fair</li></ul>	5 2	975 976	Bur Oak Black Cherry	Quercus macrocarpa 37 Prunus serotina 12	fair fair		1089 1090	Bur Oak Bur Oak	Quercus macrocarpa 28 Quercus macrocarpa 30	fair good		1203 1204	American Linden Bur Oak	Tilia americana 1 Quercus macrocarpa 4	9000	2 2
590	American Linden	Tilia americana	14 fair	3	977	Bur Oak	Quercus macrocarpa 19	poor		1091	Bur Oak	Quercus macrocarpa 14	fair		1205	Black Cherry	Prunus serotina 1	7 fair	_ 2
591	American Linden		22 fair	5	978 979	Bur Oak Bur Oak	Quercus macrocarpa 18 Quercus macrocarpa 23	fair fair		1092	Bur Oak	Quercus macrocarpa 25	good		1206	Bur Oak	Quercus macrocarpa 3	3 fair	2
592 593	Black Walnut Bur Oak	Juglans nigra Quercus macrocarpa	12 good 26 good		979 980	Bur Oak Bur Oak	Quercus macrocarpa 23  Quercus macrocarpa 23	fair		1093 1094	Bur Oak Bur Oak	Quercus macrocarpa 25 Quercus macrocarpa 39	fair fair	2	1207 1208	Siberian Elm Black Cherry	Ulmus pumila 3 Prunus serotina 1		2
594	Bur Oak	Quercus macrocarpa	22 fair		981	Bur Oak	Quercus macrocarpa 29	good		1095	Bur Oak	Quercus macrocarpa 28	good		1209	Siberian Elm	Ulmus pumila 1	4 fair	
595 596	Bur Oak	•	20 fair 20 fair		982 983	American Linden Bur Oak	Tilia americana 12 Quercus macrocarpa 36	good good		1096 1097	Black Walnut Bur Oak	Juglans nigra 17 Quercus macrocarpa 25	fair	2	1210 1211	Black Cherry Bur Oak	Prunus serotina 1 Quercus macrocarpa 2	2 good 0 fair	
596 597	Bur Oak American Linden	•	<ul><li>20 fair</li><li>18 fair</li></ul>		984	Bur Oak	Quercus macrocarpa 16	fair		109 <i>7</i> 1098	Bur Oak Bur Oak	Quercus macrocarpa 25 Quercus macrocarpa 25	good good		1211 1212	Bur Oak Bur Oak	Quercus macrocarpa 2 Quercus macrocarpa 2	o fair 6 good	
598	American Linden	Tilia americana	17 poor		985	Bur Oak	Quercus macrocarpa 19	good		1099	Bur Oak	Quercus macrocarpa 24	good		1213	Bur Oak	Quercus macrocarpa 1	9 fair	
599 600	American Linden Bur Oak		18 fair 12 fair		986 987	Bur Oak Bur Oak	Quercus macrocarpa 18 Quercus macrocarpa 13	fair fair		1100 1101	Black Walnut Bur Oak	Juglans nigra 13 Quercus macrocarpa 21	good		1214 1215	Bur Oak Hackberry	Quercus macrocarpa 3 Celtis occidentalis 2	U	2
874	Bur Oak Bur Oak	•	33 good		988	Bur Oak	Quercus macrocarpa 20	good		1101	Bur Oak Bur Oak	Quercus macrocarpa 21  Quercus macrocarpa 19	good good		1216	Bur Oak	Quercus macrocarpa 3	•	<u> </u>
875	Bur Oak	Quercus macrocarpa	12 fair		989 990	Bur Oak	Quercus macrocarpa 28 Ostrya virginica 18	good	Л	1103	Bur Oak	Quercus macrocarpa 21	good		1217	Black Cherry	Prunus serotina 1	6 fair	
876 877	Bur Oak Bur Oak	Quercus macrocarpa Quercus macrocarpa	18 fair 25 fair		990 991	Hop Hornbeam Red Oak	Ostrya virginica 18  Quercus rubra 14	good good	4	1104 1105	American Linden Bur Oak	Tilia americana 14 Quercus macrocarpa 24	fair good		1218 1219	Bur Oak Bur Oak	Quercus macrocarpa 2 Quercus macrocarpa 3	6 poor 0 good	
878	Bur Oak	Quercus macrocarpa	26 good		992	Bur Oak	Quercus macrocarpa 23	good		1106	Bur Oak	Quercus macrocarpa 43	fair		1220	Hackberry	Celtis occidentalis 1	7 fair	
879	Bur Oak	-	20 good		993 994	Bur Oak Bur Oak	Quercus macrocarpa 20 Quercus macrocarpa 24	fair good		1107 1108	Bur Oak	Quercus macrocarpa 25	fair fair	2	1221 1222	Black Cherry Crack Willow	Prunus serotina 1 Salix fragilis 1	8 fair	
880 881	Bur Oak Bur Oak	•	15 fair 20 good		995	Bur Oak	Quercus macrocarpa 13	good		1108 1109	Bur Oak Bur Oak	Quercus macrocarpa 42 Quercus macrocarpa 35	fair poor	2	1222 1223	Crack Willow American Elm	Salix fragilis 1 Ulmus americana 2	2 poor 5 fair	3
882	American Linden	Tilia americana	35 good	6	996	Bur Oak	Quercus macrocarpa 25	good	0	1110	American Linden	Tilia americana 27	fair	3	1224	Black Cherry	Prunus serotina 1	8 fair	2
883 884	Bur Oak Bur Oak	Quercus macrocarpa Quercus macrocarpa	<ul><li>33 good</li><li>13 fair</li></ul>		997 998	Hop Hornbeam Bur Oak	Ostrya virginica 13 Quercus macrocarpa 21	good good	3	1111 1112	American Linden Black Walnut	Tilia americana 17 Juglans nigra 14	fair fair	2	1225 1226	Cottonwood Cottonwood	Populus deltoides 2 Populus deltoides 1	3	
884 885	Bur Oak Bur Oak	Quercus macrocarpa Quercus macrocarpa			999	Red Oak	Quercus rubra 23	fair		1112 1113	American Linden	Tilia americana 25	fair fair	3	1226	Cottonwood	Populus deltoides 1	. 9000	
886	Bur Oak	Quercus macrocarpa	25 fair		1000	American Linden	Tilia americana 17	fair		1114	American Linden	Tilia americana 23	fair	4	1228	Bur Oak	Quercus macrocarpa 3		

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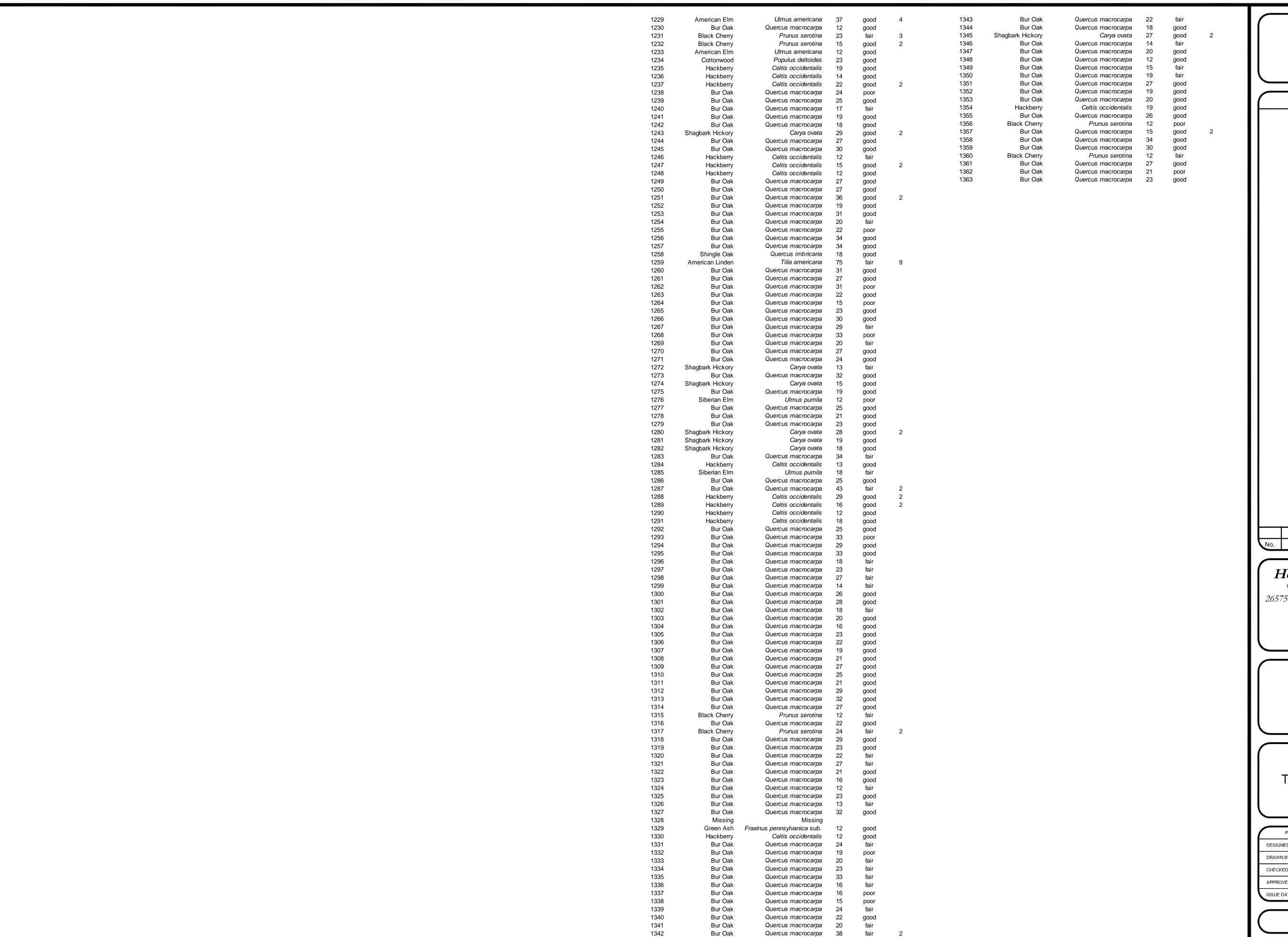
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Tree Survey Data Sheet

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ISSUE DATE	03/15/2010	

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Tree Survey Data Sheet

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