Campus Tree Survey

Yale Campus, New Haven, CT

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Prepared 12/05/2012 for the

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Acknowledgments

The Campus Tree Survey project is the result of the combined expertise of Yale students, alumni, and staff. The following individuals played an integral role in the collection and organization of the data presented in this report: Benjamin Rothfuss Dair, Klaus Geiger, Shane Hetzler, Meng Li, Dexter Locke, Stacey Maples, Philip Marshall, Colleen Murphy-Dunning, Claire Nowak, and Julius Pasay.

I. Executive Summary

During the fall of 2012, the Urban Resources Initiative (URI) inventoried all managed trees on Yale University's main campus in New Haven, CT. The URI survey teams focused on completing previous work conducted by Bartlett Tree Experts in 2008. The inventory took place on campus sections located within the Upper Prospect, Science Hill, Hillhouse, Broadway/Tower Parkway, Core, and Medical Center Planning Precincts. Data collection focused on species identification, location, and diameter measured at breast height (DBH) of all trees in the survey area. Data collected by URI was combined with 2008 Bartlett survey data and organized spatially using GIS for future analysis and spatial representation.

This report first describes the site and the methodology used for data collection. We present our data and conduct preliminary analysis, discussing the campus as a whole and addressing each planning precinct in turn. The maps, graphics, and observations offered are just a sample of what can be drawn from the data collected.

The report closes with a brief discussion of recommendations, which address both the trees rising from Yale's grounds and the data now sitting on Yale's servers. Both populations—trees and data fields—require effective stewardship in order to provide the value we seek from them. If the data is to yield useful analysis and guide good management, it must be accessible and up-to-date. If the trees are to provide the desired range of values—aesthetic, ecological, educational, and more—they must be managed accordingly. The two efforts are intimately entwined, and incorporate a host of actors and stakeholders who are involved in data collection and management. Clear articulation of landscape-related objectives can shape more specific inquiry and yield focused analysis for informed decision-making. Similarly, clearly established relationships and responsibilities among the actors and stakeholders—campus managers, data managers, researchers, students—can help the campus forest reach its fullest potential.

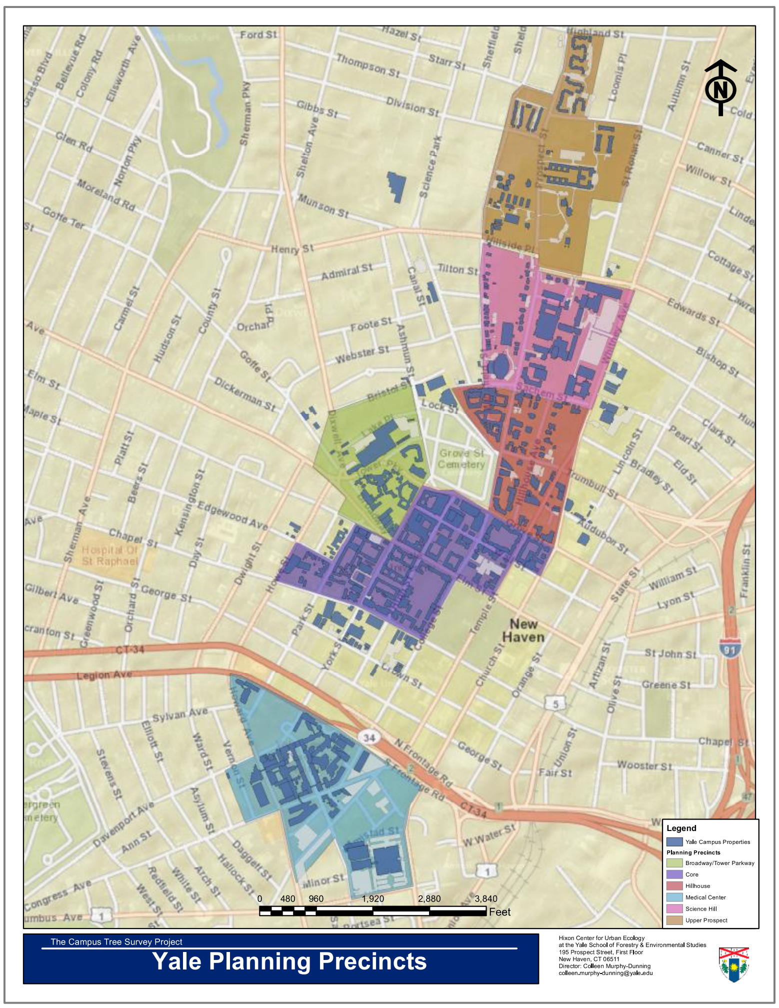
As a living landscape, the campus is ever changing; trees grow, fall, and die; new construction transforms old gardens; and planting projects bring new life to the scene. A tree survey is, therefore, always imperfect and incomplete. Nonetheless, this survey offers a foundational snapshot of Yale's campus, from which managers can make more detailed analysis, anticipate the future of the campus forest, and craft management decisions designed to meet a variety of objectives—aesthetic, ecological, educational, and other.

II. Site

The Campus Tree Survey covers much of Yale's urban campus, including the residential, academic, and research-oriented properties in downtown New Haven, in neighborhoods extending north towards Hamden, and across the Medical Center south of route 34. Previous planning documents have divided the campus into "Planning Precincts;" this report uses those precinct boundaries to organize data collection and analysis. The survey covers six planning precincts (map 1):

- Core
- Broadway/Tower Parkway
- Hillhouse
- Science Hill
- Upper Prospect
- Medical Center

(This survey does not include West Campus, the Athletic Fields, or other buildings that are owned but not operated by the University.)



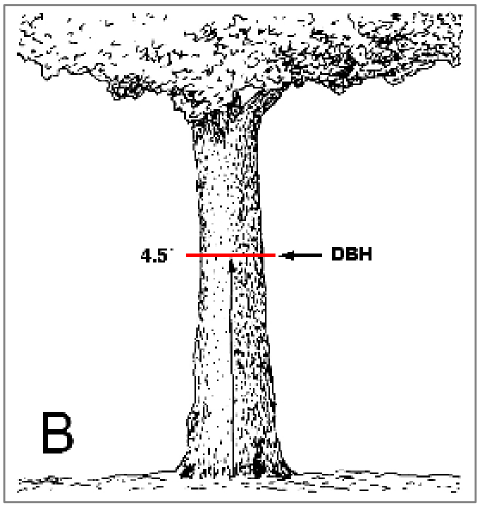
Map 1: Yale Planning Precincts

III. Methodology

The Campus Tree Survey (CTS) is a census; data collection thus aims to identify, measure, and locate all trees in areas under active management across the site. Data collection was a combined effort, with a portion of the campus visited by Bartlett Tree Experts in 2008 (parts of the Core, Hillhouse, and Science Hill Planning Precincts), and remaining areas visited by Urban Resources Initiative (URI) in the fall of 2012. The two teams employed slightly different methodologies and tools; the following are definitions and methods used by URI:

Definitions:

- Diameter at breast height (dbh): diameter of the tree at 4.5 ft above the ground.



- Trees: all woody plant species with a diameter at breast height (dbh) of four inches or more.

Data collected for each individual tree:

- Identification: All individual trees were identified as specifically as possible—either to the genus or the species level.[1]
- Measurement: Diameter at breast height (dbh) was measured using a diameter measuring tape. Stems <4" were excluded.
- Mapping: All individual trees were mapped using Trimble GPS technology and calibrated pacing where GPS satellites were not accurate beyond 3 meters. Data was recorded on digital field tablets using ESRI's ArcPad software.

The utilization of ArcPad software and the portable tablet PC technology provided a powerful interface for data collection. ArcPad is a GIS software platform designed for mobile deployment. The integration of ArcPad in the field allowed CTS team members to transform and organize tree data remotely into robust spatially codified information. This process removes traditional data transcription processes (e.g. field notes – spreadsheet – GIS) and provides a real-time source that project managers have access to via online spatial databases that are managed by the Yale Map Department.

Special cases: $d_1^2 + d_2^2 + \ldots + d_n^2$

- Multi-stem: trees with multiple stems > 4" at breast height were assigned a single diameter value, which is calculated as the square root of the sum of the squares of all individual stem diameters:

  For a tree with n stems,
  $$\text{dbh} = \sqrt{(d_1^2 + d_2^2 + \cdots + d_n^2)}$$

- Hazards: trees with hazardous elements were noted.
- Stumps: stumps were recorded.

[1] Genus (plural: genera) and species are taxonomic rank used to classify organisms; where members of the data collection team were unable to identify the species, they recorded the individual by its more general name, the genus.

Urban Resources Initiative also maintains a citywide inventory of all street trees, or those trees planted in the public right of way between sidewalks and curbs (aka the "curb strip"). This inventory is updated on an ad hoc basis, often in conjunction with other tree planting and surveying work. As of this writing, street tree data are not sufficiently up-to-date to allow for accurate analysis.

IV. Results & Analysis

Yale's campus hosts an impressive diversity of tree species and ages: over 128 species from at least 63 different genera and individual trees reaching up to 76 inches in diameter **(**Appendix B). Amid this diversity, a few dominant genera emerge, both in sheer number and in basal area.[2] The most common genera make up 2/3 of the total population (fig. 1), and the ten dominant genera by mass account for 78% of the overall basal area (fig. 2).

Genus	Count	% of Total
Quercus (Oaks)	448	16.9%
Acer (Maples)	334	12.6%
Ulmus (Elms)	193	7.3%
Cornus (Dogwoods)	142	5.4%
Pinus (Pines)	135	5.1%
Tsuga (Hemlocks)	119	4.5%
Gleditsia (Locusts)	110	4.1%
Platanus (Planetrees)	99	3.7%
Prunus (Cherry)	96	3.6%
Robinia (Locusts)	92	3.5%
Top 10 Total	**1768**	**66.6%**

Figure 1: Tree Counts of Top Ten Genera

[2] Basal area is the area of a cross-section of the tree at breast height. It is directly related to dbh and is used as a proxy for tree volume. When combined with height measurements for each individual tree, basal area can generate more accurate calculations of volume/biomass.

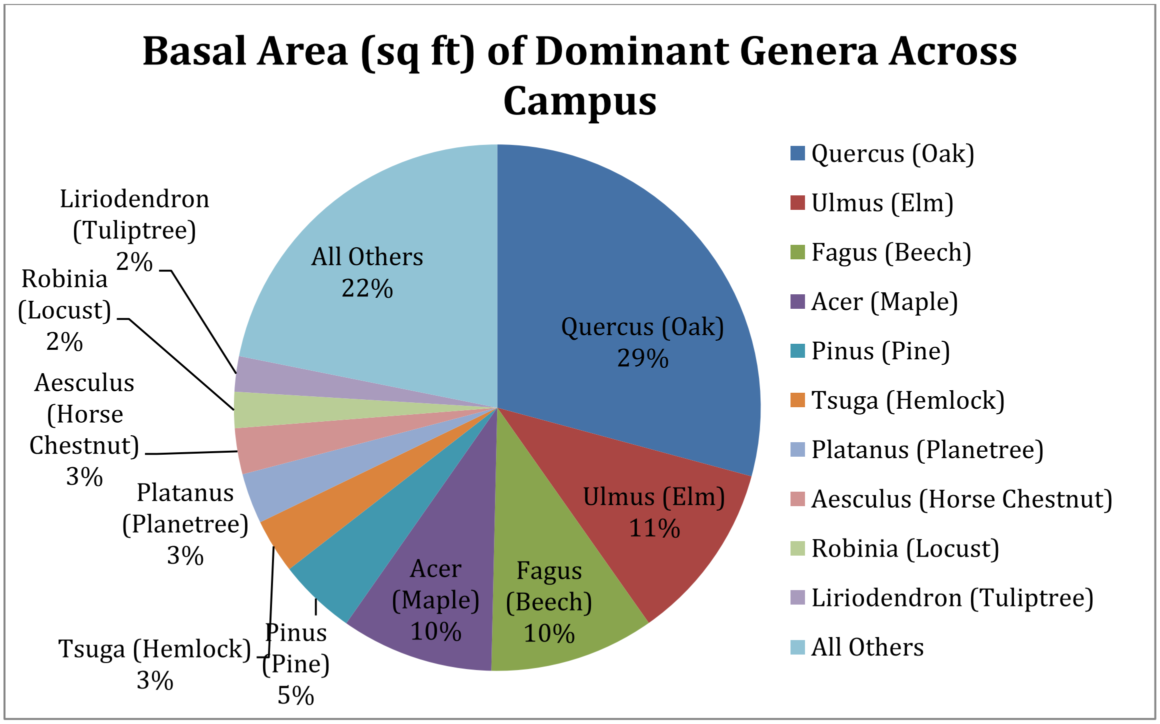


Figure 2: Basal Area of Dominant Genera

Yale’s campus, like any forest that has developed over time, hosts trees of varying sizes. Size variation reflects biodiversity, variation in site conditions, and tree age. Certain species, such as dogwoods, remain smaller; while others, such as oaks and elms, have the potential to reach impressive stature. As most campus trees are open-grown and not competing directly with other trees, size can be used as a proxy for relative age within a species. Assuming similar site conditions, larger oaks are older oaks; larger dogwoods are older dogwoods. Yale’s campus is home to a great number of smaller diameter trees; larger trees are fewer and further between (fig. 3). The largest trees are older individuals of species that have the potential to reach massive size. Smaller trees are either younger trees that have the potential to grow or older trees of species with lower height ranges. Size distribution graphics provide a snapshot of what the campus looks like today and what it might look like as individual trees age and senesce.

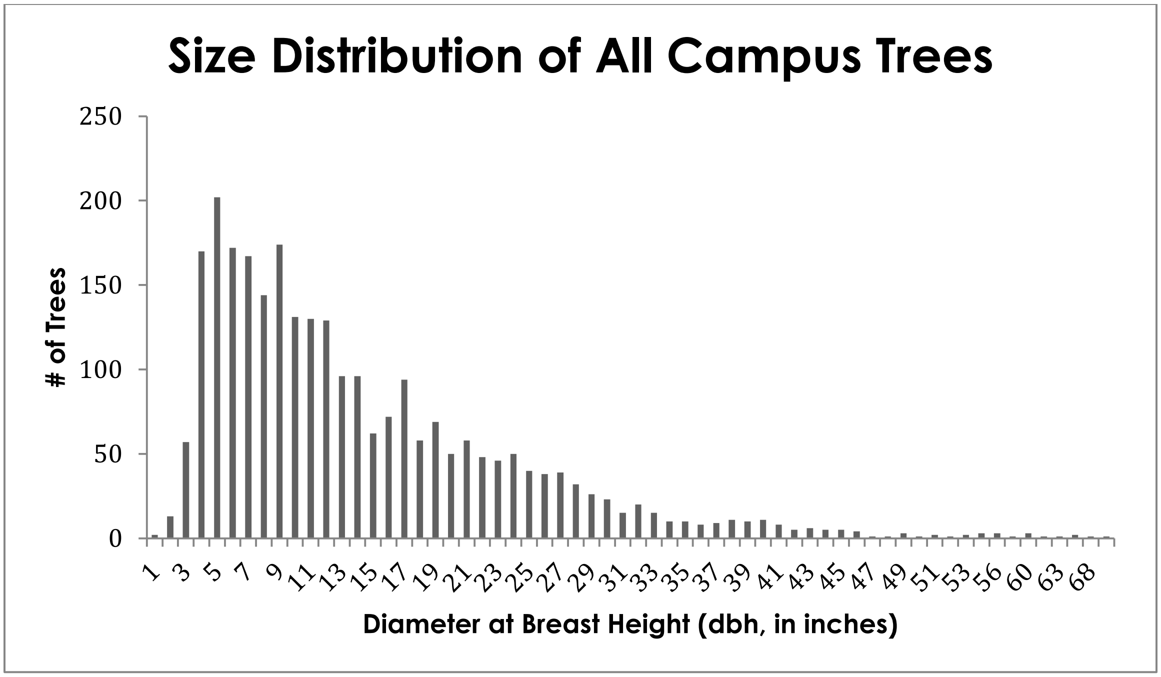


Figure 3: Size distribution of all campus trees

A closer look at each of the planning precincts allows for a deeper understanding of the spatial distribution of the campus forest and offers points of comparisons across different regions (fig. 4). Each precinct has a unique character, determined by location, size, usage, population, density of structures, past management and development, and a host of other social and ecological factors. We look briefly at notable features of each precinct in turn, beginning at the campus core and moving out into more peripheral areas of campus.

Precinct	Area (acres)	# Trees	Trees per acre	Basal Area (sq ft)	BA/acre	# genera	# species
Upper Prospect	79	786	9.9	1726	21.8	52	85
Hillhouse	47	585	12.4	850	18.1	42	61
Core	73	498	6.8	835	11.4	33	55
Science Hill	65	322	5.0	548	8.4	29	51
Broadway/Tower	44	265	6.0	131	3.0	24	35
Medical Center	87	162	1.9	203	2.3	34	49

Figure 4: Precinct Summary Table

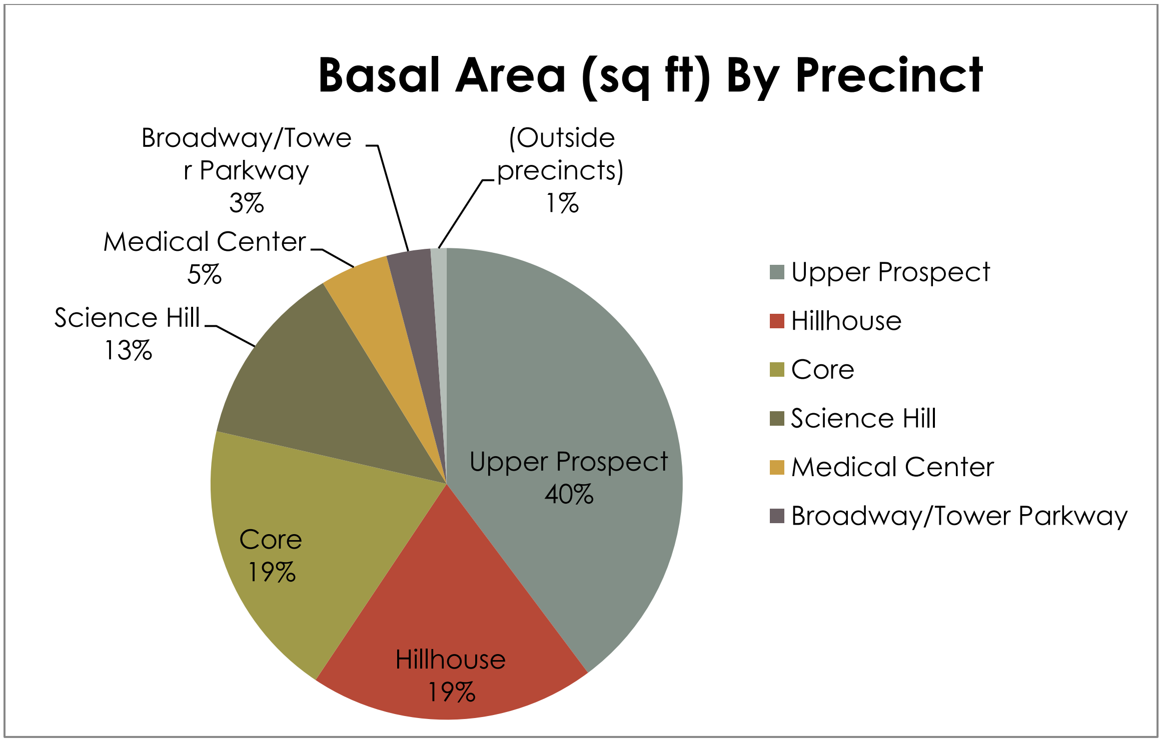


Figure 5: Basal Area by Precinct

Core Planning Precinct

The Core Planning Precinct, located in the center of downtown New Haven, is dominated by a variety of stately shade trees and smaller ornamental species. Note that elms are common across all size classes; while oaks are well represented among larger trees but nearly absent among smaller individuals. This indicates that elms will likely continue to compose a significant part of the core campus, while oaks may fade from dominance as older individuals die off. The predominance of maples between 5” and 14” indicates that this genus may have been prioritized in recent planting programs and may rise in dominance in the future. Other important trees, such as cherries and dogwoods, are generally planted for ornamental value and remain relatively small throughout their lifespans.

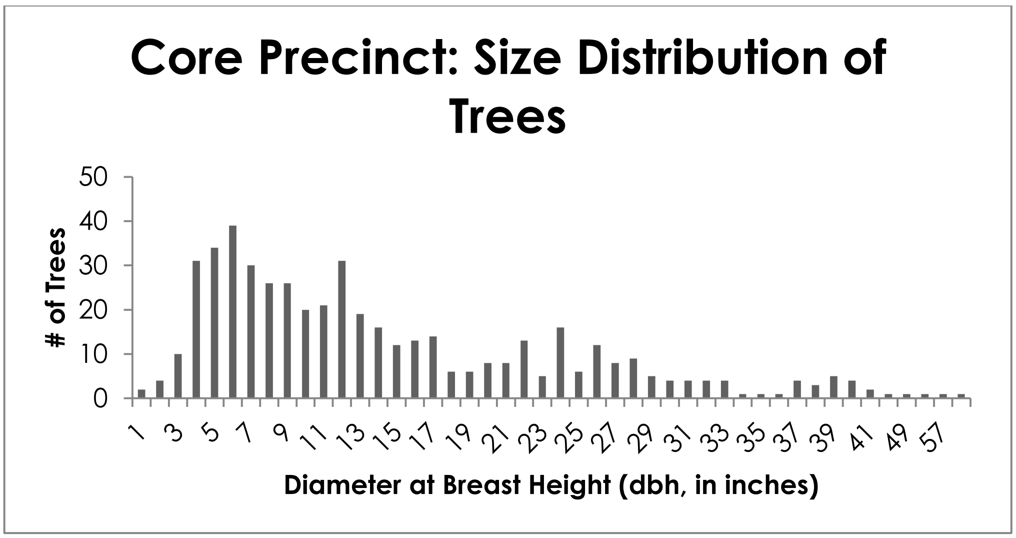


Figure 6: Core precinct: size distribution of all stems

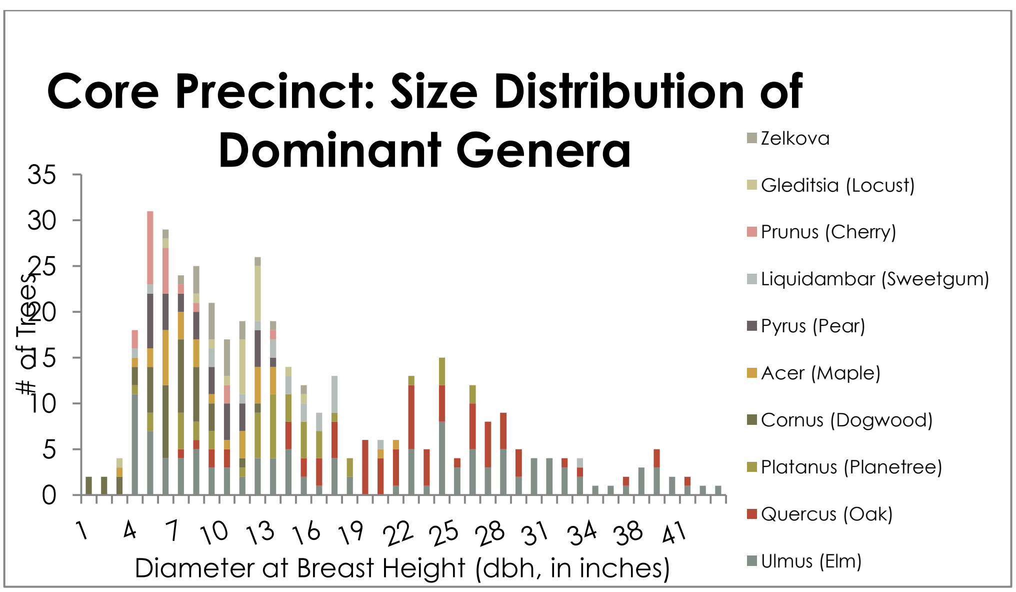


Figure 7: Core precinct: size distribution of dominant genera

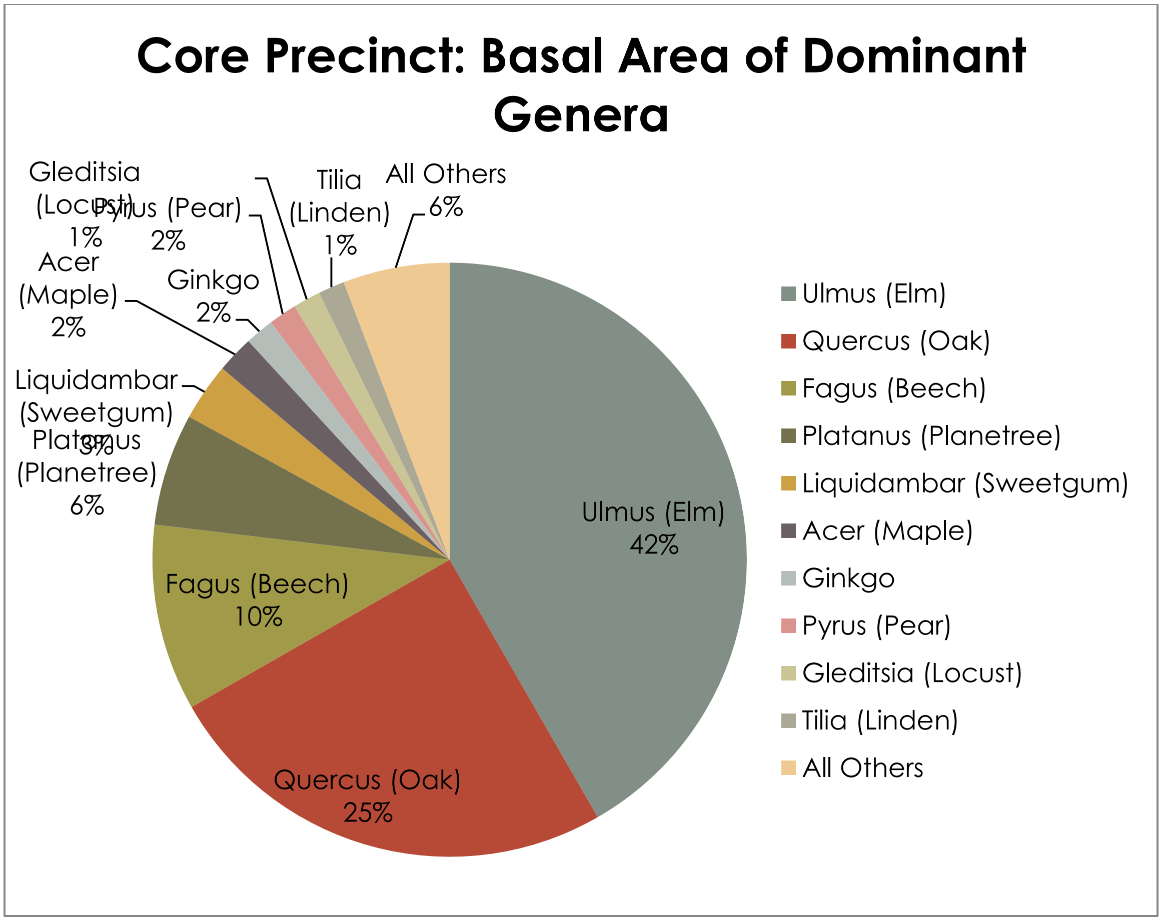
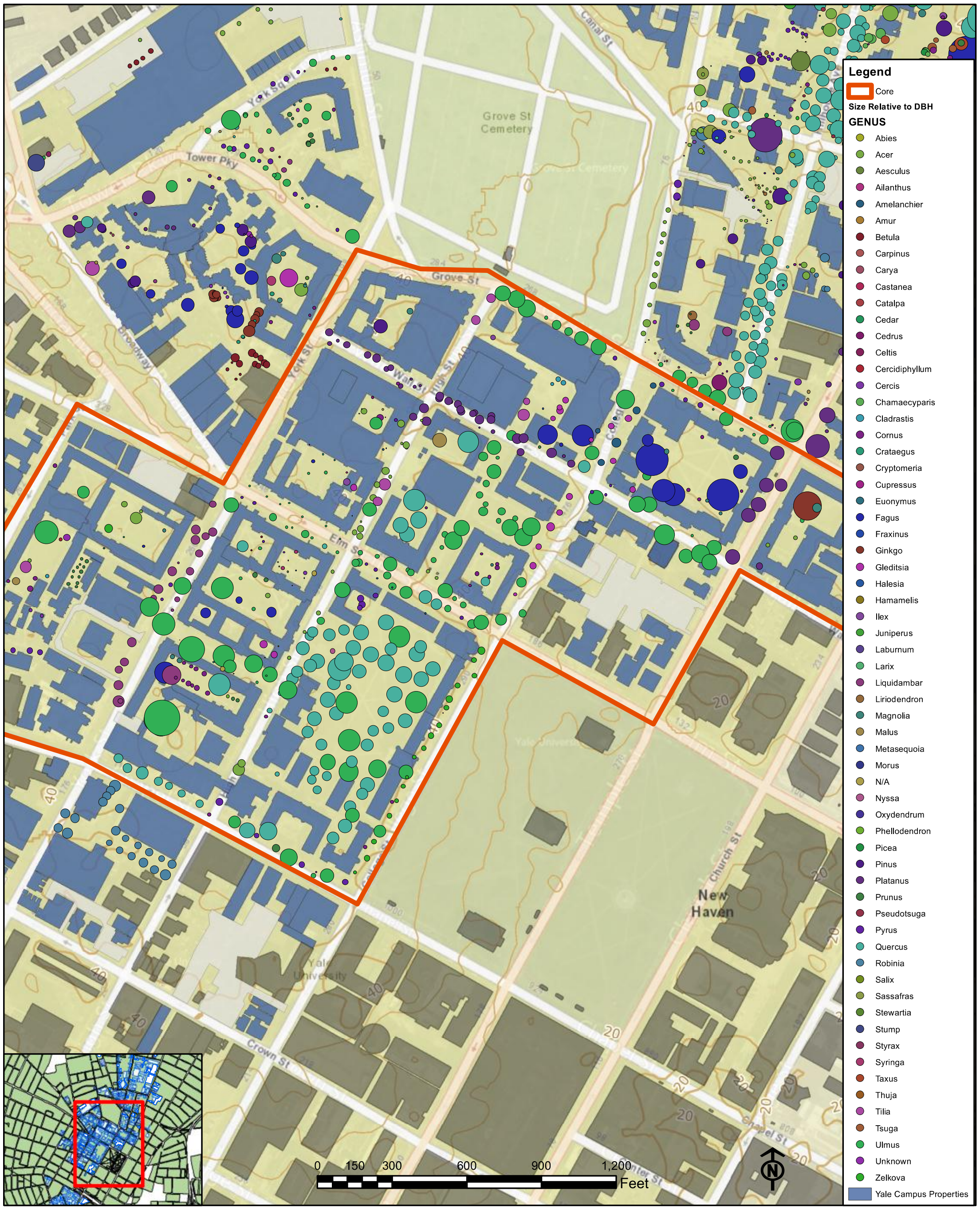


Figure 8: Core Precinct: Basal Area of Dominant Genera

Elms also represent a significant part of the area's basal area (fig **7)**. Diversity and species distribution/dominance are important considerations when planning for resilience. Though most elms are now resistant hybrids, a disease/pest occurrence on par with the Dutch Elm Disease could jeopardize a substantial portion of the core's tree population.



The Campus Tree Survey Project

Core Precinct - Trees by Genus

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Broadway/Tower Planning Precinct

The trees of the Broadway/Tower Precinct are mostly planted within college courtyards and lawns. This section of the campus forest is mainly composed of small to medium sized trees (4”-14” diameter), with very few large trees over 24” present (fig. 9). Elms, beeches, and—to a lesser extent—ginkgos, planetrees, pines, and birches, dominate the area in terms of basal area. Though elms are numerous, they have not reached massive proportions; beeches and planetrees are much grander here (fig. 10, 11).

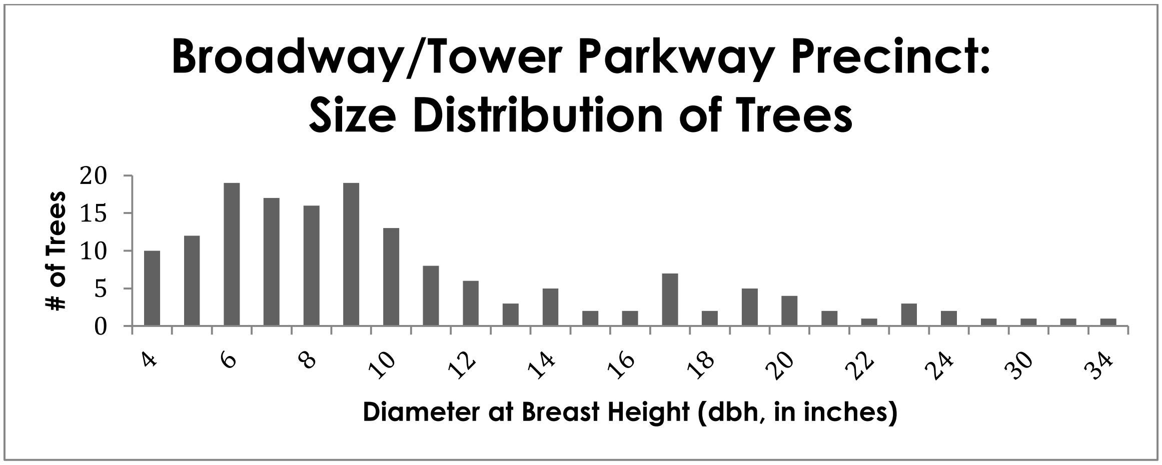


Figure 9: Broadway/Tower Parkway Precinct: Size Distribution of Trees

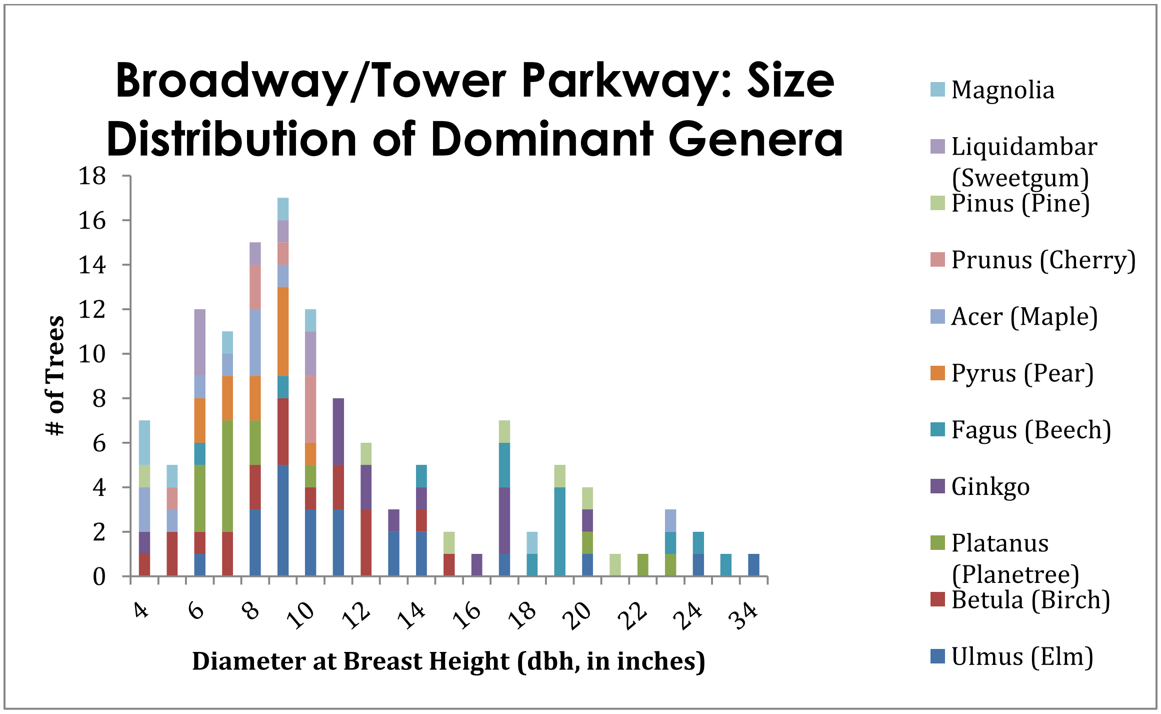


Figure 10: Broadway/Tower Parkway: Size Distribution of Dominant Genera

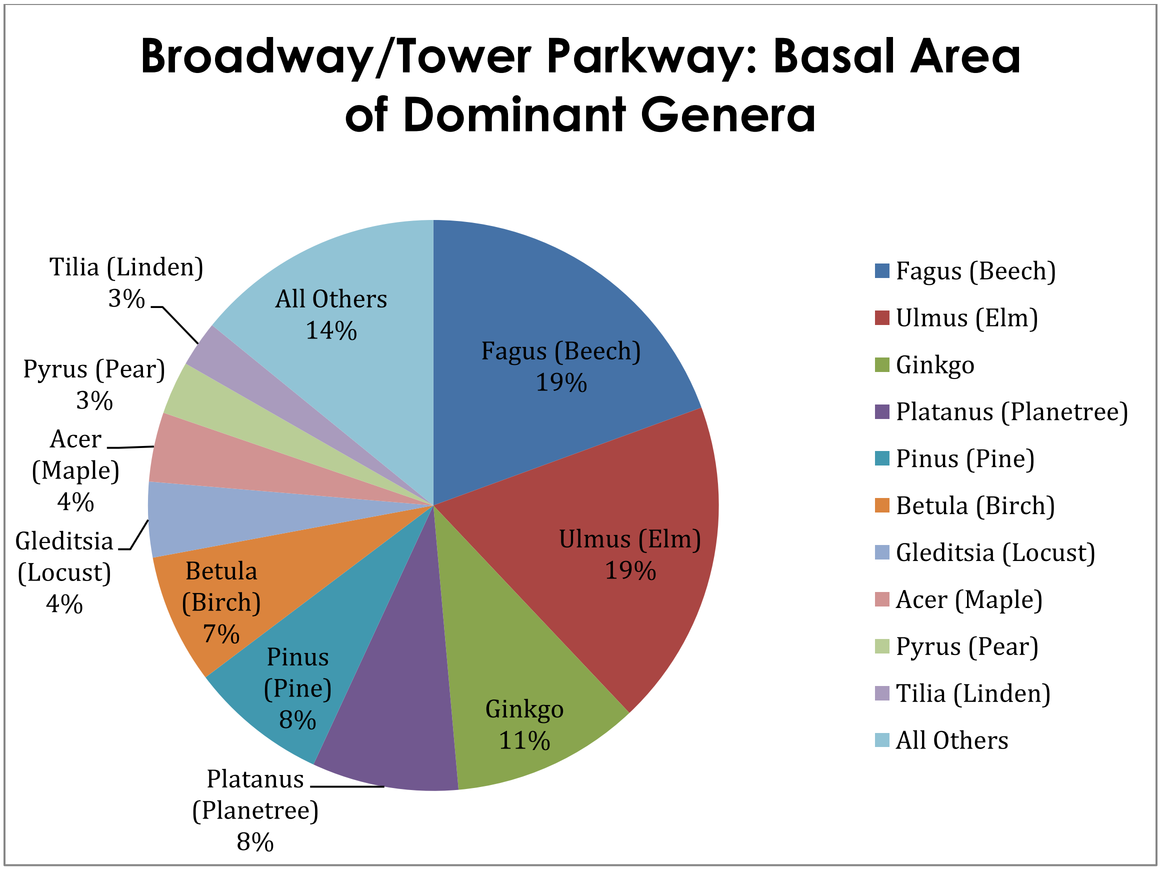
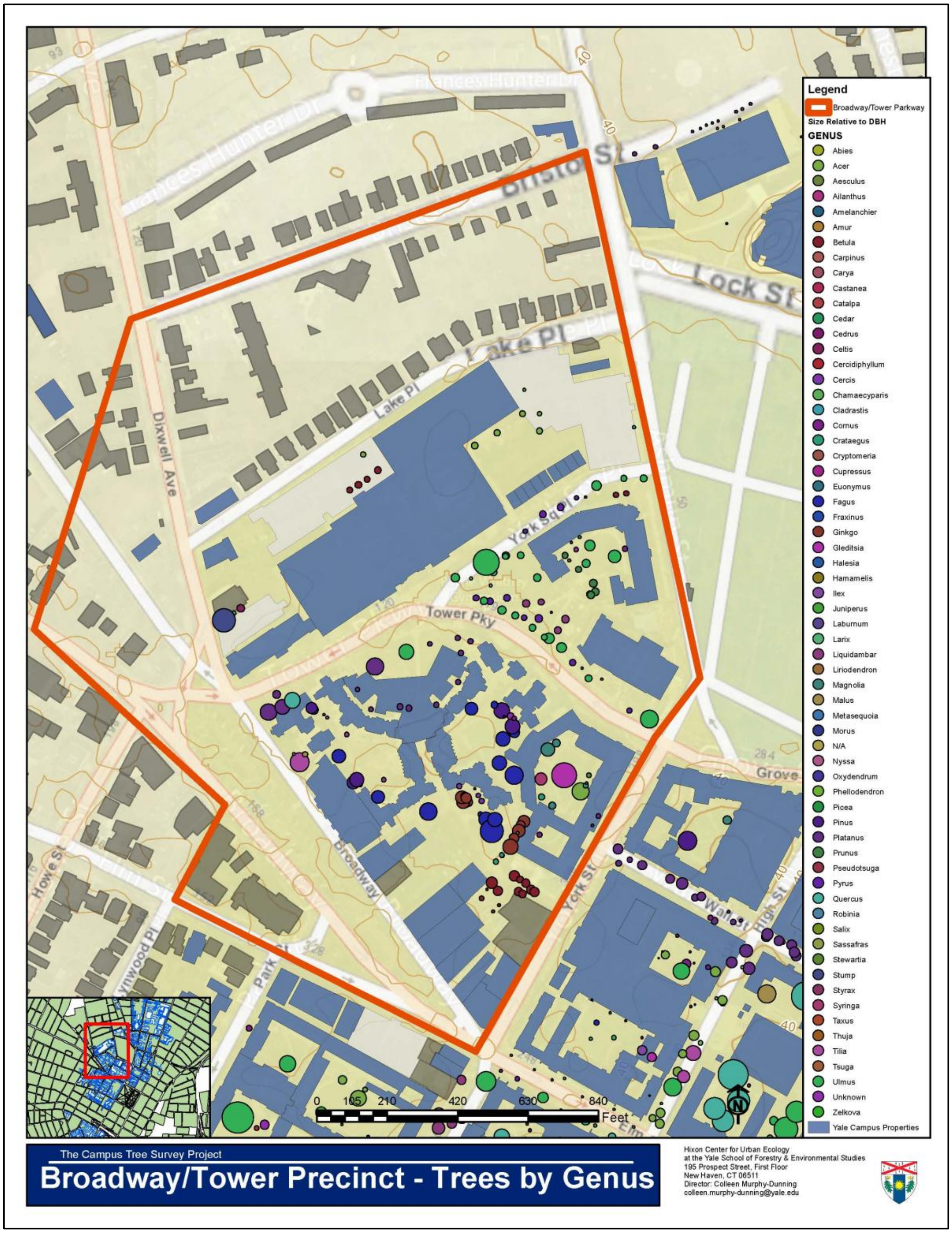


Figure 11: Broadway/Tower Parkway: Basal Area of Dominant Genera

Planetrees, elms, pears, birches, ginkgos, sweetgums, and maples are prevalent among smaller diameter-classes and represent the future of this precinct's forest. In contrast to other parts of campus, oaks are notably few and far between. Broadway/Tower is the smallest (44 acres) and least biologically diverse (35 species represented from 24 genera) planning precinct considered in this report.



Legend
Broadway/Tower Parkway
Size Relative to DBH
GENUS
Abies
Acer
Aesculus
Ailanthus
Amelanchier
Amur
Betula
Carpinus
Carya
Castanea
Catalpa
Cedar
Cedrus
Celtis
Cercidiphyllum
Cercis
Chamaecyparis
Cladrastis
Cornus
Crataegus
Cryptomeria
Cupressus
Euonymus
Fagus
Fraxinus
Ginkgo
Gleditsia
Halesia
Hamamelis
Ilex
Juniperus
Laburnum
Larix
Liquidambar
Liriodendron
Magnolia
Malus
Metasequoia
Morus
N/A
Nyssa
Oxydendrum
Phellodendron
Picea
Pinus
Platanus
Prunus
Pseudotsuga
Pyrus
Quercus
Robinia
Salix
Sassafras
Stewartia
Stump
Styrax
Syringa
Taxus
Thuja
Tilia
Tsuga
Ulmus
Unknown
Zelkova
Yale Campus Properties
Bristol St
Lock St
Lake Pl
Lake Pl
Dixwell Ave
York Sq Pl
Tower Pky
Broadway
York St
Grove
Wall St
High St
Howe St
Elm St
Park
Lynwood Pl
0 105 210 420 630 840
Feet
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Hillhouse Planning Precinct

The Hillhouse Precinct, situated between the Science Hill and Core Precincts, represents a transition area of campus moving from an urban-influenced management area to larger open spaces and gardens, such as those found in the Upper Prospect Precinct. Though it is one of the smaller precincts (47 acres), Hillhouse boasts impressive basal area (second in rank, to Upper Prospect) and the highest tree density (12.4 trees/acre). For its size, it also hosts an impressive diversity at the genus and species level, perhaps a result of elaborate plantings in the estate-like gardens of Hillhouse Avenue. The stately oaks located along the avenue are a prominent feature of the precinct's canopy. Oaks are dominant in terms of basal area and stem count; and they are present across size range (fig. 13). Maples, also a core component of the precinct's overall basal area, are generally smaller trees, often found away from the street within campus yards (fig. 14).

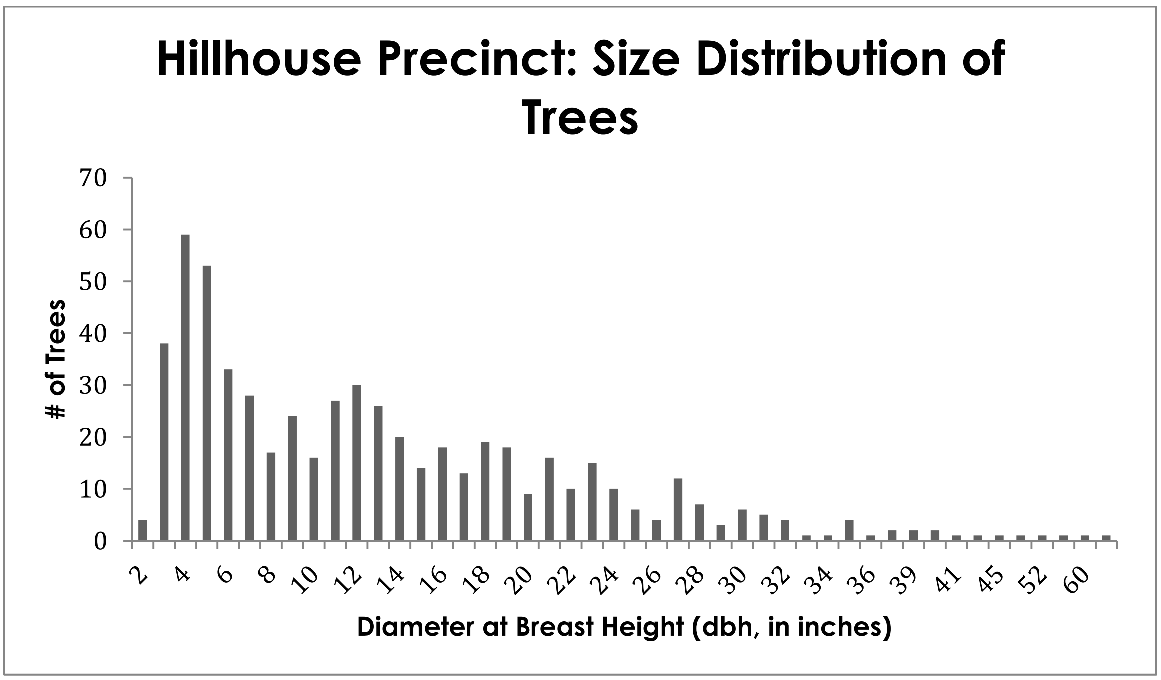


Figure 12: Hillhouse Precinct: Size Distribution of Trees

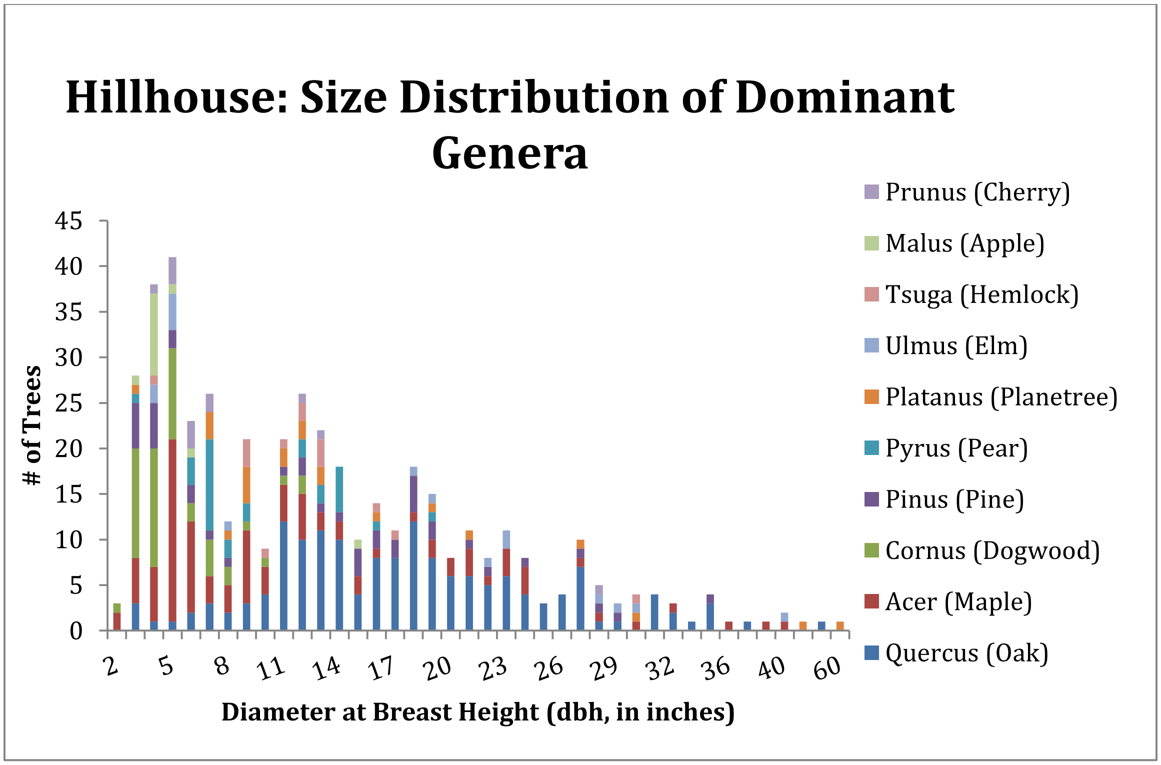


Figure 13: Hillhouse Precinct: Size Distribution of Dominant Genera

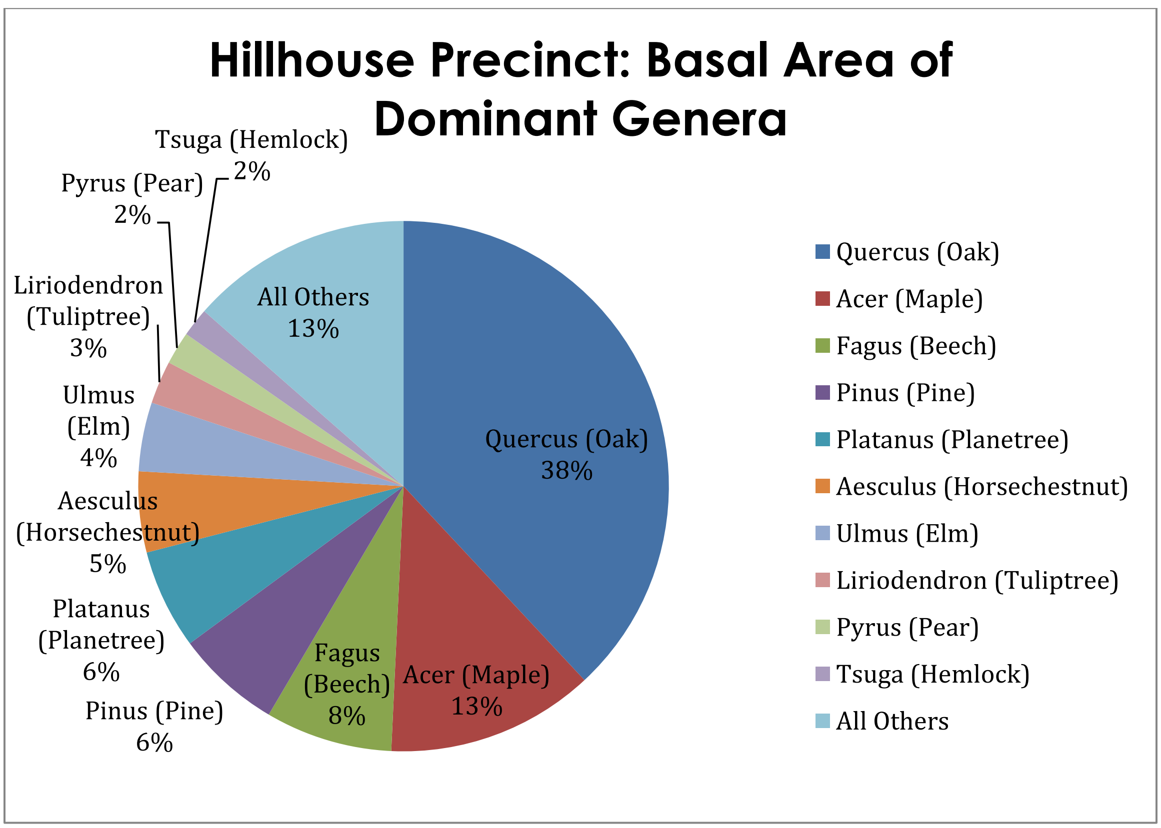
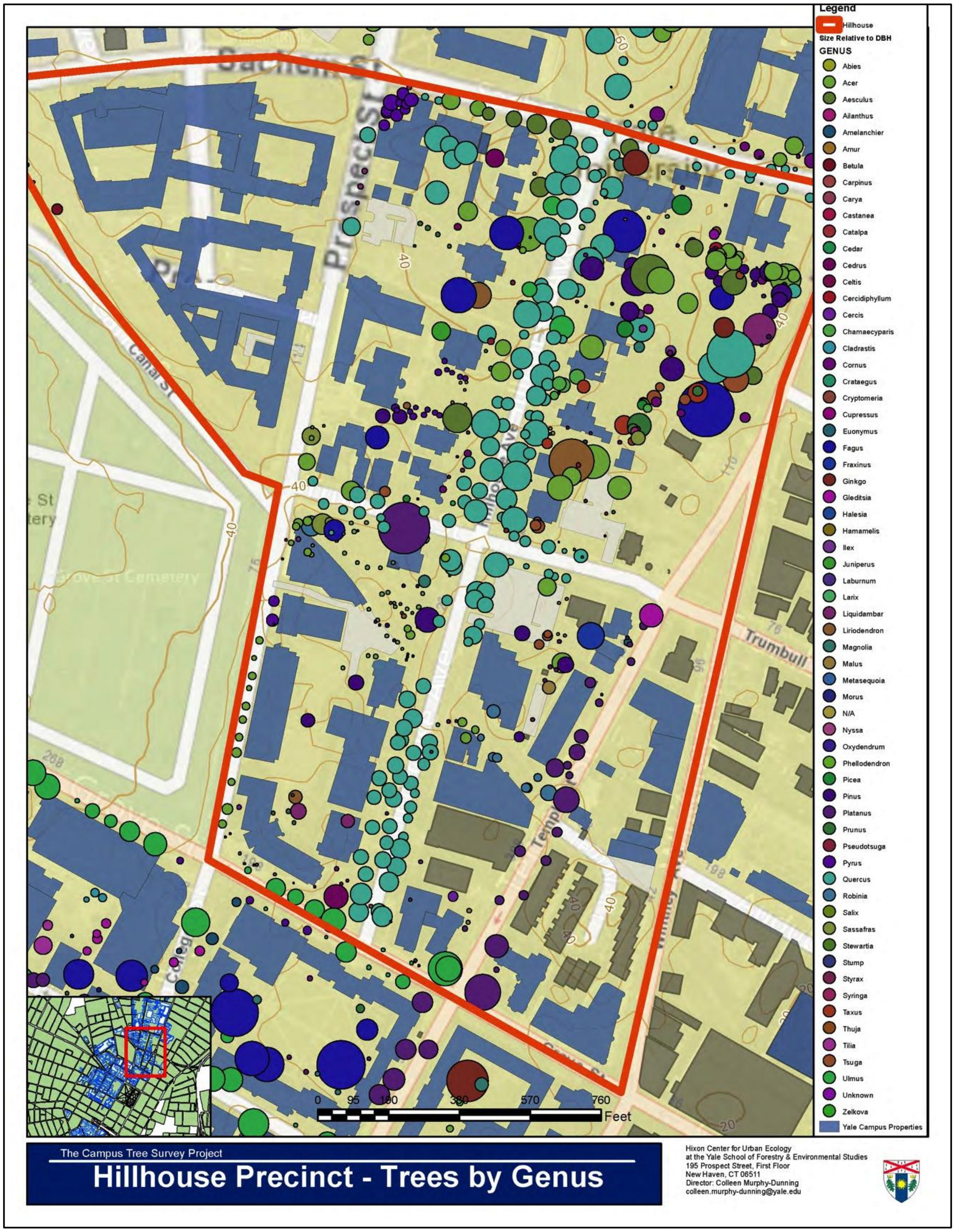


Figure 14: Hillhouse Precinct: Basal Area of Dominant Genera


Legend
Hillhouse
Size Relative to DBH
GENUS
Abies
Acer
Aesculus
Ailanthus
Amelanchier
Amur
Betula
Carpinus
Carya
Castanea
Catalpa
Cedar
Cedrus
Celtis
Cercidiphyllum
Cercis
Chamaecyparis
Cladrastis
Cornus
Crataegus
Cryptomeria
Cupressus
Euonymus
Fagus
Fraxinus
Ginkgo
Gleditsia
Halesia
Hamamelis
Ilex
Juniperus
Laburnum
Larix
Liquidambar
Liriodendron
Magnolia
Malus
Metasequoia
Morus
N/A
Nyssa
Oxydendrum
Phellodendron
Picea
Pinus
Platanus
Prunus
Pseudotsuga
Pyrus
Quercus
Robinia
Salix
Sassafras
Stewartia
Stump
Styrax
Syringa
Taxus
Thuja
Tilia
Tsuga
Ulmus
Unknown
Zelkova
Yale Campus Properties
Prospect St
Canal St
Trumbull
0 95 190 380 570 760
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Science Hill Planning Precinct

Science Hill is overwhelmingly dominated by oaks, which account for nearly two-thirds of the precinct's total basal area (fig. 17). Oaks are common throughout the range of sizes, from the youngest and most recently planted to the legacy trees of 24" to over 50" in diameter (fig. 16). Common among smaller trees are black locusts, fast growing shade trees that may rise in dominance in the future. Though located outside of the urban core, Science Hill is less densely planted than the Core and Hillhouse precincts, perhaps indicating an opportunity for future additions to the campus forest.

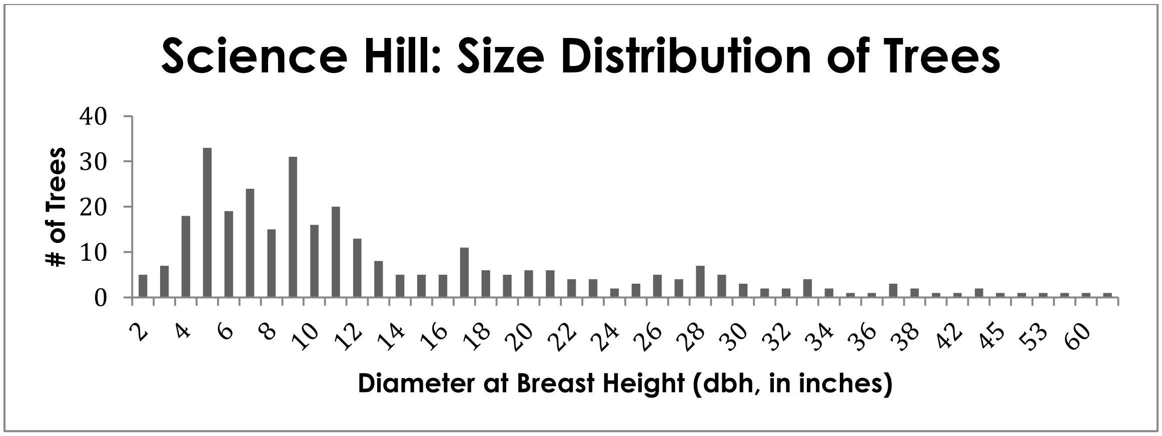


Figure 15: Science Hill Precinct: Size Distribution of Trees

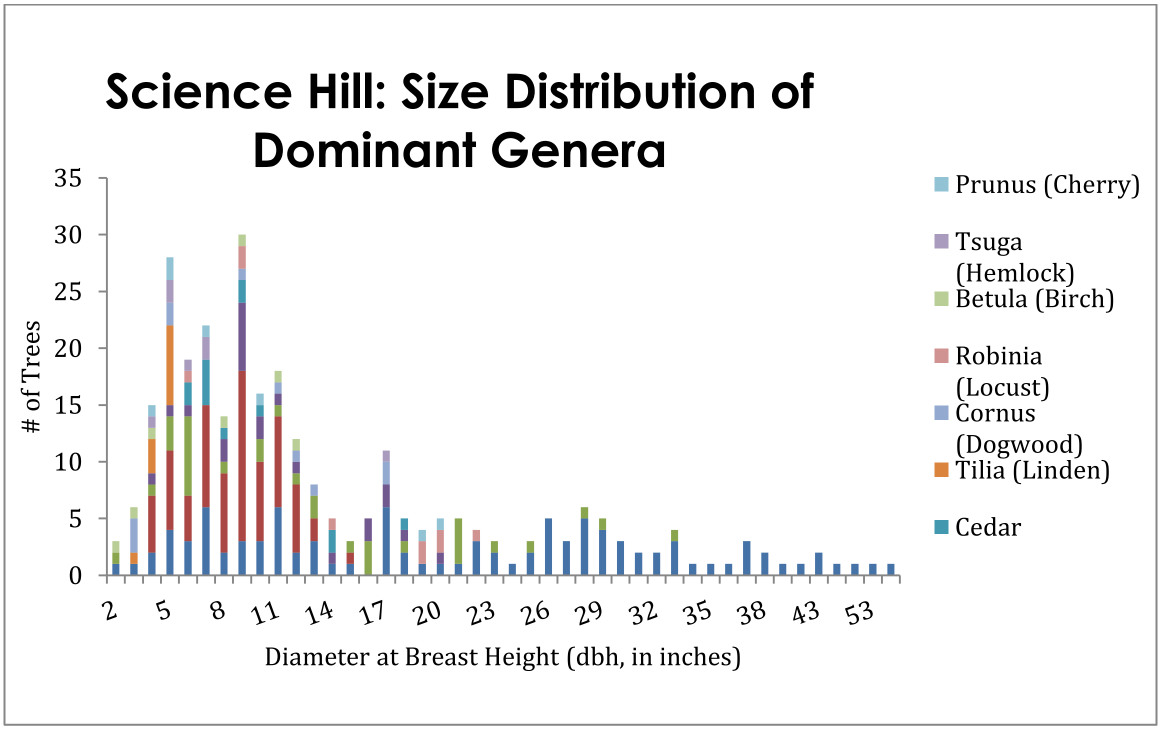


Figure 16: Science Hill Precinct: Size Distribution of Dominant Genera

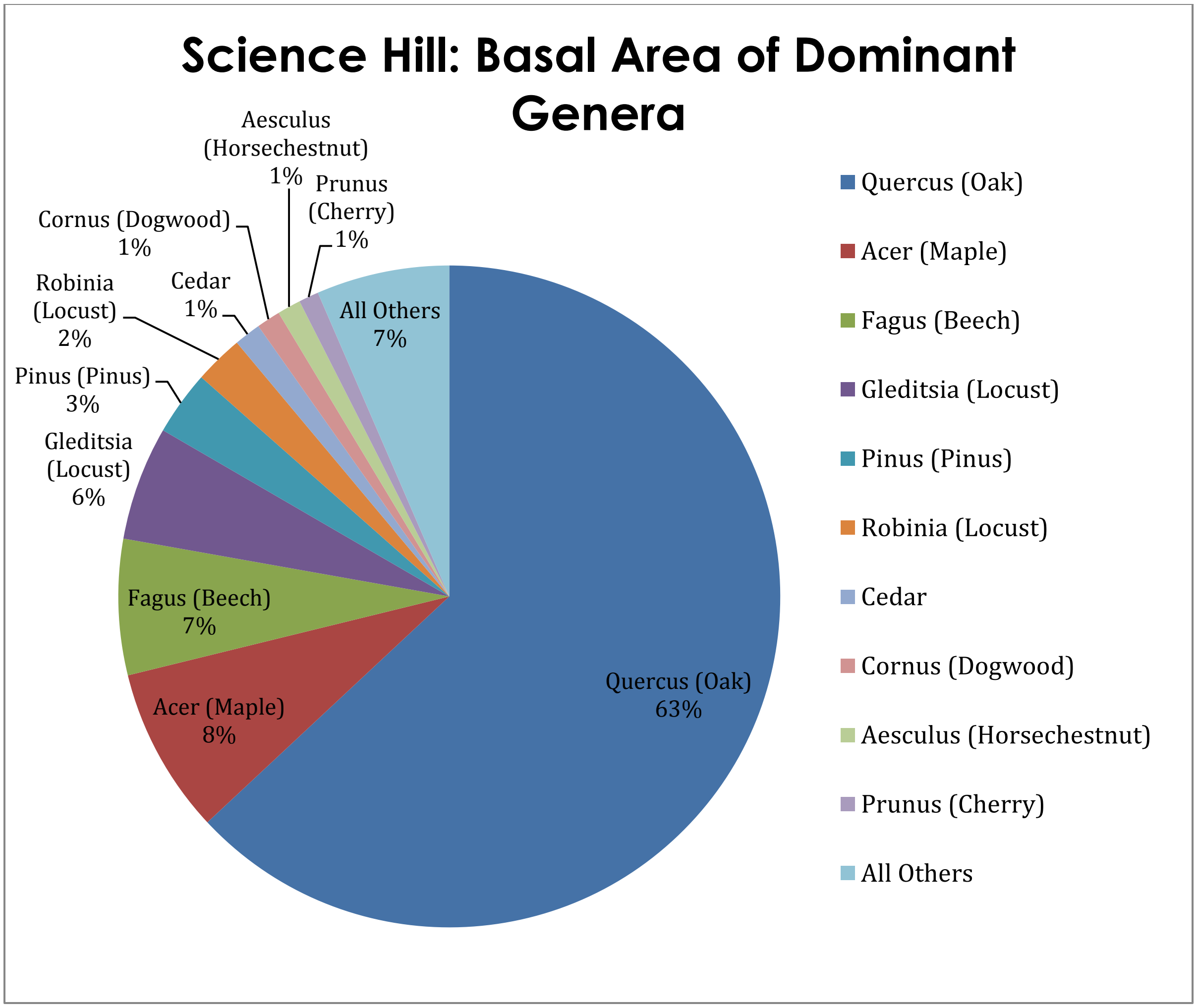
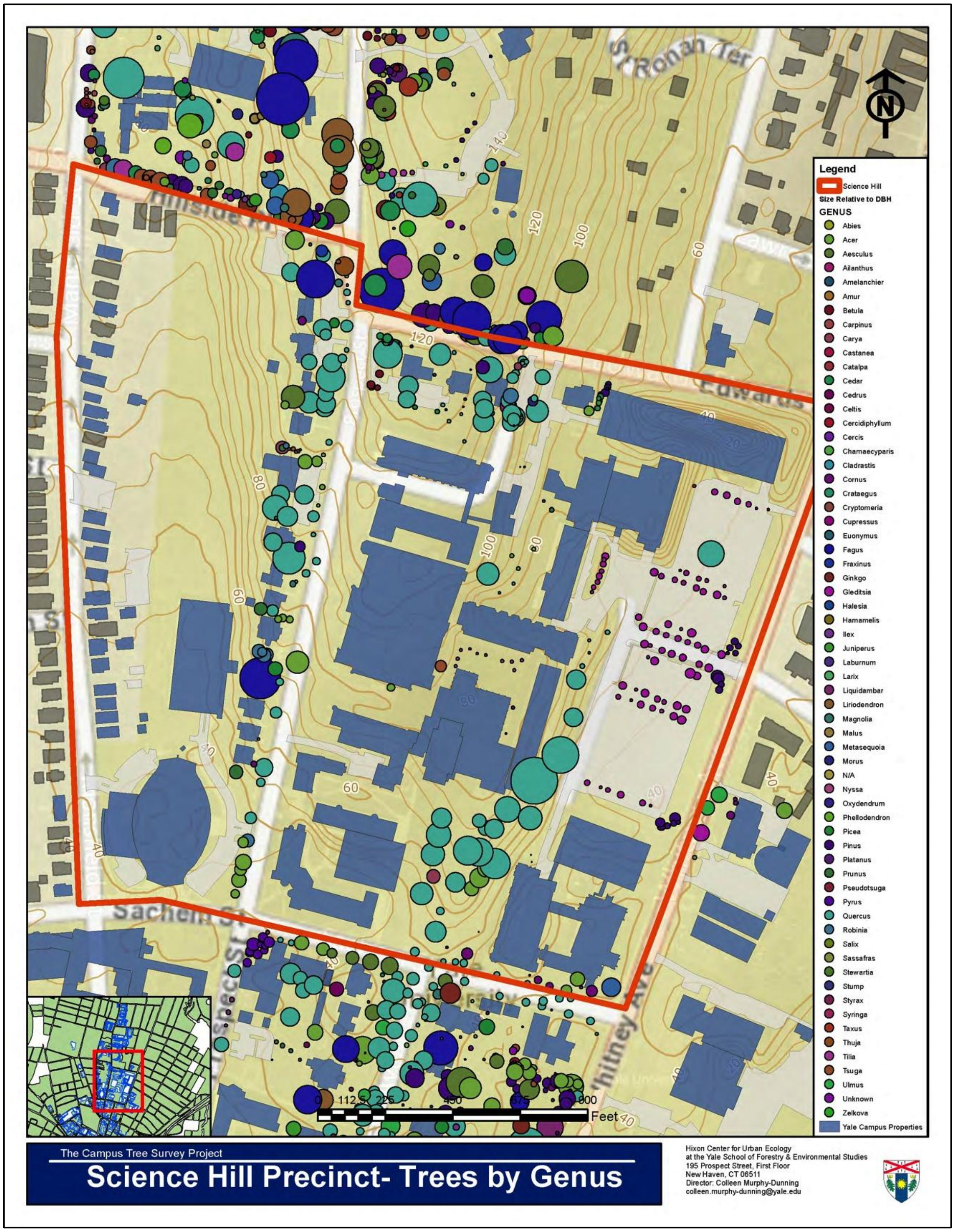


Figure 17: Science Hill Precinct: Basal Area of Dominant Genera


Legend
Science Hill
Size Relative to DBH
GENUS
Abies
Acer
Aesculus
Ailanthus
Amelanchier
Amur
Betula
Carpinus
Carya
Castanea
Catalpa
Cedar
Cedrus
Celtis
Cercidiphyllum
Cercis
Chamaecyparis
Cladrastis
Cornus
Crataegus
Cryptomeria
Cupressus
Euonymus
Fagus
Fraxinus
Ginkgo
Gleditsia
Halesia
Hamamelis
Ilex
Juniperus
Laburnum
Larix
Liquidambar
Liriodendron
Magnolia
Malus
Metasequoia
Morus
N/A
Nyssa
Oxydendrum
Phellodendron
Picea
Pinus
Platanus
Prunus
Pseudotsuga
Pyrus
Quercus
Robinia
Salix
Sassafras
Stewartia
Stump
Styrax
Syringa
Taxus
Thuja
Tilia
Tsuga
Ulmus
Unknown
Zelkova
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Upper Prospect Planning Precinct

Upper Prospect is the second largest planning precinct (79 acres), with trees that are more numerous (786 stems) and more massive (up to 76", and totaling 1726 square feet of basal area) than other parts of campus. The forest here is also the most diverse of Yale's campus (85 species from 52 genera), likely influenced by the presence of Marsh Botanic Gardens, where a great variety of trees from around the world have been planted for research, education, and aesthetic purposes. The precinct is also more pastoral in character, offering trees wide-open spaces where they may achieve impressive size.

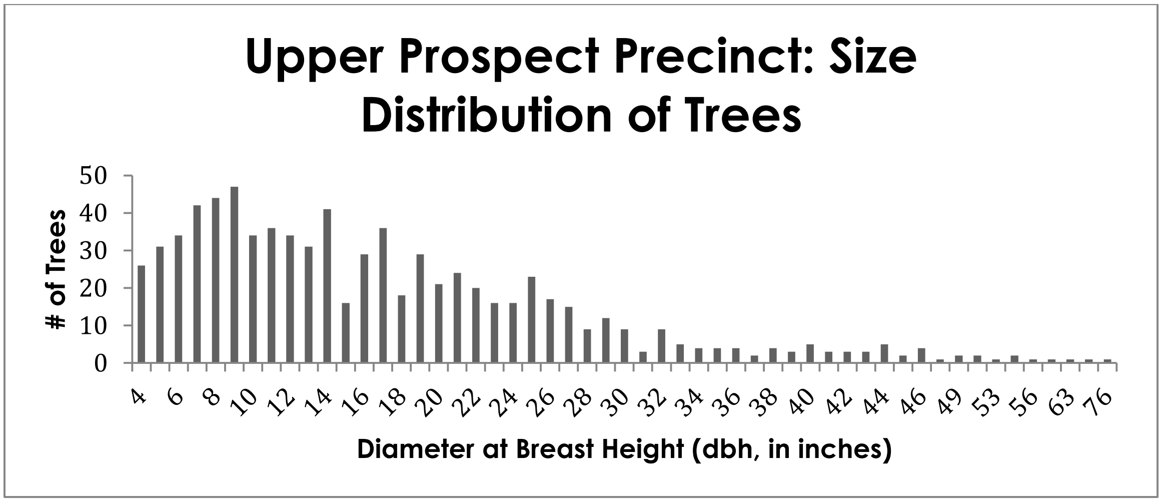


Figure 18: Upper Prospect Precinct: Size Distribution of Trees

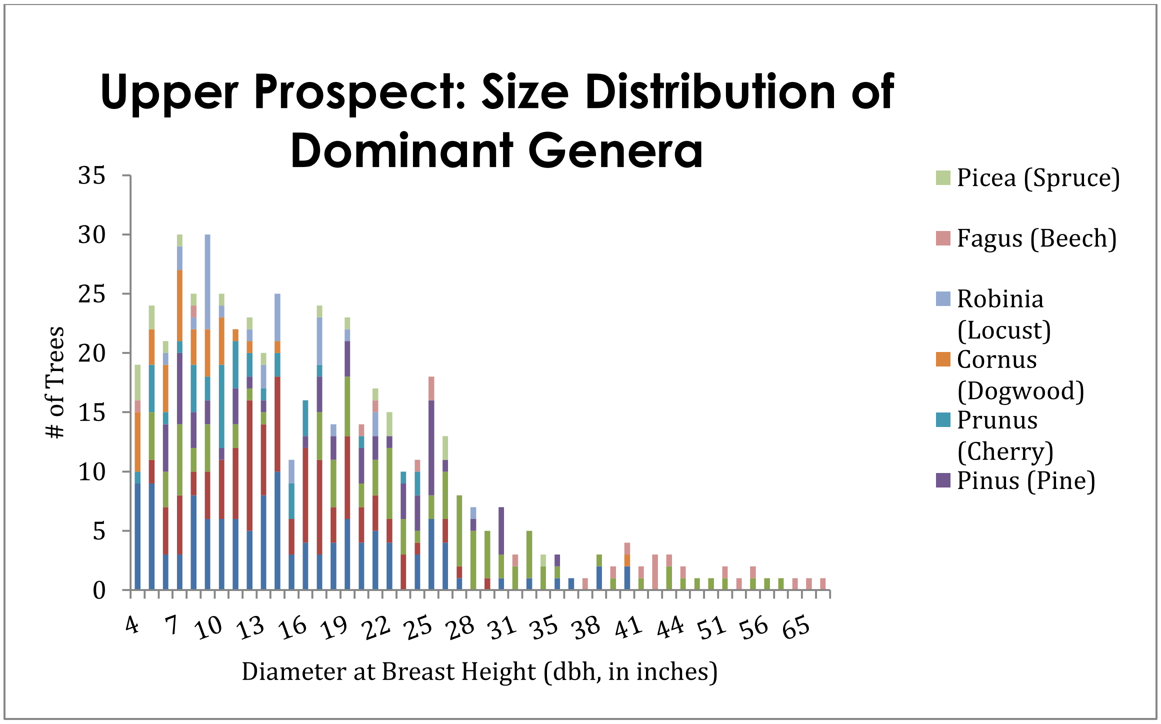


Figure 19: Upper Prospect Precinct: Size Distribution of Dominant Genera

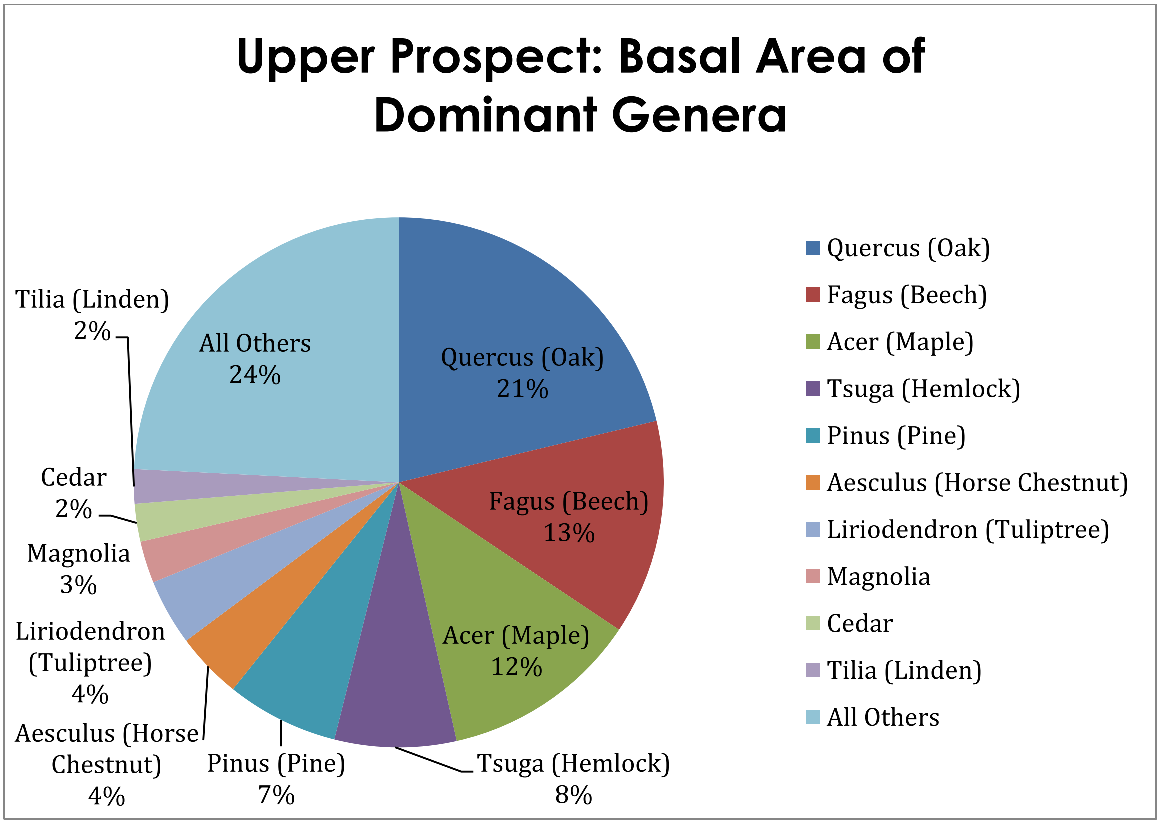
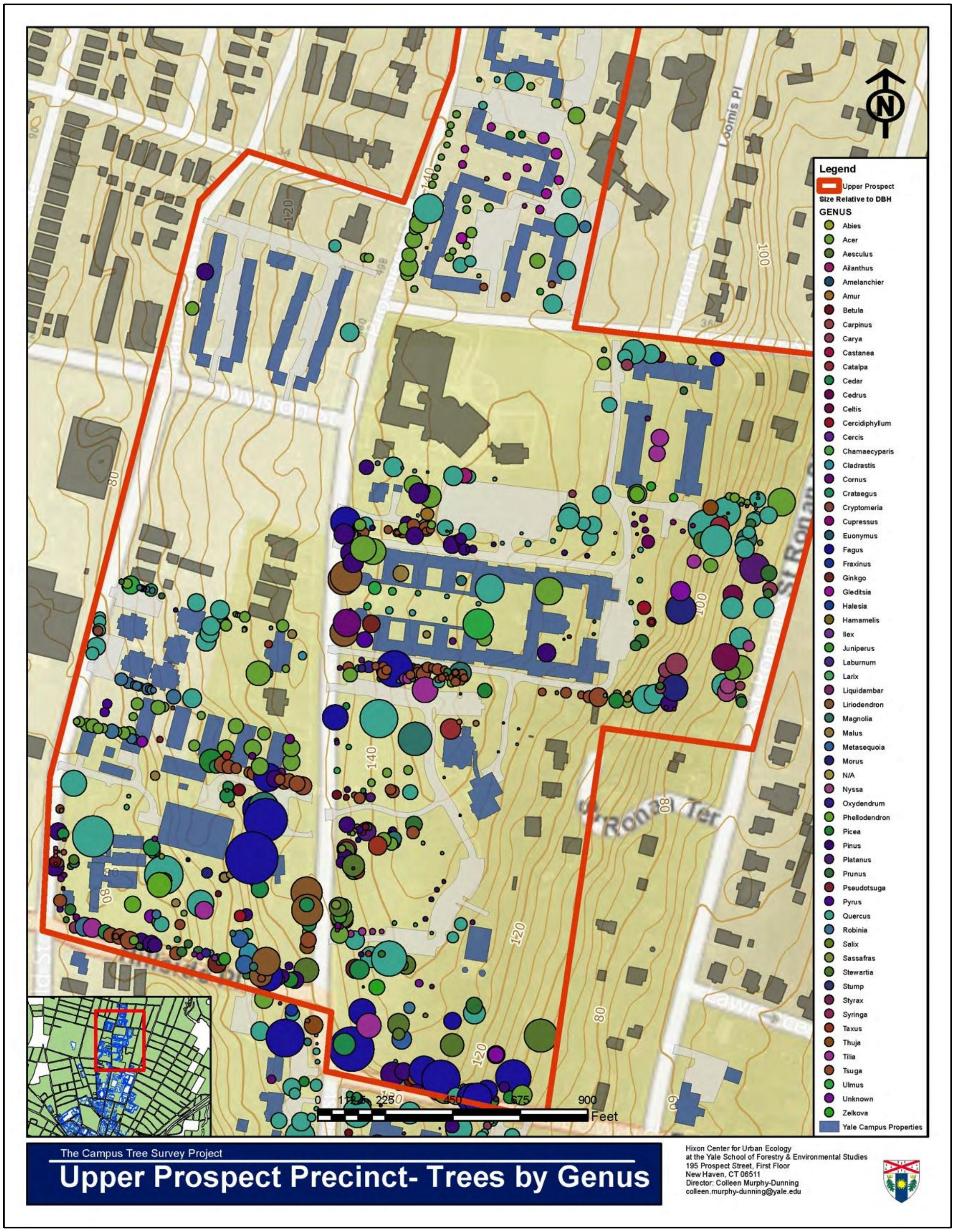


Figure 20: Upper Prospect Precinct: Basal Area of Dominant Genera

Oak, beech, and maple trees dominate, with several massive oaks and beeches: dozens of legacy trees over two feet in diameter, with several beeches reaching 60" in diameter. Maples proliferate in the smaller size classes, along with pines and hemlocks (fig. 19). Smaller (younger) oaks are also well represented, indicating their continued presence in this part of the campus forest; yet few younger beeches exist, indicating that the loss of large legacy trees could eliminate the genus from the area.


Legend
Upper Prospect
Size Relative to DBH
GENUS
Abies
Acer
Aesculus
Ailanthus
Amelanchier
Amur
Betula
Carpinus
Carya
Castanea
Catalpa
Cedar
Cedrus
Celtis
Cercidiphyllum
Cercis
Chamaecyparis
Cladrastis
Cornus
Crataegus
Cryptomeria
Cupressus
Euonymus
Fagus
Fraxinus
Ginkgo
Gleditsia
Halesia
Hamamelis
Ilex
Juniperus
Laburnum
Larix
Liquidambar
Liriodendron
Magnolia
Malus
Metasequoia
Morus
N/A
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Phellodendron
Picea
Pinus
Platanus
Prunus
Pseudotsuga
Pyrus
Quercus
Robinia
Salix
Sassafras
Stewartia
Stump
Styrax
Syringa
Taxus
Thuja
Tilia
Tsuga
Ulmus
Unknown
Zelkova
Yale Campus Properties
0 112.5 225 450 675 900
Feet
The Campus Tree Survey Project
Upper Prospect Precinct- Trees by Genus
Hixon Center for Urban Ecology
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Medical Center Planning Precinct

The Medical Center is notable for its dense urban character; tree specimens here are smaller, less numerous, and more sparsely planted than in other planning precincts (fig. 21). Many of the trees grow in tree pits, built garden beds, or small inner courtyards. This influences both the species selection and the growth potential of trees planted. Accordingly, the Medical Center has a greater presence of small, ornamental trees and a smaller population of large shade trees. Though large trees like elms, maples, and oaks still account for a significant portion of the basal area (38%), this indicates their large size relative to other genera and not an overwhelming predominance in numbers. Several common genera are shorter lived and reach smaller statures—birch, cherry, hawthorn, crabapples, and hornbeams (fig. 22, 23).

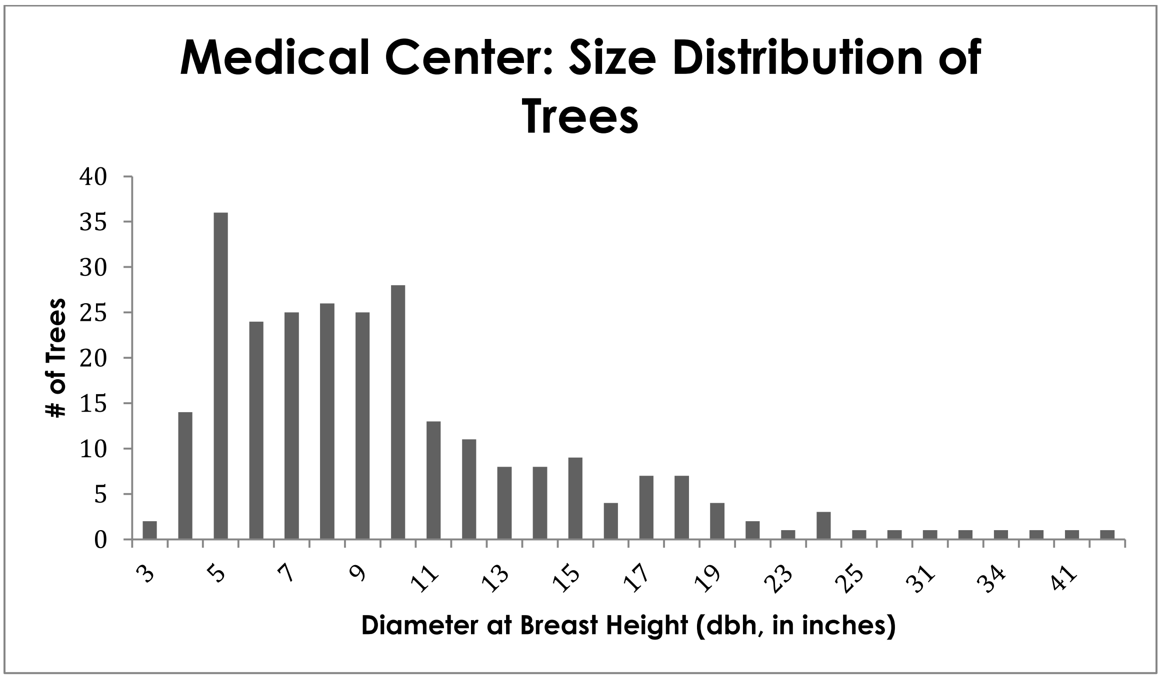


Figure 21: Medical Center Precinct: Size Distribution of Trees

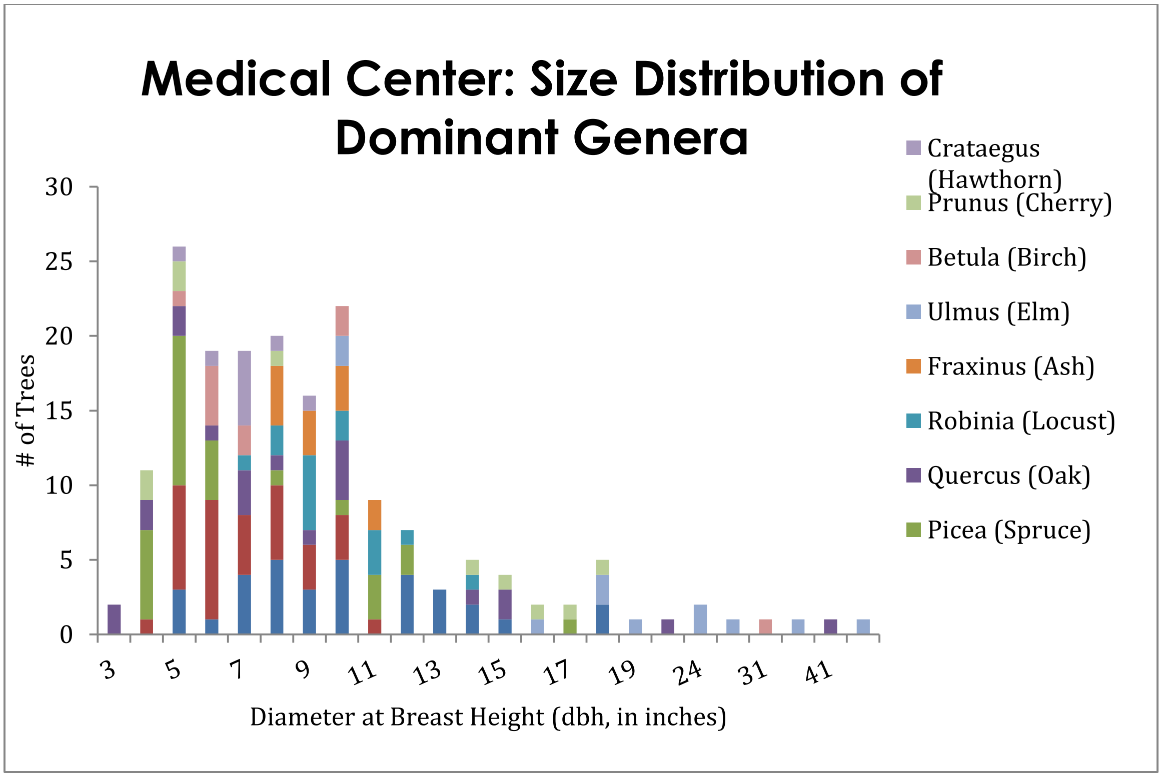


Figure 22: Medical Center Precinct: Distribution of Dominant Genera

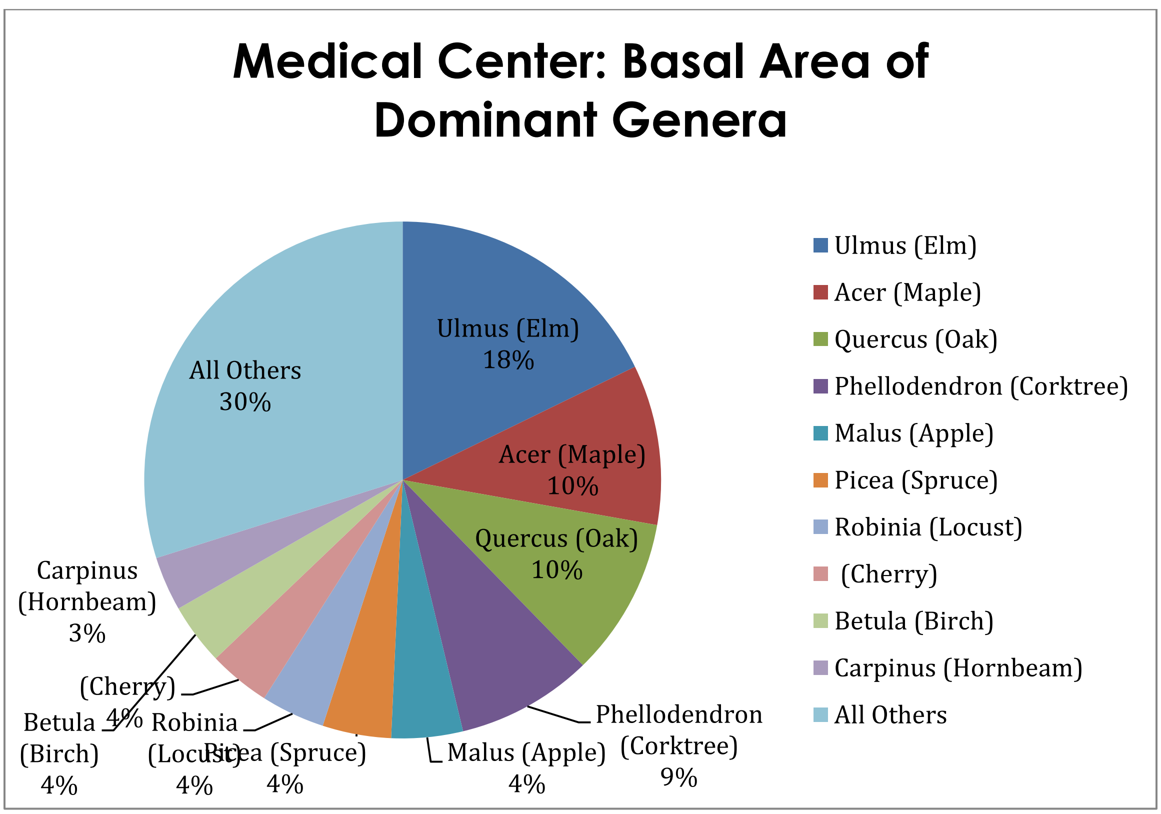
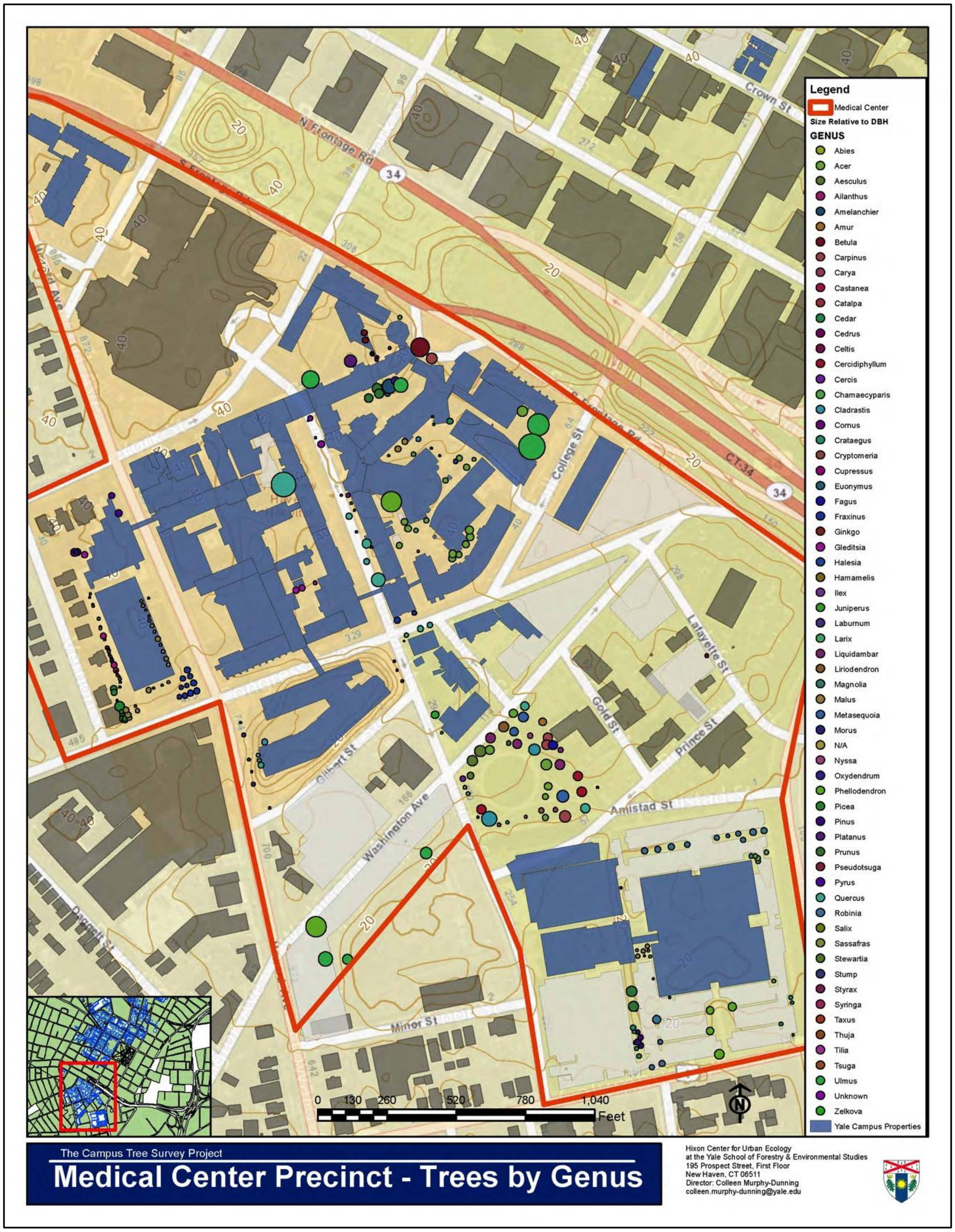


Figure 23: Medical Center Precinct: Basal Area of Dominant Genera


Legend
Medical Center
Size Relative to DBH
GENUS
Abies
Acer
Aesculus
Ailanthus
Amelanchier
Amur
Betula
Carpinus
Carya
Castanea
Catalpa
Cedar
Cedrus
Celtis
Cercidiphyllum
Cercis
Chamaecyparis
Cladrastis
Cornus
Crataegus
Cryptomeria
Cupressus
Euonymus
Fagus
Fraxinus
Ginkgo
Gleditsia
Halesia
Hamamelis
Ilex
Juniperus
Laburnum
Larix
Liquidambar
Liriodendron
Magnolia
Malus
Metasequoia
Morus
N/A
Nyssa
Oxydendrum
Phellodendron
Picea
Pinus
Platanus
Prunus
Pseudotsuga
Pyrus
Quercus
Robinia
Salix
Sassafras
Stewartia
Stump
Styrax
Syringa
Taxus
Thuja
Tilia
Tsuga
Ulmus
Unknown
Zelkova
Yale Campus Properties
N Frontage Rd
S Frontage Rd
Crown St
College St
CT-34
34
Lafayette St
Gold St
Prince St
Amistad St
Gilbert St
Washington Ave
Minor St
Daggett St
0 130 260 520 780 1,040
Feet
N
The Campus Tree Survey Project
Medical Center Precinct - Trees by Genus
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IV. Preliminary Recommendations

Data Management

The Campus Tree Survey is the first comprehensive attempt to digitally catalog all of Yale's trees. As trees are dynamic biological organisms, this inventory is constantly in flux. Solid baseline data can be useful for understanding, managing, and planning the campus forest; but the utility of the data depends on its accuracy and accessibility. Data currently reside within the Yale Map Department but are collected by individuals working at URI; meanwhile, other Yale departments would benefit from having access to the data. Yale should establish a strategy for maintaining a current inventory and allowing access to the data for analysis and decision-making. Possibilities for the tree survey include, but are not limited to:

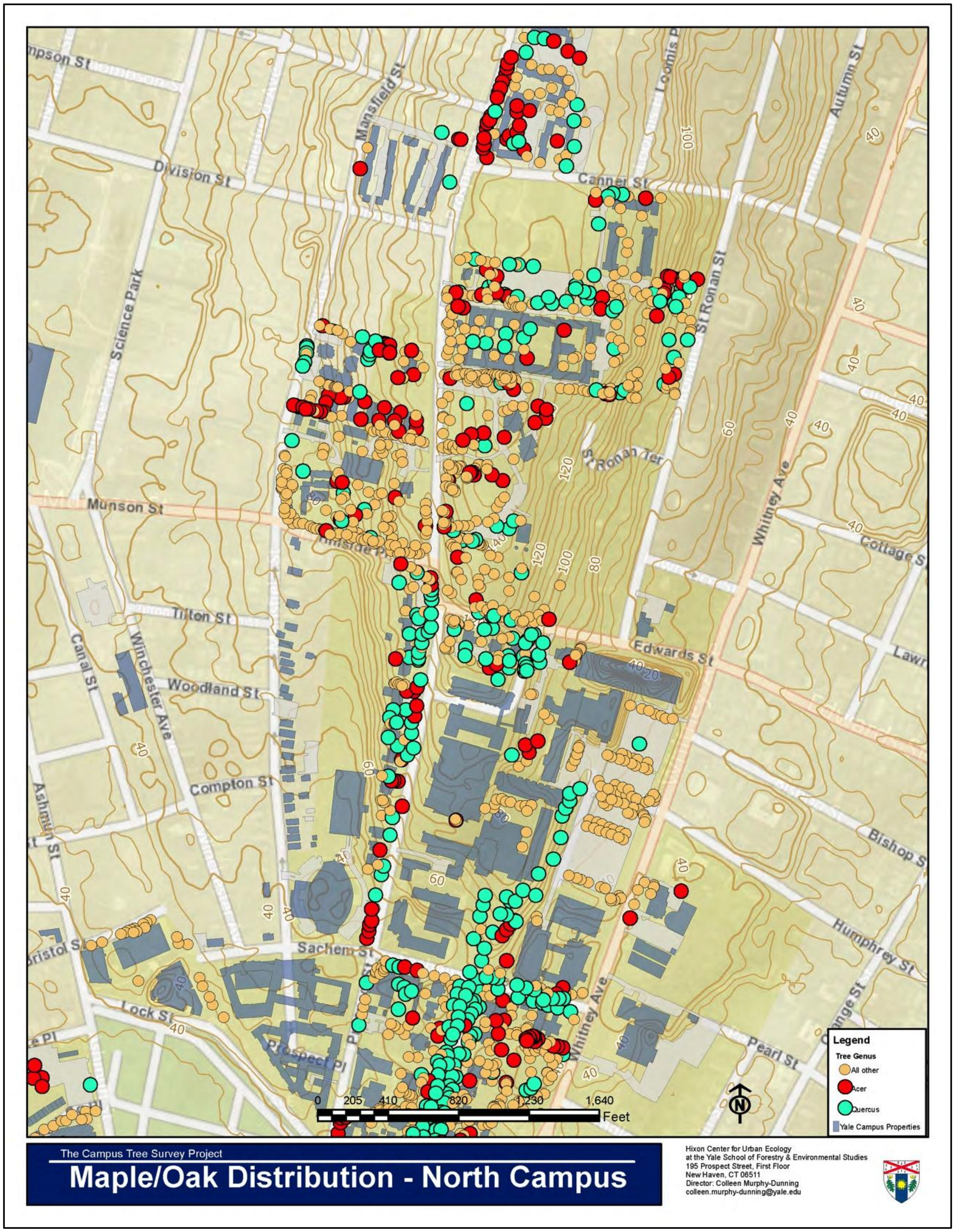
- Real time updates to the inventory with all planting projects, tree removals, and storm events
- Periodic updates of the entire campus survey
- Periodic updates of portions of the campus survey, conducted on a rotating schedule (for example, surveying one planning precinct each year, on a multi-year rotation)

Yale should also consider who is best equipped to keep the inventory up to date, recognizing that data and data collection process are potentially valuable for education, research, and planning. It is essential to streamline relationships between the different parties collecting, managing, and analyzing the data.

Campus Forest Management

In order to realize the potential of the data, Yale needs to articulate clear objectives relating to the aesthetic, ecological, and educational values of its campus forest. We recommend a more thorough management plan that includes detailed biophysical analysis of campus sites; inquires into various stakeholder values; and acknowledges the University's specific objectives.

V. Maps



Legend
Tree Genus
All other
Acer
Quercus
Yale Campus Properties
0 205 410 820 1,230 1,640
Feet
The Campus Tree Survey Project
Maple/Oak Distribution - North Campus
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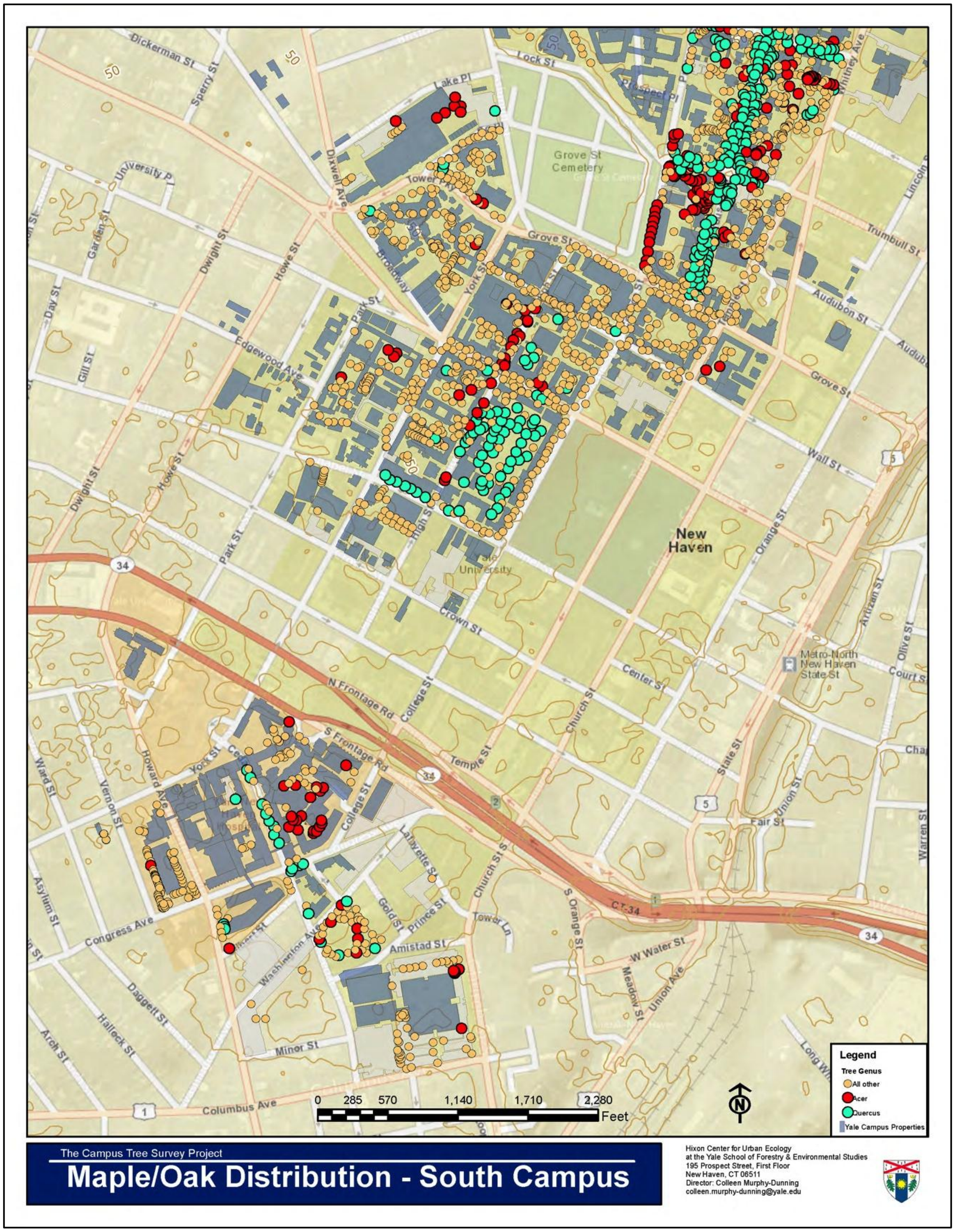
Legend
Tree Genus
All other
Acer
Quercus
Yale Campus Properties
0 285 570 1,140 1,710 2,280 Feet
The Campus Tree Survey Project
Maple/Oak Distribution - South Campus
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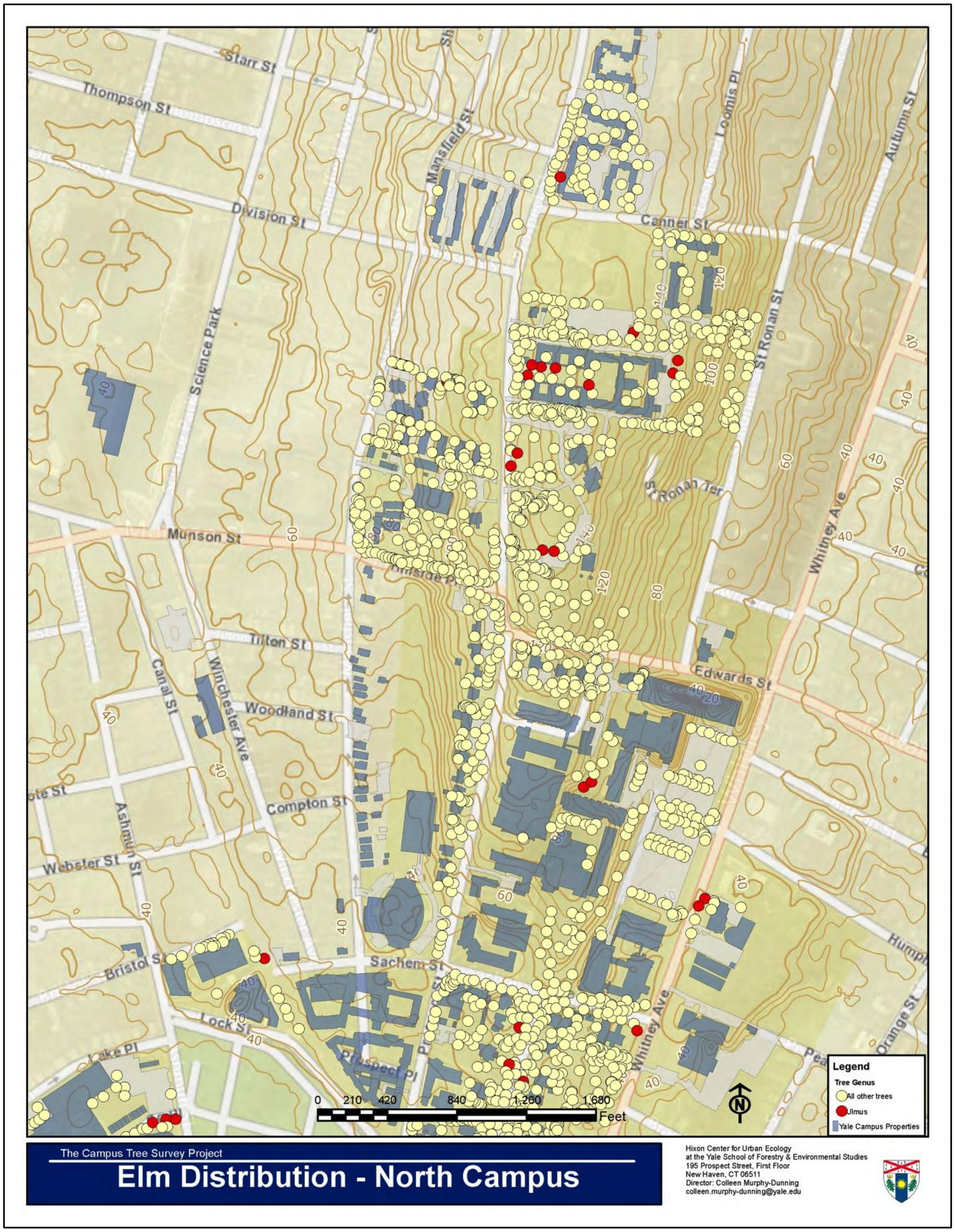
Starr St
Thompson St
Division St
Canner St
Mansfield St
Loomis Pl
Autumn St
Science Park
St Ronan St
St Ronan Ter
Whitney Ave
Munson St
Hillside Pl
Tilton St
Edwards St
Canal St
Winchester Ave
Woodland St
Compton St
Webster St
Ashmun St
Bristol St
Sachem St
Lock St
Lake Pl
Prospect Pl
Orange St
0 210 420 840 1,260 1,680 Feet
Legend
Tree Genus
All other trees
Ulmus
Yale Campus Properties
The Campus Tree Survey Project
Elm Distribution - North Campus
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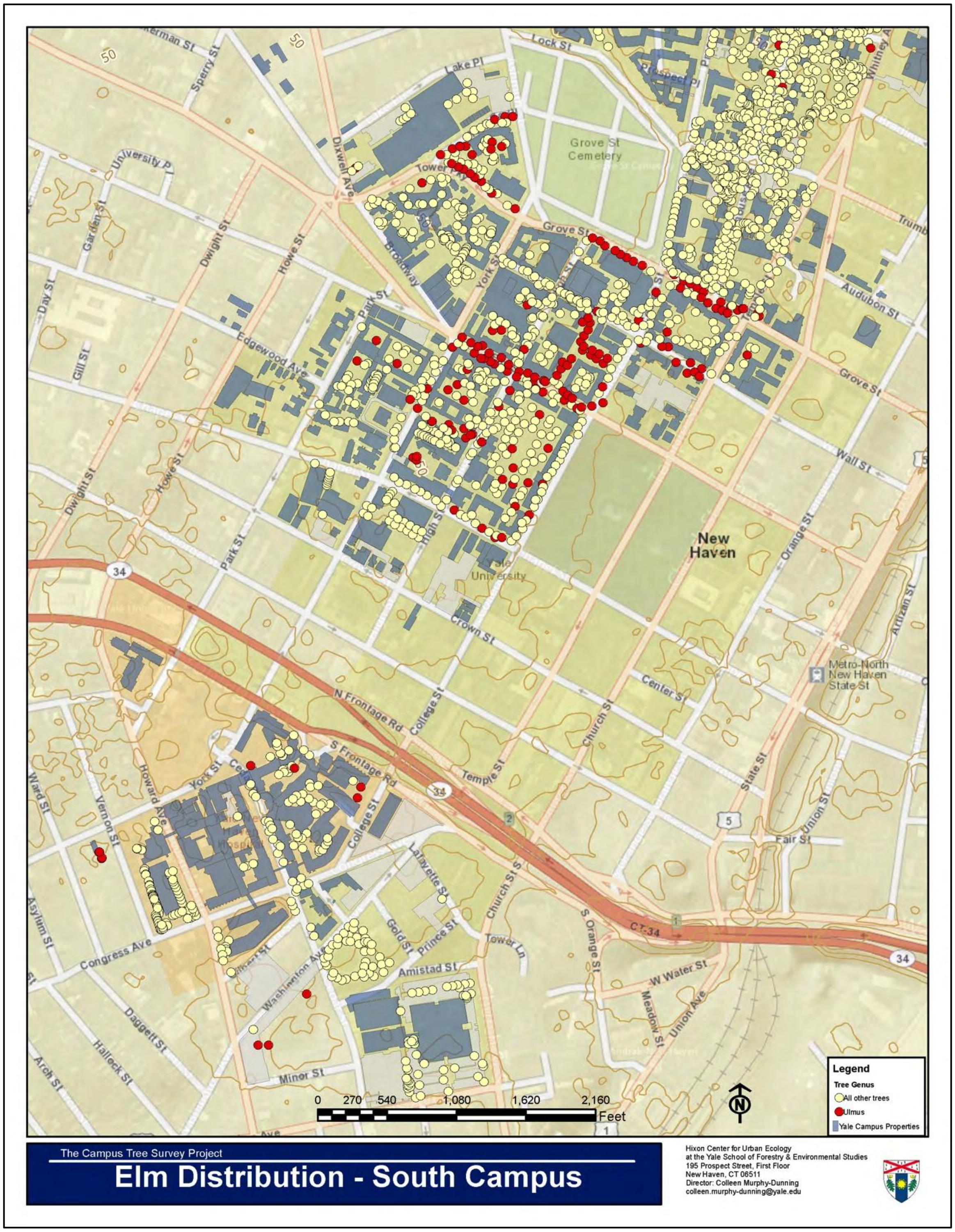

The Campus Tree Survey Project
Elm Distribution - South Campus
Legend
Tree Genus
All other trees
Ulmus
Yale Campus Properties
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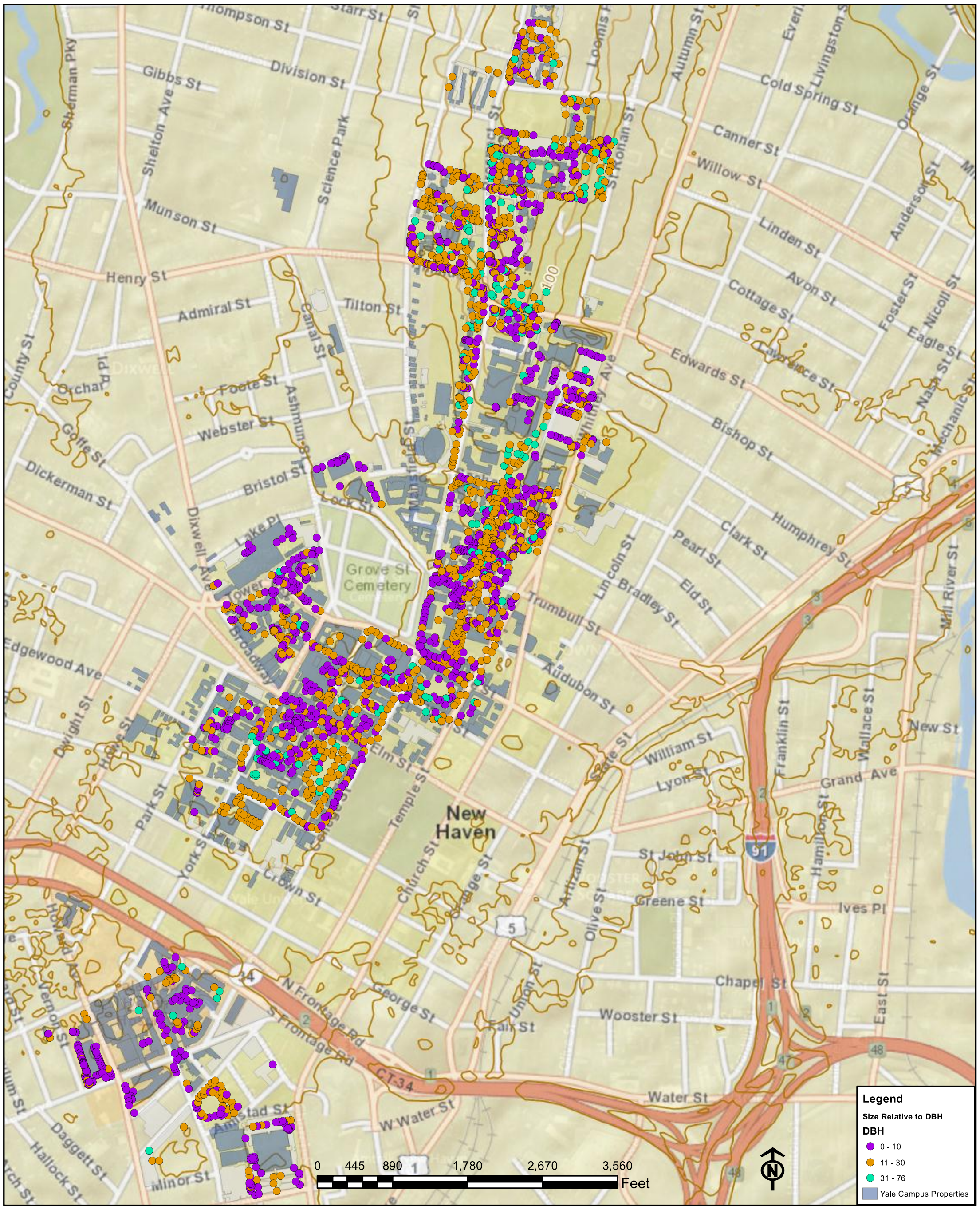
0 270 540 1,080 1,620 2,160
Feet
New Haven



The Campus Tree Survey Project

All Tree Size Distribution

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Appendix A: Index of Trees, Latin Names and Common Names

Genus (Latin Name)	Genus (Common Names)	Stems	% of Total Count
Abies	Fir	6	0.2%
Acer	Maple	334	12.5%
Aesculus	Horsechestnuts/Buckeyes	31	1.2%
Ailanthus	Tree-of-Heaven	8	0.3%
Amelanchier	Shadblow/Serviceberry	23	0.9%
Betula	Birch	49	1.8%
Carpinus	Hornbeam	14	0.5%
Carya	Hickory	16	0.6%
Castanea	Chestnut	1	0.0%
Catalpa	Catalpa	3	0.1%
Cedar	Cedar	34	1.3%
Cedrus	Cedar	5	0.2%
Celtis	Hackberry	7	0.3%
Cercidiphyllum	Katsuratree	17	0.6%
Cercis	Redbud	22	0.8%
Chamaecyparis	False Cypress	7	0.3%
Cladrastis	Yellowwood	11	0.4%
Cornus	Dogwood	142	5.3%
Crataegus	Hawthorn	17	0.6%
Cryptomeria	Japanese Cedar	6	0.2%
Cupressus	Cypress	3	0.1%
Euonymus	Spindle Tree/Burning Bush	1	0.0%
Fagus	Beech	63	2.4%
Fraxinus	Ash	14	0.5%
Ginkgo	Ginkgo	26	1.0%
Gleditsia	Locust	110	4.1%
Halesia	Silverbell/Snowdrop	1	0.0%
Hamamelis	Witch Hazel	3	0.1%
Ilex	Holly	8	0.3%
Juniperus	Juniper	3	0.1%
Laburnum	Golden Chain	1	0.0%
Larix	Larch	2	0.1%
Liquidambar	Sweetgum	44	1.6%
Liriodendron	Tulip	20	0.7%
Maackia	Amur Maackia	5	0.2%
Magnolia	Magnolia	41	1.5%
Malus	Apple	63	2.4%
Metasequoia	Dawn Redwood	7	0.3%
Morus	Mulberry	9	0.3%
Nyssa	Tupelo	5	0.2%

Oxydendrum	Sourwood	3	0.1%
Phellodendron	Cork-tree	14	0.5%
Picea	Spruce	60	2.2%
Pinus	Pine	135	5.1%
Platanus	Planetrees/Sycamores	99	3.7%
Prunus	Cherry	96	3.6%
Pseudotsuga	Douglas Fir	8	0.3%
Pyrus	Pear	79	3.0%
Quercus	Oak	448	16.8%
Robinia	Locust	92	3.4%
Salix	Willow	1	0.0%
Sassafras	Sassafras	10	0.4%
Stewartia	Stewartia	4	0.1%
Styrax	Styrax/Snowbell	4	0.1%
Syringa	Lilac	4	0.1%
Taxus	Yew	18	0.7%
Thuja	Arborvitae	5	0.2%
Tilia	Linden	33	1.2%
Tsuga	Hemlock	119	4.5%
Ulmus	Elm	193	7.2%
(Unknown)	(various)	34	1.3%
Zelkova	Zelkova	26	1.0%
		Total: 2667	**100.0%**