

2021 I-Tree Academy – Russell Gardens Canopy Assessment (Past, Present, and Future)

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Community, Geographic Area and/or Tree Resource Involved:

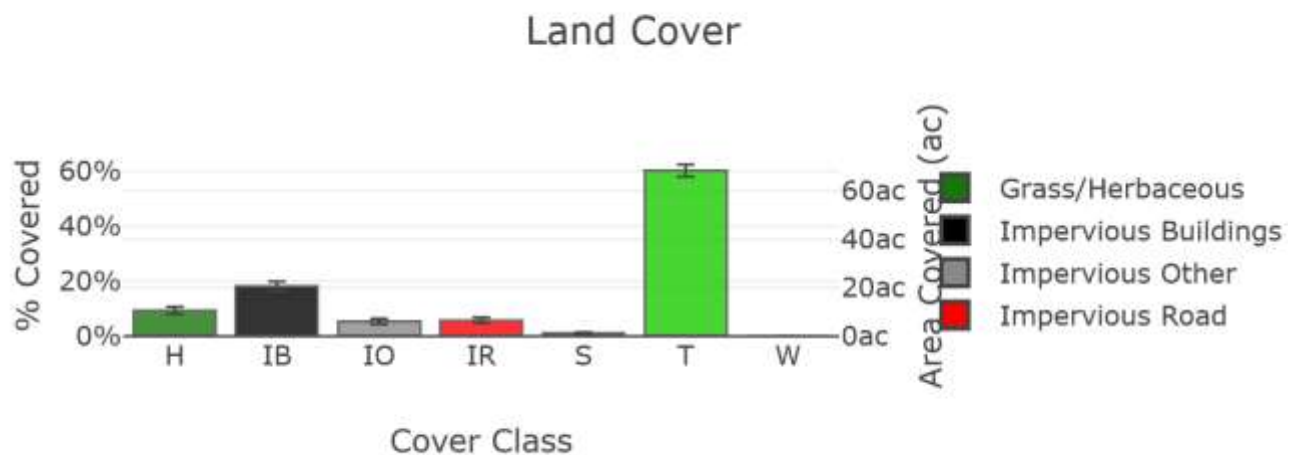
Russell Gardens NY

Brief Description of Project:

Russell Gardens is a small Village in Long Island that has recently received a street inventory from Davey Resource Group. The Village has been noticing some changes in their canopy as some of their mature trees are starting to decline. I will be looking at the Canopy from 2010 and comparing it to the Canopy of 2020 and running the inventory data through i-Tree eco so that I can look at the relative age classes and species that make up their urban forest. This should give insight as to what their urban forest will look like in the future.

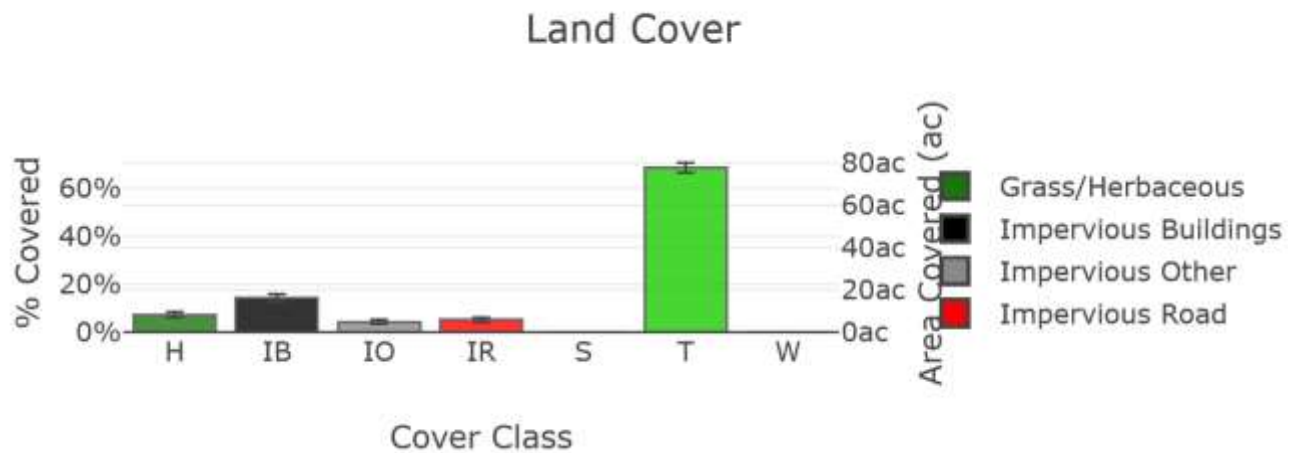
i-Tree Canopy

The i-Tree Canopy tool was first used to assess the percentage of canopy cover for Russell Gardens in 2020. A boundary was drawn to match that of a previous inventory and 500 random sample points were evaluated. Each point was categorized as either Tree/Shrub, Grass/Herbaceous, Impervious Building, Impervious Road, Impervious Other, Water, Soil/Bare Ground. The results of this survey are pictured below.



Abbr.	Cover Class	Description	Points	% Cover ± SE	Area (ac) ± SE
H	Grass/Herbaceous		47	9.40 ± 1.31	10.66 ± 1.48
IB	Impervious Buildings		91	18.20 ± 1.73	20.64 ± 1.96
IO	Impervious Other		27	5.40 ± 1.01	6.13 ± 1.15
IR	Impervious Road		29	5.80 ± 1.05	6.58 ± 1.19
S	Soil/Bare Ground		5	1.00 ± 0.45	1.13 ± 0.51
T	Tree/Shrub		301	60.20 ± 2.19	68.29 ± 2.48
W	Water		0	0.00 ± 0.00	0.00 ± 0.00
Total			500	100.00	113.43

A Change Analysis was then performed using the 500 randomly selected points from the original 2020 canopy assessment. The 500 sample points were loaded into Google Earth Pro and the June 2010 imagery was selected. Each sample point was then reassigned a category based off the 2010 imagery.



Abbr.	Cover Class	Description	Points	% Cover ± SE	Area (ac) ± SE
H	Grass/Herbaceous		37	7.40 ± 1.17	8.39 ± 1.33
IB	Impervious Buildings		72	14.40 ± 1.57	16.33 ± 1.78
IO	Impervious Other		22	4.40 ± 0.92	4.99 ± 1.04
IR	Impervious Road		26	5.20 ± 0.99	5.90 ± 1.13
S	Soil/Bare Ground		0	0.00 ± 0.00	0.00 ± 0.00
T	Tree/Shrub		343	68.60 ± 2.08	77.82 ± 2.35
W	Water		0	0.00 ± 0.00	0.00 ± 0.00
Total			500	100.00	113.43

Conclusion/ Discussion

Based on these survey efforts, Russell Gardens has seen a 8.4% loss of canopy cover in the last 10 years. This change in canopy cover was greater than the standard error of 2% which makes this change statistically significant. Sources of error include potential differences in imagery clarity and the angle at which the picture was taken. Canopy loss could be due to land development/ improvement as the community grows but its cause(s) are not within the scope of this report.

i-Tree Eco

A complete street tree inventory was completed for the survey area in 2021. The inventory data was then run through i-Tree Eco and the following report was generated. 2016 weather and pollution data was used from weather station 744860-94789. Overall condition was assessed for each tree during this inventory. The categories were Good, Fair, Poor, and Dead. The suggested crown dieback percentage values were used for these categories.

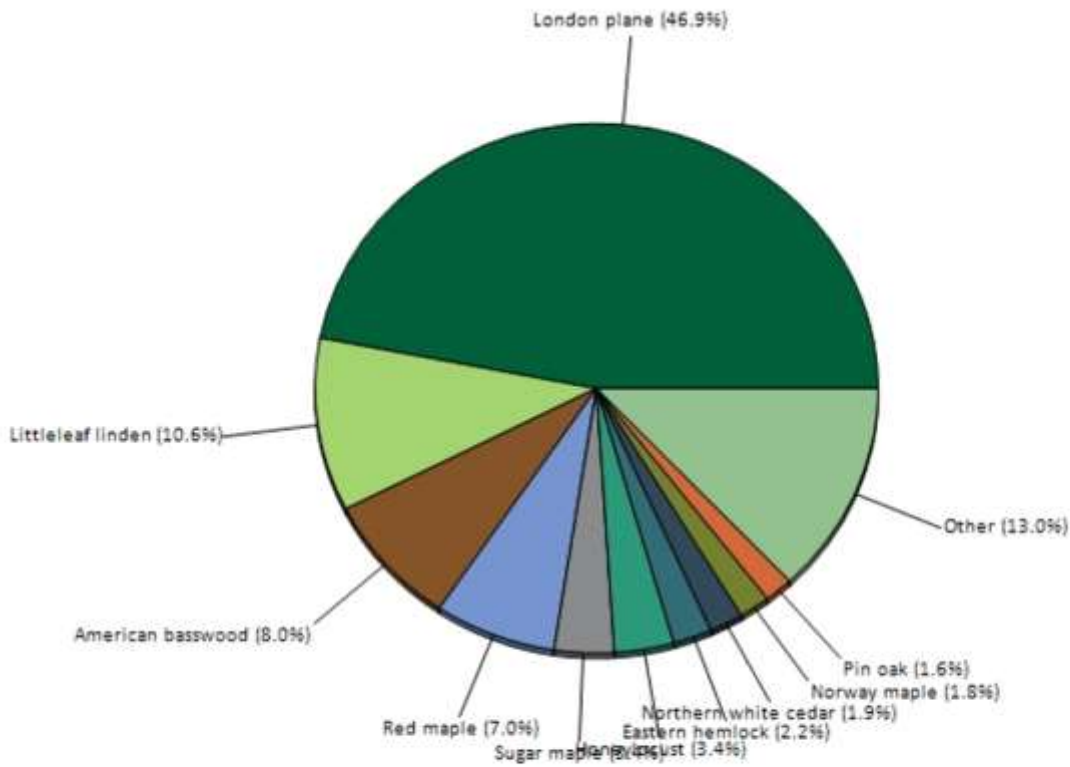


Figure 1. Tree species composition in Russell Gardens

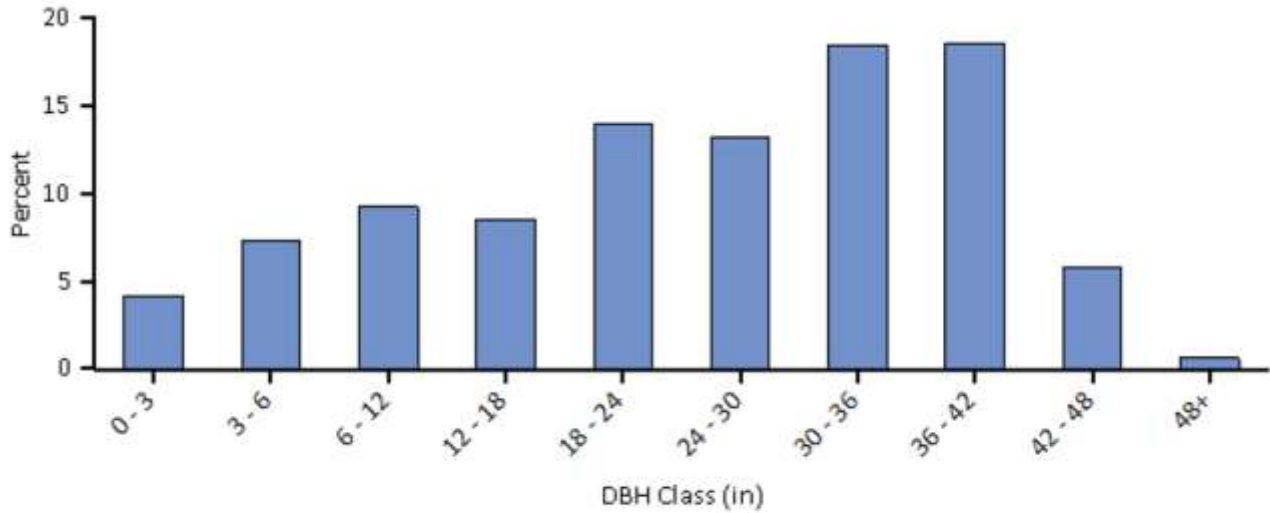


Figure 3. Percent of tree population by diameter class (DBH - stem diameter at 4.5 feet)

Table 1. Most important species in Russell Gardens

<i>Species Name</i>	<i>Percent Population</i>	<i>Percent Leaf Area</i>	<i>IV</i>
London plane	46.9	72.4	119.3
Littleleaf linden	10.6	6.4	17.0
American basswood	8.0	6.4	14.5
Red maple	7.0	6.9	13.9
Honeylocust	3.4	1.3	4.7
Sugar maple	3.4	0.4	3.8
Norway maple	1.8	1.4	3.2
Silver maple	1.0	1.6	2.7
Eastern hemlock	2.2	0.2	2.4
Pin oak	1.6	0.6	2.3

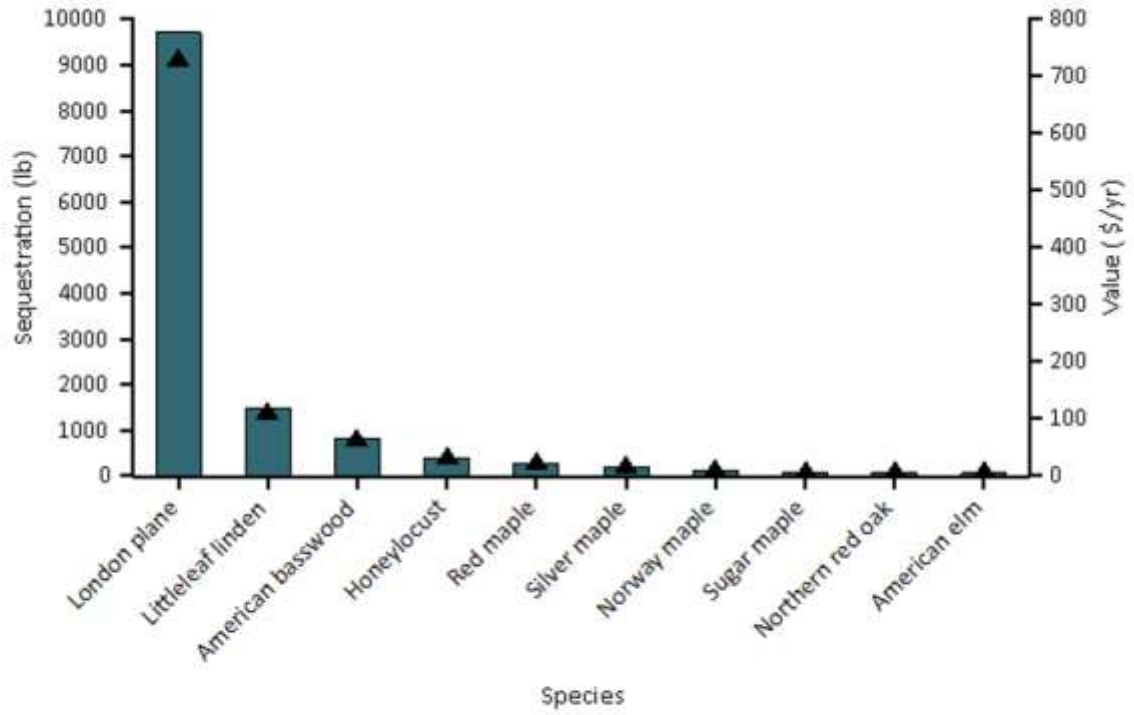


Figure 8. Estimated annual gross carbon sequestration (points) and value (bars) for urban tree species with the greatest sequestration, Russell Gardens

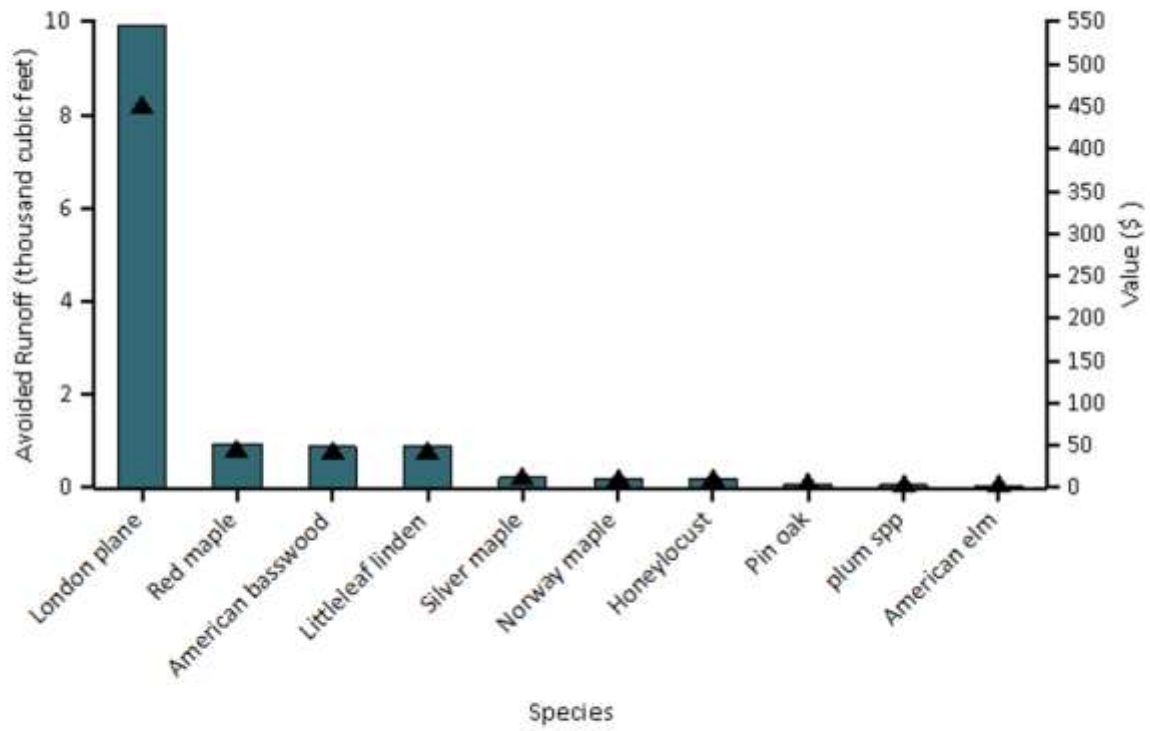
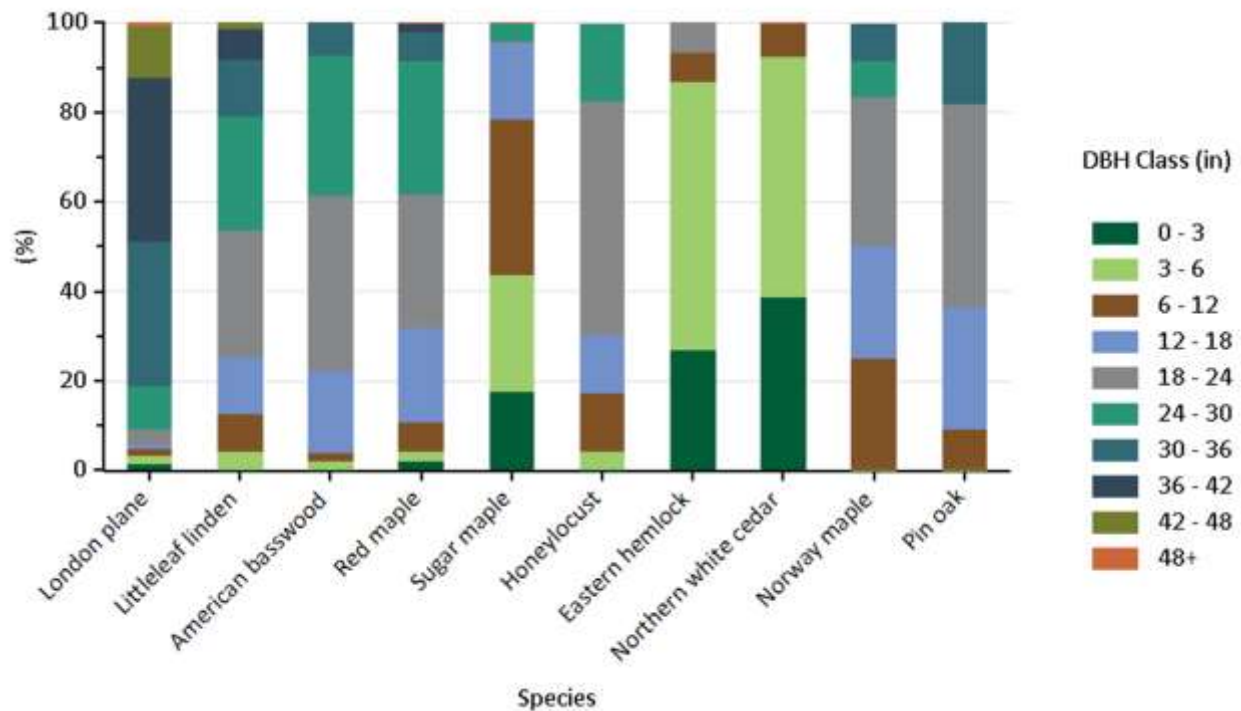
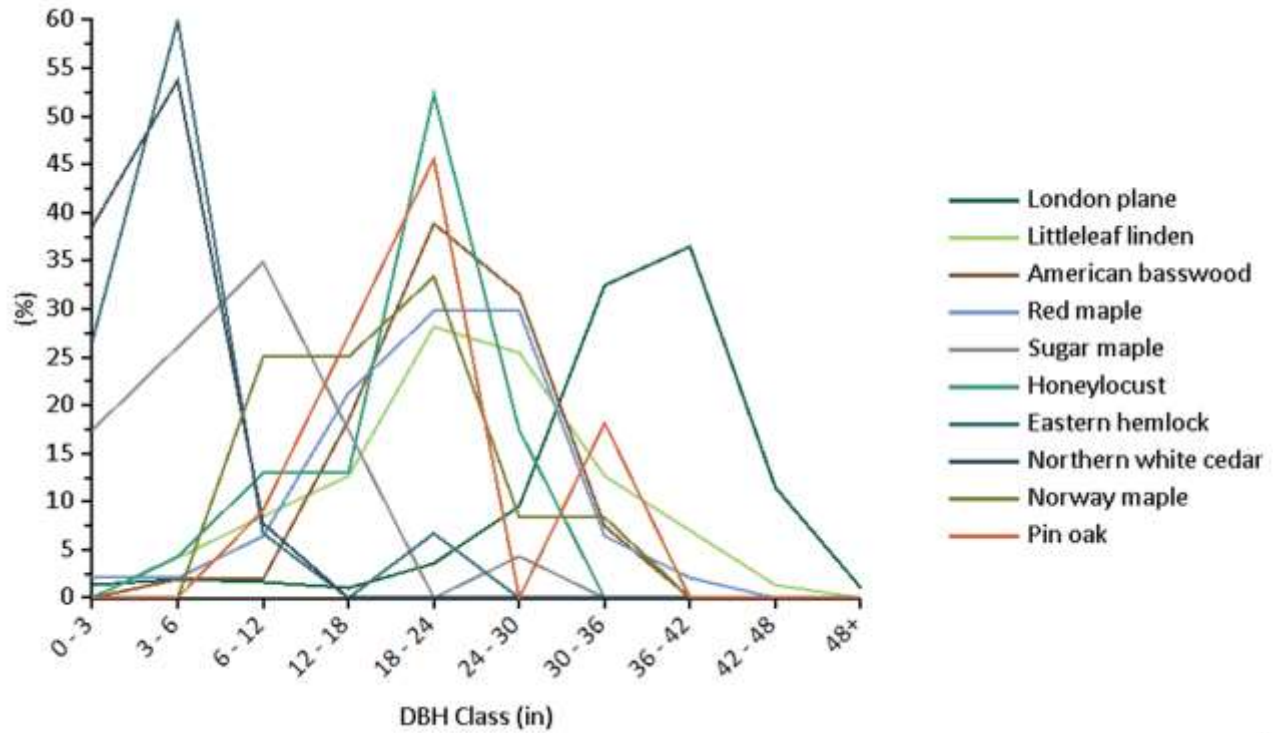


Figure 10. Avoided runoff (points) and value (bars) for species with greatest overall impact on runoff, Russell Gardens

Table 2. The top 20 oxygen production species.

Species	Oxygen (pound)	Gross Carbon Sequestration (pound/yr)	Number of Trees	Leaf Area (acre)
London plane	24,298.89	9,112.08	315	17.63
Littleleaf linden	3,684.17	1,381.57	71	1.56
American basswood	2,080.07	780.03	54	1.56
Honeylocust	1,022.96	383.61	23	0.32
Red maple	683.00	256.12	47	1.69
Silver maple	494.44	185.42	7	0.40
Norway maple	274.49	102.93	12	0.33
Sugar maple	227.91	85.46	23	0.09
Northern red oak	201.23	75.46	11	0.09
American elm	182.90	68.59	2	0.10
Sawara cypress	130.31	48.87	5	0.01
American sycamore	124.67	46.75	2	0.10
plum spp	101.55	38.08	10	0.12
Black oak	98.15	36.81	2	0.05
Pin oak	93.63	35.11	11	0.15
Eastern hemlock	74.29	27.86	15	0.04
Flowering dogwood	72.96	27.36	4	0.02
Black cherry	42.26	15.85	1	0.01
Tulip tree	41.81	15.68	7	0.01
Eastern white pine	36.23	13.59	3	0.01





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Conclusion and Discussion

The information contained within this project is for educational purposes and does not reflect the opinions nor recommendations Davey Resource Group. For this project, i-Tree Eco was used to assess the current health and benefits of the Russell Gardens' urban forest. With this data, I was able to infer what their urban forest may look like in the future if left as is. To address canopy cover, I have chosen to look at the DBH size classes and species composition.

London Plane dominates the urban forest in Russell Gardens making up 46.9% of the population. This species is also a majority of the mature/ overmature tree population (30-48+DBH) and accounts for the bulk of carbon sequestration, avoided runoff, oxygen production, etc. When this population of trees begins to decline due to old age Russell Gardens could see a large loss of canopy.

In addition, a majority of Russell Gardens' trees are currently in the mature/ overmature size classes. It is important to have a larger number of trees in the smaller DBH size classes so that young trees are available to fill future gaps in the canopy due to natural loss. For this reason, it would be beneficial for Russell Gardens to support a strong planting program.

PDF copies of the i-tree Canopy assessments and the i-tree Eco report are also available and have been submitted for Review.