The Urban Forest within Baltimore County's Urban-Rural Demarcation Line

A report prepared by the USDA Forest Service for the Baltimore County, MD Department of Environmental Protection and Resource Management

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Executive Summary

During the 2007 in-leaf season a field study was conducted to sample the urban forest within Baltimore County's Urban Rural Demarcation Line (URDL). The project was undertaken by the USDA Forest Service under contract from Baltimore County as part of its Forest Sustainability program. In total, 197 tenth-acre plots (0.04 hectare) were sampled and analyzed using the Urban Forest Effects (UFORE) Model. Field crews gathered data on trees and ground covers on the plots, and collected soil cores. The scope of this project will lead to a better understanding an urban forest's structure, functions and values. The information obtained can help promote management and decision-making to improve human health and environmental quality.

Key findings:

Estimated number of trees within the URDL: 6,758,500

Estimated number of trees by land use type:

Small lot single family	712,500
Industrial	336,900
Attached Dwellings	106,500
Large lot single family	725,600
Commercial	122,700
Open Space	3,630,900
Large Transportation	147,400
Institutional	976,000

Most common tree species:

red maple	616,800	(9.1% of tree population)
unidentified (dead trees)	590,900	(8.7% of tree population)
tulip tree	382,900	(5.7% of tree population)
black cherry	350,300	(5.2% of tree population)
boxelder	285,400	(4.2% of tree population)

Percentage of trees less than 6" (15.2 cm) diameter: 58.3%

Pollution removal: 1,450 tons[1]/year ($10.6 million/year)

1 Tons is equal to 2,000 pounds

Carbon storage[2]: 1,311,000 tons ($27.1 million)

Carbon sequestration[3]: 38,500 tons/year ($797 thousand/year)

Residential building energy savings: $18.3 million / year

Avoided carbon emissions: $467,000 / year

Structural values[4]: $6.3 billion

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2 Amount of carbon bound up in above-ground and below-ground parts of woody vegetation
3 the removal of carbon dioxide from the air by plants through photosynthesis
4 value based on the physical resource itself (e.g., the cost of having to replace a tree with a similar tree)

Introduction

Trees and forested areas contribute valuable ecosystem services that help improve environmental quality and human health in urban and urbanizing areas. These services include pollution removal, carbon storage and sequestration, and air temperature reduction. Improved understanding of the existing resource and its associated services or benefits could lead to better management plans to sustain or enhance the extent and ecosystem services of the urban forest resource. To this end, the Department of Environmental Protection and Resource Management contracted with the USDA Forest Service to sample the area within the Urban-Rural Demarcation Line (URDL) in Baltimore County and to provide a base line of data describing the urban forest found in this area.

The area within the URDL is approximately 130,700 acres, located from the border of Baltimore City outward in a crescent shape nearly ringing the entire city (Figure 1). The area is considered urban due to its population density with a mix of residential, commercial, and institutional buildings. The URDL was used for this study because Baltimore County has no incorporated municipalities and the demarcation line is viewed unofficially as a municipal boundary. The boundary has been relatively stable since its adoption in 1967 and coincides closely with the designated Priority Funding Areas under the Maryland Smart Growth framework. It is estimated that 87 percent of the County's 809,100 population (as of 2007) resides inside the URDL. For this analysis of the URDL, a land use map provided by the Baltimore County Department of Environmental Protection and Resource Management was used to distribute the sample plots. However, some of the map area was unclassified and not sampled (mostly roads, but there were also some unclassified polygons (e.g., near inner harbour)). Thus, the land area sampled within classified polygons was 108,400 acres. This report details the methods and findings of this analysis of both the vegetation and soils in the URDL.

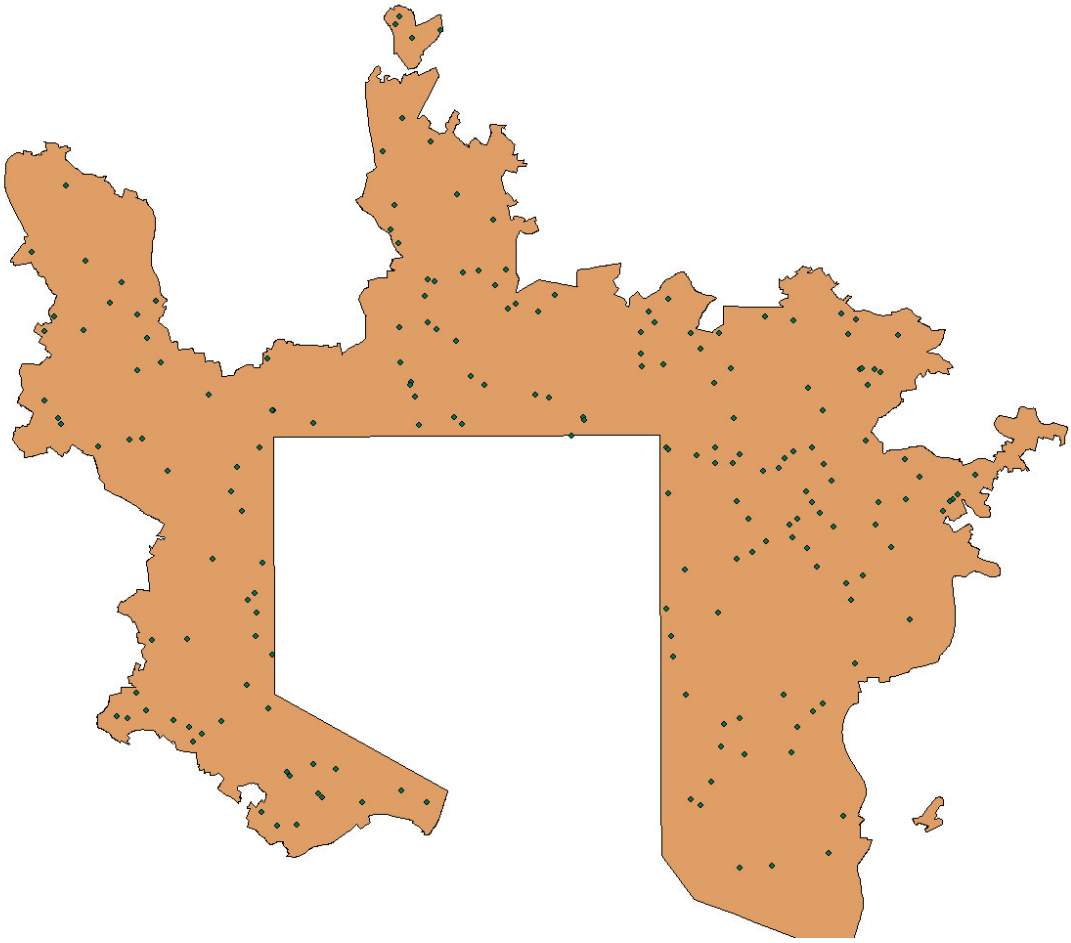


Figure 1. Sample plot distribution

Methods

The UFORE model uses standard field, air pollution, and meteorological data to quantify urban forest structure and numerous forest-related effects in various U.S. cities (Nowak and Crane 2000). Four UFORE modules were used:

Urban Forest Structure -- quantifies urban forest structure (e.g., species composition, tree density, tree health, leaf area, leaf and tree biomass) based on field data.

Carbon Storage and Sequestration -- calculates total stored C, and gross and net C sequestered annually by the urban forest based on field data.

Dry Deposition of Air Pollution -- quantifies the hourly amount of pollution removed by the urban forest and associated percent improvement in air quality throughout a year. Pollution removal is calculated for O_3, SO_2, NO_2, CO, and PM10 based on field, pollution concentration, and meteorological data.

Energy Conservation – estimates effects of trees on building energy use and consequent emissions of carbon from power plants.

The following text details the methods of a UFORE analysis. For more specific information on field data collection see http://www.itreetools.org/resource_learning_center/elements/i-Tree_v20_UsersManual.pdf

Urban Forest Structure

Urban forest structure is the spatial arrangement and characteristics of vegetation in relation to other objects such as buildings within urban areas (e.g., Nowak 1994a). During the in-leaf season of 2007, 197 (0.04 ha) field plots were measured to obtain information on vegetation structure within the URDL. Based on discussions with Baltimore County's Department of Environmental Protection and Resource

Management (DEPRM), the USDA Forest Service utilized a stratified random sampling approach to determine plot locations. This method distributed the plots approximately proportional to the amount of tree cover in the land use strata. Land use strata and tree cover estimates were provided by DEPRM. The number of plots in each stratum was adjusted to have a minimum of ten plots located within each land use Table 1.

Table 1. Plot distribution among strata within the URDL

Land use	Number of Plots	Area (ha)
Small Lot Single Family	19	9,657
Industrial	11	3,750
Attached Dwellings	12	3,911
Large Lot Single Family	31	6,230
Commercial	10	3,311
Open Space	81	9,429
Large Transportation	10	2,841
Institutional	23	4,737
Total	197	43,865

On each plot, the following general plot data were estimated/recorded:

- Percent tree cover
- Actual land use on the plot
- Percent of plot within the land use
- Ground cover: percent of ground covered by the following cover types: buildings, cement, tar-blacktop/asphalt, other impervious, soil, pervious rock, duff/mulch, herbaceous (exclusive of grass and shrubs), maintained grass, wild/unmaintained grass, and water.
- Percent shrub cover

For each tree with the center of its stem in the plot, minimum diameter at breast height (d.b.h.) of 2.54 cm, the following information was measured/recorded:

- species
- number of stems
- d.b.h. of each stem (or if greater than six stems, diameter recorded below fork and height of measure recorded)
- tree height

- height to base of live crown
- crown width (average of two perpendicular measurements).
- percent of branch dieback in crown (used to rate tree crown condition):
    - E (< 1%) - Excellent
    - G (1-10%) - Good
    - F (11-25%) - Fair
    - P (26-50%) - Poor
    - C (51-75%) - Critical
    - D (76-99%) - Dying
    - K (100% - no leaves) - Dead
- Percent of canopy volume devoid of leaves (0-100%)
- Percent of land area beneath entire tree canopy's drip line that is impervious
- Percent of land area beneath canopy drip line that is occupied by shrubs
- Crown Light Exposure (CLE): Number of sides of the tree receiving sunlight from above, based on a hexagonal representation wherein 0 means the tree is in the understory, to 6, meaning the tree is in a clearing
- Distance to residential building (if within 60 feet of tree)
- Direction to building
- Street tree: Y if a street tree, N if not.

<u>Leaf area and leaf biomass</u>

Leaf area and leaf biomass of individual trees were calculated using regression equations for deciduous urban species (Nowak 1996). If shading coefficients (percent light intensity intercepted by foliated tree crowns) used in the regression did not exist for an individual species, genus or hardwood averages were used. For deciduous trees that were too large to be used directly in the regression equation (i.e., crown height > 12 m or less than 1 m; crown width > 14 or less than 1 m), average leaf-area index (LAI: m^2 leaf area per m^2 projected ground area of canopy) was calculated by the regression equation for the maximum tree size based on the appropriate height-width ratio and shading coefficient class of the tree. This LAI was applied to the ground area (m^2) occupied by the tree to calculate leaf area (m^2). For deciduous trees with height-to-width

ratios that were too large or too small (i.e., or crown height to crown width ratio > 2 or less than 0.5) to be used directly in the regression equations, tree height or width was scaled downward to allow the crown to the reach maximum (2) or minimum (0.5) height-to-width ratio. Leaf area was calculated using the regression equation with the maximum or minimum ratio; leaf area was then scaled back proportionally to reach the original crown volume.

For conifer trees (excluding pines), average LAI per height-to-width ratio class for deciduous trees with a shading coefficient of 0.91 were applied to the tree's ground area to calculate leaf area. The 0.91 shading coefficient class is believed to be the best class to represent conifers as coniferous forests typically have about 1.5 times more LAI than deciduous forests (Barbour et al. 1980). The average shading coefficient for deciduous trees is 0.83 (Nowak 1996); 1.5 times the 0.83 class LAI is equivalent to the 0.91 class LAI. Because pines have lower LAI than other conifers and LAI that are comparable to hardwoods (e.g., Jarvis and Leverenz 1983; Leverenz and Hinckley 1990), the average shading coefficient (0.83) was used to estimate pine leaf area.

Tree leaf biomass could not be calculated directly from regression equations (due to tree parameters being out of equation range), so leaf biomass was calculated by converting leaf-area estimates using species-specific measurements of g leaf dry weight/m^2 of leaf area.[5] Shrub leaf biomass was calculated as the product of the crown volume occupied by leaves (m^3) and measured leaf biomass factors (g m^{-3}) for individual species (e.g., Winer et al. 1983; Nowak 1991). Shrub leaf area was calculated by converting leaf biomass to leaf area based on measured species conversion ratios (m^2 g^{-1}).[5] Due to limitations in estimating shrub leaf area by the crown-volume approach, shrub leaf area was not allowed to exceed a LAI of 18. If there are no leaf-biomass-to-area or leaf-biomass-to-crown-volume conversion factors for an individual species, the average of genus or hardwood/conifer values were used.[5]

[5]Nowak, D.J.; Klinger, L.; Karlik, J.; Winer, A; Harley, P. and Abdollahi, K. Tree leaf area -- leaf biomass conversion factors. Unpublished data on file at Northeastern Research Station, Syracuse, NY.

Average tree condition was calculated by assigning each condition class a numeric condition rating. A condition rating of 1.0 indicates no dieback (excellent); a condition rating of 0.0 indicates a dead tree (100-percent dieback). Each code between excellent and dead was given a rating between 1.0 and 0.0 based on the mid-value of the class (e.g., fair = 11-25 percent dieback was given a rating of 0.82 or 82-percent healthy crown. Estimates of leaf area and leaf biomass were adjusted downward based on crown leaf dieback (tree condition).

For trees with CLE = 4-5: leaf area was based on open-grown equations; CLE = 0-1: leaf area was based on LAI of closed canopy x canopy area:

$$LA = [\ln((1-x_s)/-k\ ] \times \pi r^2$$

Where x_s is shading coefficient of tree; k = 0.52 for conifers and 0.65 for hardwoods; and r = crown radius. This formula is based on estimating LAI from light intensity using the Beer-Lambert Law:

$$LAI = \ln(I / I_O) / -k$$

where I = light intensity beneath canopy; I_o = light intensity above canopy; and k = light extinction coefficient (Smith et al. 1991). The light extinction coefficients for conifers (0.52) and hardwoods (0.65) were from Jarvis and Leverenz (1983). For CLE = 2-3: leaf area was calculated as the average of leaf area from the open-grown and closed canopy equations.

Species Diversity

Species diversity indices (e.g., Shannon-Wiener's index) and species richness, i.e., number of species (Barbour et al. 1980), were calculated for living trees for the entire URDL. The proportion of the tree population that originated from different parts of the country and world was calculated based on the native range of each species (e.g., Hough 1907; Grimm 1962; Platt 1968; Little 1971, 1976, 1977, 1978; Viereck and Little 1975; Preston 1976; Clark 1979; Burns and Honkala 1990a,b; Gleason and Cronquist 1991).

Structural Value

The structural (also referred to as compensatory) value of the trees was based on methods from the Council of Tree and Landscape Appraisers (1992). Structural value, which is based on the replacement cost of a similar tree, is used for monetary settlement for damage or death of plants through litigation, insurance claims of direct payment, and loss of property value for income tax deduction. Other values can be ascribed to trees based on such factors as increases in local property values or environmental functions provided (e.g., air pollution reduction), but structural valuation is the most direct method.

Structural value is based on four tree/site characteristics: trunk area (cross-sectional area at d.b.h.), species, condition, and location. Trunk area and species are used to determine the basic value, which is then multiplied by condition and location ratings (0-1) to determine the final tree structural value.

For transplantable trees, average replacement cost and transplantable size were obtained from International Society of Arboriculture (ISA) publications (ACRT 1997) to determine the basic replacement price (dollars/cm^2 of cross-sectional area) for the tree. The basic replacement price from Maryland was multiplied by trunk area and species factor (0-1) to determine a tree's basic value. The minimum basic value for a tree prior to species adjustment was set at $150. Local species factors also were obtained from ISA publications.

For trees larger than transplantable size the basic value (BV) was:

$$BV = RC + (BP \times [TA_A - TA_R] \times SF)$$

where RC (replacement cost) is the cost of a tree at the largest transplantable size, BP (basic price) is the local average cost per unit trunk area (dollars/cm^2), TA_A is trunk area of the tree being appraised, TA_R is trunk area of the largest transplantable tree and SF is the local species factor.

For trees larger than 76.2 cm in trunk diameter, trunk area was adjusted downward based on the premise that a large mature tree would not increase in value as rapidly as

its trunk area. The following adjusted trunk-area formula was determined based on the perceived increase in tree size, expected longevity, anticipated maintenance, and structural safety (Council of Tree and Landscape Appraisers 1992):

$$ATA = -0.335d^2 + 176d - 7020$$

where ATA = adjusted trunk area and d = trunk diameter in inches.

Basic value was multiplied by condition and location factors (0.0 to –1.0) to determine the tree's structural value. Condition factors were based on percent crown dieback: excellent (< 1) = 1.0; good (1-10) = 0.95; fair (11-25) = 0.82; poor (26-50) = 0.62; critical (51-75) = 0.37; dying (76-99) = 0.13; dead (100) = 0.0.

Available data required using location factors based on land use type (Int. Soc. of Arboric. 1988): golf course = 0.8; commercial/industrial, cemetery and institutional = 0.75; parks and residential = 0.6; transportation and forest = 0.5; agriculture = 0.4; vacant = 0.2; and wetland = 0.1.

As an example of structural value calculations, if a tree that is 40.6 cm in diameter (1,295 cm^2 trunk area) has a species rating of 0.5, a condition rating of 0.82, a location rating of 0.4, a basic price of \$7 per cm^2, and a replacement cost of \$1,300 for a 12.7-cm-diameter tree (127 cm^2 trunk area), the structural value would equal:

$$[1{,}300 + (7 \times (1{,}295 - 127) \cdot 0.5)] \times 0.82 \times 0.4 = \$1{,}767$$

Data for individual trees were used to determine the total structural value of trees.

Insect and Disease Effects

The proportion of leaf area and live tree population, and estimated structural value in various susceptibility classes to gypsy moth feeding (Liebhold et al. 1995; Onstad et al. 1997), Asian longhorned beetle (e.g.,Nowak et al., 2001), emerald ash borer (all ash species) and Dutch elm disease were calculated to reveal potential urban forest damage associated with these pests.

The proportion of species population, leaf area, and leaf biomass in each d.b.h. class are calculated, as are the proportion of species population by condition class and by d.b.h. and condition class (Model Output Table #9). Field data were input into the UFORE-A module to calculate totals, averages, and standard errors by species, land use, and city totals for urban forest structure. The standard errors for leaf area and leaf biomass report sampling error rather than error of estimation. The reported sampling errors underestimate the actual standard errors. Lack of information regarding errors in the allometric equations and adjustment factors make it impossible to fully account for estimation errors.

Carbon Storage and Annual Sequestration

Increasing levels of atmospheric CO_2 and other greenhouse gases (e.g., methane, chlorofluorocarbons, nitrous oxide) are thought to contribute to an increase in atmospheric temperatures by the trapping of certain wavelengths of radiation in the atmosphere (U.S. Nat. Res. Council, 1983). Through growth processes, trees remove atmospheric CO_2 and store C within their biomass.

Biomass for each measured tree was calculated using allometric equations from the literature (see Nowak 1994b; Nowak et al., 2002b). Equations that predict above-ground biomass were converted to whole tree biomass based on root-to-shoot ratio of 0.26 (Cairns et al., 1997). Equations that compute fresh-weight biomass were multiplied by species- or genus- specific-conversion factors to yield dry-weight biomass. These conversion factors, derived from average moisture contents of species given in the literature, averaged 0.48 for conifers and 0.56 for hardwoods (USDA 1955; Young and Carpenter 1967; King and Schnell 1972; Wartluft 1977; Stanek and State 1978; Wartluft 1978; Monteith 1979; Clark et al. 1980; Ker 1980; Phillips 1981; Husch et al. 1982; Schlaegel 1984a,b,c,d; Smith 1985).

Open-grown, maintained trees tend to have less above-ground biomass than predicted by forest-derived biomass equations for trees of the same diameter at breast height (Nowak, 1994b). To adjust for this difference, biomass results for urban trees were

multiplied by a factor 0.8 (Nowak, 1994b). No adjustment was made for trees found in more natural stand conditions (e.g., on vacant lands or in forest preserves). As deciduous trees drop their leaves annually, only carbon stored in wood biomass was calculated for these trees. Total tree dry-weight biomass was converted to total stored carbon by multiplying by 0.5 (Forest Products Lab, 1952; Chow and Rolfe 1989).

The multiple equations used for individual species were combined together to produce one predictive equation for a wide range of diameters for individual species. The process of combining the individual formulas (with limited diameter ranges) into one, more general species formula, produced results that were typically within 2% of the original estimates for total carbon storage of the urban forest (i.e., the estimates using the multiple equations). Formulas were combined to prevent disjointed sequestration estimates that can occur when calculations switch between individual biomass equations.

If no allometric equation could be found for an individual species, the average of results from equations of the same genus was used. If no genus equations were found, the average of results from all broadleaf or conifer equations was used.

To estimate monetary value associated with urban tree carbon storage and sequestration, carbon values were multiplied by $22.8/tC based on the estimated marginal social costs of carbon dioxide emissions (Fankhauser, 1994).

Urban Tree Growth and Carbon Sequestration

Average diameter growth based on crown competition and tree condition was added to the existing tree diameter (year ***x***) to estimate tree diameter in year ***x+1***. To determine the average growth rate, a base growth was calculated for the Baltimore area. To determine a base growth rate, urban street tree (Frelich, 1992; Fleming, 1988; and Nowak, 1994b), park tree (DeVries, 1987), and forest growth estimates (Smith and Shifley, 1984) were standardized to growth rates for Minnesota (153 frost free days) based on:

Standardized growth = measured growth x (153/ number of frost free days of measurement)

Average standardized growth rates for street (open-grown) trees was 0.83 cm/yr. The number of frost free days for Baltimore is 214 days. Thus standardized growth rates for street trees were:

Standardized growth (SG) = 0.83 cm/yr x 214 / 153 = 1.16 cm/yr

Growth rates of trees of the same species or genera were compared to determine the average difference between standardized street tree growth and standardized park and forest growth rates. Park growth averaged 1.78 times less than street trees; and forest growth averaged 2.29 times less than street tree growth. Crown light exposure (CLE) measurements of 0-1 were used to represent forest growth conditions; 2-3: park conditions; and 4-5: open-grown conditions. Thus, base growth factors per trees were calculated as: Base growth = SG for CLE 4-5 ; Base growth = SG/1.78 for CLE 2-3; and Base growth = SG/2.26 for CLE 0-1.

Growth rates were adjusted based on tree condition. For trees in fair to excellent condition, base growth rates were multiplied by 1 (no adjustment), poor trees' growth rates were multiplied by 0.76, critical trees by 0.42, dying trees by 0.15, and dead trees' growth rates by 0. Adjustment factors were based on percent crown dieback and the assumption that less than 25-percent crown dieback had a limited effect on d.b.h. growth rates. Average height growth was calculated based on formulas from Fleming (1988) and the specific dbh growth factor used for the tree. The difference in estimates of C storage between year ***x*** and year ***x+1*** is the gross amount of C sequestered annually.

Tree death leads to the eventual release of stored C. In estimating the net amount of C sequestered by the urban forest, C emissions due to decomposition after tree death must be considered. To calculate the potential release of carbon due to tree death, estimates of annual mortality rates by condition class were derived from a study of street-tree mortality (Nowak 1986). Annual mortality was estimated as 1.92 percent for trees 0 to 3 inches in the good-excellent class; 1.46 percent for trees more than 3 inches in the good-excellent class; 3.32 percent for trees in fair condition; 8.86 percent

for trees in poor condition; 13.08 percent for trees in critical condition; 50 percent for dying trees, and 100 percent for dead trees.

Two types of decomposition rates were used: 1) rapid release for above-ground biomass of trees that are projected to be removed, and 2) delayed release for standing dead trees and tree roots of removed trees. Trees that are removed from urban areas are not normally developed into wood products for long-term carbon storage (i.e., removed trees are often burned or mulched), therefore they will most likely release their carbon relatively soon after removal.

If dead trees are not removed annually, they have an increased probability of being measured in the tree sample and decomposition rates must reflect this difference. All trees on vacant and transportation land uses, and 50% of trees in parks, were assumed to be left standing (i.e., not removed) as these trees are likely within forest stands and/or away from intensively maintained sites. These trees were assumed to decompose over a period of 20 years[6]. Trees on all other land uses were assumed to be removed within one year of tree death. For removed trees, above-ground biomass was mulched with a decomposition rate of three years[7]; below-ground biomass was assumed to decompose in 20 years.

Estimates of C emissions due to decomposition were based on the probability of the tree dying within the next year and the probability of the tree being removed using the formula:

$$Emission = C \times M_c \times \sum p_i((D_{remove}) + (D_{stand}))$$

$$D_{remove} = (p_{ab} / y_i)(1/d_m) + ((1 - p_{ab}) / y_i)(1/d_r)$$

$$D_{stand} = ((y_i - 1) / y_i)(1/d_r)$$

[6]There are few data on tree decomposition rates. Using decomposition rates of 10 to 50 years had little effect on the overall net decomposition.

[7]Although no mulch decomposition studies could be found, studies on decomposition reveal that 37-56% of carbon in tree roots and 48-67% of carbon in twigs is released within the first three years (Scheu and Schauermann, 1994).

where Emission = individual tree contribution to carbon emissions; C = carbon storage in the next year; M_c = probability of mortality based on condition class; i = decomposition class (based on number of years left standing before removal); p_i = proportion of the land use tree population in decomposition class i; p_{ab} = proportion of tree biomass above ground; y_i = number of years left standing before removal ($y_i \rightarrow \infty$ for dead trees that will never be cut down (natural decomposition)); d_m = decomposition rates for mulched above-ground biomass (3 years); and d_r = decomposition rate for standing trees and tree roots (20 years).

Individual tree estimates of mortality probability and decomposition rates were aggregated upward to yield total estimates of decomposition for the tree population. The amount of carbon sequestered due to tree growth was reduced by the amount lost due to tree mortality to estimate the net carbon sequestration rate.

UFORE-D: Air Pollution Removal

UFORE-D was used to estimate dry deposition of air pollution (i.e., pollution removal during nonprecipitation periods) to trees and shrubs (Nowak et al. 1998). This module calculates the hourly dry deposition of O_3, SO_2, NO_2, and CO, and PM10 to tree canopies throughout the year based on tree-cover data, hourly NCDC weather data, and U.S. Environmental Protection Agency (EPA) pollution-concentration monitoring data.

In UFORE-D, the pollutant flux (F; in g m $^{-2}$ s^{-1}) is calculated as the product of the deposition velocity (V_d; in m s^{-1}) and the pollutant concentration (C; in g m^{-3}):

$$F = V_d \times C$$

Deposition velocity is calculated as the inverse of the sum of the aerodynamic (R_a), quasi-laminar boundary layer (R_b) and canopy (R_c) resistances (Baldocchi et al. 1987):

$$V_d = (R_a + R_b + R_c)^{-1}$$

Hourly meteorological data from the BWI airport was used in estimating R_a and R_b. The aerodynamic resistance is calculated as (Killus et al. 1984):

$$R_a = u(z) \times u_*^{-2}$$

where u(z) is the mean windspeed at height z (m s^{-1}) and $\boldsymbol{u}_*$ is the friction velocity (m s^{-1}).

$$u_* = (k \times u(z-d))[\ln((z-d) \times z_o^{-1}) - \psi_M((z-d) \times L^{-1}) + \psi_M(z_o \times L^{-1})]^{-1}$$

where k = von Karman constant, d = displacement height (m), z_o = roughness length (m), ψ_M = stability function for momentum, and L = Monin-Obuhkov stability length. L was estimated by classifying hourly local meteorological data into stability classes using Turner classes (Panofsky and Dutton 1984) and then estimating 1/L as a function of stability class and z_o (Zannetti 1990). When L < 0 (unstable) (van Ulden and Holtslag 1985):

$$\psi_M = 2\ln[0.5(1+X)] + \ln[0.5(1+X^2)] - 2\tan^{-1}(X) + 0.5\pi$$

where X = $(1 - 28\, z\, L^{-1})^{0.25}$ (Dyer and Bradley 1982). When L > 0 (stable conditions):

$$u_* = C_{DN} \times u\{0.5 + 0.5[1 - (2u_o / C_{DN}^{\frac{1}{2}} \times u))^2]^{\frac{1}{2}}\}$$

where $C_{DN} = k\,(\ln(z/z_o))^{-1}$; $\boldsymbol{u}_o^2 = (4.7\, z\, g\, \theta_*)\, T^{-1}$; g = 9.81 m s^{-2}; $\theta_* = 0.09\,(1 - 0.5\, N^2)$; T = air temperature ($K^o$); and N = fraction of opaque cloud cover (Venkatram 1980; US EPA 1995). Under stable conditions, $\boldsymbol{u}_*$ was calculated by scaling actual windspeed with a calculated minimum windspeed based on methods given in US EPA (1995).

The quasi-laminar boundary-layer resistance was estimated as (Pederson et al. 1995):

$$R_b = 2(Sc)^{\frac{2}{3}}(\mathrm{Pr})^{-\frac{2}{3}}(k \times u_*)^{-1}$$

where k = von Karman constant, Sc = Schmidt number, and Pr is the Prandtl number.

In-leaf, hourly tree canopy resistances for O_3, SO_2, and NO_2 were calculated based on a modified hybrid of big-leaf and multilayer canopy deposition models (Baldocchi et al. 1987; Baldocchi 1988). Canopy resistance (R_c) has three components: stomatal resistance (r_s), mesophyll resistance (r_m), and cuticular resistance (r_t), such that:

$$1/R_c = 1/(r_s + r_m) + 1/r_t$$

Mesophyll resistance was set to zero s m^{-1} for SO_2 (Wesely 1989) and 10 s m^{-1} for O_3 (Hosker and Lindberg 1982). Mesophyll resistance was set to 100 s m^{-1} for NO_2 to account for the difference between transport of water and NO_2 in the leaf interior, and to

bring the computed deposition velocities in the range typically exhibited for NO_2 (Lovett 1994). Base cuticular resistances were set at 8,000 m s^{-1} for SO_2, 10,000 m s^{-1} for O_3, and 20,000 m s^{-1} for NO_2 to account for the typical variation in r_t exhibited among the pollutants (Lovett 1994).

Hourly inputs to calculate canopy resistance are photosynthetic active radiation (PAR; μE m^{-2} s^{-1}), air temperature (K^o), windspeed (m s^{-1}), $\boldsymbol{u}_*$ (m s^{-1}), CO_2 concentration (set to 360 ppm), and absolute humidity (kg m^{-3}). Air temperature, windspeed, $\boldsymbol{u}_*$, and absolute humidity are measured directly or calculated from measured hourly NCDC meteorological data. Total solar radiation is calculated based on the METSTAT model with inputs from the NCDC data set (Maxwell 1994). PAR is calculated as 46 percent of total solar radiation input (Monteith and Unsworth 1990).

As CO and removal of particulate matter by vegetation are not directly related to transpiration, R_c for CO was set to a constant for in-leaf season (50,000 s m^{-1}) and leaf-off season (1,000,000 s m^{-1}) based on data from Bidwell and Fraser (1972). For particles, the median deposition velocity from the literature (Lovett 1994) was 0.0128 m s^{-1} for the in-leaf season. Base particle V_d was set to 0.064 based on a LAI of 6 and a 50-percent resuspension rate of particles back to the atmosphere (Zinke 1967). The base V_d was adjusted according to actual LAI and in-leaf vs. leaf-off season parameters.

The model uses tree and shrub LAI and percent tree and shrub leaf area that are evergreen from UFORE-A calculations. Local leaf-on and leaf-off dates are input into the model so that deciduous-tree transpiration and related pollution deposition are limited to the in-leaf period. Particle collection and gaseous deposition on deciduous trees in winter assumed a surface-area index for bark of 1.7 (m^2 of bark per m^2 of ground surface covered by the tree crown) (Whittaker and Woodwell 1967). To limit deposition estimates to periods of dry deposition, deposition velocities were set to zero during periods of precipitation.

Hourly pollution concentrations (ppm) for gaseous pollutants for 2000 were obtained from the EPA monitors in Baltimore (one CO monitor; one NO_2 monitor; one O_3 monitor; five PM10 monitors; and one SO_2 monitor). Hourly ppm values were converted to µg m^{-3} based on measured atmospheric temperature and pressure (Seinfeld 1986). Average daily concentrations of PM10 (µg m^{-3}) also were obtained from the EPA. Missing hourly meteorological or pollution-concentration data are estimated using the monthly average for the specific hour. In several locations, an entire month of pollution-concentration data may be missing and are estimated based on interpolations from existing data. For example, O_3 concentrations may not be measured during winter months and existing O_3 concentration data are extrapolated to missing months based on the average national O_3 concentration monthly pattern.

Average hourly pollutant flux (g m^{-2} of tree canopy coverage) among the pollutant monitor sites was multiplied by total tree-canopy coverage (m^2) to estimate total hourly pollutant removal by trees across the city. Bounds of total tree removal of O_3, NO_2, SO_2, and PM10 were estimated using the typical range of published in-leaf dry deposition velocities (Lovett 1994).

The monetary value of pollution removal by trees is estimated using the median externality values (estimates of external values or impacts on society or environment not accounted for in the production of a product or good) for the United States for each pollutant (Murray et al. 1994). These values were adjusted to 2007 values based on the producer's price index (Capital District Planning Commission, 2008) and are (in dollars per metric ton (t)): NO_2 = \$9,906 t^{-1}, PM10 = \$6,614 t^{-1}, SO_2 = \$2,425 t^{-1}, and CO = \$1,407 t^{-1} . Externality values for O_3 were set to equal the value for NO_2.

UFORE-E: Building Energy Effects

UFORE-E estimates the effects of trees on building energy use and consequent emissions of carbon from power plants (Model Output Tables 17 and 18). Methods for these estimates are based on a report by McPherson and Simpson (1999). For each tree within 18 m of two-story or lower residential buildings, information on distance and

direction to the building was recorded. Any “energy tree” that was smaller than 6 meters in height or farther than 18 meters from a building was considered to have no effect on building energy use.

Using the tree size, distance, direction to building, climate region, leaf type (deciduous or evergreen) and percent cover of buildings and trees on the plot, the amount of carbon avoided from power plants due to the presence of trees was calculated based on methods in McPherson and Simpson (1999). The amount of carbon avoided was categorized into the amount of MWh (cooling), and MBtus and MWh (heating) avoided due to tree energy effects. Default energy effects per tree were set for each climate region, vintage building types (period of construction), tree size class, distance from building, energy use (heating or cooling) and/or leaf type (deciduous or evergreen) depending upon the energy effect of the tree (tree shade, windbreak effects, and local climate effect) (McPherson and Simpson, 1999). Default shading and climate effect values were applied to all trees; heating windbreak energy effects were assigned to each evergreen tree. As shading effect default values were only given for one vintage building type (post-1980), vintage adjustment factors (McPherson and Simpson, 1999) were applied to obtain shading effect values for all other vintage types.

Tree Condition Adjustment

To adjust for varying energy effects of trees due to tree condition, the default energy effect values (McPherson and Simpson, 1999) were adjusted for the tree condition as follows:

$$\text{Energy adjustment} = 0.5 + (0.5 \times \text{tree condition})$$

where tree condition = 1 - % dieback. This adjustment was done to account for differences in effects between wood and leaves in dead and live trees (dead trees were assumed to retain half the effect of healthy lives due to the shade and wind impacts of branches and trunk effects of dead trees. This adjustment factor was applied to all tree energy effects for cooling, but only to evergreen trees for the heating energy use effects.

Local Climate Effects

As tree cover increases in an area, the individual tree effect on climate diminishes, though the total effect of all trees can increase. Base climate effect values for a tree were given for plots of 10, 30 and 60 % cover (McPherson and Simpson, 1999). Interpolation formulas (McPherson and Simpson, 1999) were used to determine the actual tree value based on the specific plot percent tree and building cover. For plots with less than 10% cover, the slope between the 10 and 30 % cover values was used for the interpolation. Plots with percent cover greater than 60 % used the slope between 30 and 60 % cover with a minimum individual tree climate effect of one-third the effect at 60% cover. This minimum was set to prevent a tree from obtaining a zero or negative effect at high cover (100%).

The total shading, windbreak, and climate energy effects due to trees on a plot were calculated by summing the individual tree's energy effects for the particular energy use and housing vintage. These values were adjusted for the distribution of the different vintage types within the climate region (McPherson and Simpson, 1999).

Since the default cooling energy effects were determined based on the climate region's electricity emissions factors, it was necessary to convert the cooling energy effects to the state-specific equivalent. This conversion was accomplished by multiplying all of the plot cooling energy effects by the ratio of the state-specific electricity emissions factor (0.6156 tCO_2/MWh for MD) to the climate region's electricity emissions factor (0.605 tCO_2/MWh for Mid Atlantic Region) (McPherson & Simpson, 1999).

Home heating source distribution for the region (52% natural gas, 17% fuel oil, 4% heat pump, 10% electricity, 16% other (including wood) for the Mid Atlantic region) was used to partition the carbon emissions from heating to the appropriate energy source. Standard conversion factors (t CO_2 / MWh, t CO_2 / MBtu) were used to convert the energy effect from t CO_2 to units of energy saved (MBtus, MWh). Cooling and heating electricity use (MWh) had state-specific conversion factors (0.6156 tCO_2/MWh for MD); and non-electrical heating fuels (MBtus) used a standard conversion factor (e.g., 0.0527

t CO_2/MBtu for natural gas; 0.072 t CO_2/MBtu for fuel oil) because this factor does not vary by region (McPherson and Simpson, 1999). Total plot effects were combined to yield the total energy and associated carbon effect due to the urban forest.

To determine the estimated economic impact of the change in building energy use, state average price per kWh ($0.118) for 2007 (Energy Information Administration, 2008a) and per MBtu for natural gas and fuel oil (2007) and wood (2005) (Energy Information Administration, 2008b-d) were used. These values were $15.5, $24.4, and $2.0 per MBtu, respectively for the URDL analysis. State prices were used to determine the value of energy effects. Average price for heating change due to trees was based on the average distribution of buildings in the region that heat by natural gas (52%), fuel oil (17%), and other (including wood) (16%) (McPherson and Simpson, 1999).

Soil Sampling

Two techniques were used to acquire soil samples within the UFORE plots: 1) three undisturbed 5-cm diameter by 5-cm depth cores were used to measure bulk density and 2) a composite soil sample (0-5 cm depth) with a 2-cm-diameter stainless steel sampling probe. If present, the depth of organic horizon was recorded but was omitted from the sample. Typically, 10 to 15 cores per plot were sampled and composited from the dominant cover type within the plot. Each composite sample was air dried and sieved in the laboratory with a stainless steel 2-mm mesh sieve. The undisturbed cores were used to determine soil bulk density. Subsamples were digested at the Baltimore Ecosystem Study/University of Maryland Baltimore County (UMBC) Laboratory using 7.7 N nitric acid. These extracts were analyzed at UMBC to determine acid soluble Ag, Al, As, , Ba, Cd, Co, Cr, Cu, Fe, , Mn, Mo, Ni, , Pb, Tl, and using Inductively Coupled Plasma Atomic Admissions. A subsample of each composite sample was also sent to the Cornell University Soil Lab and extracted with Morgan's solution to estimate available concentrations of Ca, K, Mg, and P. These samples were also used to estimate organic matter concentration through loss on ignition and soil pH using a 1:2 mixture.

All elemental data are reported on a soil dry weight basis in mg kg^{-1}; bulk density as Mg m^{-3}; soil C stocks as tonnes ha^{-1}; and soil C densities (accounts for bulk density differences) as kg m^{-2} to a 1 m depth. To assess the nutrient and heavy metal status of all soils sampled, frequency distribution plots were used to determine the proportion of plots that exceed or fall within guideline values for actual concentrations measured in the UFORE plots. In the case of the essential nutrients measured (Ca, K, Mg, and P), the distribution is compared with horticultural guidelines of the Maryland Extension Service and values reported in the literature for this region. In addition, to evaluate the potential public health risk of soil contamination by heavy metals, the concentrations measured in the URDL are compared to guidelines published by the EPA and a European Union country (The Netherlands). The Netherlands target values reflect concentration levels to fully recover the functional properties of the soil for humans, plants, and animals (VROM, 1988; VROM, 1999; Swartjes, 1999), and EPA screening values are risk-based concentrations derived from standardized equations using assumptions of exposure with EPA toxicity data (http://www.epa.gov/superfund/health/conmedia/soil/pdfs/fact_sht.pdf , verified on 2/17/2009). The frequency distributions of the heavy metals Pb, Cr, Ni, and Cu were compared with distributions measured in Baltimore City and Washington DC. The use of distribution curves in the reporting of soil nutrient and heavy metal concentrations of soils is in the development phase.

Finally, using soil C data collected from separate studies in Baltimore City, Baltimore County, and elsewhere (Pouyat et al., 2006;, Pouyat et al., 2008) the soil C densities for soils were calculated, using a tabular model, in each land use category (weighted by the area of each) for three scenarios representing the range of values found (high, medium, and low C densities for residential and forest soils) to estimate the belowground C stocks for areas within the URDL (Table 3). Four “manipulations” of the above scenarios were then conducted to estimate the importance of soil C stocks in forested versus residential and impervious areas by: 1) converting 25% of forest land within the URDL to adjacent land uses, 2) converting 25% forest land to impervious surfaces, 3)

converting 25% impervious to adjacent land use and 4) converting 25% of impervious surfaces to forest.

Data Quality Control and Quality Assurance

Field crews were trained over a 3-day period to collect UFORE data by USDA Forest Service personnel. During the training session hot checks were performed on the field crews. Hot checks consist of the trainer observing the field crews on the plot doing the mensuration of plot and tree variables and correcting any issues that were encountered.

A 3 percent resampling of plots was then undertaken for cold checks early in the sampling season. These checks remeasure all of the plot and tree variables and compare them to the original field crew measurements. Only one plot did not meet the measurement quality objectives set forth by the USDA Forest Service guidelines for UFORE. The measurements not in agreement were corrected and the field crew was notified of the errors. The one plot was determined to be aberrant and the errors were not systematic with other field plots.

Results

Urban Forest Characteristics

The urban forest within the URDL has an estimated 6,758,500 trees (Model Output Table #1). A total of 89 live tree species were identified at sample plots. The three most common live species are red maple (9.1 percent), tulip tree (5.7 percent), and black cherry (5.2 percent) (Figure 2) (Model Output Table #2). Unidentified dead trees were the second most tallied of all trees in the study. Although no species were identified with these dead trees, it does portray a management situation that might need attention.

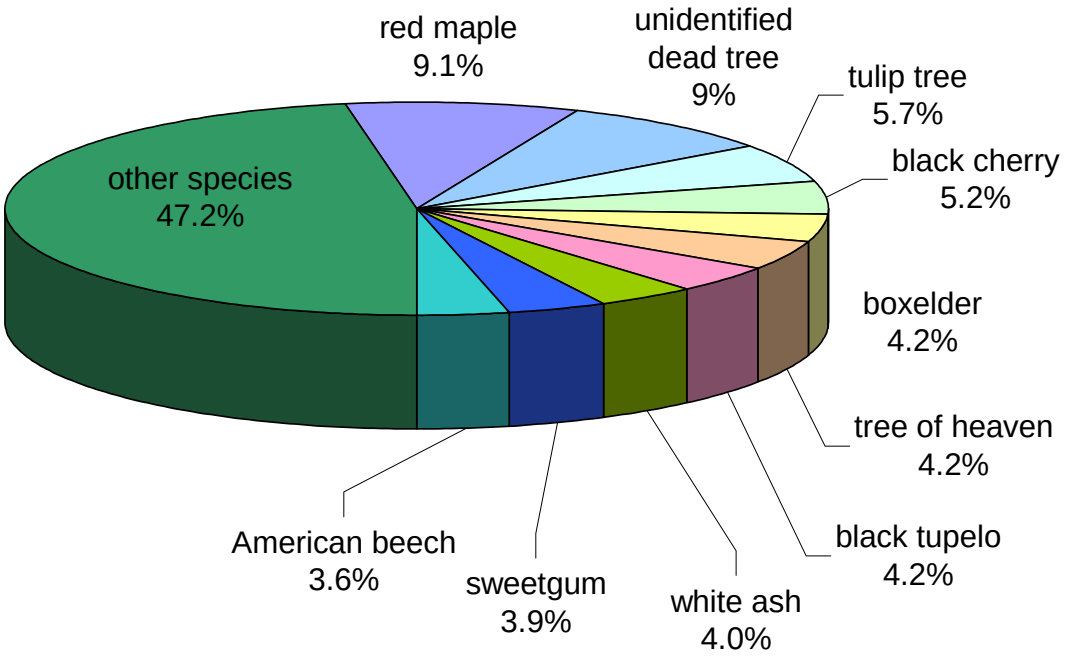


Figure 2. Species Composition in the URDL

The urban forest has a reverse J-shape diameter distribution indicating a sustainable forest structure with smaller-diameter cohorts that will replace the loss of larger individuals due to attrition. Trees that have diameters less than or equal to 6-inches constitute 58.3 percent of the population (Figure 3). The estimated percentage of trees

by size class for each species are presented in Model Output Tables #3-5. Additional tables rating tree condition by species, dbh, and/or land use are given in Model Output Tables #6-8)

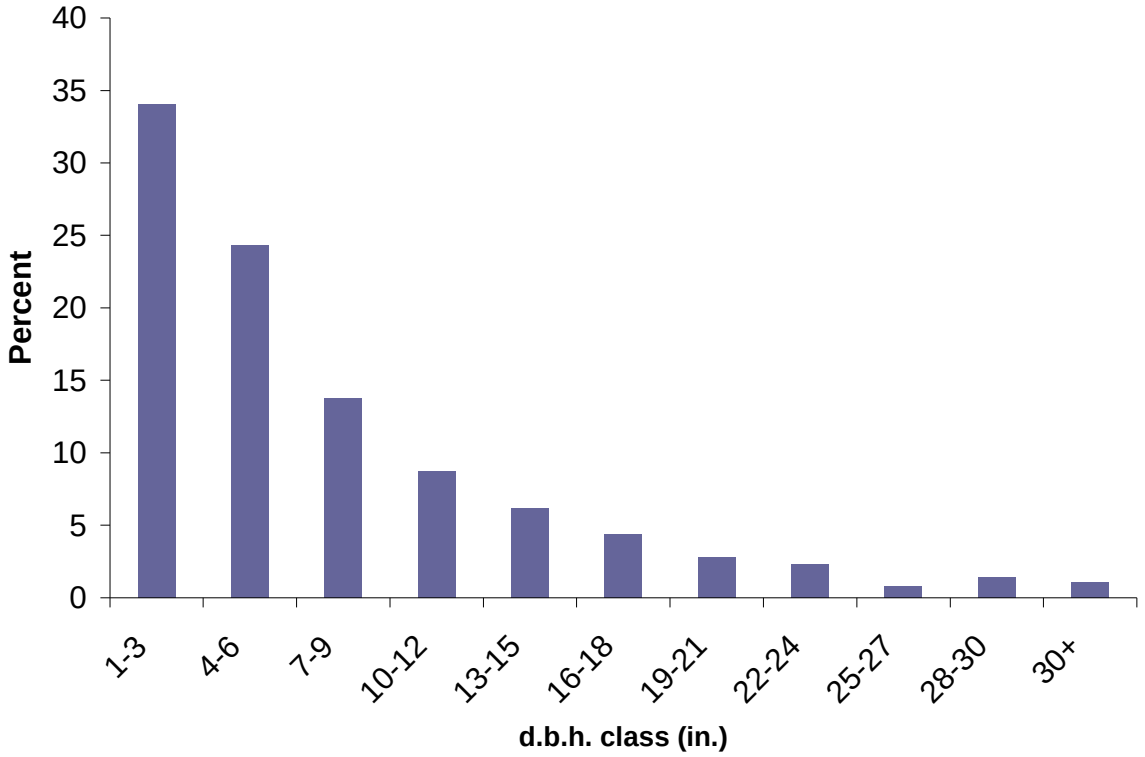


Figure 3. Diameter distribution of trees within the URDL

Among the land use categories, the highest tree density occurs in Open Space followed by Institutions and Large Lot Single-Family (Figure 4) (Model Output Tables #9-10). The overall tree density within the URDL is 62.5 trees / acre (comparable values for other cities are presented in Appendix I).

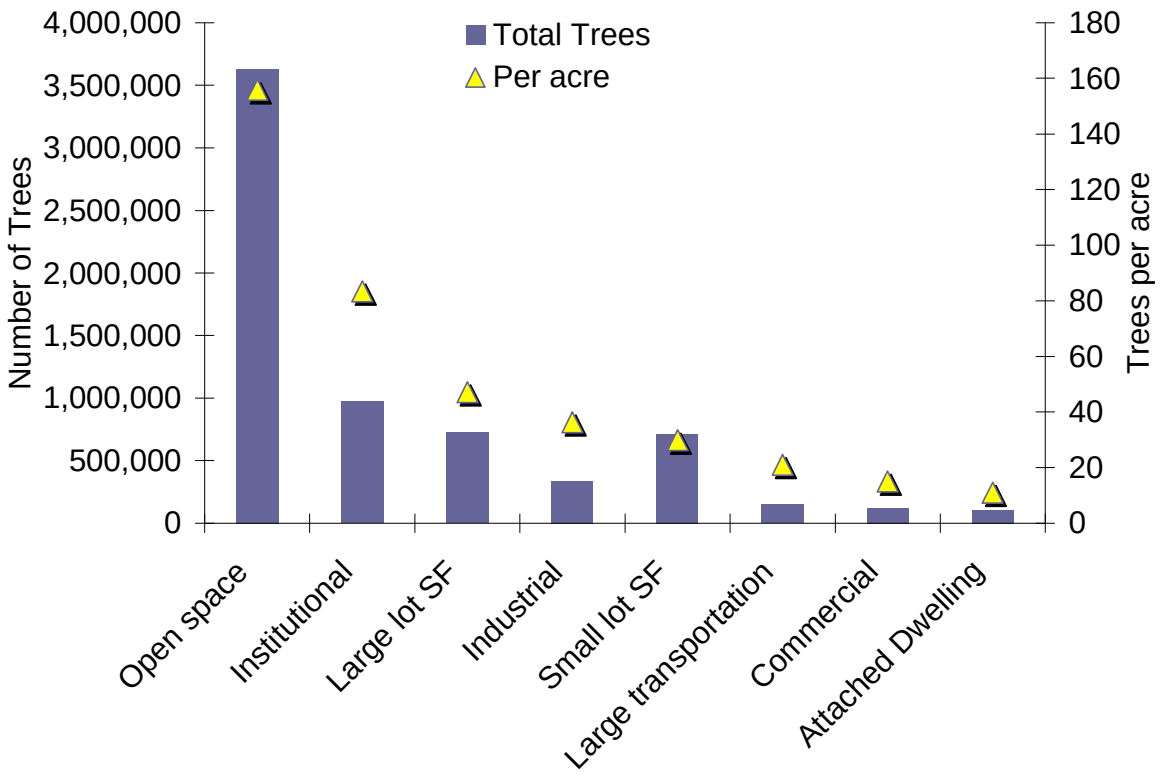
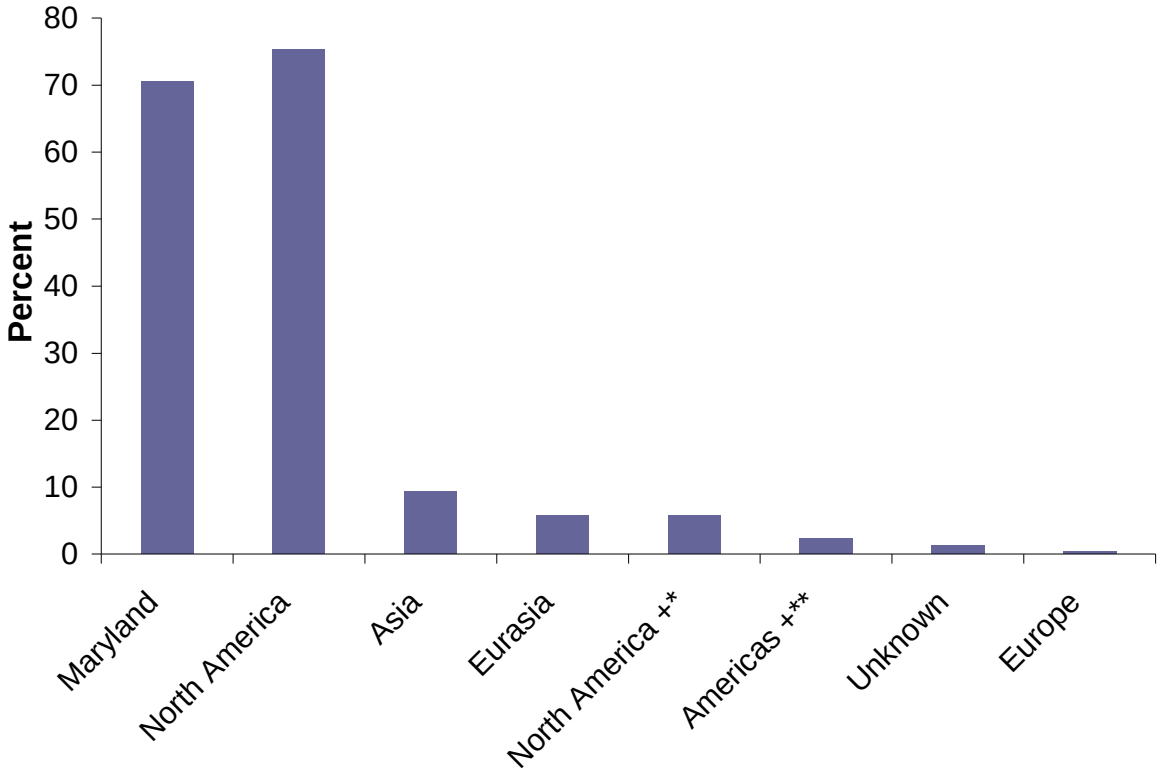


Figure 4. Number of trees and tree density in the URDL

Urban forests are composed of a mix of native and exotic tree species. Thus, urban forests often have a tree diversity that is higher than surrounding native landscapes. Increased tree diversity can minimize the overall impact or destruction by a species-specific insect or disease, but it can also pose a risk to native plants if some of the exotic species are invasive plants that can potentially out-compete and displace native species. Within the URDL, about 75 percent of the trees are from species native to North America, while 71 percent are native to the State of Maryland. Species exotic to North America make up 25 percent of the population with most exotic tree species having an Asian origin (9.3 percent of the species) (Figure 5). The percentage of species exotic to Maryland is greatest for commercial and industrial land uses (Model Output Table # 11).



* - native to North America and other continents but not South America

** - native to North and South America and at least one other continent

Figure 5. Origin of tree species within the URDL

Leaf Area and Urban Forest Ground Cover

Tree benefits such as reduced air temperature, stormwater mitigation, and pollution removal can be directly equated to leaf area of trees. Tree species that dominate leaf area of the URDL are tulip tree, red maple, and northern red oak (Model Output Table #2, 12). The three species contribute close to 37 percent of the leaf area in the study. The percent leaf area of a species is one of the components used to determine the overall species importance in the urban forest. Importance values (IV) for tree species

are calculated as the sum of percent leaf area and percent of population. The species that achieved the highest IVs are tulip tree, red maple, and white ash (Table 2).

Table 2. Highest importance values for tree species within the URDL

Common Name	% Population	% Leaf Area	IV
tulip tree	5.7	17.8	23.5
red maple	9.1	12.9	22.0
white ash	4.0	5.0	9.0
unidentified dead tree	8.7	0	8.7
northern red oak	2.0	6.3	8.3
American beech	3.6	4.4	8.0
silver maple	2.5	5.5	8.0
sweetgum	3.9	3.0	6.9
black cherry	5.2	1.7	6.9
boxelder	4.2	2.2	6.4
black tupelo	4.2	2.2	6.4

Ground covers are an important component of the urban forest. They contribute to the urban environment in different ways. Herbaceous ground cover, including maintained and unmaintained grass, provides greenspace for inhabitants along with providing benefits such as stormwater infiltration, reduced air temperatures, and pollution removal. Hardscape is another ground cover that is prevalent in urban areas (e.g., tar, cement, buildings). These ground covers impact the urban environment as well as increase stormwater runoff and increase air temperatures. Within the URDL, the ground covers that dominate are herbaceous/grass cover (53.2 percent), cement/tar surfaces (16.3 percent), and buildings (12.1 percent) (Figure 6) (Model Output Table #13).

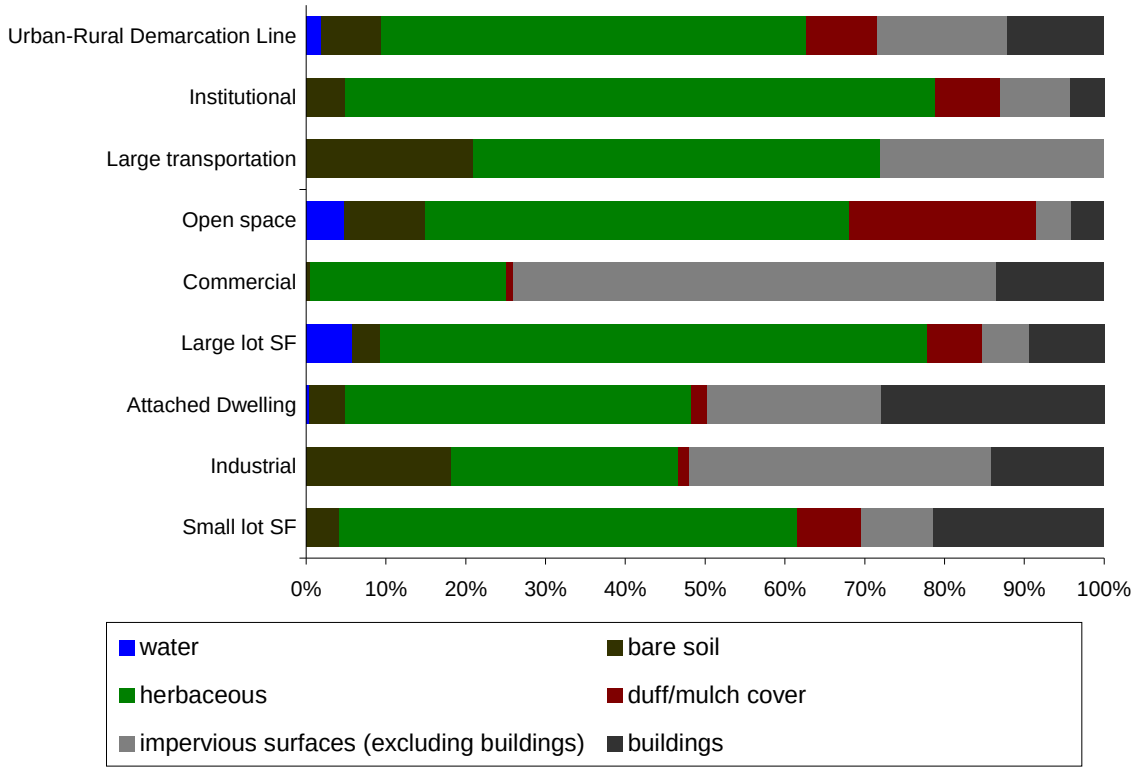


Figure 6. Ground cover percentages within the URDL

Air Pollution Removal by Urban Trees

Poor air quality is a common problem in many urban areas. It can lead to decreased human health, damage to landscape materials and ecosystem processes, and reduced visibility. The urban forest can help improve air quality by reducing air temperature, directly removing pollutants from the air, and reducing energy consumption in buildings, which consequently reduces air pollutant emissions from the power plants. Trees also emit volatile organic compounds that can contribute to ozone formation. However,

integrative studies have revealed that an increase in tree cover leads to reduced ozone formation.

A model simulation of a 20 percent loss in the Atlanta area forest due to urbanization led to a 14 percent increase in ozone concentrations for a modeled day (Cardelino and Chameides 1990). Although there were fewer trees to emit VOCs, an increase in Atlanta's air temperatures due to the urban heat island, which occurred concomitantly with tree loss, increased VOC emissions from the remaining trees and anthropogenic sources, and altered ozone chemistry such that concentrations of ozone increased.

A model simulation of California's South Coast Air Basin suggests that the air quality impacts of increased urban tree cover may be locally positive or negative with respect to ozone. The net basin-wide effect of increased urban vegetation is a decrease in ozone concentrations if the additional trees are low VOC emitters (Taha 1996).

Modeling the effects of increased urban tree cover on ozone concentrations from Washington, DC to central Massachusetts reveals that urban trees generally reduce ozone concentrations in cities, but tend to slightly increase average ozone concentrations across the entire study domain.. Interactions of the effects of trees on the physical and chemical environment demonstrate that trees can cause changes in pollution removal rates and meteorology, particularly air temperatures, wind fields, and mixing-layer heights, which, in turn, affect ozone concentrations. Changes in urban tree species composition had no detectable effect on ozone concentrations (Nowak et al. 2000). Modeling of the New York City metropolitan area also revealed that increasing tree cover 10% within urban areas reduced maximum ozone levels by about 4 ppb, which was about 37% of the amount needed for attainment (Luley and Bond 2002).

To estimate pollution removal using UFORE, the most important input variables are the local hourly weather and pollution data, amount of canopy cover (m^2) and the depth of canopy cover (leaf area index of the tree covered area). Leaf area is calculated based on the individual tree measurements on the plot and plot canopy cover is estimated by the field crews to the nearest 5 percent based on an ocular estimate using cover

templates. Total leaf area of the sample is divided by the total canopy area as determined by the plot estimates to determine the leaf area index (LAI) of the canopy area.

Typically the crews estimate tree canopy cover with 5 percent on average, and the leaf area index value for the canopy area is within the range of values found in the literature (typically around 4-5). However, if the crews underestimate canopy cover on the plots, the leaf area index will be increased to a higher than normal values (the leaf area estimate would be correct, but the index value would be inflated). Based on the leaf area index value derived from the field crew estimates of canopy cover, it is believed that the field crews underestimated canopy cover.

Tree and shrub cover based on field crew estimates were 25.5 percent (18.0 percent tree cover and 7.5 percent shrub cover). Recent analysis of high-resolution digital imagery for an urban tree cover analysis of the URDL reveals a tree and shrub cover of 37 percent (O'Neil-Dunne and Grove, unpublished data 2008). Photo interpretation of the aerial images confirms a tree and shrub cover of about 37 percent. This difference in cover estimates along with the relatively high leaf area index per unit of canopy indicates an underestimate of canopy cover by the crews. This underestimate would only affect estimates of pollution removal by trees for the UFORE model analyses.

To adjust for this probable underestimate, two pollution removal estimates were run using the UFORE model. Both runs have the same estimate of total leaf area, which is statistically correct, but each run distributes the canopy differently. For each run, only pollution removal by trees was estimated. For the original run, total tree cover equaled 16.8 percent based on the field crew estimate with a canopy LAI of 10.1. For the modified run, tree canopy cover was estimated at 29.5 percent (37 percent tree and shrub cover minus 7.5 percent shrub cover), with a canopy LAI of 5.8.

Based on the original analysis, it is estimated that trees remove 1,080 tons of air pollution (ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter smaller than 10 microns in diameter (PM_{10}), and sulfur dioxide (SO_2)) per year with an

associated value of $7.8 million. Pollution removal was greatest for ozone, followed by PM10, NO2, SO2, and CO (Figure 7, Table 3).

Based on the modified analysis with increased tree cover, it is estimated that trees remove 1,450 tons of air pollution (ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter smaller than 10 microns in diameter (PM_{10}), and sulfur dioxide (SO_2)) per year with an associated value of $10.6 million (Table 4).

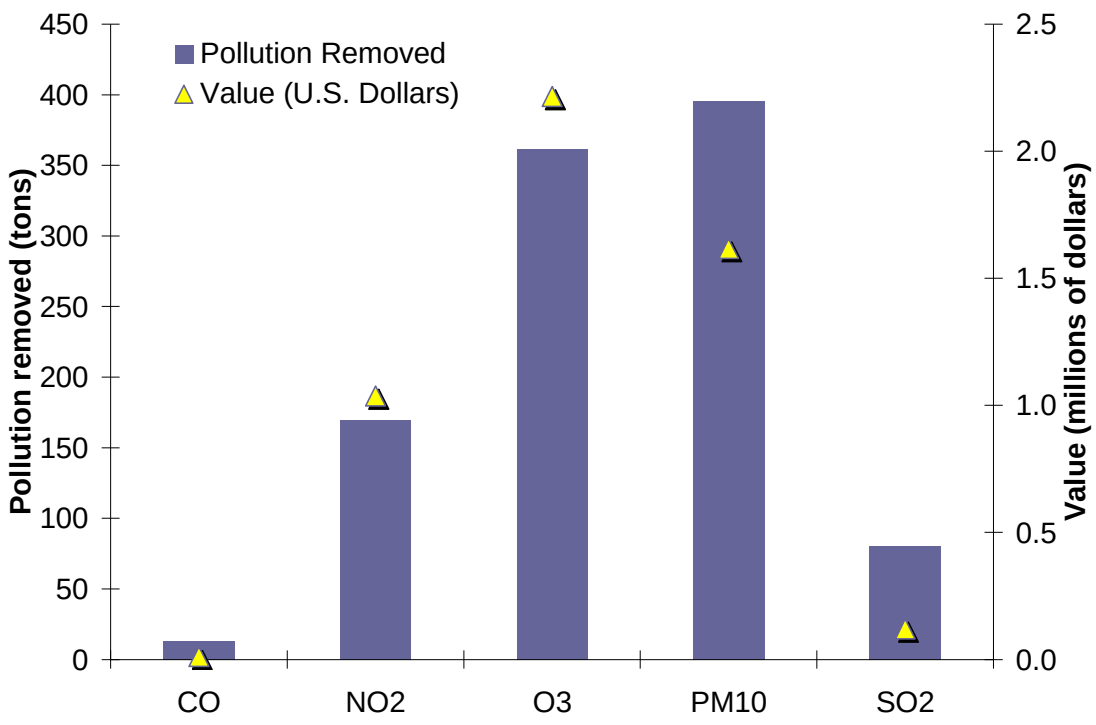


Figure 7. Pollution removal and dollar value

Table 3. Estimated air pollution removal, value and range based on field crew estimate of tree cover (underestimate of cover (16.8%)).

Pollutant	Removal (tons)	Value ($)
CO	13 (na)	16,700 (na)
NO_2	183 (69 -187)	1,648,000 (621,200 - 1,684,200)
O_3	401 (94 – 437)	3,606,100 (845,800 - 3,930,800)

PM10	395 (154 – 617)	2,371,600 (926,400 - 3,705,700)
SO_2	89 (40 – 126)	195,100 (88,900 - 277,600)
Total	1,081 (371 - 1,381)	7,837,500 (2,499,000 - 9,615,000)

Range of values in parentheses based on typical range of in-leaf dry deposition velocities in the literature (no range determined for CO; Lovett 1994)

Table 4. Estimated air pollution removal, value and range based on high resolution map estimate of tree cover (29.5%).

Pollutant	Removal (tons)	Value ($)
CO	23 (na)	29,300 (na)
NO_2	250 (109 – 316)	2,246,500 (978,800 - 2,840,900)
O_3	592 (145 – 746)	5,321,600 (1,302,700 - 6,707,000)
PM10	455 (178 – 711)	2,730,000 (1,066,400 - 4,265,700)
SO_2	134 (64 – 215)	295,400 (141,700 - 472,200)
Total	1,454 (519 – 2,010)	10,622,900 (3,518,900 – 14,315,100)

Range of values in parentheses based on typical range of in-leaf dry deposition velocities in the literature (no range determined for CO; Lovett 1994)

Carbon Storage and Sequestration

Increasing levels of atmospheric carbon dioxide (CO_2) and other "greenhouse" gases (i.e., methane (CH_4), chlorofluorocarbons, nitrous oxide (N_2O), and tropospheric ozone (O_3)) are thought by many to be contributing to an increase in atmospheric temperatures by the trapping of certain wavelengths of radiation in the atmosphere. Eleven of the last twelve years (1995 -2006) rank among the 12 warmest years in the instrumental record of global surface temperature (since 1850). The total temperature increase from 1850 – 1899 to 2001 – 2005 is 0.76 [0.57 to 0.95]°C. For the next two decades a warming of about 0.2°C per decade is projected. Based on various modeling scenarios, increased globally averaged surface warming by 2090-2099 is projected to be between 0.6°C (2000 emission level) to 4.0ºC (IPCC, 2007).

Carbon dioxide is a dominant greenhouse gas. By fixing carbon during photosynthesis and storing excess carbon as biomass, growing trees act as a sink for CO_2. The net long-term CO_2 source/sink dynamics of forests change through time as trees grow, die, and decay. In addition, human influences on forests (e.g., management) can further affect CO_2 source/sink dynamics of forests through such factors as fossil fuel emissions

and harvesting/utilization of biomass. However, increasing the number of trees might potentially slow the accumulation of atmospheric carbon (e.g., Moulton and Richards, 1990). In addition to carbon storage and sequestration, urban trees can help mitigate climate change by altering energy use in buildings, and consequently altering carbon dioxide emissions from fossil-fuel based power plants.

Trees reduce the amount of carbon in the atmosphere by sequestering carbon in new growth every year. The amount of carbon annually sequestered is increased with the size and health of the trees (Model Output Table #14). The gross sequestration of trees within the URDL is about 38,500 tons of carbon per year with an associated value of $797 thousand. Net carbon sequestration in the urban forest is about 25,900 tons per year.

As trees grow they store more carbon as wood. As trees die and decay, they release much of the stored carbon back to the atmosphere. Thus, carbon storage is an indication of the amount of carbon that can be lost if trees are allowed to die and decompose. Trees within the URDL are estimated to store 1,311,000 tons of carbon ($27.1 million). Of the species sampled, tulip trees store and sequester the most carbon (approximately 19.4% of the total carbon stored and 11.8% of all sequestered carbon) (Figures 8 Table 5).

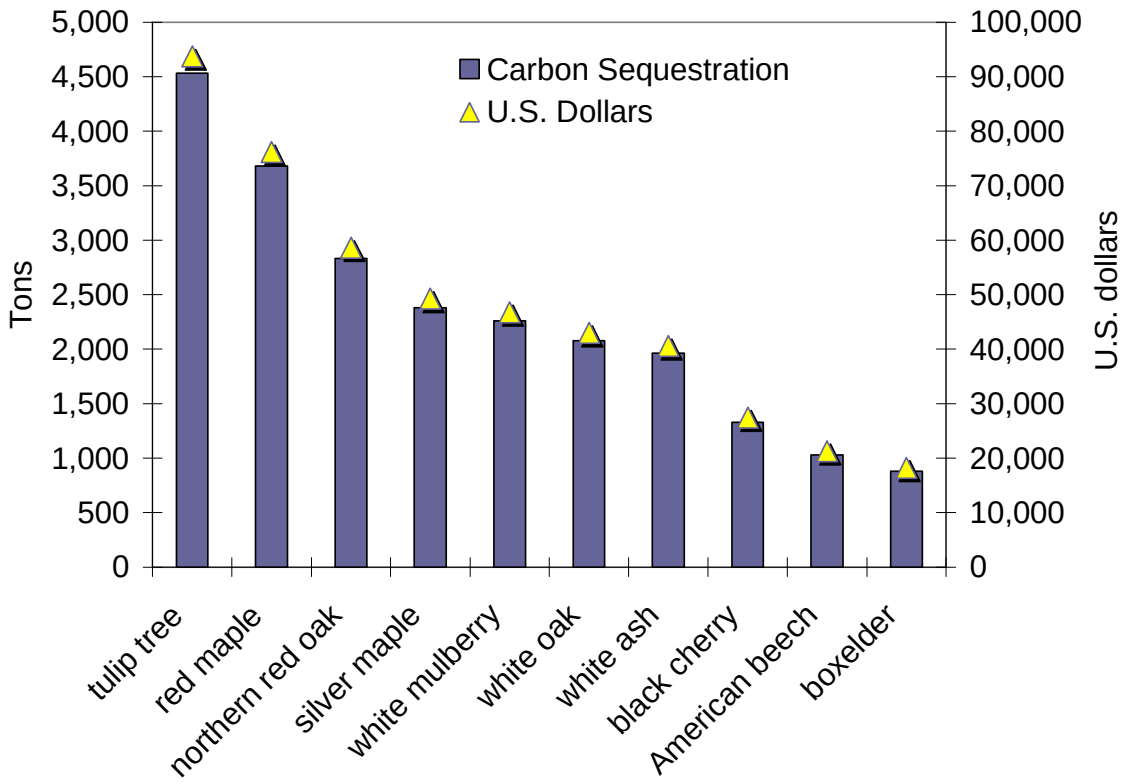


Figure 8. Carbon storage and sequestration for trees within the URDL

Table 5. Estimated carbon storage and gross annual sequestration by trees within the URDL

	Carbon Storage (tons)			Carbon Sequestration (tons/yr)		
Species	**%**	**N**	**SE**	**%**	**N**	**SE**
tulip tree	19.4	230,900	62,000	11.8	4,110	950
northern red oak	11.3	133,900	36,700	7.4	2,570	760
red maple	7.8	93,100	24,000	9.5	3,340	730
white ash	7.1	84,700	37,100	5.1	1,780	740
silver maple	6.5	77,600	36,900	6.2	2,160	890
white oak	6.1	72,500	25,200	5.4	1,890	610
dead tree	5.2	61,400	14,000	0	0	0
white mulberry	4.7	55,400	32,400	5.9	2,050	1,060
American beech	2.2	26,500	11,100	2.7	930	320
black cherry	1.9	22,200	10,200	3.4	1,210	420
chestnut oak	1.9	22,200	15,300	1.7	610	350
horsechestnut	1.6	18,700	18,700	1.1	380	380
American sycamore	1.5	17,300	13,100	1.6	560	350
sweetgum	1.4	16,100	6,000	1.7	590	210
eastern cottonwood	1.3	16,100	15,100	0.8	280	260
black locust	1.2	14,700	8,300	1.5	530	260

boxelder	1.1	12,600	4,900	2.3	800	290
norway maple	1	12,300	5,100	2	710	270
honeylocust	1	11,900	10,800	1.5	540	490
eastern white pine	0.9	10,900	7,100	1.9	660	430
cherry	0.9	11,000	9,400	1.8	650	490
Japanese maple	0.9	10,300	7,300	1.3	460	280
black tupelo	0.7	8,600	3,000	1.5	530	200
willow oak	0.7	8,000	6,300	0.5	190	110
balsam poplar	0.7	8,700	8,700	1.1	370	370
pin oak	0.7	8,700	8,200	0.7	250	200
sweet cherry	0.6	6,800	3,400	1.6	570	300
holly	0.6	7,100	7,100	1.1	390	390
tree of heaven	0.5	5,600	2,900	1.4	490	250
sassafras	0.5	6,100	2,800	0.9	330	140
American holly	0.5	5,900	3,600	1	330	180
Norway spruce	0.5	6,100	4,200	0.6	210	130
river birch	0.4	4,500	4,500	0.5	180	180
northern white cedar	0.4	4,500	4,100	0.4	140	130
ligustrum	0.4	5,000	5,000	0.8	280	280
blue spruce	0.4	4,900	4,900	0.7	250	250
common persimmon	0.4	4,700	4,700	0.5	160	150
mockernut hickory	0.3	3,800	3,500	0.2	80	60
American basswood	0.3	3,000	2,500	0.5	170	140
American chestnut	0.3	3,500	3,500	0.4	130	130
swamp white oak	0.3	3,300	3,300	0.2	80	80
dogwood	0.2	2,600	900	1	350	130
crabapple	0.2	2,300	1,400	0.7	230	140
costal plain willow	0.2	2,700	2,400	0.5	190	170
northern catalpa	0.2	2,100	1,700	0.4	160	110
pignut hickory	0.2	2,200	1,300	0.3	110	50
red pine	0.2	2,900	2,600	0.2	50	40
Japanese zelkova	0.2	2,700	1,900	0.6	200	150
eastern hemlock	0.2	3,000	2,800	0.3	100	90
willow	0.2	1,900	1,900	0.2	70	70
white willow	0.2	2,900	2,900	0.2	50	50
Chinese elm	0.2	1,800	1,800	0.1	50	50
American hornbeam	0.1	1,500	700	0.5	180	90
London planetree	0.1	1,300	800	0.3	110	70
American elm	0.1	800	600	0.2	60	40
black spruce	0.1	1,500	1,000	0.4	160	100
black walnut	0.1	1,400	1,200	0.2	70	50
common pear	0.1	800	500	0.2	70	50
eastern red cedar	0.1	1,200	1,200	0.1	40	40
pear	0.1	1,700	1,700	0.3	100	100
sugar maple	0.1	900	800	0.2	70	50
elm	0.1	600	600	0.1	50	50
singleleaf ash	0.1	1,300	1,300	0.1	30	30
yew	0.1	1,500	1,500	0.1	50	50
paper birch	0.1	900	900	0.1	40	40
Atlantic white cedar	0.1	1,000	1,000	0.1	20	20

Virginia pine	0.1	1,100	1,100	0.1	30	30
hawthorn	0	400	300	0.2	50	40
quaking aspen	0	100	100	0	20	20
Scotch pine	0	300	300	0.1	20	20
spruce	0	200	200	0.1	40	30
roundleaf serviceberry	0	100	100	0	10	10
bitternut hickory	0	400	400	0.2	70	70
slippery elm	0	100	100	0	10	10
yellow birch	0	300	300	0	10	10
green ash	0	300	200	0.1	30	20
other species	0	600	500	0.1	30	20
butternut	0	100	100	0	10	10
southern catalpa	0	100	100	0	10	10
shingle oak	0	100	100	0	10	10
flowering dogwood	0	0	0	0	10	0
black ash	0	0	0	0	0	0
eastern redbud	0	0	0	0	0	0
ash	0	0	0	0	0	0
juniper	0	100	100	0	10	10
magnolia	0	0	0	0	0	0
eastern hophornbeam	0	0	0	0	0	0
sandbar willow	0	500	500	0.1	20	20
Japanese snowbell	0	100	100	0	20	20
Siberian elm	0	0	0	0	0	0

Tree Effects on Building Energy Use

Trees affect energy consumption by shading buildings, providing evaporative cooling, and blocking winter winds. Trees tend to reduce building energy consumption in the summer months and can either increase or decrease building energy use in the winter months, depending on the location of trees around buildings. Estimates of tree effects on energy use are based on field measurements of tree distance and direction to single-family and attached residential buildings (McPherson and Simpson, 1999).

Based on 2007 prices, trees within the URDL are estimated to reduce energy-related costs from residential buildings by $18.3 million annually. Trees also provide an additional $467,300 in value by reducing the amount of carbon released by fossil-fuel based power plants (a reduction of 22,600 tons of carbon emissions) (Tables 6-7). More specific details on energy effects are given in Model Output Tables #15-16.

Table 6. Annual energy savings due to trees near residential buildings during the heating and cooling seasons.

Unit	Heating	Cooling	Total
MBTU[†]	954,000	n/a	954,000
MWH[††]	14,500	21600	36,100
Carbon avoided (t)	18,600	4,000	22,600

[†]One Million British Thermal Units
[††]Megawatt-hour

Table 7. Annual savings ($) in residential energy expenditure during the heating and cooling seasons.

Savings	Heating	Cooling	Total
Energy	$15,758,000	$2,547,000	$18,803,000
Carbon avoided	$384,500	$82,800	$467,300

Structural and Functional Values

Urban forests have a structural value based on the trees themselves (e.g., the cost of having to replace a tree with a similar tree). Structural values are an asset value of the tree and do not include any functional values that the tree produces. The structural value of an urban forest tends to increase with a rise in the number and size of healthy trees (Nowak and Crane, 2002). The ten tree species with greatest structural value are presented in Figure 9.

Trees also have functional values based on the functions the trees perform. Annual functional values also tend to increase with increased number and size of healthy trees, and are usually on the order of several million dollars per year. Through proper management, urban forest values can be increased; likewise, the values and benefits can decrease as the amount of healthy tree cover declines.

<u>Structural values:</u>

- Structural value: $6.3 billion
- Carbon storage: $27.1 million

<u>Annual functional values:</u>

- Carbon sequestration: $797 thousand
- Pollution removal (29.5% tree cover): $10.6 million
- Lower energy costs and carbon emission reductions: $18.3 million

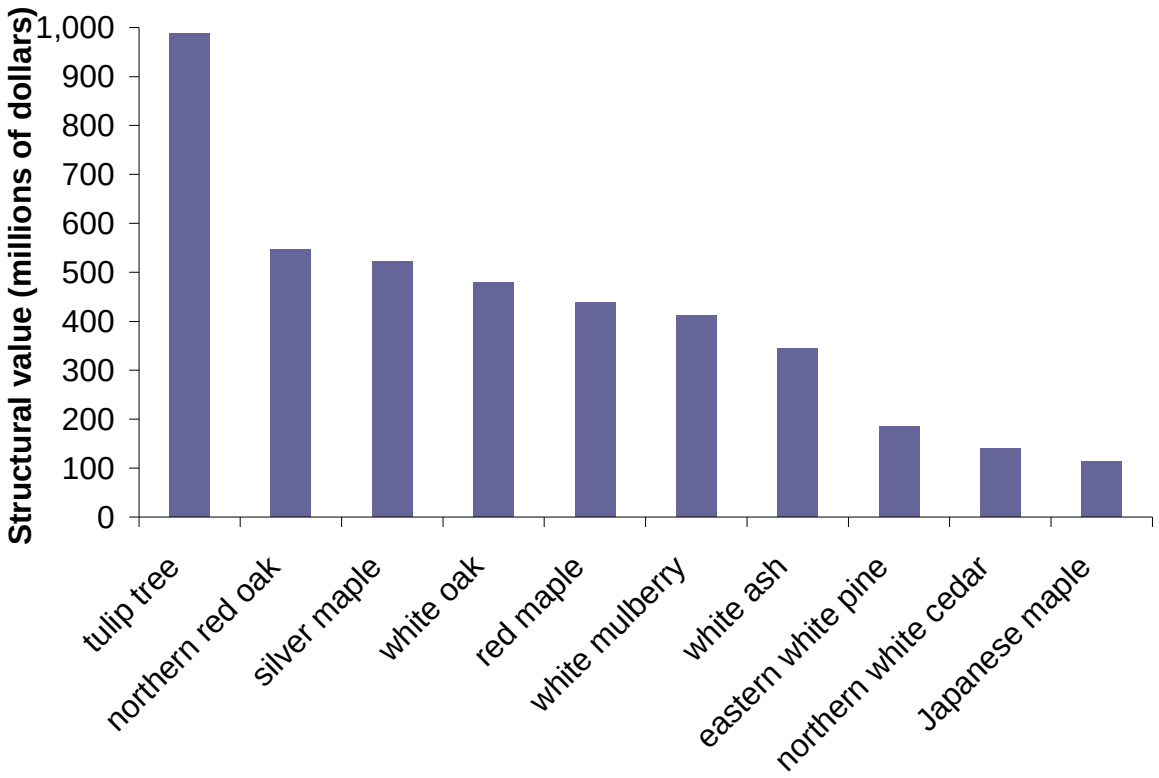


Figure 9. The ten most valuable tree species (structural value) within the URDL

Potential Pest Impacts

Various insects and diseases can infest urban forests, potentially killing trees and reducing the health, value, and sustainability of the urban forest. As pests tend to have differing tree hosts, the potential damage or risk of each pest will differ. Four exotic pests were analyzed for their potential impact (Figure 10): Asian longhorned beetle (ALB), gypsy moth (GM), emerald ash borer (EAB), and Dutch elm disease (DED). The model only estimates potential maximum damage of the pest; and actual damage is likely to be much less than potential maximum for some pests, or maximum damage may not be reached for several years or at all depending upon local management.

The Asian longhorned beetle (ALB) is an insect that bores into and kills a wide range of hardwood species (Northern Area S&PF, 2005). ALB poses a threat to 41.9 percent of

the URDL urban forest, which represents a potential loss of $2.4 billion in damage to the structure (Model Output Table # 17).

The gypsy moth (GM) is a defoliator that feeds on many species causing widespread defoliation and tree death if outbreak conditions last several years (Northern Area S&PF, 2005). This pest threatens 14.6 percent of the population, which represents a potential loss of $1.5 billion in structural value (Model Output Table # 18).

Emerald ash borer (EAB) has killed thousands of ash trees in parts of the United States (Northern Area S&PF, 2005). EAB has the potential to affect 4.3 percent of the population ($354 million in structural damage) (Model Output Table #19).

American elm, one of the most important street trees in the twentieth century, has been devastated by the Dutch elm disease (DED). Since first reported in the 1930s, it has killed over 50 percent of the native elm population in the United States (Stack et. al., 1996). Although some elm species have shown varying degrees of resistance, URDL - Baltimore County could possibly lose 0.8 percent of its trees to this pest ($15.8 million in structural value) (Model Output Table # 20).

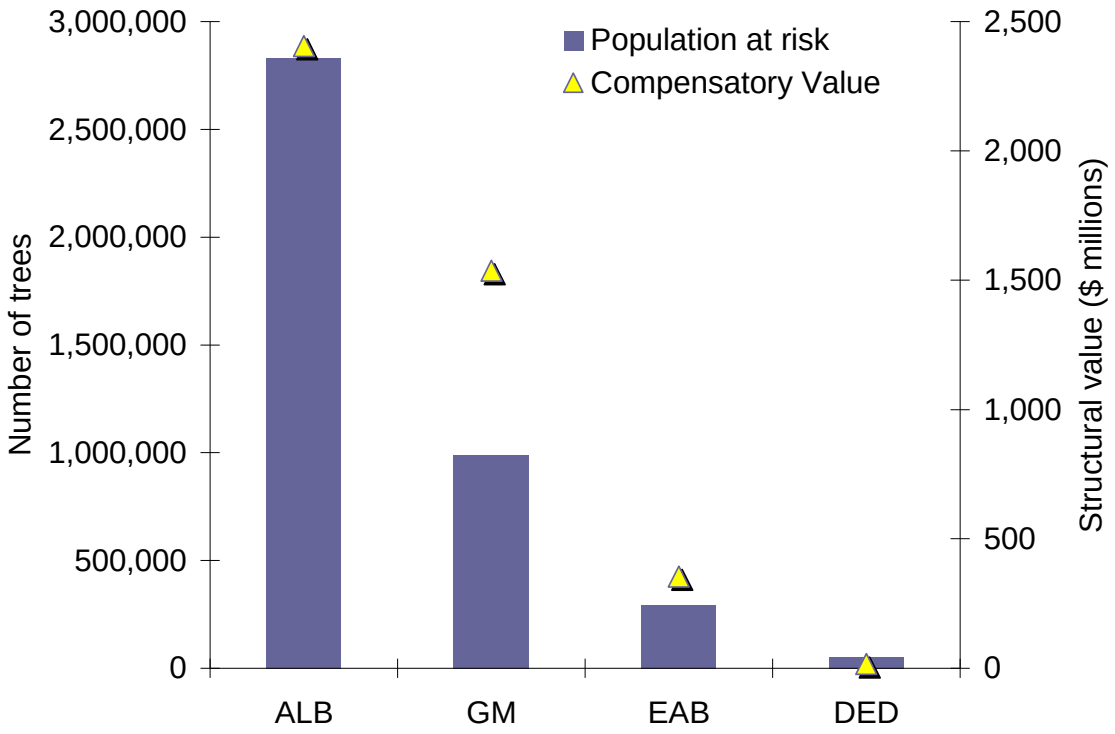


Figure 10. Potential maximum pest impacts for the URDL

Urban Soils in the URDL

Soils form the foundation for many ecological processes such as nutrient cycling, the spatial distribution of plant and soil organism assemblages and ultimately the location of human habitation (Brady and Weil, 1999). Although soils in urban and urbanizing landscapes are predominately altered by human activity, they serve, like unaltered soils, as an important growth medium for plants and are a critical mediator of numerous ecosystem processes (Effland and Pouyat, 1997). As such, soils can function in urban landscapes by reducing the bioavailability of pollutants, storing carbon (C) and nutrients, serving as a habitat for soil fauna, and moderating the hydrologic cycle through absorption, storage, and supply of water (De Kimpe and Morel, 2000, Lehmann and Stahr, 2007, Pouyat et al., 2007ab).

In providing these services, soil plays a unique role as the “brown infrastructure” of urban ecological systems, much in the same way urban vegetation is thought of as green infrastructure (Pouyat et al., 2007a, Heidt and Neef, 2008). Whereas green infrastructure provides services attributed to vegetation, such as the moderation of energy fluxes by tree canopies (Heidt and Neef, 2008); brown infrastructure provides ecosystem services attributed to soil, such as storm water infiltration and purification, and as a support medium for built structures (De Kimpe and Morel, 2000, Lehmann and Stahr, 2007, Pouyat et al., 2007b).

As land is converted to urban uses, direct and indirect factors affect soil chemical and physical characteristics. Direct effects include those typically associated with urban soils, such as physical disturbances, incorporation of anthropic materials, and burial or coverage of soil by fill material and impervious surfaces (Craul, 1992; Jim, 1998). Soil management practices, e.g., fertilization and irrigation, which are introduced after the initial development disturbance, also are considered direct effects. Indirect effects of urbanization involve changes in the abiotic and biotic environment, which can influence the development of intact soils. Unlike direct physical disturbance, changes in environmental factors resulting from urbanization affect soil development at temporal

scales in which natural soil formation processes are at work (Pouyat and Effland, 1999). Indirect effects include the urban heat island (Oke, 1995; Mount et al., 1999), soil hydrophobicity (White and McDonnell, 1988; Craul, 1992), introductions of exotic plant and animal species (Steinberg et al., 1997; Ehrenfeld et al., 2001), and atmospheric deposition of pollutants such as N (Lovett et al., 2000), heavy metals (De Miguel et al., 1997; Mielke, 1999), and potentially toxic organic chemicals (Wong et al., 2004).

We expect that both direct and indirect effects on soils are occurring within the Urban-Rural Demarcation Line (URDL). Results from Baltimore City showed a wide range of characteristics among all land-use and cover classes; though a subset of the soil variables measured (P, K, bulk density, and pH) were differentiated by the Anderson classes (Pouyat et al., 2007a). Differences were greatest between classes of land use and cover characterized by intensive land management (lawns) and the absence of management (forests). In particular, concentrations of P and K, both of which are components of most lawn fertilizers, and bulk density differentiated plots between forest and grass cover. Unlike P or K, heavy metals such as Pb, Cu, and zinc (Zn) did not differentiate the land-use and cover classes used in the Baltimore study, but rather were found to be related to major transportation corridors and the age of housing stock (Yesilonis et al. 2008).

In an effort to evaluate both direct and indirect effects of urban land use on soil characteristics within the URDL area of Baltimore County, and to relate these effects to overall soil quality, including plant nutrient requirements, soil C stocks, and EPA and EU heavy metal screening values, we analyzed soil samples collected from the UFORE plots for 21 chemical and physical characteristics. In addition, we compared these results to the Cities of Baltimore and Washington, DC. The plant nutrient requirements, heavy metal screening values, and soil C sequestration estimates are all modules being developed for the UFORE model.

Summary Statistics

Mean and median values of each variable measured across all plots revealed that soil properties within the URDL varied widely. Chemical properties were more variable than physical properties (bulk density) except for soil pH (Table 8). For example, differences between minimum and maximum values of available Ca, K, and Mg were more than tenfold and the highest coefficient of variation (CV) exceeded 81.1% compared to 17.6% for bulk density (Table 1). Concentrations of heavy metals (nitric acid extraction) also were highly variable, with CVs of up to 380%.

Table 8. Baltimore County metal and nutrient concentration statistics (mg/kg).

	Median	Mean	Minimum	Maximum	Standard Deviation	CV
Al	21,049.63	30,115.19	3909.27	324,923.55	38,372.78	127.42
Cr	25.93	47.85	3.86	748.91	79.00	165.10
Mn	272.72	685.21	18.04	17,681.72	1,811.32	264.34
Fe	14,853.01	24,071.78	3067.22	303,007.14	36,029.73	149.68
Co	8.93	18.54	1.07	349.70	39.24	211.70
Ni	15.84	31.95	1.36	455.94	57.04	178.53
Cu	15.77	35.81	2.29	706.42	92.60	258.55
As	4.02	6.02	0.00	88.95	10.62	176.49
Mo	0.50	0.67	0.10	4.36	0.64	95.64
Ag	0.06	0.22	0.01	5.54	0.58	262.96
Cd	0.23	1.17	0.00	20.22	2.34	200.69
Ba	64.18	88.43	8.94	684.51	83.22	94.11
Pb	32.69	70.27	0.00	3,230.84	265.39	377.67
Tl	0.15	0.19	0.02	1.15	0.18	90.40
P	11.50	15.50	0.80	75.50	13.10	84.53
K	130.00	140.59	25.00	420.00	67.76	48.20
Mg	192.50	209.80	17.50	675.00	113.44	54.07
Ca	1,290.00	1,557.71	90.00	11,630.00	1,263.05	81.08
pH	5.40	5.42	3.50	7.20	0.77	14.17
D_b (Mg/m^3)	1.15	1.11	0.37	1.47	0.20	17.60
OM (%)	5.35	5.73	0.80	30.30	2.83	49.29

Comparison to other soil investigations in urban landscapes, the URDL soils generally fell within the ranges measured, but with lower pH and metal levels. Pouyat et al. (2007a) found in Baltimore City that bulk densities ranged from 0.71 to 1.74 with a mean and median of 1.18 Mg m^{-3} compared to 0.37 and 1.47 in the URDL area (Table 8). Short et al. (1986) characterized highly disturbed soils derived from fill in the National Mall in Washington, DC, which like most of the areas within the URDL lies along the fall

line between the Atlantic Coastal Plain and Piedmont provinces in the mid-Atlantic region of the USA. In Washington, bulk density measurements of surface horizons generally fell within the range of soils in Baltimore City but tended to be higher than the URDL soils. Bulk density ranged from 1.25 to 1.85 Mg m^{-3}, respectively. Other urban investigations of surface soils found higher bulk densities than in the URDL area, such as Hong Kong where two-thirds of sampled soils exceeded bulk densities of 1.6 Mg m^{-3} (Jim, 1998) and in Pullman, WA and Moscow, ID USA where bulk densities ranged between 1.4 and 1.7 Mg m^{-3} in residential soils (Scharenbroch et al., 2005). We suspect that the range in bulk density for the URDL area was larger than in these studies because soils that were not drastically disturbed, e.g., forest plots, were included in the URDL analysis.

Although soil chemical characteristics in the URDL area generally had high CVs, soil pH had a relatively low CV of 14.2% (range: 3.5 to 7.2) (Table 8). These values are similar to those in Baltimore City, which also had a generally low CV of 12.8% (range: 3.3 to 7.6). However, as can be seen later in this report, we compared the distribution of soil pH between the city and county and show that the county has soils that are slightly more acidic. Other investigations of urban areas have shown similar pH results. In predominately residential soils in Ibadan, Nigeria (population > 2 million), soil pH (1:2 soil to 0.1 ***M*** CaCl solution ratio) ranged from 5.1 to 7.6 with a CV of 15% (Gbadegesin and Olabode, 2000). However, data collected in New York City's Central Park over a 20-year period showed a wide range in soil pH (1:2 soil to water ratio), from 3.5 (pine grove) to 8.8 (street tree pit), but with a narrower range in pH (4.8 to 6.3) for lawn sites (Pouyat et al., 2002). For roadside soils in Hong Kong, soil pH (1:2 soil to water ratio) ranged from 6.8 to 10.0 with a CV of 6.2% (Jim, 1998).

Heavy metal concentrations within the URDL fell somewhat below the range of data reported in other studies. In Baltimore City, Yesilonis et al. (2008) measured in soils collected in UFORE plots mean concentrations of 231, 45, 141 mg kg^{-1} of Pb, Cu, and Zn, respectively, while in Washington DC, concentrations for these same metals were 301, 29, and 171, respectively, across all land use types (Yesilonis et al., unpub. data).

As a comparison to more disturbed soils, Short et al. (1986) measured mean concentrations of 210, 30, and 88 for Pb, Cu, and Zn, respectively in the National Mall, Washington, DC.

Differences were also found between land-use types with the residential associated plots having higher concentrations of Al, P, Fe, and Co and lower pH than the other types (Table 9). These results were similar to the Baltimore City UFORE soil results in that residential land uses had higher concentrations of P and lower pH than the other types (Pouyat et al., 2007a). We suspect that the higher P and lower pH measurements are related to lawn fertilization. In addition, the only land-use type that exhibited high concentrations of heavy metals was the industrial type; however, we were only able to gain permission to sample for soil in one industrial plot.

Table 9. 2007 Baltimore URDL UFORE soil mean concentrations (mg/kg) by land use.

BALTIMORE COUNTY URDL							
	Commercial	Industry	Institutional	Attached Dwellings	Open Space	Residential : Large Lot	Residential: Small Lot
Al*	38098.22	7213.49	23704.82	32869.14	25030.81	53340.33	20834.48
Cr*	49.97	333.55	46.07	59.58	44.71	55.18	28.61
Mn*	392.93	17681.72	330.37	370.53	537.29	1248.47	223.88
Fe*	27477.06	24215.35	17908.21	17117.22	21765.75	45984.51	12577.85
Co*	20.84	23.14	11.10	18.65	14.50	47.48	7.93
Ni*	39.95	120.15	20.14	36.24	25.69	70.30	15.44
Cu*	35.55	589.28	23.81	23.73	24.08	74.38	15.54
As*	3.06	66.01	4.52	3.79	4.64	8.89	8.03
Mo*	0.38	3.49	0.63	0.60	0.62	0.89	0.57
Ag*	0.67	5.54	0.10	0.10	0.09	0.37	0.27
Cd*	1.48	20.22	0.86	2.98	0.39	1.53	1.56
Ba*	88.87	423.87	75.33	84.18	84.64	125.78	51.19
Pb*	70.90	3230.84	48.13	19.63	50.37	61.75	41.80
Tl*	0.29	0.51	0.14	0.17	0.18	0.31	0.15
P†	6.75	7.50	13.95	22.43	14.02	16.82	19.76
K†	150.83	97.50	156.31	160.33	127.78	148.12	146.72
Mg†	149.55	147.50	214.49	224.98	213.63	210.34	208.95
Ca†	1575.50	3100.00	1538.90	1734.67	1603.38	1342.58	1539.39
pH	5.72	6.60	5.42	5.87	5.35	5.31	5.45
Db (Mg/m^3)	1.16	0.99	1.21	1.29	1.08	1.13	1.06
OM (%)	6.00	6.4.0	6.27	4.67	5.87	5.16	5.92

* 7.7 N Nitric acid extraction

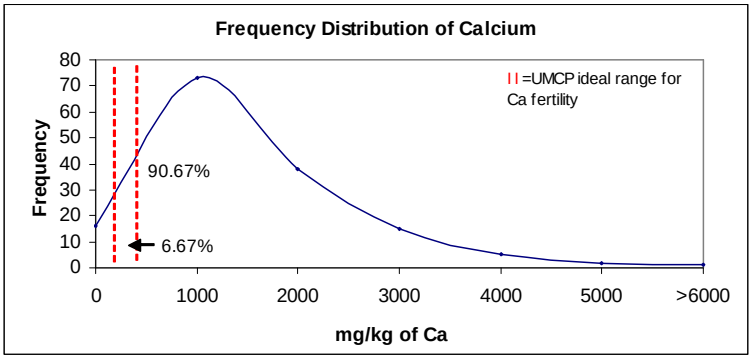
† Morgan extraction

Nutrient Status

To assess the nutrient status of soils within the URDL, we compared the median levels of the elements measured in this study with recommended levels for horticultural plants in the literature. Whitcomb (1987) recommended available soil concentrations (mg kg^{-1}) for horticultural soils of 300 to 1000, 74 to 150, 100 to 500, and 30 to 60 for Ca, K, Mg, and P, respectively, compared to median available concentrations of 1290, 130, 193, and 12 mg kg^{-1} found in the URDL soils (Table 8). We also compared the frequency distribution of plot concentrations with the Maryland Cooperative Extension soil fertility guidelines and found that for all cases, except P, the concentrations of macro nutrients fell within the recommended ranges (Fig. 1). Thus, it is apparent that in the majority of the plots sampled, URDL soils have sufficient nutrient levels to support plant growth, and in the case of Ca excessive (> 90% of the plots, see Fig. 1a), given the recommended ranges.

Figure 1. Available nutrients with soil test interpretation categories.

a.



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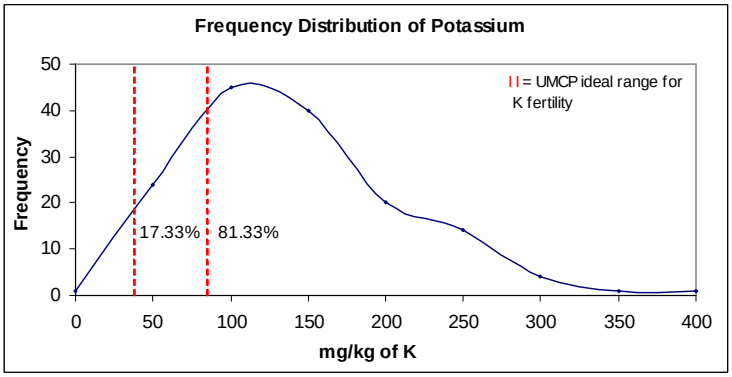
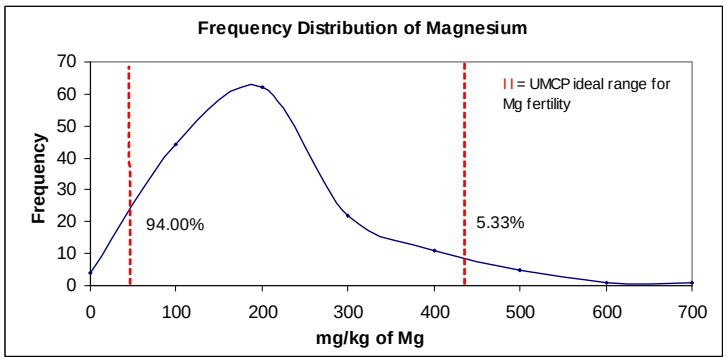


c.



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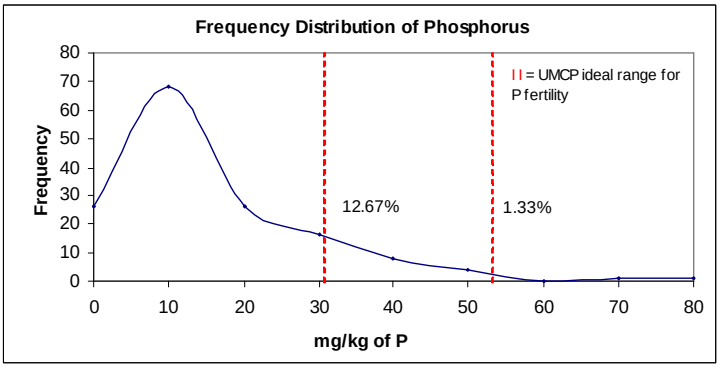
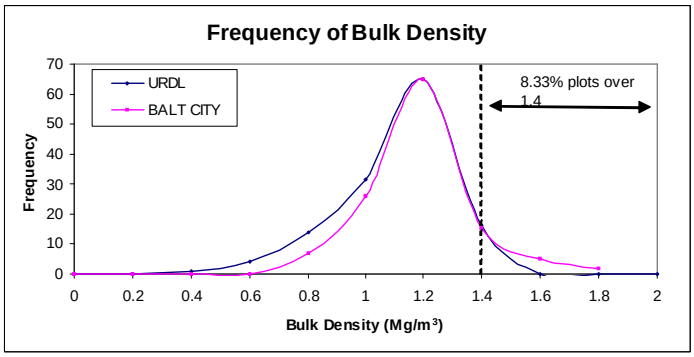


In addition, bulk density measurements appear to fall under the density in which root growth is impaired (> 90% of the plots, see Fig. 2a) while soil pH was found to be slightly acidic (approximately 5.0), which is lower than soils sampled in Baltimore City (Fig. 2c). We expect that this is due to the differences in rock type or parent material between the surface geologies of the City and County and possibly differences in Ca deposition that tends to occur in high rates within highly urbanized areas (Pouyat et al., 2007a). The pH results suggest that plants requiring more alkaline conditions should be avoided, or when planted, the soil amended with lime. Finally, the amount of organic matter in the soils sampled showed a bimodal distribution, which we expect reflects the differences in organic matter accumulation between forested plots and the more urbanized plots (Fig. 2b). This distribution is partially explained by the statistically significant relationship between bulk density (a measure of site impacts) and organic matter concentration for soils within the URDL (Fig. 3). Whatever the case, the organic matter percentages are above those considered adequate for plant growth and to support soil microbial activity. Although these data suggest that soils within the URDL

for the most part have the potential to be highly productive for plants, there will be situations, e.g. street tree pits, in which soil characteristics will be less than optimum for plant growth and will require amendments.

Figure 2. Soil bulk density, organic matter concentration and pH distributions of URDL soils in comparison to Baltimore City UFORE soils.

a.



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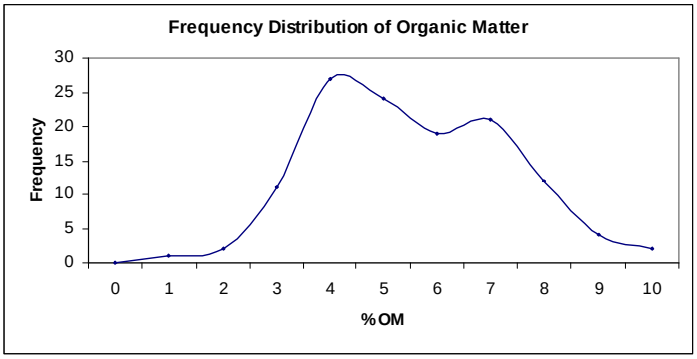

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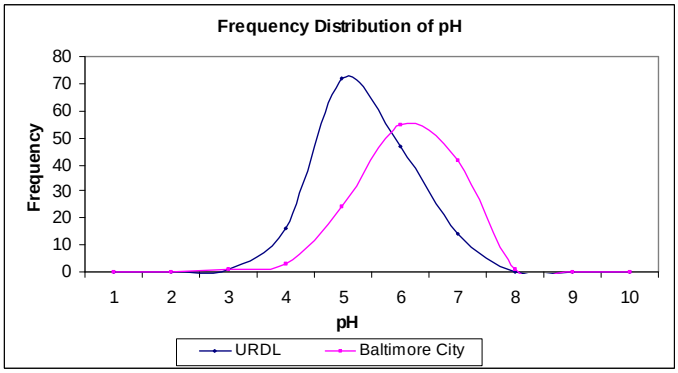
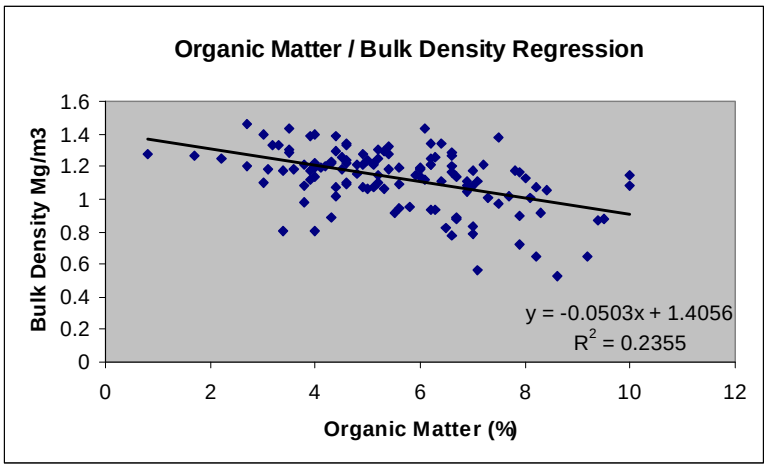


Figure 3. Relationship between bulk density and organic matter concentration for soils sampled within the URDL.



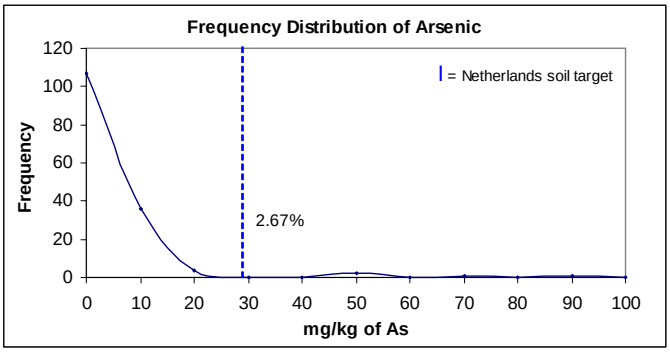
Heavy Metal Status

The concentrations of the metals Pb, Cu, Ni, Cd, and Cr found for soils within the URDL is a reflection of both the chemical composition of the parent material and potential polluting sources of a particular heavy metal. The metals Cu, Ni, Cd, and Cr are important constituents of mafic rock types, which serve as parent material for many of the native soils found in areas within the URDL. Yesilonis et al. (2008) found for soils in Baltimore City that sources for Pb and Cu were related to both vehicular use and age of building lot (or contamination by paint applied prior to the 1980s). Pouyat et al. (2007a) found that parent material, especially those related to mafic rock types, continued to exert an influence on soil chemical properties in Baltimore City. The results for soils within the URDL are consistent with these results. Copper, Ni, and Cd were found to be slightly higher than the Netherlands soil target levels, which we feel reflect the influence of mafic rock types (Fig. 4). Background levels for Cu, Ni, and Cd for soils in Baltimore County range between 12-42, 13-22, and < 1 ppm, respectively. Otherwise, there were no consistent signs of soil contamination for soils within the URDL. If we compare the URDL metal results with Baltimore City and Washington DC, we find a significant

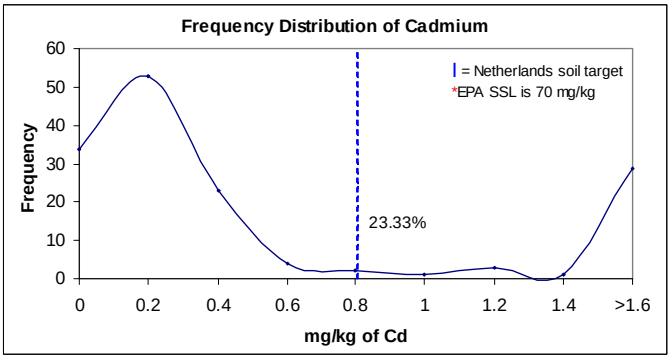
difference in contamination of Pb, Cu, and Ni (Fig. 5). This is good news for people living within the developed areas of Baltimore County. We expect the lower concentrations for these metals are related to the younger age of building lots found in the county, which would suggest less use of Pb based paint; and the more recent development of major highways and roads, which would suggest that higher traffic volumes occurred mostly after Pb was taken out of gasoline.

Figure 4. Frequency distributions of heavy metals with EPA and EU soil standards.

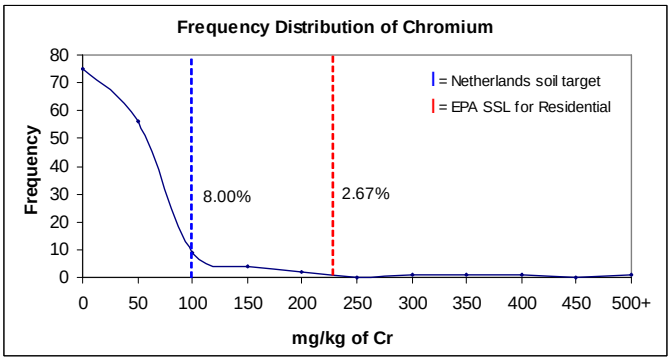
a.



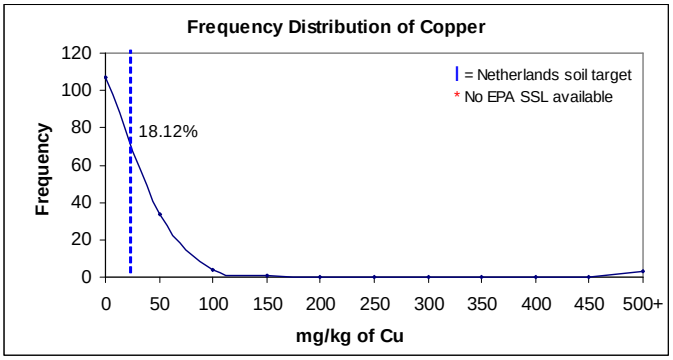
b.



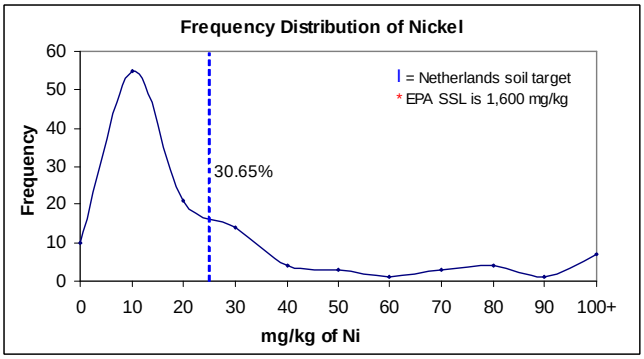
c.



d.


Frequency Distribution of Copper
= Netherlands soil target
* No EPA SSL available
18.12%
Frequency
120
100
80
60
40
20
0
0
50
100
150
200
250
300
350
400
450
500+
mg/kg of Cu

e.


Frequency Distribution of Nickel
= Netherlands soil target
* EPA SSL is 1,600 mg/kg
30.65%
Frequency
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100+
mg/kg of Ni

f.

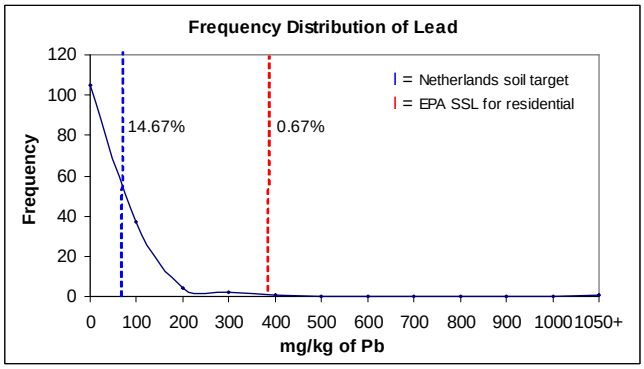
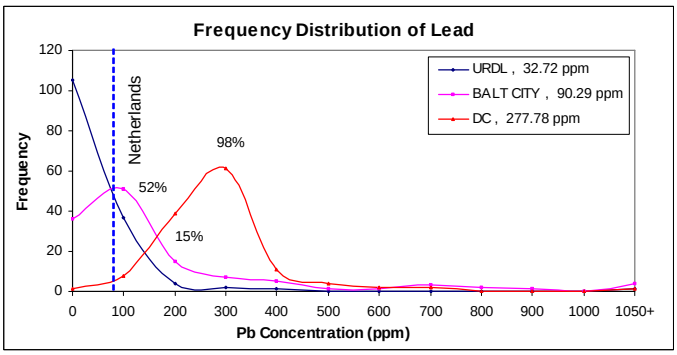
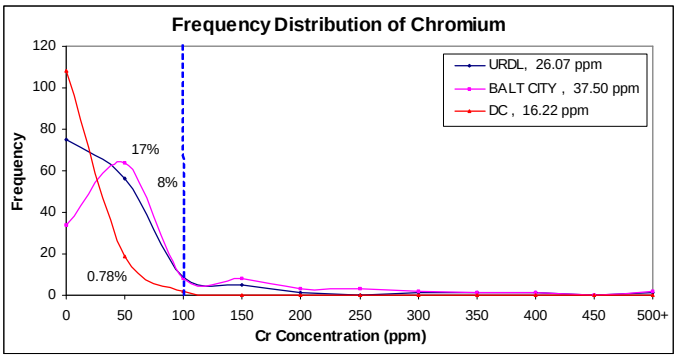

Frequency Distribution of Lead
= Netherlands soil target
= EPA SSL for residential
14.67%
0.67%
Frequency
120
100
80
60
40
20
0
0
100
200
300
400
500
600
700
800
900
1000
1050+
mg/kg of Pb

Figure 5. Comparison of soil distributions of heavy metals among URDL, Baltimore City, and Washington DC.

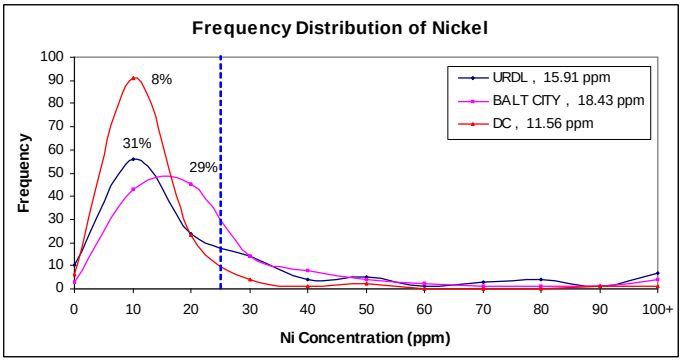
a.



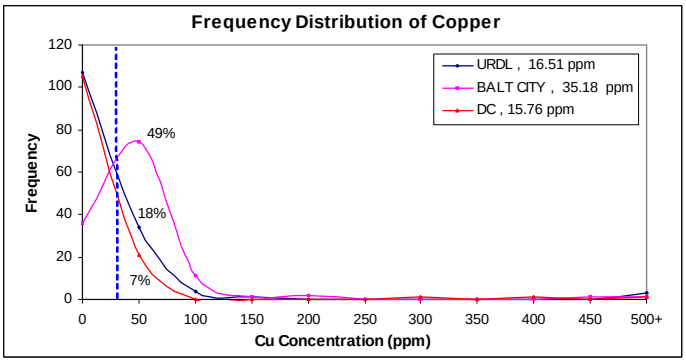
b.



c.



d.



Soil Carbon Sequestration

Using C data collected from soils within areas of the URDL, we calculated the belowground C stocks for URDL soils (Table 10). The belowground stocks were about 2-fold higher than aboveground levels, which is similar to ratios found in other cities (Pouyat et al., 2006) and for native ecosystems around the world (Post et al., 1982). In addition, we calculated soil C densities for soils within the URDL and projected changes in C densities and stocks that may occur based on land-use change (Table 10). Positive changes may be used as C credits, which are currently being offered at 22.8 per tonne.

Table 10. Soil C densities, total soil C and soil C per ha for the soils within the URDL. Includes three scenarios of land-use conversion.

Range	Carbon density[1]	Total carbon[2]	Cabon/ha[3]
Median[4]	5.95	2,609,000	59.5
Upper limit[5]	6.48	2,842,500	64.8
Lower limit[6]	4.59	2,015,500	46.0
Scenario[7]			
Forest to landuse	5.78	2,534,200	57.8
Forest to impervious	5.70	2,501,800	57.0
Impervious to pervious	6.46	2,835,700	64.7
Impervious to forest	6.87	3,014,100	68.7

[1]Measured in kg/m^3. Landuse carbon densities were taken from Pouyat et al (2008). Impervious carbon densities, and percent impervious and pervious for a given landuse were taken from Pouyat et al (2006).
[2]Measured in tonnes.
[3]Measured in tonnes/hectare.
[4]Assumptions: Attached dwellings (SFA/townhomes/condos/apartments), large lot single family dwellings, and small lot single family dwellings had a carbon density of 11.00 kg/m^3; Commercial, industrial, institutional, and large transportation: 3.30; Open space 5.90; impervious: 3.30.
[5]Assumptions: Attached dwellings (SFA/townhomes/condos/apartments), large lot single family dwellings, and small lot single family dwellings had a carbon density of 12.60 kg/m^3; Commercial, industrial, institutional, and large transportation: 3.30; Open space 5.90; impervious: 3.30.
[6]Assumptions: Attached dwellings (SFA/townhomes/condos/apartments), large lot single family dwellings, and small lot single family dwellings had a carbon density of 6.70 kg/m^3; Commercial, industrial, institutional, and large transportation: 3.30; Open space 5.90; impervious: 3.30.
[7]Scenarios are based on the replacement of 25% of one cover for another cover, e.g. “Forest to landuse” means that we modeled the removal of 25% of the forest and replaced it with the surrounding landuse.

The range of C that may be stored in soils within the URDL ranged from an estimated low of 4.59 to a high of 6.48 kg m^{-3}. These densities translate to 2,015,500 tonnes C and 46 tonnes C ha^{-1}, and 2,842,500 tonnes C and 65 tonnes C ha^{-1}. Under a scenario of losing forested land to impervious surfaces, there is a loss of approximately 110,000 tonnes C compared to the intermediate amount, and up to 340,000 tonnes C compared to the Upper limit (Table 10). By contrast, if impervious areas are converted to forest, the additional amount of C stored could amount to 1 million tonnes (subtracting the lower limit by the impervious to forest scenario in Table 10) given enough time for the soils to accumulate this C. We are currently modifying state of the art mathematical models (e.g., CENTURY) to make projections in C accumulation in urban soils.

Soil Summary

Soils within the URDL area of Baltimore County exhibited overall lower heavy metal contamination than the other cities in the region that have UFORE soil data available. URDL soils also were found to contain sufficient macro and micro nutrients for most horticultural and native plants with the exception of P; however, P levels appeared to be high in large lot residential areas suggesting the input of P through lawn fertilizer applications. We found similar build up of P in residential soils of Baltimore City and previous work in the Cub Hill area of the County. Efforts should be made by the County to inform lawn care companies and homeowners to limit their additions of both N and P in fertilizer and to only make these additions if needed (preferably in association with a soil test).

The C stocks of soils existing in the URDL soils, although disturbed, contain more than twice the amount than in aboveground stocks. The overall difference between forested soil C stocks and residential stocks is small if impervious areas are excluded in the estimation. However, with impervious surfaces included, the soils of forested areas represent the highest storage capacity of C in the non-wetland areas of the county. Any further losses of forest will result in a significant decline in those stocks. Also, any conversion from largely impervious landscapes to forested soils represents the greatest

potential for sequestering C in upland areas within the URDL. We plan on improving these estimates using the CENTURY model in the near future and will provide these results to DEPRM at that time.

Appendix I. City Comparison

A commonly-asked question is, “How does this city compare to other cities?” Although comparison among cities should be made with caution as there are many attributes of a city that affect urban forest structure and functions, summary data are provided from other cities analyzed using the UFORE model.

I. City totals, trees only

City	% Tree cover	Number of trees	Carbon storage (tons)	Carbon sequestration (tons/yr)	Pollution removal (tons/yr)	Pollution value U.S. $[1]
Calgary, Canada[a]	7.2	11,889,000	445,000	21,400	326	2,357,000
Atlanta, GA[b]	36.7	9,415,000	1,344,000	46,400	1,663	12,213,000
Baltimore URDL[c]	**29.5**	**6,758,000**	**1,311,000**	**38,500**	**1,410**	**10,600,000**
New York, NY[b]	20.9	5,212,000	1,350,000	42,300	1,677	11,834,000
Baltimore, MD[c]	21.0	2,627,000	597,000	16,200	430	3,123,000
Philadelphia, PA[b]	15.7	2,113,000	530,000	16,100	576	4,150,000
Washington, DC[d]	28.6	1,928,000	526,000	16,200	418	2,858,000
Boston, MA[b]	22.3	1,183,000	319,000	10,500	284	2,092,000
Woodbridge, NJ[e]	29.5	986,000	160,000	5,560	210	1,525,000
Minneapolis, MN[f]	26.4	979,000	250,000	8,900	306	2,242,000
Syracuse, NY[c]	23.1	876,000	173,000	5,420	109	836,000
San Francisco, CA[a]	11.9	668,000	194,000	5,100	141	1,018,000
Morgantown, WV[g]	35.5	658,000	93,000	2,890	72	485,000
Moorestown, NJ[e]	28.0	583,000	117,000	3,760	118	841,000
Jersey City, NJ[e]	11.5	136,000	21,000	890	41	292,000
Casper, way	8.9	123,000	37,000	1,200	50	275,000
Freehold, NJ[e]	34.4	48,000	20,000	545	22	162,000

II. Per acre values of tree effects

City	No. of trees	Carbon Storage (tons)	Carbon sequestration (tons/yr)	Pollution removal (lbs/yr)	Pollution value U.S. $[1]
Calgary, Canada[a]	66.7	2.5	0.12	3.7	13.2
Atlanta, GA[b]	111.6	15.9	0.55	39.4	144.8
Baltimore URDL[c]	**62.5**	**12.1**	**0.36**	**26.8**	**97.8**
New York, NY[b]	26.4	6.8	0.21	17.0	59.9
Baltimore, MD[c]	50.8	11.6	0.31	16.6	60.4
Philadelphia, PA[b]	25.1	6.3	0.19	13.6	49.2
Washington, DC[d]	49.0	13.4	0.41	21.3	72.7
Boston, MA[b]	33.5	9.1	0.30	16.1	59.3
Woodbridge, NJ[e]	66.5	10.8	0.38	28.4	102.9
Minneapolis, MN[f]	26.2	6.7	0.24	16.4	60.0
Syracuse, NY[c]	54.5	10.8	0.34	13.5	52.0
San Francisco, CA[a]	22.5	6.6	0.17	9.5	34.4
Morgantown, WV[g]	119.2	16.8	0.52	26.0	87.8
Moorestown, NJ[e]	62.1	12.4	0.40	25.1	89.5
Jersey City, NJ[e]	14.4	2.2	0.09	8.6	30.8
Casper, way	9.1	2.8	0.09	5.6	20.4
Freehold, NJ[e]	38.3	16.0	0.44	34.9	129.8

[1] Pollution values updated to 2007 values

Data collection group
a City personnel
b ACRT, Inc.
c U.S. Forest Service
d Casey Trees Endowment Fund
eNew Jersey Department of Environmental Protection
f Davey Resource Group
g West Virginia University

Appendix II. Species List

Genus	Species	Common Name	% Pop.	% Leaf Area	IV[a]	Potential Pest[b] ALB	GM	EAB	DED
Acer	negundo	boxelder	4.2	2.2	6.4	▲			
Acer	palmatum	Japanese maple	0.5	1.0	1.5	▲			
Acer	platanoides	Norway maple	2.3	2.4	4.7	▲			
Acer	rubrum	red maple	9.1	12.9	22.0	▲			
Acer	saccharinum	silver maple	2.5	5.5	8.0	▲			
Acer	saccharum	sugar maple	0.1	0.2	0.3	▲			
Aesculus	hippocastanum	horsechestnut	0.1	0.6	0.7	▲			
Ailanthus	altissima	tree of heaven	4.2	1.2	5.4				
Amelanchier	sanguinea	roundleaf serviceberry	0.2	<0.1	0.2				
Betula	alleghaniensis	yellow birch	0.2	<0.1	0.2	▲			
Betula	nigra	river birch	0.6	0.8	1.4	▲	▲		
Betula	papyrifera	paper birch	<0.1	0.1	0.1	▲	▲		
Carpinus	caroliniana	American hornbeam	1.5	1.5	3.0				
Carya	cordiformis	bitternut hickory	0.2	<0.1	0.2				
Carya	glabra	pignut hickory	0.5	0.2	0.7				
Carya	tomentosa	mockernut hickory	0.3	0.1	0.4				
Castanea	dentata	American chestnut	0.1	0.1	0.2				
Catalpa	bignonioides	southern catalpa	0.1	<0.1	0.1				
Catalpa	speciosa	northern catalpa	0.7	0.2	0.9				
Cercis	canadensis	eastern redbud	<0.1	<0.1	<0.1				
Chamaecyparis	thyoides	Atlantic white cedar	<0.1	0.1	0.1				
Cornus	florida	flowering dogwood	0.1	0.0	0.1				
Cornus	species	dogwood	2.4	0.9	3.3				
Crataegus	species	hawthorn	0.4	0.1	0.5		▲		
Diospyros	virginiana	common persimmon	0.1	0.3	0.4				
Fagus	grandifolia	American beech	3.6	4.4	8.0				
Fraxinus	americana	white ash	4.0	5.0	9.0	▲		▲	
Fraxinus	anomala	singleleaf ash	0.1	<0.1	0.1	▲		▲	
Fraxinus	nigra	black ash	0.1	<0.1	0.1	▲		▲	
Fraxinus	pennsylvanica	green ash	0.2	0.1	0.3	▲		▲	
Fraxinus	species	ash	<0.1	<0.1	<0.1	▲		▲	
Gleditsia	triacanthos	honeylocust	0.9	0.3	1.2				
Ilex	opaca	American holly	1.0	0.6	1.6				
Ilex	species	holly	1.0	0.5	1.5				

Juglans	cinerea	butternut	0.2	0.0	0.2		
Juglans	nigra	black walnut	0.3	0.3	0.6		
Juniperus	species	juniper	<0.1	<0.1	<0.1		
Juniperus	virginiana	eastern red cedar	0.1	0.3	0.4		
Ligustrum	japonicum	ligustrum	0.4	<0.1	0.4		
Liquidambar	styraciflua	sweetgum	3.9	3.0	6.9		▲
Liriodendron	tulipifera	tulip tree	5.7	17.8	23.5		
Magnolia	species	magnolia	<0.1	<0.1	<0.1		
Malus	species	crabapple	2.0	0.3	2.3	▲	▲
Morus	alba	white mulberry	2.9	2.0	4.9		
Nyssa	sylvatica	black tupelo	4.2	2.2	6.4		
Ostrya	virginiana	eastern hophornbeam	<0.1	<0.1	<0.1		▲
Other	species	other species	0.2	0.1	0.3		
Picea	abies	Norway spruce	0.4	0.7	1.1		
Picea	mariana	black spruce	0.4	0.2	0.6		
Picea	pungens	blue spruce	0.4	0.8	1.2		
Picea	species	spruce	0.3	0.1	0.4		
Pinus	resinosa	red pine	0.4	0.5	0.9		
Pinus	strobus	eastern white pine	1.7	3.0	4.7		
Pinus	sylvestris	Scotch pine	0.3	0.2	0.5		
Pinus	virginiana	virginia pine	<0.1	0.1	0.1		
Platanus	acerifolia	London planetree	1.0	0.5	1.5	▲	
Platanus	occidentalis	American sycamore	1.1	1.6	2.7	▲	
Populus	balsamifera	balsam poplar	0.4	0.7	1.1	▲	▲
Populus	deltoides	eastern cottonwood	0.7	1.8	2.5	▲	
Populus	tremuloides	quaking aspen	0.3	<0.1	0.3	▲	▲
Prunus	avium	sweet cherry	2.4	0.7	3.1	▲	
Prunus	serotina	black cherry	5.2	1.7	6.9	▲	
Prunus	species	cherry	1.0	0.7	1.7	▲	
Pyrus	communis	common pear	0.2	0.2	0.4	▲	
Pyrus	species	pear	0.1	0.3	0.4		
Quercus	alba	white oak	1.7	3.6	5.3		▲
Quercus	bicolor	swamp white oak	<0.1	0.2	0.2		▲
Quercus	imbricaria	shingle oak	0.1	<0.1	0.1		▲
Quercus	palustris	pin oak	0.2	0.4	0.6		▲
Quercus	phellos	willow oak	0.5	0.9	1.4		▲
Quercus	prinus	chestnut oak	1.0	1.3	2.3		▲
Quercus	rubra	northern red oak	2.0	6.3	8.3		▲
Robinia	pseudoacacia	black locust	1.4	1.4	2.8	▲	
Salix	alba	white willow	<0.1	0.1	0.1	▲	▲
Salix	caroliniana	costal plain willow	0.8	0.2	1.0	▲	▲

Salix	exigua	sandbar willow	<0.1	<0.1	<0.1	♠	♠	
Salix	species	willow	0.1	0.1	0.2	♠	♠	
Sassafras	albidum	sassafras	3.1	1.0	4.1			
Styrax	japonicus	Japanese snowbell	<0.1	<0.1	<0.1			
Taxus	species	yew	0.1	0.4	0.5			
Thuja	occidentalis	northern white cedar	0.4	0.5	0.9			
Tilia	americana	American basswood	0.3	1.0	1.3	♠	♠	
Tsuga	canadensis	eastern hemlock	0.1	0.5	0.6			
Ulmus	americana	American elm	0.4	0.2	0.6	♠		♠
Ulmus	parvifolia	Chinese elm	<0.1	0.2	0.2	♠	♠	
Ulmus	pumila	Siberian elm	<0.1	<0.1	<0.1	♠		
Ulmus	rubra	slippery elm	0.2	0.1	0.3	♠		♠
Ulmus	species	elm	0.1	0.2	0.3	♠		♠
Unknown	species	dead tree	8.7	<0.1	8.7			
Zelkova	serrata	Japanese zelkova	0.3	0.3	0.6			

[a] IV = importance value (% population + % leaf area)
[b] ALB = Asian longhorned beetle; GM = gypsy moth; EAB = emerald ash borer; DED = Dutch elm disease

References

ACRT, Inc. 1997. **Large tree model technical manual**. Cuyahoga Falls, OH: ACRT, Inc.,

Barbour, M.G; Burk, J.H.; Pitts, W.D. 1980. **Terrestrial plant ecology**. Menlo Park, CA: Benjamin/Cummings. 604 p.

Baldocchi, D. 1988. **A multi-layer model for estimating sulfur dioxide deposition to a deciduous oak forest canopy**. Atmospheric Environment. 22: 869-884.

Baldocchi, D.D.; Hicks, B.B.; Camara, P. 1987. **A canopy stomatal resistance model for gaseous deposition to vegetated surfaces**. Atmospheric Environment. 21: 91-101.

Bidwell, R.G.S.; Fraser, D.E. 1972. **Carbon monoxide uptake and metabolism by leaves**. Canadian Journal of Botany***.*** 50: 1435-1439.

Brady, N.C., Weil, R.R. 1999. **The Nature and Properties of Soils**. New Jersey, Prentice-Hall.

Burns, R.M.; Honkala, B.H. 1990a. **Silvics of North America. Vol. 1. Conifers**. Agric. Handb. 654. Washington, DC: U.S. Department of Agriculture. 675 p.

Burns, R.M.; Honkala, B.H. 1990b. **Silvics of North America. Vol. 2. Hardwoods**. Agric. Handb. 654. Washington, DC: U.S. Department of Agriculture. 877 p.

Cardelino, C.A. and Chameides, W.L. 1990. **Natural hydrocarbons, urbanization, and urban ozone**. ***J. Geophys. Res.*** 95(D9**)**:13,971-13,979.

Cairns, M.A.; Brown, S.; Helmer, E.H.; Baumgardner, G.A. 1997. **Root biomass allocation in the world's upland forests**. Oecologia. 111: 1-11.

Chow, P.; Rolfe, G.L. 1989. **Carbon and hydrogen contents of short-rotation biomass of five hardwood species.** Wood and Fiber Science. 21(1): 30-36.

Clark, A.; Phillips, D.R.; Hitchcock, H.C. 1980. **Predicted weights and volumes of scarlet oak trees on the Tennessee Cumberland Plateau**. Res. Pap. SE-214. Ashville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station. 45 p.

Clark, D.E. 1979. **Sunset New Western Garden Book**. Menlo Park, CA: Lane Publ. Co. 512 p.

Craul, P.J. 1992. **Urban Soil in Landscape Design**. New York, John Wiley & Sons, Inc.

Council of Tree and Landscape Appraisers. 1992. **Guide for plant appraisal.** Savoy, IL: International Society of Arboriculture. 103 p.

De Kimpe, C.R., Morel, J.L. 2000. **Urban soil management: A growing concern**. Soil Science 165, 31-40.

De Miguel, E., Llamas, J.F., Chacon, E., Berg, T., Royset, O..1997. **Origin and patterns of distribution of trace elements in street dust: Unleaded petrol and urban lead**. Atmospheric Environment 31, 2733-2740.

DeVries, R.E. 1987. **A preliminary investigation of the growth and longevity of trees in Central Park**. New Brunswick, NJ: Rutgers University 95 p. M.S. thesis.

Dyer, A.J.; Bradley, C.F. 1982. **An alternative analysis of flux gradient relationships**. Boundary-Layer Meteorology. 22: 3-19.

Effland, W.R., Pouyat, R.V. 1997. **The genesis, classification, and mapping of soils in urban areas**. Urban Ecosystems 1, 217-228.

Ehrenfeld, J.G., Kourtev, P., Huang, W. 2001. **Changes in soil functions following invasions of exotic understory plants in deciduous forests**. Ecol. Applic. 11, 1278-1300.

Energy Information Administration. 2008a. **Sales Revenue Data**. http://www.eia.doe.gov/electricity/page/sales_revenue.xls. [Accessed October 2008].

Energy Information Administration. 2008b. **Heating Oil and Propane Update**. http://tonto.eia.doe.gov/oog/info/hopu/hopu.asp [Accessed October 2008].

Energy Information Administration. 2008c. **Natural Gas Navigator**. http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_a_EPG0_PRS_DMcf_a.htm [Accessed October 2008].

Energy Information Administration. 2008d. **Residential Energy Consumption Survey**. http://www.eia.doe.gov/emeu/states/sep_sum/html/sum_pr_tot.html [Accessed October 2008].

Fankhauser, S. 1994. **The social costs of greenhouse gas emissions: an expected value approach.** The Energy Journal. 15(2): 157-184.

Fleming, L.E. 1988. **Growth estimation of street trees in central New Jersey**. New Brunswick, NJ: Rutgers University. 143 p. M.S. thesis.

Forest Products Laboratory. 1952. **Chemical analyses of wood**. Tech. Note 235. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory. 4 p.

Frelich, L.E. 1992. **Predicting dimensional relationships for Twin Cities shade trees**. St. Paul, MN: University of Minnesota, Department of Forest Resources. 33 p.

Gbadegesin, A., Olabode, M.A.. 2000. **Soil properties in the metropolitan region of Ibadan, Nigeria: implications for the management of the urban environment of developing countries**. Environmentalist 20:205-214.

Gleason, H.A.; Cronquist, A. 1991. **Manual of vascular plants of Northeastern United States and Adjacent Canada**. Bronx, NY: New York Botanical Garden. 910 p.

Grimm, W.C. 1962. **The book of trees**. Harrisburg, PA: Stackpole Co. 487 p.

Heidt, V., Neef, M. 2008. **Benefits of urban green space for improving urban climate**. In pages 84-96, Carreiro, M. et al. (eds) Ecology, Planning and Management of Urban Forests, Springer, NY.

Hough, R.B. 1907. **Handbook of the trees of the Northern States and Canada**. Lowville, NY: R.B. Hough. 470 p.

Hosker, R.P., Jr.; Lindberg, S.E. 1982. **Review: atmospheric deposition and plant assimilation of gases and particles.** Atmospheric Environment. 16(5): 889-910.

Husch, B.; Miller, C.I.; Beers, T.W. 1982. **Forest mensuration.** New York: John Wiley and Sons. 402 p.

International Society of Arboriculture. 1988. **Valuation of landscape trees, shrubs, and other plants**. Champaign, IL: International Society of Arboriculture. 50 p.

Jarvis, P.G.; Leverenz, J.W. 1983. **Productivity of temperate, deciduous and evergreen forests.** In: Lange, O.L.; Nobel, P.S.; Osmond, C.B.; Ziegler, H., eds. Physiological plant ecology IV, encyclopedia of plant physiology, volume 12D. Springer-Verlag, Berlin: 233-280.

Jim, C.Y. 1998. **Soil characteristics and management in an urban park in Hong Kong**. Environmental Management 22, 683-695.

Ker, M.F. 1980. **Tree biomass equations for seven species in southwestern New Brunswick**. Fredericton, NB: Canadian Forestry Service. 18 p.

Killus, J.P.; Meyer, J.P.; Durran, D.R.; Anderson, G.E.; Jerskey, T.N.; Reynolds, S.D.; Ames, J. 1984. **Continued research in mesoscale air pollution simulation modeling. Volume V: refinements in numerical analysis, transport, chemistry, and pollutant removal.** Publ. EPA/600/3-84/095a. Research Triangle Park, NC: U.S. Environmental Protection Agency.

King, W.W.; Schnell, R.L. 1972. **Biomass estimates of black oak tree components**. Tech. Note Bl. Norris, TN: Tennessee Valley Authority, Division of Forestry. 24 p.

Lehmann, A. Stahr, K. 2007. **Nature and significance of anthropogenic urban soils**. Journal of Soils And Sediments 7, 247-260.

Leverenz, J.W.; Hinckley, T.M. 1990. **Shoot structure, leaf area index and productivity of evergreen conifer stands**. Tree Physiology. 6: 135-149.

Liebhold, A.M.; Gottschalk, K.W.; Muzika, R.; Montgomery, M.E.; Young, R.; O'Day, K.; Kelley, B. 1995. **Suitability of North American tree species to the gypsy moth: a summary of field and laboratory tests**. Gen. Tech. Rep. NE-211. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 34 p.

Little, E.L. 1971. **Atlas of United States trees. Vol. 1. Conifers and important hardwoods.** Misc. Pub. 1146. Washington, DC: U.S. Department of Agriculture, Forest Service. 400 p.

Little, E.L. 1976. **Atlas of United States trees. Vol. 3. Minor western hardwoods**. Misc. Pub. 1314. Washington, DC: U.S. Department of Agriculture, Forest Service. 300 p.

Little, E.L. 1977. **Atlas of United States trees. Vol. 4. Minor eastern hardwoods**. Misc. Pub. 1342. Washington, DC: U.S. Department of Agriculture, Forest Service. 235 p.

Little, E.L. 1978. **Atlas of United States trees. Vol. 5. Florida**. Misc. Pub. 1361. Washington, DC: U.S. Department of Agriculture, Forest Service. 138 p.

Lovett, G.M. 1994. **Atmospheric deposition of nutrients and pollutants in North America: an ecological perspective**. Ecological Applications. 4: 629-650.

Lovett, G.M., Traynor, M.M., Pouyat, R.V., Carreiro, M.M., Zhu, W.X., Baxter, J.W. 2000. **Atmospheric deposition to oak forests along an urban-rural gradient**. Environmental Science & Technology 34, 4294-4300.

Luley, C.J. and Bond, J. 2002. **A plan to integrate management of urban trees into air quality planning.** Report to Northeast State Foresters Association. Davey Resource Group, Kent, OH. 73 p.

Maxwell, E.L. 1994. **A meteorological/statistical solar radiation model**. In: Proceedings of the 1994 annual conference of the American Solar Energy Society. San Jose, CA: American Solar Energy Society: 421-426.

McPherson, E.G. ;Simpson, J.R.. 1999. **Carbon dioxide reduction through urban forestry: Guidelines for professional and volunteer tree planters**. Gen. Tech. Rep. PSW-171. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 237 p.

Mielke, H.W. 1999. Lead in the inner cities. American Scientist 87, 62-73.

Monteith, D.B. 1979. **Whole tree weight tables for New York**. AFRI Res. Rep. 40. Syracuse, NY: State University of New York, College of Environmental Science and Forestry, Applied Forestry Research Institute. 64 p.

Monteith, J.L.; Unsworth, M.H. 1990. **Principles of environmental physics**. New York: Edward Arnold. 291 p.

Moulton, R.J., Richards, K.R., 1990**. Costs of sequestering carbon through tree planting and forest management in the United States.** USDA Forest Service, General Technical Report WO-58. Washington, DC.

Mount, H., Hernandez, L., Goddard, T., Indrick, S. 1999. **Temperature signatures for anthropogenic soils in New York City**. In: Kimble, J. M., Ahrens, R. J. & Bryant, R. B. (Eds.) Classification, correlation, and management of anthropogenic soils. Nevada and California, USDA-NRCS, National Soil Survey Center.

Murray, F.J.; Marsh, L.; Bradford, P.A. 1994. **New York State energy plan, vol. II: issue reports**. Albany, NY: New York State Energy Office.

Northeastern Area State and Private Forestry. 2005. **Asian Longhorned Beetle.** Newtown

Square, PA: U.S. Department of Agriculture, Northeastern Area State and Private Forestry. http://www.na.fs.fed.us/fhp/alb/

Northeastern Area State and Private Forestry. 2005. **Gypsy moth digest.** Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry. http://www.na.fs.fed.us/fhp/gm/

Northeastern Area State and Private Forestry. 2005. **Forest health protection emerald ash borer home.** Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry. http://www.na.fs.fed.us/fhp/eab

Nowak, D.J. 1986. **Silvics of an urban tree species: Norway maple (*Acer platanoides* L.)**. Syracuse, NY: State University of New York, College of Environmental Science and Forestry. 148 p. M.S. thesis.

Nowak, D.J. 1991. **Urban forest development and structure: analysis of Oakland, California.** Berkeley, CA: University of California. 232 p. Ph.D. dissertation.

Nowak, D.J. 1994a. **Understanding the structure of urban forests.** Journal of For***estry*** 92(10): 42-46.

Nowak, D.J. 1994b. **Atmospheric carbon dioxide reduction by Chicago's urban forest**. In: McPherson, E.G.; Nowak, D.J.; Rowntree, R.A., eds. Chicago's urban forest ecosystem: results of the Chicago Urban Forest Climate Project. Gen. Tech. Rep. NE-186. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station: 83-94.

Nowak, D.J. 1996. **Estimating leaf area and leaf biomass of open-grown deciduous urban trees.** Forest Science. 42(4): 504-507.

Nowak, D.J.; Civerolo, K.L.; Rao, S.T.; Sistla, G.; Luley, C.J.; Crane, D.E. 2000. **A modeling study of the impact of urban trees on ozone**. Atmospheric Environment. 34: 1601-1613.

Nowak, D.J.; Crane, D.E. 2000. **The Urban Forest Effects (UFORE) Model: quantifying urban forest structure and functions**. In: Hansen, M.; Burk, T., eds. Integrated tools for natural resources inventories in the 21st century: proceedings of the IUFRO conference. Gen. Tech. Rep. NC-212, St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station: 714-720.

Nowak, D.J., Crane, D.E., Stevens, J.C., Ibarra, M. 2002b. **Brooklyn's Urban Forest**. GTR-NE-290. Newtown Square, PA. U.S. Department of Agriculture, Forest Service, Northeastern Research Station 107 p.

Nowak, D.J.; McHale, P.J.; Ibarra, M.; Crane, D.; Stevens, J.; Luley, C. 1998. **Modeling the effects of urban vegetation on air pollution**. In: Gryning, S.E.; Chaumerliac, N., eds. Air pollution modeling and its application XII. New York: Plenum Press: 399-407.

Nowak, D.J.; Pasek, J.E.; Sequeira, R.A.; Crane, D.E.; Mastro, V.C. 2001. **Potential effect of *Anoplophora glabripennis* (Coleoptera: Cerambycidae) on urban trees in the United States.** Journal of Economic Entomology. 94(1):116-122.

Oke, T.R. 1995. **The heat island of the urban boundary layer: characteristics, causes and effects**. ***In:*** Wind climate in cities (J. E. Cermak, ed.), pp. 81-107. Kluwer Academic Publishers, Dortrecht, The Netherlands.

Onstad, D.W.; Nowak, D.J.; Jeffords, M.R. 1997. **Potential defoliation of trees by outbreak populations of gypsy moth in the Chicago area**. Journal of Arboriculture***.*** 23(2): 57-64.

Panofsky, H.A.; Dutton, J.A. 1984. **Atmospheric turbulence**. New York: John Wiley. 397 p.

Pederson, J.R.; Massman, W.J.; Mahrt, L.; Delany, A.; Oncley, S.; den Hartog, G.; Neumann, H.H.; Mickle, R.E.; Shaw, R.H.; Paw U, K.T.; Grantz, D.A.; MacPherson, J.I.; Desjardins, R.; Schuepp, P.H.; Pearson R., Jr.; Arcado, T.E. 1995. **California ozone deposition experiment: methods, results, and opportunities**. Atmospheric Environment. 29(21): 3115-3132.

Phillips, D.R. 1981. **Predicted total-tree biomass of understory hardwoods*.*** Rep. Pap. SE-223. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station. 22 p.

Platt, R. 1968. **Discover American trees**. New York: Dodd, Mead and Co. 256 p.

Pouyat, R.V., Belt, K., Pataki, D., Groffman, P.M., Hom, J. Band, L. 2007b. **Urban land-use change effects on biogeochemical cycles**. ***In:*** pages 45-58, Canadell, J.G., D.E. Pataki, and L.F. Pitelka (eds.) Terrestrial Ecosystems in a Changing World. Global Change, The IGBP Series, Springer, Berlin-Heidelberg-New York.

Pouyat, R.V., Effland, W.R. 1999. **The investigation and classification of humanly modified soils in the Baltimore Ecosystem Study**. In: Kimble, J. M., Ahrens, R. J. & R.B, B. (Eds.) Classification, correlation, and management of anthropogenic soils. Nevada and California, USDA-NRCS, National Soil Survey Center.

Pouyat, R., Groffman, P., Yesilonis, I., Hernandez, L. 2002.. **Soil carbon pools and fluxes in urban ecosystems**. Environ. Pollut. 116:S107-S118.

Pouyat, R.V., Yesilonis, I., Nowak, D.J. 2006. **Carbon storage by urban soils in the USA.** Journal of Environmental Quality 35, 1566-1575.

Pouyat, R.V., Yesilonis, I.D., Russell-Anelli, J. Neerchal, N.K. 2007a. **Soil chemical and physical properties that differentiate urban land-use and cover types**. Soil Science Society of America Journal 71, 1010-101

Pouyat, R.V., Yesilonis, I.D., Golubiewski, N.E. 2008. **A comparison of soil organic carbon stocks between residential turf grass and native soil**. Urban Ecosystems DOI 10.1007/s11252-008-0059-6.

Post, W.M., Emanuel, W.R., Zinke, P.J., Stangenberger, A.G. 1982. **Soil carbon pools and world life zones**. Nature 298: 156-159

Preston, R.J. 1976. **North American trees**. Ames, IA: Iowa State University Press. 399 p.

Scharenbroch, B.C., Lloyd, J.E., Johnson-Maynard, J.L. 2005. **Distinguishing urban soils with physical, chemical, and biological properties**. Pedobiologia 49, 283-296.

Schlaegel, B.E. 1984a. **Green ash volume and weight tables**. Res. Pap. SO-206. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 14 p.

Schlaegel, B.E. 1984b. **Overcup volume and weight tables**. Res. Pap. SO-207. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 14 p.

Schlaegel, B.E. 1984c. **Sugarberry volume and weight tables**. Res. Pap. SO-205. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 13 p.

Schlaegel, B.E. 1984d. **Sweetgum volume and weight tables**. Res. Pap. SO-204. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 14 p.

Seinfeld, J.H. 1986. **Air pollution**. New York: John Wiley. 738 p.

Short, J.R., Fanning, D.S., Foss, J.E. Patterson, J.C. 1986. **Soils of the Mall in Washington, DC: I, Statistical summary of properties**. Soil Sci. Soc. Am. J. 50, 699-705.

Smith, F.W.; Sampson, D.A.; Long, J.N. 1991. **Comparison of leaf area index estimates from allometrics and measured light interception**. Forest Science. 37(6): 1682-1688.

Smith, W.B. 1985. **Factors and equations to estimate forest biomass in the North Central region.** Res. Pap. NC-268. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 6 p.

Smith, W.B.; Shifley, S.R. 1984. **Diameter growth, survival, and volume estimates for trees in Indiana and Illinois**. Res. Pap. NC-257. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 10 p.

Stack, R.W.; McBride, D.K.; Lamey, H.A. 1996. **Dutch elm disease.** PP-324 (revised). Fargo, ND: North Dakota State University, Cooperative Extension Service. http://www.ext.nodak.edu/extpubs/plantsci/trees/pp324w.htm

Stanek, W.; State, D. 1978. **Equations predicting primary productivity (biomass) of trees, shrubs and lesser vegetation based on current literature.** Publ. BC-X-183. Victoria, BC: Canadian Forest Service. 58 p.

Steinberg, D.A., Pouyat, R.V., Parmelee, R.W., Groffman, P.M. 1997. **Earthworm Abundance and Nitrogen Mineralization Rates Along an Urban-Rural Land Use Gradient**. Soil Biology and Biochemistry 29, 427-430.

Swartjes, F.A. 1999. **Risk-based assessment of soil and groundwater quality in the Netherlands: Standards and remediation urgency**. Risk Analysis 19, 1235-1249.

Taha, H. 1996**. Modeling impacts of increased urban vegetation on ozone air quality in the South Coast Air Basin.** ***Atmos. Environ.*** 30(20):3423-3430

U.S. Department of Agriculture. 1955. **Wood handbook**. Agric. Handb. 72. Washington DC: U.S. Department of Agriculture. 528 p.

U.S. Department of Labor and Statistics. 2003. Consumer Price Indices. 16 Apr 2003. http://www.ftp.bls.gov/pub/special.requests/cpi/cpiai.txt. [Accessed 24 Apr 2003].

U.S. Environmental Protection Agency. 1995. **PCRAMMIT user's guide**. Research Triangle Park, NC: U.S. Environmental Protection Agency. 53 p.

U.S. National Research Council. 1983. **Changing climate: report of the Carbon Dioxide Assessment Committee**. Washington, DC: National Academy Press. 496 p.

van Ulden, A.P.; Holtslag, A.A.M. 1985. **Estimation of atmospheric boundary layer parameters for diffusion application**. Journal of Climatology and Applied Meteorology***.*** 24: 1196-1207.

Venkatram, A. 1980. **Estimating the Monin-Obukhov length in the stable boundary layer for dispersion calculations**. Boundary-Layer Meteorology. 19: 481-485.

Viereck, L.A.; Little. E.L. 1975. **Atlas of United States trees. Vol. 2. Alaska trees and common shrubs**. Misc. Publ. 1293. Washington, DC: U.S. Department of Agriculture, Forest Service. 109 p.

VROM (Dutch Ministry of Housing, Spatial Planning and the Environment). 1988. **Premises for Risk Management** (annex to the Dutch Environmental Policy Plan). Lower House, session 1988-1989, 21 137, no. 5.

VROM (Dutch Ministry of Housing, Spatial Planning and the Environment). 1999. **Ministerial Circular on Target and Intervention Values** (in Dutch).

Wartluft, J.L. 1977. **Weights of small Appalachian hardwood trees and components.** Res. Pap. NE-366. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 4 p.

Wartluft, J.L. 1978. **Estimating top weights of hardwood sawtimber**. Res. Pap. NE-427. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 7 p.

Wesely, M.L. 1989. **Parameterization for surface resistance to gaseous dry deposition in regional-scale numerical models**. Atmospheric Environment. 23: 1293-1304.

Whitcomb, C.E. 1987. **Establishment and maintenance of landscape trees**. Lacebark Publications, Stillwater, OK.

White, C.S., McDonnell, M.J. 1988. **Nitrogen cycling processes and soil characteristics in an urban versus rural forest**. Biogeochemistry 5, 243-262.

Whittaker, R.H.; Woodwell, G.M. 1967. **Surface area relations of woody plants and forest communities**. American Journal of Botany. 54: 931-939.

Winer, A.M.; Fitz, D.R.; Miller, P.R.; Atkinson, R.; Brown, D.E.; Carter, W.P.; Dodd, M.C.; Johnson, C.W.; Myers, M.A.; Neisess, K.R.; Poe, M.P.; Stephens, E.R. 1983. **Investigation of the role of natural hydrocarbons in photochemical smog formation in California*.*** Riverside, CA: Statewide Air Pollution Research Center.

Wong, F., Harner, T., Liu, Q., Diamond, M.L. 2004. **Using experimental and forest soils to investigate the uptake of polycyclic aromatic hydrocarbons (PAHs) along an urban-rural gradient**. Environmental Pollution 129, 387-398.

Yesilonis, I.D., Pouyat, R.V., Neerchal, N.K. 2008. **Spatial distribution of metals in soils in Baltimore, Maryland: Role of native parent material, proximity to major roads, housing age and screening guidelines**. Environmental Pollution 156, 723-731.

Young, H.E.; Carpenter, P.M. 1967. **Weight, nutrient element and productivity studies of seedlings and saplings of eight tree species in natural ecosystems*.*** Orono, ME: University of Maine, Maine Agricultural Experiment Station. 39 p.

Zannetti, P. 1990. **Air pollution modeling.** New York: Van Nostrand Reinhold. 444 p.

Zinke, P.J. 1967. **Forest interception studies in the United States**. In: Sopper, W.E.; Lull, H.W., eds. Forest hydrology. Oxford, UK: Pergamon Press: 137-161.

Model Output Table

#1. TOTAL ESTIMATES FOR TREES IN THE BALTIMORE COUNTY URDL

		TREES		CARBON (mt)		CARBON SEQ (mt/yr)		NET CARBON SEQ (mt/yr)		LEAF AREA (km2)		LEAF BIOMASS (mt)		TREE VALUE (U.S. $)	
LANDUSE	SPECIES COMMON NAME	N	SE	N	SE	N	SE	N	SE	N	SE	N	SE	N	SE
Small lot SF	Silver maple	67217	32928	53420.76	35512.14	1366.72	834.32	989.28	561.97	22.926	13.123	1206.64	690.67	355,187,130	215702232
	Holly	67217	67214	7076.34	7076.08	393.93	393.92	365.93	365.91	3.562	3.562	476.24	476.23	67,777,886	67775365
	Honeylocust	53774	53772	10787.89	10787.49	487.97	487.96	390.83	390.82	2.166	2.166	226.83	226.82	70,205,165	70202554
	Black tupelo	53774	53772	854.06	854.03	148.63	148.62	144.7	144.69	3.847	3.847	133.07	133.06	16,522,418	16521804
	American hornbeam	40330	40329	254.52	254.51	78.49	78.49	77.06	77.05	6.675	6.675	402.1	402.09	4,044,679	4044529
	Japanese maple	26887	18475	3930.74	3489.57	256.84	192.73	241.24	179.53	3.865	2.696	217.53	151.76	47,575,374	39789347
	Red maple	26887	18475	9464.15	8410.03	437.84	337.82	347.44	260.24	5.608	4.955	377.67	333.69	70,773,573	59413671
	Dogwood	26887	18475	886.94	610.63	155.12	106.66	151.24	103.99	2.494	1.874	145.43	109.27	17,110,642	11764332
	Dead tree	26887	18475	4632.96	4516.01	0	0	-1273.91	1241.75	0	0	0	0	0	0
	American beech	26887	26886	1378.04	1377.98	151.45	151.44	137.62	137.61	6.172	6.172	263.01	263	13,732,221	13731710
	Ligustrum	26887	26886	5013.03	5012.84	284.27	284.26	264.53	264.52	0.163	0.163	14.84	14.84	49,492,407	49490566
	White mulberry	26887	26886	25782.74	25781.78	818.32	818.28	719.21	719.18	3.776	3.776	276.24	276.23	185,279,931	185273040
	Blue spruce	26887	26886	4858.09	4857.91	245.85	245.84	226.83	226.82	6.423	6.422	1089.63	1089.59	63,787,311	63784938
	Cherry	26887	26886	9317.58	9317.23	482.7	482.68	446.19	446.17	2.837	2.837	219.53	219.52	54,108,602	54106589
	Black cherry	26887	18475	228.6	214.54	66.61	56.8	65.47	55.79	0.86	0.735	66.66	57.01	2,295,808	1872443
	Norway maple	13443	13443	3630.94	3630.81	186.65	186.65	172.43	172.42	5.068	5.068	273.52	273.51	31,460,717	31459547
	Tree of heaven	13443	13443	126.65	126.65	37.91	37.91	37.3	37.3	0.679	0.679	50.61	50.61	1,035,155	1035116
	Hawthorn	13443	13443	109.35	109.35	34.57	34.57	34.03	34.03	0.159	0.159	5.72	5.72	1,835,098	1835030
	White ash	13443	13443	2390.19	2390.1	184.69	184.68	161.18	161.17	0.806	0.806	45.8	45.79	18,701,581	18700885
	Tulip tree	13443	13443	8251.73	8251.42	293.39	293.38	215.39	215.38	4.777	4.777	281.6	281.59	70,809,760	70807126
	Spruce	13443	13443	160.4	160.39	34.65	34.65	33.92	33.92	0.407	0.407	69.06	69.05	2,580,817	2580721
	Black spruce	13443	13443	853.65	853.62	80.26	80.26	76.78	76.78	0.762	0.762	143.71	143.7	14,507,483	14506944
	Eastern cottonwood	13443	13443	6.88	6.88	5.66	5.66	5.59	5.59	0.141	0.141	10.15	10.15	526,812	526793
	Northern red oak	13443	13443	10763.92	10763.52	393.91	393.89	292.05	292.04	4.708	4.708	375.17	375.15	73,309,064	73306337
	Black locust	13443	13443	18.99	18.99	11.01	11.01	10.86	10.86	0.393	0.393	21.15	21.15	526,812	526793
	Sassafras	13443	13443	33.69	33.69	14.75	14.75	14.5	14.5	0.663	0.663	32.61	32.61	664,842	664817
	American basswood	13443	13443	2449.08	2448.98	129.8	129.8	120.2	120.19	6.945	6.945	202.76	202.75	38,687,851	38686412
	Total	712499	252847	166681.9	55613.91	6782	2041.59	4467.89	1737.21	96.882	27.792	6627.26	1804.31	1,272,539,140	378431480

Industrial	Tree of heaven	210568	210556	2055.68	2055.56	214.32	214.31	212.68	212.66	3.752	3.752	279.84	279.82	4,912,333	4912041
	Northern catalpa	33691	33689	452	451.97	43.03	43.03	42.67	42.66	0.868	0.868	52.84	52.83	1,084,391	1084326
	Northern white cedar	25268	25267	4043.46	4043.22	126.76	126.75	105.39	105.38	3.509	3.509	674.81	674.77	126,839,181	126831651
	Roundleaf serviceberry	16845	16844	108.02	108.01	13.65	13.65	13.57	13.57	0.116	0.116	8.79	8.79	514,966	514935
	American hornbeam	8423	8422	14.17	14.17	3.51	3.51	3.49	3.49	0.038	0.038	2.3	2.3	132,608	132600
	Eastern white pine	8423	8422	269.25	269.24	27.82	27.82	26.72	26.72	1.723	1.723	110.8	110.8	8,718,230	8717712
	London planetree	8423	8422	74.07	74.07	8.97	8.97	8.9	8.89	0.52	0.52	22.71	22.71	329,029	329010
	American sycamore	8423	8422	326.37	326.36	45.74	45.74	44.36	44.35	3.135	3.135	151.89	151.88	7,381,842	7381404
	Pin oak	8423	8422	485.02	484.99	60.47	60.47	58.44	58.43	0.905	0.905	81.88	81.87	8,872,351	8871825
	Black locust	8423	8422	229.52	229.51	17.34	17.34	17.17	17.17	1.76	1.759	94.73	94.72	696,024	695982
	Total	336909	283292	8057.57	4715.9	561.64	324.71	533.37	316.55	16.325	8.84	1480.58	803.86	159,480,954	126104618
Attached Dwelli	Balsam poplar	24569	24568	8654.55	8654.03	374.04	374.02	340.4	340.38	5.549	5.549	400.39	400.36	70,411,056	70406757
	Red maple	16380	11042	4006.01	3779.51	209.11	168.16	172.01	133.27	1.569	1.179	105.64	79.4	30,982,878	27995364
	Silver maple	16380	16379	7566.88	7566.42	239.2	239.18	210.12	210.1	6.538	6.538	344.11	344.09	67,558,577	67554452
	Black cherry	16380	16379	213.73	213.71	54.16	54.16	53.09	53.09	0.564	0.564	43.78	43.77	1,918,850	1918733
	Japanese maple	8190	8189	6413.39	6413	205.92	205.91	181.26	181.25	3.766	3.765	211.94	211.93	65,861,671	65857650
	Norway maple	8190	8189	1613.98	1613.88	107.56	107.55	101.14	101.14	2.779	2.778	149.97	149.96	15,224,756	15223826
	White ash	8190	8189	47.28	47.28	15.53	15.52	15.19	15.19	0.089	0.089	5.07	5.07	665,457	665417
	American holly	8190	8189	3247.34	3247.14	148.26	148.25	117.26	117.25	2.174	2.174	290.65	290.64	23,463,175	23461743
	Total	106468	37202	31763.17	15901.31	1353.78	603.46	1190.48	514.38	23.028	9.785	1551.54	692.22	276,086,419	137003751
Large lot SF	Eastern white pine	100773	65805	10304.57	7111.48	619.6	425.36	563.9	383.64	20.153	14.112	1295.98	907.53	169,654,515	114472677
	White mulberry	70541	24920	22995.65	19291.2	905.89	649.87	806.04	567.3	5.525	2.463	404.16	180.2	163,257,798	132438345
	American beech	65502	55997	2955.59	2113.26	206.6	145.12	200.58	141.34	5.084	4.318	216.62	184.01	17,363,367	12719456
	Tulip tree	40309	19118	54522.46	29474.52	807.35	410.39	221.35	365.98	18.432	9.684	1086.54	570.82	165,154,833	93141244
	Norway maple	35270	22569	3563.74	2276.16	209.74	121.3	201.68	116.89	4.371	2.685	235.92	144.92	19,230,303	11000384
	Dead tree	35270	18761	9374.7	5910.97	0	0	-1646.83	1299.5	0	0	0	0	0	0
	Boxelder	30232	21016	3117.59	2647.55	207.28	172.5	196.26	162.13	3.282	2.948	300.24	269.66	17,138,675	15513087
	Red maple	30232	16861	6360.45	4094.39	266.59	151.97	248.52	138.2	7.505	3.855	505.42	259.59	42,562,454	30829610
	Silver maple	20155	11993	7219.45	4193.64	266.79	170.5	243.79	155.5	6.156	4.306	323.99	226.64	36,283,019	23328185
	Tree of heaven	20155	11993	2911.96	2047.96	159.93	107.74	148.6	99.74	2.979	2.688	222.19	200.47	17,584,520	12271998
	Cherry	20155	9559	965.15	779.41	110.77	70.15	106.42	66.99	1.547	1.32	119.66	102.1	7,549,838	6190280
	Dogwood	15116	11114	538.63	500.84	68.49	63.49	66.31	61.39	0.527	0.432	30.73	25.19	6,964,892	6824811
	Crabapple	15116	11114	1412.06	1192.7	91.98	64.45	59.85	43.25	0.689	0.482	59.39	41.54	11,283,394	8333128
	Black spruce	15116	11114	659.93	478.27	74.85	52.18	72.11	50.32	0.712	0.521	134.4	98.34	10,315,317	7479916
	American sycamore	15116	8430	14822.57	12979.61	397.04	336.86	346.19	287.72	4.459	4.045	216.04	195.96	72,225,910	66858307

	Black cherry	15116	15114	4100.95	4100.54	242.29	242.27	213.47	213.45	1.944	1.944	150.77	150.75	23,495,533	23493202
	White oak	15116	8430	19456.57	17606.21	580.37	450.88	505.72	384.32	6.185	4.669	449.93	339.68	132,302,741	110129433
	Black locust	15116	15114	4822.7	4822.22	124.91	124.9	121.56	121.55	1.63	1.629	87.73	87.72	10,831,911	10830836
	Slippery elm	15116	15114	101.57	101.56	12.57	12.57	12.42	12.42	0.709	0.709	31.76	31.76	544,085	544031
	Bitternut hickory	10077	10076	411.02	410.98	64.88	64.87	63.11	63.1	0.186	0.186	11.69	11.69	7,252,125	7251405
	Common persimmon	10077	7005	4723.47	4677.23	159.46	154.04	141.37	136.05	1.947	1.805	145.21	134.62	33,178,771	33003376
	White ash	10077	7005	36296.55	30632.19	245.49	199.86	109.35	184.71	6.465	5.255	367.3	298.56	146,232,257	114824466
	Eastern hemlock	10077	7005	2955.8	2796.2	99.76	85.75	69.23	59.25	3.9	3.845	362.24	357.14	29,034,112	26613906
	Sugar maple	5039	5038	135.27	135.26	28.65	28.65	28.04	28.04	0.658	0.658	39.66	39.65	1,601,903	1601744
	Horsechestnut	5039	5038	18718.29	18716.44	382.2	382.16	311.04	311.01	4.235	4.235	296.18	296.15	107,672,812	107662127
	American hornbeam	5039	5038	214.65	214.63	28.81	28.81	27.91	27.9	0.617	0.617	37.18	37.17	3,625,213	3624853
	American chestnut	5039	5038	3481.24	3480.89	128.92	128.91	95.97	95.96	1.096	1.096	50.05	50.05	18,920,977	18919099
	Pignut hickory	5039	5038	153.1	153.08	11.65	11.65	11.38	11.38	0.005	0.005	0.09	0.09	538,212	538159
	Flowering dogwood	5039	5038	15.05	15.05	2.99	2.99	2.97	2.97	0.221	0.221	12.84	12.84	79,328	79320
	Singleleaf ash	5039	5038	1333.99	1333.86	34.07	34.07	33.15	33.14	0.213	0.213	17.11	17.1	3,677,249	3676884
	American holly	5039	5038	775.88	775.8	59.38	59.37	56.27	56.26	0.457	0.457	61.16	61.15	8,820,622	8819747
	Sweetgum	5039	5038	6.37	6.37	2.79	2.79	2.75	2.74	0.053	0.053	2.42	2.42	245,633	245609
	Black tupelo	5039	5038	163.95	163.94	11.02	11.02	10.9	10.9	0.119	0.119	4.11	4.11	784,902	784824
	Norway spruce	5039	5038	3884.51	3884.13	107.53	107.52	71.09	71.08	3.218	3.217	536.29	536.24	34,115,560	34112175
	Common pear	5039	5038	431.89	431.85	43.37	43.36	41.6	41.59	1.136	1.136	84.72	84.71	5,786,082	5785508
	Willow oak	5039	5038	439.22	439.18	36.03	36.02	34.26	34.25	0.749	0.749	66.43	66.43	6,549,654	6549004
	Chestnut oak	5039	5038	219.48	219.46	39.73	39.73	38.76	38.76	0.336	0.336	26.41	26.41	3,488,590	3488244
	Northern red oak	5039	5038	8351.55	8350.72	119.39	119.37	113.65	113.63	1.206	1.206	96.12	96.11	15,948,684	15947102
	Sassafras	5039	5038	283.43	283.4	15.64	15.64	15.14	15.14	0.091	0.091	4.48	4.48	1,066,668	1066562
	Yew	5039	5038	1471.5	1471.35	49.09	49.08	43.42	43.42	3.052	3.051	337.02	336.99	23,777,292	23774932
	American basswood	5039	5038	593.54	593.48	42.96	42.95	40.59	40.58	0.999	0.999	29.16	29.16	10,800,104	10799032
	Elm	5039	5038	603.19	603.13	48.88	48.88	46.45	46.45	1.205	1.205	82.09	82.08	8,256,946	8256127
	Total	725562	174812	255869.23	62266.16	7115.71	1655.69	4096.3	1413.43	124.053	27.105	8541.44	1846.17	1,395,196,802	323092799
Commercial	London planetree	40905	40902	615.43	615.39	58.38	58.37	56.85	56.84	1.835	1.835	80.13	80.12	10,147,366	10146746
	Sweet cherry	24543	24541	2636.63	2636.47	252.48	252.47	241.72	241.7	1.142	1.142	88.37	88.36	30,834,304	30832419
	Scotch pine	16362	16361	261.66	261.65	20.81	20.81	20.18	20.18	1.358	1.358	130.93	130.92	5,842,039	5841682
	Japanese zelkova	16362	16361	1413.59	1413.5	140.33	140.32	134.54	134.54	1.255	1.255	93.61	93.6	26,403,100	26401487
	Silver maple	8181	8180	1538.53	1538.43	67.36	67.36	61.38	61.38	0.524	0.524	27.58	27.58	24,546,212	24544712
	Northern catalpa	8181	8180	1664.62	1664.51	103.29	103.28	96.7	96.7	0.604	0.604	36.75	36.75	14,927,653	14926741
	Pear	8181	8180	1651.81	1651.71	102.1	102.1	95.57	95.56	2.361	2.361	176.1	176.09	21,803,741	21802409
	Total	122715	64816	9782.26	4783.12	744.75	400.88	706.94	382.44	9.079	4.02	633.47	284.17	134,504,416	64599344

Open space	Dead tree	457509	93663	35814.85	10418.86	0	0	-2802.88	968.61	0	0	0	0	0	0
	Red maple	378829	97823	56795.16	19584.09	1765.79	490.16	1686.1	468.5	63.324	21.227	4264.53	1429.5	225,849,873	79315881
	Tulip tree	279751	79223	112334.12	30641.76	2215.16	573.56	2082.18	541.56	95.515	27.928	5630.39	1646.3	388,492,043	104905404
	Black cherry	221469	55679	8313.49	3930.14	519.15	161.94	483.66	152.52	7.054	2.124	547.06	164.69	43,046,016	21907245
	Boxelder	209813	103652	7777.05	3968.37	458.44	206.35	437.63	198.16	10.582	5.142	968.03	470.36	24,902,757	11126661
	Black tupelo	203985	73205	7364.82	2901.4	344.07	126.56	331.43	122.67	13.047	4.849	451.25	167.71	29,816,877	11373883
	White ash	198157	87113	31462.78	17122.94	1112.66	674.98	1011.58	595.58	27.552	12.544	1565.48	712.74	160,436,875	123858718
	Sweetgum	171930	76113	15335.42	6023.96	468.88	189.81	447.65	180.98	17.296	7.569	794.04	347.46	74,015,061	34932817
	American beech	148618	61138	17478.51	9689.38	489.41	232.42	474.9	224.46	20.042	8.5	854.02	362.19	41,375,358	22022486
	Dogwood	113649	42305	1198.89	463.46	121.64	43.38	119.59	42.63	3.903	1.556	227.62	90.72	7,157,268	3393015
	Sweet cherry	101992	52434	2513.17	1694.21	202.06	127.02	190.71	118.45	1.803	1.151	139.51	89.07	18,211,740	12641551
	Norway maple	90336	45901	3245.97	2198.46	186.74	104.72	182.2	101.77	6.279	3.535	338.88	190.77	13,653,659	8910006
	Sassafras	72852	37918	5073.13	2645.56	191.01	92.5	186.06	90.33	5.125	2.922	252.05	143.74	16,551,466	7676083
	White oak	69938	22498	29654.46	10336.45	779.83	274.56	729.74	252.21	12.313	4.998	895.66	363.54	141,959,766	66656947
	Northern red oak	67024	20827	73484.7	24957.6	1140.56	371.51	997.11	320.78	28.348	12.371	2258.84	985.71	170,640,262	70689084
	White mulberry	64110	31850	6299.27	3973.96	268.54	147.74	248.61	137.64	4.328	2.196	316.6	160.6	57,930,653	33498085
	Chestnut oak	61195	27117	21934.45	15276.74	570.26	346.85	539.24	334.63	9.514	6.411	747.72	503.82	52,639,756	31001645
	Costal plain willow	55367	52489	2723.12	2388.96	185.81	172	164.75	151.26	1.2	1.176	74.09	72.62	25,636,859	24531495
	American sycamore	52453	31026	2164.44	1440.54	114.5	71.33	112.76	70.16	4.883	2.801	236.58	135.72	6,944,436	4452954
	River birch	43711	43704	4462.68	4461.91	183.87	183.84	180.71	180.68	5.777	5.776	447.74	447.66	13,346,232	13343942
	American hornbeam	43711	25929	352.51	212.55	40.3	23.88	39.82	23.6	3.17	2.346	190.96	141.3	1,432,354	859629
	American holly	40797	27748	991.1	895.15	60.48	49.31	59.45	48.42	1.215	0.993	162.38	132.72	3,724,094	3247993
	Silver maple	37883	22503	7155.85	4739.18	166.43	86.57	155.31	80.56	4.128	2.155	217.26	113.41	27,693,378	16793891
	Black locust	37883	27015	3263.88	2565.66	158.16	109.69	153.27	107.4	4.009	3.408	215.82	183.46	15,570,537	9280480
	Eastern cottonwood	32055	29245	16047.5	15099.15	278.8	260.94	264.05	250.35	13.915	13.89	1004	1002.17	33,049,076	31405155
	American elm	29141	22088	832.81	610.26	59.68	42.66	58.58	41.95	1.705	1.335	123.99	97.09	7,007,157	5359759
	Pignut hickory	26227	13111	2068.86	1334.61	97.88	53.09	94.09	50.86	1.589	0.7	30.27	13.33	10,402,713	6817535
	Red pine	26227	19447	2946.37	2641.7	54.92	41.29	41.04	29.53	3.839	3.79	564.62	557.29	4,846,500	3957726
	Willow oak	26227	18542	7595.56	6333.88	149.39	107.91	140.68	101.17	6.45	4.809	572.21	426.61	15,097,953	11952017
	Cherry	23313	9816	670.03	599.13	51.97	39.51	49.99	37.68	0.909	0.679	70.3	52.55	5,787,326	5273218
	Mockernut hickory	20398	12574	3847.52	3520.9	81.06	64.28	77.89	61.84	1.073	0.799	61.46	45.78	7,421,067	6380986
	Black walnut	20398	15062	1354.13	1150.78	69.94	53.61	68.7	52.69	2.233	1.694	178.95	135.75	6,828,032	4811397
	London planetree	20398	17687	625.91	441.33	41.29	29.18	40.35	28.56	1.656	1.166	72.31	50.91	5,106,834	3977261
	Yellow birch	11656	9179	323.99	318.88	14.51	12.64	12.78	10.96	0.311	0.273	12.89	11.32	602,378	519347
	Hawthorn	11656	9179	251.81	242.69	18.7	17.06	18.38	16.74	0.364	0.324	13.08	11.66	1,018,790	970231
	Green ash	11656	7062	305.34	191.58	29.85	21.11	28.95	20.41	0.808	0.574	52.68	37.43	4,764,707	3252999
	Other species	11656	5717	565.41	476.47	27.78	17.96	26.85	17.54	0.858	0.588	64.01	43.85	2,047,114	1460784
	Norway spruce	11656	9179	987.75	932.44	46.64	39.01	42.68	35.41	1.01	0.844	168.29	140.72	12,000,368	11265307

	Tree of heaven	8742	6482	254.13	249.42	16.05	14.91	15.67	14.53	0.564	0.533	42.03	39.78	727,006	701532
	Southern catalpa	8742	8741	121.1	121.08	9.55	9.54	9.45	9.45	0.05	0.05	2.65	2.65	622,783	622676
	Eastern red cedar	8742	8741	1222.27	1222.06	38.62	38.61	35.85	35.84	2.335	2.335	648.67	648.56	19,420,323	19416990
	Eastern white pine	8742	6482	356.47	353.71	16	15.04	15.17	14.22	1.082	1.037	69.59	66.71	6,326,888	6087175
	Shingle oak	8742	8741	54.67	54.66	6.48	6.48	6.38	6.38	0.068	0.068	6.26	6.26	279,214	279166
	Black ash	5828	4095	11.35	7.97	2.59	1.82	2.58	1.81	0.156	0.138	9.31	8.24	83,051	58348
	Crabapple	5828	4095	211.91	200.7	16.94	15.11	16.45	14.64	0.104	0.083	8.97	7.13	2,805,041	2745156
	Common pear	5828	4095	385.29	315.57	25.05	19.95	24.28	19.25	0.701	0.493	52.29	36.75	4,195,308	3932206
	Willow	5828	4095	1942.25	1937.08	74.18	73.27	66.66	65.78	0.638	0.62	39.37	38.25	13,659,442	13631972
	Sugar maple	2914	2914	783.03	782.89	45.47	45.46	42.38	42.38	1.012	1.012	60.97	60.96	6,917,092	6915906
	Paper birch	2914	2914	937.01	936.84	43.3	43.29	41.14	41.14	0.956	0.955	66.83	66.82	5,910,506	5909492
	Eastern redbud	2914	2914	3.82	3.82	1.59	1.59	1.57	1.57	0.092	0.092	5.87	5.87	137,638	137614
	Atlantic white cedar	2914	2914	957.92	957.76	24.69	24.69	19.39	19.39	0.827	0.827	206.67	206.64	14,111,012	14108590
	Flowering dogwood	2914	2914	12.34	12.34	2.1	2.1	2.09	2.09	0.012	0.012	0.69	0.69	56,347	56337
	Ash	2914	2914	11	10.99	1.83	1.83	1.81	1.81	0.137	0.137	12.38	12.38	44,367	44359
	Juniper	2914	2914	65.01	65	8.11	8.11	7.45	7.45	0.144	0.144	39.99	39.99	1,086,045	1085859
	Magnolia	2914	2914	29.02	29.02	2.5	2.5	2.36	2.36	0.006	0.006	0.38	0.38	82,156	82142
	Eastern hophornbeam	2914	2914	6.42	6.42	2.03	2.03	2.01	2.01	0.054	0.054	3.52	3.52	147,056	147031
	Scotch pine	2914	2914	77.41	77.39	3.65	3.65	3.6	3.6	0.037	0.037	3.58	3.57	841,817	841673
	Virginia pine	2914	2914	1099.06	1098.87	33.31	33.31	22.98	22.97	0.841	0.841	81.09	81.07	14,697,164	14694642
	Swamp white oak	2914	2914	3270.8	3270.23	83.91	83.9	76.53	76.51	1.191	1.191	109.27	109.25	27,146,404	27141746
	Pin oak	2914	2914	15.19	15.19	3.44	3.44	3.34	3.34	0.016	0.016	1.49	1.48	243,944	243902
	White willow	2914	2914	2903.78	2903.28	54.31	54.3	11.75	11.74	0.618	0.618	38.15	38.14	11,860,786	11858751
	Sandbar willow	2914	2914	548.52	548.42	18.4	18.4	18.02	18.01	0.167	0.167	10.3	10.3	1,512,992	1512732
	Japanese snowbell	2914	2914	116.43	116.41	16	16	15.5	15.5	0.14	0.14	10.42	10.42	2,162,506	2162135
	Northern white cedar	2914	2914	463.54	463.46	11.75	11.75	10.7	10.7	0.064	0.064	12.38	12.38	13,083,164	13080919
	Chinese elm	2914	2914	1818.8	1818.49	50.02	50.01	45.9	45.9	1.464	1.463	166.32	166.29	20,083,277	20079831
	Siberian elm	2914	2914	2.34	2.34	0.77	0.77	0.76	0.76	0.064	0.064	4.35	4.35	25,498	25494
	Elm	2914	2914	4	4	0.15	0.15	0.04	0.04	0	0	0.02	0.02	5,948	5947
	Total	3630933	490704	513301.67	70348.08	13378.94	1728.38	9698.4	1427.54	400.664	59.32	26499.36	3856.12	1,845,282,110	284601232
Large trans															
	Sweetgum	70200	70195	388.54	388.51	91.14	91.13	90.77	90.77	3.951	3.951	181.38	181.36	6,455,695	6455235
	Tree of heaven	21060	14982	182.64	172.63	51.4	45.66	51.24	45.51	0.611	0.548	45.57	40.84	1,341,435	1180630
	White mulberry	21060	14982	303.56	291.76	47.88	39.63	47.63	39.41	1.652	1.519	120.82	111.13	4,810,609	4330285
	Black cherry	21060	21058	66.14	66.13	25.22	25.22	25.13	25.13	0.518	0.517	40.14	40.13	835,905	835845
	Boxelder	7020	7019	28.95	28.94	10.95	10.95	10.91	10.91	0.213	0.213	19.49	19.49	140,632	140622
	Northern catalpa	7020	7019	24.02	24.02	9.05	9.05	9.02	9.02	0.068	0.068	4.14	4.14	250,325	250307
	Total	147420	124891	993.85	689.43	235.65	178.02	234.71	177.36	7.012	5.233	411.54	283.2	13,834,601	9675218

Institutions	Red maple	164487	105896	16487.7	9646.06	660.58	365.89	638.83	354.05	21.108	11.564	1421.5	778.79	68,864,443	31218325
	Sassafras	120624	120613	698.44	698.38	106.17	106.17	98.33	98.32	1.701	1.701	83.65	83.64	14,025,036	14023757
	Crabapple	115141	115130	635	634.95	120.34	120.33	116.94	116.93	1.832	1.832	157.92	157.91	14,851,093	14849739
	Dead tree	71278	31537	11578.33	5630.42	0	0	-1499.85	1023.83	0	0	0	0	0	0
	Tulip tree	49346	23435	55747.97	44331.06	795.46	560.38	612.58	399.62	18.02	9.587	1062.24	565.16	364,038,567	327089519
	Black cherry	49346	43953	9243.51	8420.17	297.63	290.07	175.3	306.66	2.368	2.359	183.62	182.96	17,136,026	16022277
	Northern red oak	49346	24740	41285.46	23132.27	917.13	518.46	757.89	412.04	14.16	8.393	1128.32	668.79	286,627,269	188318992
	Boxelder	38380	33101	1684.95	1314.1	123.05	97.17	118.31	93.82	2.873	2.573	262.82	235.34	15,940,709	11715682
	White ash	38380	24350	14468.96	11819.48	221.36	155.22	167.69	109.8	3.212	2.138	182.48	121.45	19,223,592	13442492
	Sweet cherry	32897	22725	1623.02	1426.99	111.82	89.67	107.24	85.58	2.146	1.874	166.05	145.01	13,483,329	11951313
	White oak	32897	18108	23425.11	14836.23	525.77	310.85	442.84	256.41	8.842	5.342	643.2	388.58	205,813,236	137019961
	Silver maple	21932	21930	687.48	687.42	54.93	54.92	52.02	52.02	2.154	2.154	113.36	113.35	10,705,604	10704628
	Black tupelo	21932	17099	240.87	209.3	23.85	18.08	23.47	17.85	0.208	0.145	7.19	5.01	1,963,847	1364964
	Quaking aspen	21932	21930	132.46	132.45	15.61	15.61	15.42	15.42	0.307	0.307	24.14	24.14	530,112	530064
	Black locust	21932	12910	6336.49	6191.54	214.1	194.93	173.63	155.18	2.837	2.487	152.75	133.9	49,920,896	47850561
	American holly	16449	16447	911.26	911.18	64.59	64.59	60.93	60.93	0.431	0.431	57.65	57.65	15,721,202	15719769
	Sweetgum	16449	12034	333.97	304.9	23.64	20.88	22.4	19.68	1.496	1.486	68.69	68.23	9,116,800	8894640
	Tree of heaven	10966	10965	77.74	77.74	14.52	14.52	14.3	14.3	0.355	0.355	26.45	26.45	653,755	653696
	Butternut	10966	10965	121.97	121.96	10.42	10.42	10.27	10.27	0.153	0.153	8.46	8.46	471,814	471771
	White mulberry	10966	7575	42.62	36.73	10.07	7.7	9.62	7.32	0.084	0.059	6.14	4.34	961,829	702221
	Norway spruce	10966	10965	1206.92	1206.81	60.72	60.72	57.93	57.93	1.484	1.484	247.32	247.3	17,279,825	17278249
	Norway maple	5483	5482	282.44	282.41	15.87	15.87	15.67	15.67	0.166	0.166	8.99	8.98	1,223,305	1223193
	American hornbeam	5483	5482	635.71	635.65	26.1	26.1	25	25	0.811	0.811	48.88	48.87	1,800,180	1800015
	Bitternut hickory	5483	5482	27.43	27.43	4.36	4.36	4.33	4.33	0.139	0.139	8.73	8.73	171,624	171608
	Dogwood	5483	5482	18.5	18.5	0.5	0.5	0.02	0.02	0.009	0.009	0.54	0.54	11,990	11989
	American beech	5483	5482	4709.69	4709.26	86.04	86.03	82.79	82.78	2.936	2.936	125.12	125.11	10,571,408	10570444
	Honeylocust	5483	5482	1144.34	1144.24	53.62	53.61	49.15	49.15	0.238	0.238	24.9	24.9	13,162,324	13161124
	Spruce	5483	5482	10.47	10.47	2.12	2.12	2.09	2.09	0.02	0.02	3.32	3.32	78,680	78672
	Pin oak	5483	5482	8189.89	8189.15	187.06	187.04	155.85	155.84	1.777	1.777	160.79	160.78	60,904,059	60898505
	Japanese zelkova	5483	5482	1246.03	1245.92	56.57	56.57	51.72	51.72	0.849	0.849	63.35	63.34	17,262,014	17260439
	Total	975957	317123	203234.78	73270.96	4804.01	1392.71	2562.73	1080.26	92.716	26.771	6448.59	1750.49	1,232,514,567	546342058
CITY TOTAL		6758463	732998	1189684.42	132611.89	34976.48	3535.3	23490.81	2960.25	769.76	77.201	52193.78	5087.64	6,329,439,009	816104120

#2. TOTAL ESTIMATES FOR CITY TREES BY SPECIES IN THE BALTIMORE COUNTY URDL

	TREES			CARBON (mt)			CARBON SEQ (mt/yr)			NET CARBON SEQ (mt/yr)			LEAF AREA (km2)			LEAF BIOMASS (mt)			TREE VALUE (U.S. $)	
SPECIES COMMON NAME	%	N	SE	%	N	SE	%	N	SE	N	SE	%	N	SE	%	N	SE	%	N	SE
Red maple	9.1	616815	146734	7.8	93113.48	24049.12	9.5	3339.91	734.59	3092.9	670.4	12.9	99.113	25.002	12.8	6674.76	1683.75	6.9	439,033,221	111936510
Dead tree	8.7	590944	102278	5.2	61400.84	13985.28	0	0	0	-7223.46	2284.09	0	0	0	0	0	0	0	0	0
Tulip tree	5.7	382849	85859	19.4	230856.29	61975.75	11.8	4111.36	947.36	3131.51	795.81	17.8	136.744	31.44	15.4	8060.77	1853.33	15.6	988,495,203	362879646
Black cherry	5.2	350258	79457	1.9	22166.41	10161.49	3.4	1205.06	419.35	1016.13	411.61	1.7	13.308	3.871	2	1032.02	300.17	1.4	88,728,138	36006353
Boxelder	4.2	285445	111042	1.1	12608.54	4948.25	2.3	799.72	286.17	763.11	272.91	2.2	16.95	6.465	3	1550.57	591.37	0.9	58,122,773	22399452
Tree of heaven	4.2	284934	212238	0.5	5608.8	2921.23	1.4	494.14	247.97	479.79	243.01	1.2	8.939	4.74	1.3	666.7	353.56	0.4	26,254,204	13345969
Black tupelo	4.2	284729	92564	0.7	8623.71	3036.14	1.5	527.57	196.36	510.5	190.84	2.2	17.221	6.193	1.1	595.62	214.18	0.8	49,088,044	20119997
White ash	4	268248	92078	7.1	84665.77	37107.16	5.1	1779.72	744.3	1465	653.53	5	38.124	13.791	4.2	2166.12	783.59	5.5	345,259,761	170459692
Sweetgum	3.9	263618	104359	1.4	16064.3	6044.17	1.7	586.45	211.6	563.57	203.44	3	22.796	8.666	2	1046.52	397.85	1.4	89,833,190	36621671
American beech	3.6	246489	87329	2.2	26521.83	11064.63	2.7	933.49	324.67	895.88	310.08	4.4	34.234	11.731	2.8	1458.78	499.87	1.3	83,042,355	30774480
Sassafras	3.1	211958	127245	0.5	6088.69	2751.03	0.9	327.57	142.44	314.03	135.15	1	7.58	3.447	0.7	372.8	169.53	0.5	32,308,011	16036444
White mulberry	2.9	193563	51382	4.7	55423.84	32445.79	5.9	2050.7	1056.11	1831.1	927.14	2	15.365	5.24	2.2	1123.97	383.33	6.5	412,240,820	230233318
Silver maple	2.5	171747	50503	6.5	77588.96	36895.1	6.2	2161.43	892.99	1711.9	630.16	5.5	42.426	15.59	4.3	2232.94	820.52	8.2	521,973,920	229421724
Dogwood	2.4	161134	47797	0.2	2642.97	915.88	1	345.75	131.49	337.17	128.06	0.9	6.933	2.473	0.8	404.32	144.24	0.5	31,244,792	14017498
Sweet cherry	2.4	159433	62194	0.6	6772.83	3443.49	1.6	566.35	296.5	539.66	282.45	0.7	5.091	2.478	0.8	393.93	191.75	1	62,529,373	35401706
Norway maple	2.3	152723	53797	1	12337.06	5087.36	2	706.56	268.95	673.12	253.43	2.4	18.663	7.289	1.9	1007.28	393.41	1.3	80,792,740	37727455
Crabapple	2	136085	115738	0.2	2258.97	1366.01	0.7	229.26	137.34	193.24	125.53	0.3	2.625	1.896	0.4	226.28	163.44	0.5	28,939,527	17247946
Northern red oak	2	134852	35383	11.3	133885.63	36654.76	7.4	2570.98	759.1	2160.7	609	6.3	48.424	15.72	7.4	3858.46	1252.55	8.6	546,525,280	214683764
White oak	1.7	117951	30085	6.1	72536.14	25237.56	5.4	1885.97	612.62	1678.3	526.36	3.6	27.34	8.678	3.8	1988.79	631.3	7.6	480,075,743	188005612
Eastern white pine	1.7	117937	66658	0.9	10930.29	7125.36	1.9	663.42	426.54	605.79	384.83	3	22.958	14.255	2.8	1476.38	916.7	2.9	184,699,632	114965412
American hornbeam	1.5	102985	49245	0.1	1471.57	748.52	0.5	177.21	90.85	173.28	88.94	1.5	11.311	7.148	1.3	681.42	430.6	0.2	11,035,034	5787433
Black locust	1.4	96797	37103	1.2	14671.58	8259.82	1.5	525.52	257.01	476.49	225.4	1.4	10.628	4.869	1.1	572.17	262.11	1.2	77,546,180	49938687
American sycamore	1.1	75992	33236	1.5	17313.38	13063.38	1.6	557.28	347.36	503.3	299.45	1.6	12.478	5.834	1.2	604.51	282.64	1.4	86,552,188	67411773
American holly	1	70474	33659	0.5	5925.57	3574.54	1	332.72	179.18	293.91	151.56	0.6	4.278	2.471	1.1	571.85	330.37	0.8	51,729,093	29764104
Cherry	1	70354	30176	0.9	10952.76	9368.95	1.8	645.44	489.35	602.6	452.74	0.7	5.292	3.202	0.8	409.48	247.74	1.1	67,445,765	54714252
London planetree	1	69726	45352	0.1	1315.41	760.9	0.3	108.64	65.87	106.1	64.23	0.5	4.011	2.235	0.3	175.15	97.61	0.2	15,583,229	10903362
Holly	1	67217	67214	0.6	7076.34	7076.08	1.1	393.93	393.92	365.93	365.91	0.5	3.562	3.562	0.9	476.24	476.23	1.1	67,777,886	67775365
Chestnut oak	1	66234	27581	1.9	22153.93	15278.32	1.7	609.99	349.12	578	336.87	1.3	9.85	6.419	1.5	774.13	504.51	0.9	56,128,346	31197273
Honeylocust	0.9	59256	54050	1	11932.24	10848.01	1.5	541.59	490.89	439.98	393.9	0.3	2.404	2.179	0.5	251.72	228.18	1.3	83,367,489	71425582
Costal plain willow	0.8	55367	52489	0.2	2723.12	2388.96	0.5	185.81	172	164.75	151.26	0.2	1.2	1.176	0.1	74.09	72.62	0.4	25,636,859	24531495
Northern catalpa	0.7	48892	35371	0.2	2140.64	1724.95	0.4	155.37	112.25	148.39	106.07	0.2	1.54	1.059	0.2	93.73	64.49	0.3	16,262,369	14968166
Eastern cottonwood	0.7	45498	32186	1.3	16054.38	15099.15	0.8	284.45	261	269.64	250.41	1.8	14.056	13.89	1.9	1014.15	1002.22	0.5	33,575,888	31409573
River birch	0.6	43711	43704	0.4	4462.68	4461.91	0.5	183.87	183.84	180.71	180.68	0.8	5.777	5.776	0.9	447.74	447.66	0.2	13,346,232	13343942
Japanese maple	0.5	35077	20209	0.9	10344.14	7300.94	1.3	462.77	282.04	422.5	255.11	1	7.631	4.631	0.8	429.47	260.66	1.8	113,437,044	76944279
Pignut hickory	0.5	31265	14046	0.2	2221.95	1343.36	0.3	109.53	54.36	105.47	52.12	0.2	1.593	0.7	0.1	30.36	13.33	0.2	10,940,925	6838743
Willow oak	0.5	31265	19214	0.7	8034.79	6349.08	0.5	185.42	113.76	174.94	106.81	0.9	7.199	4.867	1.2	638.64	431.75	0.3	21,647,607	13628652

American elm	0.4	29141	22088	0.1	832.81	610.26	0.2	59.68	42.66	58.58	41.95	0.2	1.705	1.335	0.2	123.99	97.09	0.1	7,007,157	5359759
Black spruce	0.4	28559	17442	0.1	1513.57	978.47	0.4	155.11	95.73	148.89	91.8	0.2	1.474	0.923	0.5	278.11	174.13	0.4	24,822,800	16321782
Northern white cedar	0.4	28182	25434	0.4	4507	4069.7	0.4	138.51	127.3	116.09	105.92	0.5	3.573	3.509	1.3	687.19	674.88	2.2	139,922,345	127504424
Norway spruce	0.4	27661	15161	0.5	6079.19	4172.81	0.6	214.89	129.49	171.7	98.3	0.7	5.711	3.642	1.8	951.9	607.05	1	63,395,753	39863335
Ligustrum	0.4	26887	26886	0.4	5013.03	5012.84	0.8	284.27	284.26	264.53	264.52	0	0.163	0.163	0	14.84	14.84	0.8	49,492,407	49490566
Blue spruce	0.4	26887	26886	0.4	4858.09	4857.91	0.7	245.85	245.84	226.83	226.82	0.8	6.423	6.422	2.1	1089.63	1089.59	1	63,787,311	63784938
Red pine	0.4	26227	19447	0.2	2946.37	2641.7	0.2	54.92	41.29	41.04	29.53	0.5	3.839	3.79	1.1	564.62	557.29	0.1	4,846,500	3957726
Hawthorn	0.4	25100	16278	0	361.16	266.19	0.2	53.27	38.55	52.41	37.93	0.1	0.523	0.361	0	18.8	12.99	0	2,853,888	2075737
Balsam poplar	0.4	24569	24568	0.7	8654.55	8654.03	1.1	374.04	374.02	340.4	340.38	0.7	5.549	5.549	0.8	400.39	400.36	1.1	70,411,056	70406757
Quaking aspen	0.3	21932	21930	0	132.46	132.45	0	15.61	15.61	15.42	15.42	0	0.307	0.307	0	24.14	24.14	0	530,112	530064
Japanese zelkova	0.3	21845	17255	0.2	2659.62	1884.22	0.6	196.91	151.3	186.26	144.13	0.3	2.104	1.515	0.3	156.95	113.02	0.7	43,665,114	31543007
Mockernut hickory	0.3	20398	12574	0.3	3847.52	3520.9	0.2	81.06	64.28	77.89	61.84	0.1	1.073	0.799	0.1	61.46	45.78	0.1	7,421,067	6380986
Black walnut	0.3	20398	15062	0.1	1354.13	1150.78	0.2	69.94	53.61	68.7	52.69	0.3	2.233	1.694	0.3	178.95	135.75	0.1	6,828,032	4811397
Scotch pine	0.3	19276	16618	0	339.07	272.85	0.1	24.46	21.12	23.78	20.5	0.2	1.396	1.359	0.3	134.51	130.97	0.1	6,683,856	5902005
Spruce	0.3	18926	14518	0	170.87	160.73	0.1	36.76	34.71	36.02	33.98	0.1	0.427	0.407	0.1	72.38	69.13	0	2,659,497	2581920
American basswood	0.3	18482	14356	0.3	3042.61	2519.87	0.5	172.76	136.72	160.78	126.86	1	7.944	7.016	0.4	231.92	204.83	0.8	49,487,955	40165378
Roundleaf serviceberry	0.2	16845	16844	0	108.02	108.01	0	13.65	13.65	13.57	13.57	0	0.116	0.116	0	8.79	8.79	0	514,966	514935
Pin oak	0.2	16820	10463	0.7	8690.1	8203.51	0.7	250.97	196.6	217.63	166.46	0.4	2.698	1.994	0.5	244.15	180.43	1.1	70,020,355	61541828
Bitternut hickory	0.2	15560	11471	0	438.45	411.89	0.2	69.24	65.02	67.43	63.25	0	0.325	0.232	0	20.42	14.59	0.1	7,423,749	7253436
Slippery elm	0.2	15116	15114	0	101.57	101.56	0	12.57	12.57	12.42	12.42	0.1	0.709	0.709	0.1	31.76	31.76	0	544,085	544031
Yellow birch	0.2	11656	9179	0	323.99	318.88	0	14.51	12.64	12.78	10.96	0	0.311	0.273	0	12.89	11.32	0	602,378	519347
Green ash	0.2	11656	7062	0	305.34	191.58	0.1	29.85	21.11	28.95	20.41	0.1	0.808	0.574	0.1	52.68	37.43	0.1	4,764,707	3252999
Other species	0.2	11656	5717	0	565.41	476.47	0.1	27.78	17.96	26.85	17.54	0.1	0.858	0.588	0.1	64.01	43.85	0	2,047,114	1460784
Butternut	0.2	10966	10965	0	121.97	121.96	0	10.42	10.42	10.27	10.27	0	0.153	0.153	0	8.46	8.46	0	471,814	471771
Common pear	0.2	10867	6492	0.1	817.18	534.86	0.2	68.42	47.73	65.87	45.83	0.2	1.837	1.238	0.3	137.01	92.34	0.2	9,981,390	6995309
Common persimmon	0.1	10077	7005	0.4	4723.47	4677.23	0.5	159.46	154.04	141.37	136.05	0.3	1.947	1.805	0.3	145.21	134.62	0.5	33,178,771	33003376
Eastern hemlock	0.1	10077	7005	0.2	2955.8	2796.2	0.3	99.76	85.75	69.23	59.25	0.5	3.9	3.845	0.7	362.24	357.14	0.5	29,034,112	26613906
Southern catalpa	0.1	8742	8741	0	121.1	121.08	0	9.55	9.54	9.45	9.45	0	0.05	0.05	0	2.65	2.65	0	622,783	622676
Eastern red cedar	0.1	8742	8741	0.1	1222.27	1222.06	0.1	38.62	38.61	35.85	35.84	0.3	2.335	2.335	1.2	648.67	648.56	0.3	19,420,323	19416990
Shingle oak	0.1	8742	8741	0	54.67	54.66	0	6.48	6.48	6.38	6.38	0	0.068	0.068	0	6.26	6.26	0	279,214	279166
Pear	0.1	8181	8180	0.1	1651.81	1651.71	0.3	102.1	102.1	95.57	95.56	0.3	2.361	2.361	0.3	176.1	176.09	0.3	21,803,741	21802409
Sugar maple	0.1	7953	5820	0.1	918.3	794.49	0.2	74.13	53.74	70.43	50.81	0.2	1.67	1.207	0.2	100.63	72.72	0.1	8,518,996	7098967
Flowering dogwood	0.1	7953	5820	0	27.39	19.46	0	5.09	3.65	5.06	3.63	0	0.233	0.221	0	13.53	12.85	0	135,675	97292
Elm	0.1	7953	5820	0.1	607.19	603.14	0.1	49.03	48.88	46.49	46.45	0.2	1.205	1.205	0.2	82.11	82.08	0.1	8,262,894	8256129
Black ash	0.1	5828	4095	0	11.35	7.97	0	2.59	1.82	2.58	1.81	0	0.156	0.138	0	9.31	8.24	0	83,051	58348
Willow	0.1	5828	4095	0.2	1942.25	1937.08	0.2	74.18	73.27	66.66	65.78	0.1	0.638	0.62	0.1	39.37	38.25	0.2	13,659,442	13631972
Horsechestnut	0.1	5039	5038	1.6	18718.29	18716.44	1.1	382.2	382.16	311.04	311.01	0.6	4.235	4.235	0.6	296.18	296.15	1.7	107,672,812	107662127
American chestnut	0.1	5039	5038	0.3	3481.24	3480.89	0.4	128.92	128.91	95.97	95.96	0.1	1.096	1.096	0.1	50.05	50.05	0.3	18,920,977	18919099
Singleleaf ash	0.1	5039	5038	0.1	1333.99	1333.86	0.1	34.07	34.07	33.15	33.14	0	0.213	0.213	0	17.11	17.1	0.1	3,677,249	3676884
Yew	0.1	5039	5038	0.1	1471.5	1471.35	0.1	49.09	49.08	43.42	43.42	0.4	3.052	3.051	0.6	337.02	336.99	0.4	23,777,292	23774932
Paper birch	0	2914	2914	0.1	937.01	936.84	0.1	43.3	43.29	41.14	41.14	0.1	0.956	0.955	0.1	66.83	66.82	0.1	5,910,506	5909492
Eastern redbud	0	2914	2914	0	3.82	3.82	0	1.59	1.59	1.57	1.57	0	0.092	0.092	0	5.87	5.87	0	137,638	137614

Atlantic white cedar	0	2914	2914	0.1	957.92	957.76	0.1	24.69	24.69	19.39	19.39	0.1	0.827	0.827	0.4	206.67	206.64	0.2	14,111,012	14108590
Ash	0	2914	2914	0	11	10.99	0	1.83	1.83	1.81	1.81	0	0.137	0.137	0	12.38	12.38	0	44,367	44359
Juniper	0	2914	2914	0	65.01	65	0	8.11	8.11	7.45	7.45	0	0.144	0.144	0.1	39.99	39.99	0	1,086,045	1085859
Magnolia	0	2914	2914	0	29.02	29.02	0	2.5	2.5	2.36	2.36	0	0.006	0.006	0	0.38	0.38	0	82,156	82142
Eastern hophornbeam	0	2914	2914	0	6.42	6.42	0	2.03	2.03	2.01	2.01	0	0.054	0.054	0	3.52	3.52	0	147,056	147031
Virginia pine	0	2914	2914	0.1	1099.06	1098.87	0.1	33.31	33.31	22.98	22.97	0.1	0.841	0.841	0.2	81.09	81.07	0.2	14,697,164	14694642
Swamp white oak	0	2914	2914	0.3	3270.8	3270.23	0.2	83.91	83.9	76.53	76.51	0.2	1.191	1.191	0.2	109.27	109.25	0.4	27,146,404	27141746
White willow	0	2914	2914	0.2	2903.78	2903.28	0.2	54.31	54.3	11.75	11.74	0.1	0.618	0.618	0.1	38.15	38.14	0.2	11,860,786	11858751
Sandbar willow	0	2914	2914	0	548.52	548.42	0.1	18.4	18.4	18.02	18.01	0	0.167	0.167	0	10.3	10.3	0	1,512,992	1512732
Japanese snowbell	0	2914	2914	0	116.43	116.41	0	16	16	15.5	15.5	0	0.14	0.14	0	10.42	10.42	0	2,162,506	2162135
Chinese elm	0	2914	2914	0.2	1818.8	1818.49	0.1	50.02	50.01	45.9	45.9	0.2	1.464	1.463	0.3	166.32	166.29	0.3	20,083,277	20079831
Siberian elm	0	2914	2914	0	2.34	2.34	0	0.77	0.77	0.76	0.76	0	0.064	0.064	0	4.35	4.35	0	25,498	25494

#3. PERCENT OF POPULATION BY DBH CLASS FOR TREES IN THE BALTIMORE COUNTY URDL

	DBH CLASSES (cm)															
	2.5 - 7.6		7.7 - 15.2		15.3 - 22.9		23 - 30.5		30.6 - 38.1		38.2 - 45.7		45.8 - 53.3		53.4 - 61	
SPECIES COMMON NAME	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Boxelder	41.9	5.7	33.8	6.7	15.8	3.48	4	1.26	3.5	1.46	0	.	0	.	1	1.12
Japanese maple	0	.	38.3	27.84	0	.	0	.	38.3	27.84	0	.	0	.	23.3	0
Norway maple	33.8	3.44	34.5	3.67	9	2.64	8.7	3.58	12.1	3.1	1.9	1.87	0	.	0	.
Red maple	22.5	4.58	28.3	3.74	19.8	3.09	8.7	2.14	9.8	3.63	3.2	1.34	5.8	2.14	1.4	0.77
Silver maple	13.2	1.43	10	3.64	12.7	7.77	4.6	2.04	15.4	8	4.8	0	7.7	2.79	6.5	1.88
Sugar maple	0	.	63.4	0	0	.	0	.	36.6	0	0	.	0	.	0	.
Horsechestnut	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Tree of heaven	47.4	3.43	48.1	2.5	1	0.49	0	.	3.5	2.2	0	.	0	.	0	.
Roundleaf serviceberry	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0	.
Yellow birch	50	17.78	25	8.89	25	8.89	0	.	0	.	0	.	0	.	0	.
River birch	6.7	0	40	0	33.3	0	6.7	0	13.3	0	0	.	0	.	0	.
Paper birch	0	.	0	.	0	.	0	.	100	0	0	.	0	.	0	.
American hornbeam	62.6	0	27.2	0	10.2	0	0	.	0	.	0	.	0	.	0	.
Bitternut hickory	35.2	0	32.4	0	32.4	0	0	.	0	.	0	.	0	.	0	.
Pignut hickory	9.3	9.55	62.7	13.01	9.3	9.55	9.3	5.71	9.3	9.55	0	.	0	.	0	.
Mockernut hickory	57.1	10.06	14.3	10.47	14.3	15.09	0	.	0	.	0	.	0	.	14.3	10.47
American chestnut	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0	.
Southern catalpa	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0	.	0	.
Northern catalpa	48.8	0	34.5	0	0	.	0	.	16.7	0	0	.	0	.	0	.
Eastern redbud	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Atlantic white cedar	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0	.
Flowering dogwood	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Dogwood	55.4	9.42	39.7	8.66	4.9	2.35	0	.	0	.	0	.	0	.	0	.
Hawthorn	23.2	8.26	76.8	8.26	0	.	0	.	0	.	0	.	0	.	0	.
Common persimmon	0	.	50	35.94	0	.	0	.	0	.	0	.	0	.	50	35.94
American beech	47	4.51	27.4	5.47	11.9	1.63	5.6	3.22	1.2	1	2.4	2	3.4	1.18	0	.
White ash	27.9	7.76	18.1	4.28	14	3.42	12.6	1.33	10.9	5.45	6.4	2.52	3.3	1.73	1.1	1.12
Singleleaf ash	0	.	0	.	0	.	0	.	100	0	0	.	0	.	0	.
Black ash	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Green ash	0	.	50	17.78	50	17.78	0	.	0	.	0	.	0	.	0	.
Ash	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Honeylocust	45.4	0	0	.	22.7	0	0	.	9.3	0	0	.	22.7	0	0	.

American holly	32.6	8.93	20.7	3.9	20.2	5.35	14.9	0	0	.	11.6	0	0	.	0	.
Holly	60	0	0	.	20	0	0	.	0	.	20	0	0	.	0	.
Butternut	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0	.
Black walnut	0	.	28.6	12.66	57.1	10.47	14.3	5.03	0	.	0	.	0	.	0	.
Juniper	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
Eastern red cedar	0	.	33.3	0	0	.	0	.	66.7	0	0	.	0	.	0	.
Ligustrum	0	.	50	0	0	.	0	.	0	.	50	0	0	.	0	.
Sweetgum	34.3	4.37	29.3	5.9	14.2	3.61	17.7	5.06	2.2	2.26	0	.	1.1	1.09	1.1	1.19
Tulip tree	4.6	2.33	15.8	4.02	11.1	2.91	11.9	2.22	12.2	2.74	9.8	2.3	7.9	2.86	11	2.83
Magnolia	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
Crabapple	66.6	1.52	23.8	1.77	5.8	2.34	0	.	3.7	3.55	0	.	0	.	0	.
White mulberry	31.3	6.29	15.7	5.63	17.5	6.31	5.6	3.45	12.2	2.51	4.1	2.52	0	.	0	.
Black tupelo	54.1	5.79	23.8	3.59	13.9	1.92	6.1	3.08	2	1.39	0	.	0	.	0	.
Eastern hophornbeam	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Other species	25	21.78	50	25.15	0	.	25	21.78	0	.	0	.	0	.	0	.
Norway spruce	21.1	7.49	10.5	3.75	0	.	39.6	0	0	.	10.5	11.24	0	.	18.2	0
Black spruce	0	.	35.3	16.91	64.7	16.91	0	.	0	.	0	.	0	.	0	.
Blue spruce	0	.	0	.	50	0	0	.	0	.	50	0	0	.	0	.
Spruce	29	0	71	0	0	.	0	.	0	.	0	.	0	.	0	.
Red pine	33.3	15.81	22.2	10.54	11.1	5.27	11.1	10.54	11.1	10.54	11.1	10.54	0	.	0	.
Eastern white pine	9.2	4.83	4.3	4.22	15.7	8.44	42.7	11.07	15.3	6.86	8.5	3.84	4.3	4.65	0	.
Scotch pine	0	.	84.9	0	15.1	0	0	.	0	.	0	.	0	.	0	.
Virginia pine	0	.	0	.	0	.	0	.	0	.	0	.	0	.	100	0
London planetree	79.9	4.25	0	.	15.9	0.85	4.2	5.1	0	.	0	.	0	.	0	.
American sycamore	26.8	7.15	23	6.56	29.2	5.8	7.7	5.28	6.6	5.5	0	.	0	.	0	.
Balsam poplar	0	.	0	.	0	.	0	.	0	.	100	0	0	.	0	.
Eastern cottonwood	29.5	0	6.4	0.83	0	.	32	4.14	0	.	12.8	7.46	12.8	1.66	0	.
Quaking aspen	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0	.
Sweet cherry	48.7	5.53	19.9	5.47	21	5.53	8.6	1.44	1.8	1.01	0	.	0	.	0	.
Black cherry	52	6.18	23.6	5.04	7.1	1.93	10.3	1.82	3.8	0.88	2.3	0.84	0.8	0.84	0	.
Cherry	27.9	9.53	18.5	8.32	23.3	3.46	11.3	7.19	0	.	19.1	0	0	.	0	.
Common pear	0	.	26.8	19.08	46.4	0	26.8	19.08	0	.	0	.	0	.	0	.
Pear	0	.	0	.	0	.	0	.	100	0	0	.	0	.	0	.
White oak	7.1	5.38	9.6	5.38	17	6.09	28.7	6.99	4.3	3.55	9.9	3.66	0	.	4.9	3.62
Swamp white oak	0	.	0	.	0	.	0	.	0	.	0	.	0	.	100	0
Shingle oak	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0	.	0	.
Pin oak	17.3	0	0	.	50.1	0	0	.	0	.	0	.	0	.	0	.
Willow oak	18.6	8.96	18.6	7.8	34.8	7.8	9.3	3.9	0	.	0	.	9.3	9.66	9.3	9.66
Chestnut oak	22	8.27	16.4	8.49	13.2	5.29	13.2	6.26	17.6	7.93	8.8	4.25	0	.	8.8	5.9
Northern red oak	2.2	2.2	8.4	4.53	8.1	6.53	6.5	3.49	2.2	1.78	10.5	5.62	18.6	3.94	16.5	6.77
Black locust	19.6	5.42	32.4	6.95	6	5.36	25.5	2.42	0	.	10.9	3.55	5.7	3.55	0	.

White willow	0	.	0	.	0	.	0	.	0	.	0	.	0	.	100	0
Costal plain willow	0	.	47.4	3.55	36.8	2.76	15.8	6.31	0	.	0	.	0	.	0	.
Sandbar willow	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0	.
Willow	50	35.57	0	.	0	.	0	.	0	.	0	.	50	35.57	0	.
Sassafras	70.6	2.85	14.8	2.07	7.7	1.88	4.1	1.52	1.4	1.46	1.4	0.87	0	.	0	.
Japanese snowbell	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.
Yew	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0	.
Northern white cedar	0	.	0	.	0	.	0	.	0	.	59.8	0	10.3	0	29.9	0
American basswood	0	.	0	.	0	.	27.3	0	72.7	0	0	.	0	.	0	.
Eastern hemlock	0	.	0	.	50	35.94	0	.	0	.	0	.	0	.	50	35.94
American elm	20	5.69	50	21.34	30	15.65	0	.	0	.	0	.	0	.	0	.
Chinese elm	0	.	0	.	0	.	0	.	0	.	0	.	0	.	100	0
Siberian elm	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Slippery elm	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0	.	0	.
Elm	36.6	0	0	.	0	.	63.4	0	0	.	0	.	0	.	0	.
Dead tree	39.3	3.8	23.8	3.46	16.7	3.02	7.1	2.61	6.1	2.71	3.2	1.02	2.3	1.33	0	.
Japanese zelkova	0	.	0	.	37.5	0	37.5	0	25.1	0	0	.	0	.	0	.
	61.1 - 68.6		68.7 - 76.2		76.3 - 83.8		83.9 - 91.4		91.5 - 99.1		99.2 - 106.7		106.8 - 114.3		114.4 - 121.9	
SPECIES COMMON NAME	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Red maple	0.5	0.48	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Silver maple	0	.	15.7	11.14	1.7	1.62	7.8	7.54	0	.	0	.	0	.	0	.
Horsechestnut	0	.	0	.	0	.	0	.	0	.	100	0	0	.	0	.
American beech	0	.	1.2	1.13	0	.	0	.	0	.	0	.	0	.	0	.
White ash	1.9	1.35	2	1.12	0	.	0	.	0	.	0	.	0	.	0	.
Tulip tree	5.1	2.14	2.8	1.43	2.1	1.23	0.8	0.74	0	.	0.8	0.79	1.4	1.32	1.4	1.32
White mulberry	1.5	1.36	9.5	2.02	2.6	2.02	0	.	0	.	0	.	0	.	0	.
American sycamore	0	.	0	.	0	.	6.6	5.5	0	.	0	.	0	.	0	.
Eastern cottonwood	0	.	0	.	0	.	6.4	0.83	0	.	0	.	0	.	0	.
White oak	2.5	2.31	9.3	6.72	2.5	2.2	0	.	4.3	3.55	0	.	0	.	0	.
Pin oak	32.6	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Northern red oak	10.2	3.55	12.5	5.4	0	.	2.2	2.1	2.2	2.2	0	.	0	.	0	.
Dead tree	1	1.01	0.5	0.51	0	.	0	.	0	.	0	.	0	.	0	.
	122 - 129.5		129.6 - 137.2		137.3 - 144.8		144.9 - 152.4		152.5 - 160		160.1 - 167.6		167.7 - 175.3		175.4 - 182.9	

SPECIES COMMON NAME	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
White ash	1.9	1.35	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Tulip tree	1.3	1.34	0	.	0	.	0	.	0	.	0	.	0	.	0	.

#4. PERCENT OF POPULATION BY DBH CLASS FOR TREES IN THE BALTIMORE COUNTY URDL

		DBH CLASSES (cm)															
		2.5 - 7.6		7.7 - 15.2		15.3 - 22.9		23 - 30.5		30.6 - 38.1		38.2 - 45.7		45.8 - 53.3		53.4 - 61	
LANDUSE	SPECIES COMMON NAME	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Small lot SF	Japanese maple	0	.	50	36.32	0	.	0	.	50	36.32	0	.	0	.	0	.
	Norway maple	0	.	0	.	0	.	0	.	100	0	0	.	0	.	0	.
	Red maple	0	.	0	.	50	36.32	0	.	0	.	0	.	50	36.32	0	.
	Silver maple	0	.	0	.	20	19.28	0	.	20	19.28	0	.	0	.	0	.
	Tree of heaven	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
	American hornbeam	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0	.	0	.
	Dogwood	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
	Hawthorn	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
	American beech	50	0	0	.	50	0	0	.	0	.	0	.	0	.	0	.
	White ash	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0	.
	Honeylocust	50	0	0	.	25	0	0	.	0	.	0	.	25	0	0	.
	Holly	60	0	0	.	20	0	0	.	0	.	20	0	0	.	0	.
	Ligustrum	0	.	50	0	0	.	0	.	0	.	50	0	0	.	0	.
	Tulip tree	0	.	0	.	0	.	0	.	0	.	0	.	0	.	100	0
	White mulberry	0	.	0	.	0	.	0	.	50	0	0	.	0	.	0	.
	Black tupelo	50	0	25	0	25	0	0	.	0	.	0	.	0	.	0	.
	Black spruce	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.
	Blue spruce	0	.	0	.	50	0	0	.	0	.	50	0	0	.	0	.
	Spruce	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
	Eastern cottonwood	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Black cherry	50	36.32	50	36.32	0	.	0	.	0	.	0	.	0	.	0	.
	Cherry	0	.	0	.	50	0	0	.	0	.	50	0	0	.	0	.
	Northern red oak	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0	.
	Black locust	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Sassafras	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	American basswood	0	.	0	.	0	.	0	.	100	0	0	.	0	.	0	.
	Dead tree	0	.	50	36.32	0	.	0	.	50	36.32	0	.	0	.	0	.
	Total	26.4	9.83	20.8	5.52	17	2.98	1.9	1.69	11.3	4.94	7.5	4.24	5.7	2.18	1.9	1.69
Industrial	Tree of heaven	52	0	48	0	0	.	0	.	0	.	0	.	0	.	0	.
	Roundleaf	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0	.

	serviceberry																				
	American hornbeam	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Northern catalpa	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Eastern white pine	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
	London planetree	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	American sycamore	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
	Pin oak	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
	Black locust	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Northern white cedar	0	.	0	.	0	.	0	.	0	.	66.7	0	0	.	33.3	0		
	Total	45	8.67	40	7.71	7.5	9.9	0	.	0	.	5	6.6	0	.	2.5	3.3		
Attached Dwelli	Japanese maple	0	.	0	.	0	.	0	.	0	.	0	.	0	.	100	0		
	Norway maple	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0	.		
	Red maple	0	.	50	36.93	0	.	0	.	0	.	50	36.93	0	.	0	.		
	Silver maple	0	.	0	.	0	.	0	.	0	.	0	.	50	0	50	0		
	White ash	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.		
	American holly	0	.	0	.	0	.	0	.	0	.	100	0	0	.	0	.		
	Balsam poplar	0	.	0	.	0	.	0	.	0	.	100	0	0	.	0	.		
	Black cherry	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0	.		
	Total	15.4	13.76	15.4	10	0	.	7.7	8.2	0	.	38.5	20.23	7.7	7.57	15.4	8.96		
Large lot SF	Boxelder	0	.	50	11.98	16.7	18.3	0	.	33.3	13.83	0	.	0	.	0	.		
	Norway maple	14.3	7.76	42.9	7.76	14.3	7.76	14.3	15.52	14.3	13.44	0	.	0	.	0	.		
	Red maple	0	.	16.7	9.78	50	16.94	16.7	16.94	0	.	0	.	16.7	16.94	0	.		
	Silver maple	0	.	0	.	0	.	25	15.56	50	17.97	0	.	25	23.77	0	.		
	Sugar maple	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.		
	Horsechestnut	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.		
	Tree of heaven	50	31.12	0	.	0	.	0	.	50	31.12	0	.	0	.	0	.		
	American hornbeam	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.		
	Bitternut hickory	0	.	50	0	50	0	0	.	0	.	0	.	0	.	0	.		
	Pignut hickory	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.		
	American chestnut	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0	.		
	Flowering dogwood	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.		
	Dogwood	33.3	31.94	33.3	15.97	33.3	15.97	0	.	0	.	0	.	0	.	0	.		
	Common persimmon	0	.	50	35.94	0	.	0	.	0	.	0	.	0	.	50	35.94		
	American beech	53.8	0.85	23.1	5.1	15.4	3.4	7.7	9.36	0	.	0	.	0	.	0	.		
	White ash	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.		
	Singleleaf ash	0	.	0	.	0	.	0	.	100	0	0	.	0	.	0	.		
	American holly	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0	.		
	Sweetgum	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.		

	Tulip tree	0	.	0	.	12.5	12.71	12.5	8.98	0	.	0	.	25	15.56	0	.
	Crabapple	0	.	33.3	15.97	33.3	15.97	0	.	33.3	31.94	0	.	0	.	0	.
	White mulberry	21.4	11.85	14.3	9.62	21.4	11.85	7.1	7.3	14.3	6.88	7.1	5.54	0	.	0	.
	Black tupelo	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
	Norway spruce	0	.	0	.	0	.	0	.	0	.	0	.	0	.	100	0
	Black spruce	0	.	66.7	31.94	33.3	31.94	0	.	0	.	0	.	0	.	0	.
	Eastern white pine	5	4.94	5	4.94	10	9.88	50	12.96	15	7.55	10	4.49	5	5.44	0	.
	American sycamore	0	.	0	.	33.3	27.66	0	.	33.3	27.66	0	.	0	.	0	.
	Black cherry	0	.	0	.	33.3	0	0	.	33.3	0	33.3	0	0	.	0	.
	Cherry	25	22.01	50	25.41	0	.	25	22.01	0	.	0	.	0	.	0	.
	Common pear	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.
	White oak	0	.	0	.	0	.	33.3	27.66	33.3	27.66	0	.	0	.	0	.
	Willow oak	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.
	Chestnut oak	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
	Northern red oak	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Black locust	0	.	0	.	0	.	66.7	0	0	.	33.3	0	0	.	0	.
	Sassafras	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.
	Yew	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0	.
	American basswood	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0	.
	Eastern hemlock	0	.	0	.	50	35.94	0	.	0	.	0	.	0	.	50	35.94
	Slippery elm	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0	.	0	.
	Elm	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0	.
	Dead tree	0	.	0	.	42.9	19.24	14.3	14.67	0	.	28.6	8.8	14.3	12.45	0	.
	Total	13.9	4.99	18.1	3.21	18.8	2.79	16.7	4.55	11.8	4.03	4.9	1.47	5.6	1.91	2.1	1.61
Commercial	Silver maple	0	.	0	.	0	.	0	.	0	.	100	0	0	.	0	.
	Northern catalpa	0	.	0	.	0	.	0	.	100	0	0	.	0	.	0	.
	Scotch pine	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
	London planetree	80	0	0	.	20	0	0	.	0	.	0	.	0	.	0	.
	Sweet cherry	0	.	0	.	66.7	0	33.3	0	0	.	0	.	0	.	0	.
	Pear	0	.	0	.	0	.	0	.	100	0	0	.	0	.	0	.
	Japanese zelkova	0	.	0	.	50	0	50	0	0	.	0	.	0	.	0	.
	Total	26.7	18.17	13.3	9.08	26.7	13.85	13.3	11.63	13.3	11.34	6.7	7.32	0	.	0	.
Open space	Boxelder	45.8	7.58	36.1	8.94	13.9	2.86	2.8	1.62	0	.	0	.	0	.	1.4	1.53
	Norway maple	51.6	4.96	35.5	5.41	9.7	3.28	0	.	0	.	3.2	3.15	0	.	0	.
	Red maple	32.3	7.31	22.3	4.38	14.6	3.67	10	3.02	11.5	4.77	3.1	1.49	3.1	1.8	2.3	1.26
	Silver maple	30.8	6.47	30.8	16.5	7.7	8.5	7.7	4.12	7.7	7.34	0	.	0	.	7.7	8.5
	Sugar maple	0	.	0	.	0	.	0	.	100	0	0	.	0	.	0	.
	Tree of heaven	33.3	31.62	33.3	15.81	33.3	15.81	0	.	0	.	0	.	0	.	0	.
	Yellow birch	50	17.78	25	8.89	25	8.89	0	.	0	.	0	.	0	.	0	.

River birch	6.7	0	40	0	33.3	0	6.7	0	13.3	0	0	.	0	.	0	.
Paper birch	0	.	0	.	0	.	0	.	100	0	0	.	0	.	0	.
American hornbeam	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0	.	0	.
Pignut hickory	11.1	11.38	55.6	15.51	11.1	11.38	11.1	6.8	11.1	11.38	0	.	0	.	0	.
Mockernut hickory	57.1	10.06	14.3	10.47	14.3	15.09	0	.	0	.	0	.	0	.	14.3	10.47
Southern catalpa	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0	.	0	.
Eastern redbud	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Atlantic white cedar	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0	.
Flowering dogwood	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Dogwood	69.2	12.67	28.2	12.09	2.6	2.57	0	.	0	.	0	.	0	.	0	.
Hawthorn	50	17.78	50	17.78	0	.	0	.	0	.	0	.	0	.	0	.
American beech	45.1	7.48	35.3	8.78	3.9	2.25	5.9	3.4	2	1.66	3.9	3.32	2	1.96	0	.
White ash	30.9	10.17	16.2	5.59	16.2	4.38	10.3	1.81	14.7	7.38	5.9	1.58	4.4	2.34	1.5	1.52
Black ash	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Green ash	0	.	50	17.78	50	17.78	0	.	0	.	0	.	0	.	0	.
Ash	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
American holly	42.9	15.43	35.7	6.73	21.4	9.24	0	.	0	.	0	.	0	.	0	.
Black walnut	0	.	28.6	12.66	57.1	10.47	14.3	5.03	0	.	0	.	0	.	0	.
Juniper	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
Eastern red cedar	0	.	33.3	0	0	.	0	.	66.7	0	0	.	0	.	0	.
Sweetgum	22	5.96	25.4	8.92	18.6	5.32	27.1	7.75	3.4	3.47	0	.	1.7	1.68	1.7	1.82
Tulip tree	6.3	3.2	17.7	4.14	11.5	3.19	12.5	2.27	16.7	3.75	11.5	2.57	5.2	2.65	8.3	3.56
Magnolia	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
Crabapple	50	35.57	0	.	50	35.57	0	.	0	.	0	.	0	.	0	.
White mulberry	31.8	8.51	31.8	13.3	18.2	8.62	9.1	6.65	0	.	4.5	4.54	0	.	0	.
Black tupelo	54.3	8.02	21.4	4.91	12.9	2.68	8.6	4.3	2.9	1.94	0	.	0	.	0	.
Eastern hophornbeam	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Other species	25	21.78	50	25.15	0	.	25	21.78	0	.	0	.	0	.	0	.
Norway spruce	50	17.78	25	8.89	0	.	0	.	0	.	25	26.68	0	.	0	.
Red pine	33.3	15.81	22.2	10.54	11.1	5.27	11.1	10.54	11.1	10.54	11.1	10.54	0	.	0	.
Eastern white pine	66.7	31.62	0	.	0	.	0	.	33.3	31.62	0	.	0	.	0	.
Scotch pine	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.
Virginia pine	0	.	0	.	0	.	0	.	0	.	0	.	0	.	100	0
London planetree	71.4	14.52	0	.	14.3	2.9	14.3	17.42	0	.	0	.	0	.	0	.
American sycamore	38.9	10.35	33.3	9.5	16.7	2.63	11.1	7.66	0	.	0	.	0	.	0	.
Eastern cottonwood	0	.	9.1	1.18	0	.	45.5	5.88	0	.	18.2	10.58	18.2	2.35	0	.
Sweet cherry	60	7.71	25.7	6.15	11.4	8.35	0	.	2.9	1.58	0	.	0	.	0	.
Black cherry	60.5	8.71	27.6	6.64	3.9	2.95	3.9	2.4	1.3	1.34	1.3	1.32	1.3	1.32	0	.
Cherry	62.5	21.55	12.5	12.18	12.5	10.43	12.5	10.43	0	.	0	.	0	.	0	.
Common pear	0	.	50	35.57	0	.	50	35.57	0	.	0	.	0	.	0	.

	White oak	4.2	4.26	8.3	7.8	20.8	9.17	33.3	9.06	0	.	16.7	6.17	0	.	8.3	6.11
	Swamp white oak	0	.	0	.	0	.	0	.	0	.	0	.	0	.	100	0
	Shingle oak	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0	.	0	.
	Pin oak	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Willow oak	22.2	10.68	22.2	9.29	22.2	9.29	11.1	4.65	0	.	0	.	11.1	11.52	11.1	11.52
	Chestnut oak	23.8	8.95	9.5	9.19	14.3	5.73	14.3	6.78	19	8.58	9.5	4.6	0	.	9.5	6.39
	Northern red oak	4.3	4.42	8.7	6.31	0	.	13	7.02	4.3	3.59	13	8.32	17.4	7.93	8.7	5.47
	Black locust	0	.	46.2	11.14	15.4	13.7	38.5	6.19	0	.	0	.	0	.	0	.
	White willow	0	.	0	.	0	.	0	.	0	.	0	.	0	.	100	0
	Costal plain willow	0	.	47.4	3.55	36.8	2.76	15.8	6.31	0	.	0	.	0	.	0	.
	Sandbar willow	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0	.
	Willow	50	35.57	0	.	0	.	0	.	0	.	0	.	50	35.57	0	.
	Sassafras	44	8.29	28	6.02	8	5.46	12	4.41	4	4.26	4	2.55	0	.	0	.
	Japanese snowbell	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.
	Northern white cedar	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0	.
	American elm	20	5.69	50	21.34	30	15.65	0	.	0	.	0	.	0	.	0	.
	Chinese elm	0	.	0	.	0	.	0	.	0	.	0	.	0	.	100	0
	Siberian elm	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Elm	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Dead tree	48.4	4.79	24.2	3.61	14.6	3.16	5.7	2.13	2.5	1.48	1.9	1.13	0.6	0.65	0	.
	Total	37.1	2.22	25.4	1.5	13.1	1.21	9.3	0.94	5.5	0.84	3.3	0.57	2.1	0.45	2.2	0.5
Large trans	Boxelder	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Tree of heaven	33.3	33.12	66.7	33.12	0	.	0	.	0	.	0	.	0	.	0	.
	Northern catalpa	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Sweetgum	60	0	40	0	0	.	0	.	0	.	0	.	0	.	0	.
	White mulberry	66.7	33.12	0	.	33.3	33.12	0	.	0	.	0	.	0	.	0	.
	Black cherry	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Total	66.7	4.73	28.6	5.37	4.8	6.45	0	.	0	.	0	.	0	.	0	.
Institutions	Boxelder	42.9	8.85	14.3	2.95	28.6	14.75	14.3	2.95	0	.	0	.	0	.	0	.
	Norway maple	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
	Red maple	10	3.34	46.7	8.87	23.3	4.16	6.7	2.55	10	8.04	0	.	3.3	1.42	0	.
	Silver maple	50	0	25	0	25	0	0	.	0	.	0	.	0	.	0	.
	Tree of heaven	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0	.
	American hornbeam	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.
	Bitternut hickory	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Dogwood	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	American beech	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0	.
	White ash	14.3	13.52	42.9	7.81	14.3	7.81	0	.	0	.	14.3	15.61	0	.	0	.
	Honeylocust	0	.	0	.	0	.	0	.	100	0	0	.	0	.	0	.

	American holly	33.3	0	0	.	33.3	0	33.3	0	0	.	0	.	0	.	0	.
	Butternut	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0	.
	Sweetgum	33.3	32.13	33.3	16.07	33.3	16.07	0	.	0	.	0	.	0	.	0	.
	Tulip tree	0	.	22.2	20.51	11.1	8.74	11.1	8.74	0	.	11.1	10.25	11.1	10.25	11.1	8.74
	Crabapple	76.2	0	23.8	0	0	.	0	.	0	.	0	.	0	.	0	.
	White mulberry	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Black tupelo	75	9.04	25	9.04	0	.	0	.	0	.	0	.	0	.	0	.
	Norway spruce	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0	.
	Spruce	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Quaking aspen	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0	.
	Sweet cherry	50	12.05	16.7	18.4	16.7	6.96	16.7	6.96	0	.	0	.	0	.	0	.
	Black cherry	11.1	1.79	0	.	22.2	3.57	55.6	7.14	11.1	1.79	0	.	0	.	0	.
	White oak	16.7	17.04	16.7	9.84	16.7	9.84	16.7	9.84	0	.	0	.	0	.	0	.
	Pin oak	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Northern red oak	0	.	11.1	8.93	22.2	17.85	0	.	0	.	11.1	10.41	0	.	33.3	16.93
	Black locust	25	23.91	25	23.91	0	.	0	.	0	.	25	15.65	25	15.65	0	.
	Sassafras	86.4	0	9.1	0	4.5	0	0	.	0	.	0	.	0	.	0	.
	Dead tree	15.4	6.9	23.1	9.75	23.1	11.12	15.4	15.11	15.4	15.11	0	.	7.7	8.16	0	.
	Japanese zelkova	0	.	0	.	0	.	0	.	100	0	0	.	0	.	0	.
	Total	37.1	8.22	23.6	6.07	14	2.96	9	3.14	4.5	2.4	2.2	1.32	2.8	1.3	2.2	1.45
CITY TOTAL		34	2.13	24.3	1.45	13.8	1.06	8.7	0.89	6.3	0.91	4.4	0.76	2.8	0.45	2.3	0.47

		DBH CLASSES (cm)															
		61.1 - 68.6		68.7 - 76.2		76.3 - 83.8		83.9 - 91.4		91.5 - 99.1		99.2 - 106.7		106.8 - 114.3		114.4 - 121.9	
LANDUSE	SPECIES COMMON NAME	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Small lot SF	Silver maple	0	.	40	28.47	0	.	20	19.28	0	.	0	.	0	.	0	.
	White mulberry	0	.	50	0	0	.	0	.	0	.	0	.	0	.	0	.
	Total	0	.	5.7	4.27	0	.	1.9	2.06	0	.	0	.	0	.	0	.
Large lot SF	Horsechestnut	0	.	0	.	0	.	0	.	0	.	100	0	0	.	0	.
	White ash	50	35.94	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Tulip tree	12.5	11	12.5	8.98	12.5	8.98	0	.	0	.	0	.	0	.	0	.
	White mulberry	0	.	7.1	5.54	7.1	5.54	0	.	0	.	0	.	0	.	0	.
	American sycamore	0	.	0	.	0	.	33.3	27.66	0	.	0	.	0	.	0	.
	White oak	0	.	0	.	0	.	0	.	33.3	27.66	0	.	0	.	0	.
	Northern red oak	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.

	Total	2.1	1.07	1.4	0.82	1.4	0.82	0.7	0.67	0.7	0.71	0.7	0.72	0	.	0	.
Open space	Red maple	0.8	0.79	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Silver maple	0	.	0	.	7.7	7.34	0	.	0	.	0	.	0	.	0	.
	American beech	0	.	2	1.88	0	.	0	.	0	.	0	.	0	.	0	.
	Tulip tree	5.2	2.47	2.1	1.46	1	1.07	1	1.02	0	.	1	1.08	0	.	0	.
	White mulberry	4.5	4.09	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Eastern cottonwood	0	.	0	.	0	.	9.1	1.18	0	.	0	.	0	.	0	.
	White oak	4.2	3.9	0	.	4.2	3.71	0	.	0	.	0	.	0	.	0	.
	Northern red oak	13	7.14	8.7	4.82	0	.	4.3	4.23	4.3	4.42	0	.	0	.	0	.
	Dead tree	1.3	1.3	0.6	0.65	0	.	0	.	0	.	0	.	0	.	0	.
	Total	1	0.32	0.5	0.21	0.2	0.13	0.2	0.17	0.1	0.08	0.1	0.08	0	.	0	.
Institutions	White ash	0	.	14.3	7.81	0	.	0	.	0	.	0	.	0	.	0	.
	Tulip tree	0	.	0	.	0	.	0	.	0	.	0	.	1	1.1	10.25	11.1	10.25
	White oak	0	.	33.3	24.1	0	.	0	.	0	.	0	.	0	.	0	.
	Pin oak	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Northern red oak	0	.	22.2	13.24	0	.	0	.	0	.	0	.	0	.	0	.
	Total	0.6	0.61	2.8	1.36	0	.	0	.	0	.	0	.	0.6	0.51	0.6	0.51
CITY TOTAL		0.9	0.23	1.4	0.51	0.3	0.11	0.4	0.25	0.1	0.09	0.1	0.09	0.1	0.07	0.1	0.07

		DBH CLASSES (cm)															
		122 - 129.5		129.6 - 137.2		137.3 - 144.8		144.9 - 152.4		152.5 - 160		160.1 - 167.6		167.7 - 175.3		175.4 - 182.9	
LANDUSE	SPECIES COMMON NAME	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Large lot SF	White ash	50	35.94	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Tulip tree	12.5	12.71	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Total	1.4	1	0	.	0	.	0	.	0	.	0	.	0	.	0	.
CITY TOTAL		0.1	0.11	0	.	0	.	0	.	0	.	0	.	0	.	0	.

#5. PERCENT OF DBH CLASS POPULATION BY SPECIES FOR TREES IN THE BALTIMORE COUNTY URDL

		DBH CLASSES (cm)															
		2.5 - 7.6		7.7 - 15.2		15.3 - 22.9		23 - 30.5		30.6 - 38.1		38.2 - 45.7		45.8 - 53.3		53.4 - 61	
LANDUSE	SPECIES COMMON NAME	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Small lot SF	Japanese maple	0	.	9.1	8.49	0	.	0	.	16.7	12.76	0	.	0	.	0	.
	Norway maple	0	.	0	.	0	.	0	.	16.7	12.76	0	.	0	.	0	.
	Red maple	0	.	0	.	11.1	10.15	0	.	0	.	0	.	33.3	27.96	0	.
	Silver maple	0	.	0	.	11.1	8.6	0	.	16.7	16.14	0	.	0	.	0	.
	Tree of heaven	0	.	9.1	7.5	0	.	0	.	0	.	0	.	0	.	0	.
	American hornbeam	14.3	6.46	9.1	7.5	0	.	0	.	0	.	0	.	0	.	0	.
	Dogwood	0	.	18.2	10.67	0	.	0	.	0	.	0	.	0	.	0	.
	Hawthorn	0	.	9.1	9.38	0	.	0	.	0	.	0	.	0	.	0	.
	American beech	7.1	3.23	0	.	11.1	8.6	0	.	0	.	0	.	0	.	0	.
	White ash	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0	.
	Honeylocust	14.3	16.04	0	.	11.1	10.15	0	.	0	.	0	.	33.3	27.96	0	.
	Holly	21.4	22.57	0	.	11.1	10.15	0	.	0	.	25	22.24	0	.	0	.
	Ligustrum	0	.	9.1	9.38	0	.	0	.	0	.	25	22.24	0	.	0	.
	Tulip tree	0	.	0	.	0	.	0	.	0	.	0	.	0	.	100	0
	White mulberry	0	.	0	.	0	.	0	.	16.7	16.14	0	.	0	.	0	.
	Black tupelo	14.3	6.46	9.1	7.5	11.1	8.6	0	.	0	.	0	.	0	.	0	.
	Black spruce	0	.	0	.	11.1	10.15	0	.	0	.	0	.	0	.	0	.
	Blue spruce	0	.	0	.	11.1	11.49	0	.	0	.	25	22.24	0	.	0	.
	Spruce	0	.	9.1	8.49	0	.	0	.	0	.	0	.	0	.	0	.
	Eastern cottonwood	7.1	3.23	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Black cherry	7.1	3.23	9.1	8.49	0	.	0	.	0	.	0	.	0	.	0	.
	Cherry	0	.	0	.	11.1	11.49	0	.	0	.	25	22.24	0	.	0	.
	Northern red oak	0	.	0	.	0	.	0	.	0	.	0	.	33.3	27.96	0	.
	Black locust	7.1	3.23	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Sassafras	7.1	3.23	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	American basswood	0	.	0	.	0	.	0	.	16.7	16.14	0	.	0	.	0	.
	Dead tree	0	.	9.1	8.49	0	.	0	.	16.7	16.14	0	.	0	.	0	.
Industrial	Tree of heaven	72.2	0	75	0	0	.	0	.	0	.	0	.	0	.	0	.
	Roundleaf serviceberry	5.6	0	6.3	0	0	.	0	.	0	.	0	.	0	.	0	.
	American hornbeam	5.6	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Northern catalpa	11.1	0	12.5	0	0	.	0	.	0	.	0	.	0	.	0	.

	Eastern white pine	0	.	0	.	33.3	0	0	.	0	.	0	.	0	.	0	.
	London planetree	5.6	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	American sycamore	0	.	0	.	33.3	0	0	.	0	.	0	.	0	.	0	.
	Pin oak	0	.	0	.	33.3	0	0	.	0	.	0	.	0	.	0	.
	Black locust	0	.	6.3	0	0	.	0	.	0	.	0	.	0	.	0	.
	Northern white cedar	0	.	0	.	0	.	0	.	0	.	100	0	0	.	100	0
Attached Dwelli	Japanese maple	0	.	0	.	0	.	0	.	0	.	0	.	0	.	50	36.93
	Norway maple	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0	.
	Red maple	0	.	50	36.93	0	.	0	.	0	.	20	17.72	0	.	0	.
	Silver maple	0	.	0	.	0	.	0	.	0	.	0	.	100	0	50	36.93
	White ash	50	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	American holly	0	.	0	.	0	.	0	.	0	.	20	17.72	0	.	0	.
	Balsam poplar	0	.	0	.	0	.	0	.	0	.	60	35.45	0	.	0	.
	Black cherry	50	0	50	36.93	0	.	0	.	0	.	0	.	0	.	0	.
Large lot SF	Boxelder	0	.	11.5	7.34	3.7	2.91	0	.	11.8	11.52	0	.	0	.	0	.
	Norway maple	5	5.49	11.5	8.66	3.7	3.56	4.2	4.06	5.9	4.97	0	.	0	.	0	.
	Red maple	0	.	3.8	3.52	11.1	6.2	4.2	4.42	0	.	0	.	12.5	11.88	0	.
	Silver maple	0	.	0	.	0	.	4.2	4.06	11.8	6.65	0	.	12.5	11.88	0	.
	Sugar maple	0	.	3.8	3.35	0	.	0	.	0	.	0	.	0	.	0	.
	Horsechestnut	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Tree of heaven	10	7.64	0	.	0	.	0	.	11.8	7.26	0	.	0	.	0	.
	American hornbeam	0	.	0	.	3.7	3.7	0	.	0	.	0	.	0	.	0	.
	Bitternut hickory	0	.	3.8	3.35	3.7	3.7	0	.	0	.	0	.	0	.	0	.
	Pignut hickory	0	.	3.8	3.52	0	.	0	.	0	.	0	.	0	.	0	.
	American chestnut	0	.	0	.	0	.	0	.	0	.	0	.	12.5	11.88	0	.
	Flowering dogwood	5	3.82	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Dogwood	5	3.82	3.8	3.84	3.7	3.7	0	.	0	.	0	.	0	.	0	.
	Common persimmon	0	.	3.8	3.52	0	.	0	.	0	.	0	.	0	.	33.3	31.94
	American beech	35	22.66	11.5	10.56	7.4	7.41	4.2	4.42	0	.	0	.	0	.	0	.
	White ash	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Singleleaf ash	0	.	0	.	0	.	0	.	5.9	4.97	0	.	0	.	0	.
	American holly	0	.	0	.	0	.	4.2	4.42	0	.	0	.	0	.	0	.
	Sweetgum	5	5.24	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Tulip tree	0	.	0	.	3.7	3.7	4.2	4.06	0	.	0	.	25	15.56	0	.
	Crabapple	0	.	3.8	3.99	3.7	3.7	0	.	5.9	6.11	0	.	0	.	0	.
	White mulberry	15	7.85	7.7	5.33	11.1	6.92	4.2	4.42	11.8	8.34	14.3	11.73	0	.	0	.
	Black tupelo	0	.	3.8	3.52	0	.	0	.	0	.	0	.	0	.	0	.
	Norway spruce	0	.	0	.	0	.	0	.	0	.	0	.	0	.	33.3	15.97
	Black spruce	0	.	7.7	7.37	3.7	3.56	0	.	0	.	0	.	0	.	0	.

	Eastern white pine	5	5.49	3.8	3.99	7.4	7.41	41.7	21.74	17.6	14.92	28.6	19.24	12.5	11.88	0	.
	American sycamore	0	.	0	.	3.7	2.91	0	.	5.9	4.97	0	.	0	.	0	.
	Black cherry	0	.	0	.	3.7	3.84	0	.	5.9	5.76	14.3	11.73	0	.	0	.
	Cherry	5	3.82	7.7	4.87	0	.	4.2	4.06	0	.	0	.	0	.	0	.
	Common pear	0	.	0	.	3.7	3.84	0	.	0	.	0	.	0	.	0	.
	White oak	0	.	0	.	0	.	4.2	4.42	5.9	5.76	0	.	0	.	0	.
	Willow oak	0	.	0	.	3.7	3.56	0	.	0	.	0	.	0	.	0	.
	Chestnut oak	0	.	3.8	3.84	0	.	0	.	0	.	0	.	0	.	0	.
	Northern red oak	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Black locust	0	.	0	.	0	.	8.3	8.12	0	.	14.3	11.73	0	.	0	.
	Sassafras	0	.	0	.	3.7	2.91	0	.	0	.	0	.	0	.	0	.
	Yew	0	.	0	.	0	.	0	.	0	.	0	.	12.5	11.88	0	.
	American basswood	0	.	0	.	0	.	4.2	4.06	0	.	0	.	0	.	0	.
	Eastern hemlock	0	.	0	.	3.7	3.7	0	.	0	.	0	.	0	.	33.3	15.97
	Slippery elm	10	7.64	3.8	3.52	0	.	0	.	0	.	0	.	0	.	0	.
	Elm	0	.	0	.	0	.	4.2	4.06	0	.	0	.	0	.	0	.
	Dead tree	0	.	0	.	11.1	6.2	4.2	4.42	0	.	28.6	15.8	12.5	11.88	0	.
Commercial	Silver maple	0	.	0	.	0	.	0	.	0	.	100	0	0	.	0	.
	Northern catalpa	0	.	0	.	0	.	0	.	50	37.27	0	.	0	.	0	.
	Scotch pine	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.
	London planetree	100	0	0	.	25	27.95	0	.	0	.	0	.	0	.	0	.
	Sweet cherry	0	.	0	.	50	18.63	50	0	0	.	0	.	0	.	0	.
	Pear	0	.	0	.	0	.	0	.	50	37.27	0	.	0	.	0	.
	Japanese zelkova	0	.	0	.	25	9.32	50	0	0	.	0	.	0	.	0	.
Open space	Boxelder	7.1	3.58	8.2	4.02	6.1	3.68	1.7	1.13	0	.	0	.	0	.	3.7	3.7
	Norway maple	3.5	1.75	3.5	1.83	1.8	1.31	0	.	0	.	2.4	2.46	0	.	0	.
	Red maple	9.1	2.99	9.2	2.76	11.7	3.67	11.2	3.21	22.1	8.61	9.8	4.18	15.4	8.78	11.1	6.33
	Silver maple	0.9	0.51	1.3	1.21	0.6	0.63	0.9	0.82	1.5	1.5	0	.	0	.	3.7	3.56
	Sugar maple	0	.	0	.	0	.	0	.	1.5	1.47	0	.	0	.	0	.
	Tree of heaven	0.2	0.21	0.3	0.31	0.6	0.61	0	.	0	.	0	.	0	.	0	.
	Yellow birch	0.4	0.29	0.3	0.31	0.6	0.59	0	.	0	.	0	.	0	.	0	.
	River birch	0.2	0.21	1.9	1.85	3.1	2.99	0.9	0.85	2.9	2.86	0	.	0	.	0	.
	Paper birch	0	.	0	.	0	.	0	.	1.5	1.47	0	.	0	.	0	.
	American hornbeam	2.2	1.28	1.6	0.94	0	.	0	.	0	.	0	.	0	.	0	.
	Pignut hickory	0.2	0.21	1.6	1.03	0.6	0.62	0.9	0.87	1.5	1.45	0	.	0	.	0	.
	Mockernut hickory	0.9	0.61	0.3	0.31	0.6	0.63	0	.	0	.	0	.	0	.	3.7	3.41
	Southern catalpa	0.4	0.42	0.3	0.31	0	.	0	.	0	.	0	.	0	.	0	.
	Eastern redbud	0.2	0.22	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Atlantic white cedar	0	.	0	.	0	.	0	.	0	.	0	.	3.8	3.84	0	.

Flowering dogwood	0.2	0.21	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Dogwood	5.8	2.48	3.5	1.64	0.6	0.61	0	.	0	.	0	.	0	.	0	.
Hawthorn	0.4	0.3	0.6	0.63	0	.	0	.	0	.	0	.	0	.	0	.
American beech	5	2.16	5.7	2.7	1.2	0.89	2.6	1.91	1.5	1.47	4.9	4.67	3.8	3.53	0	.
White ash	4.5	1.8	3.5	1.48	6.7	3.73	6	3.19	14.7	10.4	9.8	5.64	11.5	8.12	3.7	3.56
Black ash	0.4	0.3	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Green ash	0	.	0.6	0.44	1.2	0.89	0	.	0	.	0	.	0	.	0	.
Ash	0.2	0.22	0	.	0	.	0	.	0	.	0	.	0	.	0	.
American holly	1.3	0.69	1.6	1.3	1.8	1.81	0	.	0	.	0	.	0	.	0	.
Black walnut	0	.	0.6	0.46	2.5	1.94	0.9	0.85	0	.	0	.	0	.	0	.
Juniper	0	.	0.3	0.32	0	.	0	.	0	.	0	.	0	.	0	.
Eastern red cedar	0	.	0.3	0.32	0	.	0	.	2.9	2.95	0	.	0	.	0	.
Sweetgum	2.8	1.4	4.7	2.9	6.7	3.54	13.8	5.38	2.9	2.95	0	.	3.8	3.84	3.7	3.56
Tulip tree	1.3	0.78	5.4	2.05	6.7	2.8	10.3	3.02	23.5	8.29	26.8	8.87	19.2	9.73	29.6	10.46
Magnolia	0	.	0.3	0.31	0	.	0	.	0	.	0	.	0	.	0	.
Crabapple	0.2	0.21	0	.	0.6	0.59	0	.	0	.	0	.	0	.	0	.
White mulberry	1.5	0.84	2.2	1.2	2.5	1.83	1.7	1.69	0	.	2.4	2.46	0	.	0	.
Black tupelo	8.2	2.9	4.7	2.09	5.5	1.98	5.2	2.78	2.9	2.11	0	.	0	.	0	.
Eastern hophornbeam	0.2	0.22	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Other species	0.2	0.22	0.6	0.43	0	.	0.9	0.85	0	.	0	.	0	.	0	.
Norway spruce	0.4	0.44	0.3	0.32	0	.	0	.	0	.	2.4	2.46	0	.	0	.
Red pine	0.6	0.63	0.6	0.63	0.6	0.6	0.9	0.84	1.5	1.47	2.4	2.46	0	.	0	.
Eastern white pine	0.4	0.44	0	.	0	.	0	.	1.5	1.47	0	.	0	.	0	.
Scotch pine	0	.	0	.	0.6	0.6	0	.	0	.	0	.	0	.	0	.
Virginia pine	0	.	0	.	0	.	0	.	0	.	0	.	0	.	3.7	3.7
London planetree	1.1	1.09	0	.	0.6	0.61	0.9	0.88	0	.	0	.	0	.	0	.
American sycamore	1.5	0.87	1.9	1.25	1.8	1	1.7	1.71	0	.	0	.	0	.	0	.
Eastern cottonwood	0	.	0.3	0.3	0	.	4.3	4.08	0	.	4.9	3.48	7.7	7.38	0	.
Sweet cherry	4.5	2.01	2.8	1.91	2.5	1.84	0	.	1.5	1.31	0	.	0	.	0	.
Black cherry	10	2.99	6.6	1.86	1.8	1.34	2.6	1.47	1.5	1.5	2.4	2.46	3.8	3.84	0	.
Cherry	1.1	0.6	0.3	0.31	0.6	0.63	0.9	0.88	0	.	0	.	0	.	0	.
Common pear	0	.	0.3	0.32	0	.	0.9	0.88	0	.	0	.	0	.	0	.
White oak	0.2	0.21	0.6	0.64	3.1	1.74	6.9	2.85	0	.	9.8	4.03	0	.	7.4	5
Swamp white oak	0	.	0	.	0	.	0	.	0	.	0	.	0	.	3.7	3.7
Shingle oak	0.4	0.44	0.3	0.31	0	.	0	.	0	.	0	.	0	.	0	.
Pin oak	0.2	0.22	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Willow oak	0.4	0.3	0.6	0.61	1.2	1.19	0.9	0.84	0	.	0	.	3.8	3.84	3.7	3.56
Chestnut oak	1.1	0.43	0.6	0.63	1.8	1.03	2.6	1.91	5.9	3.62	4.9	3.31	0	.	7.4	7.12
Northern red oak	0.2	0.21	0.6	0.42	0	.	2.6	1.85	1.5	1.5	7.3	4.83	15.4	6.87	7.4	5.2
Black locust	0	.	1.9	1.59	1.2	0.86	4.3	3.45	0	.	0	.	0	.	0	.
White willow	0	.	0	.	0	.	0	.	0	.	0	.	0	.	3.7	3.7

	Costal plain willow	0	.	2.8	2.82	4.3	4.19	2.6	1.93	0	.	0	.	0	.	0	.
	Sandbar willow	0	.	0	.	0	.	0.9	0.82	0	.	0	.	0	.	0	.
	Willow	0.2	0.21	0	.	0	.	0	.	0	.	0	.	3.8	3.84	0	.
	Sassafras	2.4	1.27	2.2	1.41	1.2	0.85	2.6	1.39	1.5	1.43	2.4	2.34	0	.	0	.
	Japanese snowbell	0	.	0	.	0.6	0.63	0	.	0	.	0	.	0	.	0	.
	Northern white cedar	0	.	0	.	0	.	0	.	0	.	0	.	3.8	3.84	0	.
	American elm	0.4	0.3	1.6	1.58	1.8	1.35	0	.	0	.	0	.	0	.	0	.
	Chinese elm	0	.	0	.	0	.	0	.	0	.	0	.	0	.	3.7	3.7
	Siberian elm	0.2	0.22	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Elm	0.2	0.22	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Dead tree	16.5	2.7	12	2.18	14.1	3.58	7.8	2.54	5.9	3.48	7.3	3.96	3.8	3.84	0	.
Large trans	Boxelder	7.1	9.13	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Tree of heaven	7.1	9.13	33.3	0	0	.	0	.	0	.	0	.	0	.	0	.
	Northern catalpa	7.1	1.52	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Sweetgum	42.9	9.13	66.7	0	0	.	0	.	0	.	0	.	0	.	0	.
	White mulberry	14.3	3.04	0	.	100	0	0	.	0	.	0	.	0	.	0	.
	Black cherry	21.4	4.56	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Institutions	Boxelder	4.5	4.71	2.4	2.62	8	5.67	6.3	6.14	0	.	0	.	0	.	0	.
	Norway maple	0	.	2.4	2.57	0	.	0	.	0	.	0	.	0	.	0	.
	Red maple	4.5	2.94	33.3	15.14	28	11.17	12.5	8.89	37.5	14.11	0	.	20	19.18	0	.
	Silver maple	3	2.41	2.4	2.08	4	4.13	0	.	0	.	0	.	0	.	0	.
	Tree of heaven	1.5	1.57	2.4	2.62	0	.	0	.	0	.	0	.	0	.	0	.
	American hornbeam	0	.	0	.	4	3.97	0	.	0	.	0	.	0	.	0	.
	Bitternut hickory	1.5	1.52	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Dogwood	1.5	1.62	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	American beech	0	.	0	.	0	.	0	.	0	.	0	.	20	14.17	0	.
	White ash	1.5	1.2	7.1	5.97	4	4.29	0	.	0	.	25	15.65	0	.	0	.
	Honeylocust	0	.	0	.	0	.	0	.	12.5	12.58	0	.	0	.	0	.
	American holly	1.5	1.7	0	.	4	4.29	6.3	6.54	0	.	0	.	0	.	0	.
	Butternut	1.5	1.62	2.4	2.51	0	.	0	.	0	.	0	.	0	.	0	.
	Sweetgum	1.5	1.68	2.4	2.08	4	4.13	0	.	0	.	0	.	0	.	0	.
	Tulip tree	0	.	4.8	4.16	4	3.42	6.3	4.73	0	.	25	15.65	20	14.17	25	23.91
	Crabapple	24.2	19.24	11.9	10.41	0	.	0	.	0	.	0	.	0	.	0	.
	White mulberry	3	0.99	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Black tupelo	4.5	2.94	2.4	1.62	0	.	0	.	0	.	0	.	0	.	0	.
	Norway spruce	0	.	0	.	0	.	12.5	12.27	0	.	0	.	0	.	0	.
	Spruce	1.5	1.52	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Quaking aspen	3	3.05	4.8	3.25	0	.	0	.	0	.	0	.	0	.	0	.
	Sweet cherry	4.5	3.61	2.4	2.67	4	4.13	6.3	6.14	0	.	0	.	0	.	0	.

	Black cherry	1.5	1.62	0	.	8	6.85	31.3	18.27	12.5	12.58	0	.	0	.	0	.
	White oak	1.5	1.68	2.4	1.62	4	3.22	6.3	6.14	0	.	0	.	0	.	0	.
	Pin oak	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Northern red oak	0	.	2.4	1.62	8	6.44	0	.	0	.	25	23.91	0	.	75	23.91
	Black locust	1.5	1.57	2.4	2.08	0	.	0	.	0	.	25	23.91	20	19.18	0	.
	Sassafras	28.8	22.85	4.8	5.13	4	3.97	0	.	0	.	0	.	0	.	0	.
	Dead tree	3	2.25	7.1	4.7	12	7.12	12.5	12.27	25	17.5	0	.	20	19.18	0	.
	Japanese zelkova	0	.	0	.	0	.	0	.	12.5	12.58	0	.	0	.	0	.
CITY TOTAL	Boxelder	5.2	2.26	5.9	2.36	4.8	2.09	1.9	1.13	2.4	2.32	0	.	0	.	1.9	1.89
	Japanese maple	0	.	0.8	0.77	0	.	0	.	3.2	2.42	0	.	0	.	5.3	3.93
	Norway maple	2.3	1.05	3.2	1.29	1.5	0.84	2.3	0.84	4.4	2.62	1	0.99	0	.	0	.
	Red maple	6	1.81	10.6	2.67	13.1	2.95	9.2	2.46	14.2	4.27	6.7	2.97	18.6	7.76	5.7	3.24
	Silver maple	1	0.48	1	0.74	2.3	1.31	1.4	0.96	6.2	3.42	2.8	0	6.9	2.5	7.2	4.33
	Sugar maple	0	.	0.3	0.27	0	.	0	.	0.7	0.69	0	.	0	.	0	.
	Horsechestnut	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Tree of heaven	5.9	0.58	8.4	0.79	0.3	0.31	0	.	2.4	1.46	0	.	0	.	0	.
	Roundleaf serviceberry	0.4	0	0.5	0	0	.	0	.	0	.	0	.	0	.	0	.
	Yellow birch	0.3	0.17	0.2	0.17	0.3	0.3	0	.	0	.	0	.	0	.	0	.
	River birch	0.1	0.13	1.1	1.04	1.6	1.52	0.5	0.49	1.4	1.33	0	.	0	.	0	.
	Paper birch	0	.	0	.	0	.	0	.	0.7	0.69	0	.	0	.	0	.
	American hornbeam	2.8	0.92	1.7	0.86	1.1	0.79	0	.	0	.	0	.	0	.	0	.
	Bitternut hickory	0.2	0.24	0.3	0.27	0.5	0.54	0	.	0	.	0	.	0	.	0	.
	Pignut hickory	0.1	0.13	1.2	0.65	0.3	0.32	0.5	0.5	0.7	0.68	0	.	0	.	0	.
	Mockernut hickory	0.5	0.36	0.2	0.18	0.3	0.32	0	.	0	.	0	.	0	.	1.9	1.74
	American chestnut	0	.	0	.	0	.	0	.	0	.	0	.	2.6	2.5	0	.
	Southern catalpa	0.3	0.25	0.2	0.18	0	.	0	.	0	.	0	.	0	.	0	.
	Northern catalpa	1	0.07	1	0	0	.	0	.	1.9	1.44	0	.	0	.	0	.
	Eastern redbud	0.1	0.13	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Atlantic white cedar	0	.	0	.	0	.	0	.	0	.	0	.	1.5	1.52	0	.
	Flowering dogwood	0.3	0.21	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Dogwood	3.9	1.49	3.9	1.37	0.9	0.62	0	.	0	.	0	.	0	.	0	.
	Hawthorn	0.3	0.18	1.2	0.92	0	.	0	.	0	.	0	.	0	.	0	.
	Common persimmon	0	.	0.3	0.28	0	.	0	.	0	.	0	.	0	.	3.3	3.14
	American beech	5	1.63	4.1	1.73	3.1	1.62	2.4	1.43	0.7	0.69	2	1.88	4.4	2.46	0	.
	White ash	3.3	1.07	3	1.18	4	2	5.8	1.84	6.9	4.85	5.8	2.55	4.6	3.2	1.9	1.82
	Singleleaf ash	0	.	0	.	0	.	0	.	1.2	1	0	.	0	.	0	.
	Black ash	0.3	0.18	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Green ash	0	.	0.4	0.25	0.6	0.45	0	.	0	.	0	.	0	.	0	.
	Ash	0.1	0.13	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Honeylocust	1.2	1.31	0	.	1.4	1.31	0	.	1.3	1.3	0	.	7	5.87	0	.

American holly	1	0.49	0.9	0.73	1.5	1.11	1.8	1.34	0	.	2.8	2.45	0	.	0	.
Holly	1.8	1.85	0	.	1.4	1.31	0	.	0	.	4.5	4.04	0	.	0	.
Butternut	0.2	0.25	0.3	0.35	0	.	0	.	0	.	0	.	0	.	0	.
Black walnut	0	.	0.4	0.26	1.2	0.98	0.5	0.49	0	.	0	.	0	.	0	.
Juniper	0	.	0.2	0.18	0	.	0	.	0	.	0	.	0	.	0	.
Eastern red cedar	0	.	0.2	0.18	0	.	0	.	1.4	1.38	0	.	0	.	0	.
Ligustrum	0	.	0.8	0.85	0	.	0	.	0	.	4.5	4.04	0	.	0	.
Sweetgum	3.9	0.98	4.7	1.66	4	1.9	8	3.11	1.4	1.38	0	.	1.5	1.52	1.9	1.82
Tulip tree	0.8	0.46	3.7	1.29	4.6	1.6	7.8	2.07	11	3.87	12.7	3.76	15.7	5.43	27.4	6.34
Magnolia	0	.	0.2	0.17	0	.	0	.	0	.	0	.	0	.	0	.
Crabapple	3.9	3.04	2	1.5	0.9	0.62	0	.	1.2	1.23	0	.	0	.	0	.
White mulberry	2.6	0.63	1.9	0.8	3.6	1.37	1.9	1.34	5.5	3.5	2.7	1.71	0	.	0	.
Black tupelo	6.7	1.84	4.1	1.4	4.2	1.5	3	1.61	1.4	0.98	0	.	0	.	0	.
Eastern hophornbeam	0.1	0.13	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Other species	0.1	0.13	0.4	0.24	0	.	0.5	0.49	0	.	0	.	0	.	0	.
Norway spruce	0.3	0.26	0.2	0.18	0	.	1.9	1.84	0	.	1	0.99	0	.	3.3	1.57
Black spruce	0	.	0.6	0.59	2	1.41	0	.	0	.	0	.	0	.	0	.
Blue spruce	0	.	0	.	1.4	1.49	0	.	0	.	4.5	4.04	0	.	0	.
Spruce	0.2	0.24	0.8	0.77	0	.	0	.	0	.	0	.	0	.	0	.
Red pine	0.4	0.37	0.4	0.35	0.3	0.3	0.5	0.48	0.7	0.69	1	0.99	0	.	0	.
Eastern white pine	0.5	0.35	0.3	0.32	2	1.08	8.6	4.5	4.2	3.09	3.4	2.29	2.6	2.5	0	.
Scotch pine	0	.	1	0	0.3	0.31	0	.	0	.	0	.	0	.	0	.
Virginia pine	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1.9	1.89
London planetree	2.4	0.64	0	.	1.2	1.03	0.5	0.51	0	.	0	.	0	.	0	.
American sycamore	0.9	0.51	1.1	0.7	2.4	0.66	1	0.99	1.2	1	0	.	0	.	0	.
Balsam poplar	0	.	0	.	0	.	0	.	0	.	8.3	4.9	0	.	0	.
Eastern cottonwood	0.6	0.26	0.2	0.17	0	.	2.5	2.36	0	.	2	1.4	3	2.91	0	.
Quaking aspen	0.5	0.48	0.7	0.46	0	.	0	.	0	.	0	.	0	.	0	.
Sweet cherry	3.4	1.31	1.9	1.14	3.6	1.29	2.3	0.92	0.7	0.61	0	.	0	.	0	.
Black cherry	7.9	1.8	5.1	1.35	2.6	1.34	6.2	2.87	3.2	1.88	2.7	1.71	1.5	1.52	0	.
Cherry	0.9	0.39	0.8	0.43	1.8	1.52	1.4	0.98	0	.	4.5	4.04	0	.	0	.
Common pear	0	.	0.2	0.18	0.5	0.56	0.5	0.51	0	.	0	.	0	.	0	.
Pear	0	.	0	.	0	.	0	.	1.9	1.44	0	.	0	.	0	.
White oak	0.4	0.29	0.7	0.43	2.1	1	5.8	2.09	1.2	1.16	3.9	1.63	0	.	3.8	2.56
Swamp white oak	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1.9	1.89
Shingle oak	0.3	0.26	0.2	0.18	0	.	0	.	0	.	0	.	0	.	0	.
Pin oak	0.1	0.13	0	.	0.9	0	0	.	0	.	0	.	0	.	0	.
Willow oak	0.3	0.18	0.4	0.34	1.2	0.8	0.5	0.48	0	.	0	.	1.5	1.52	1.9	1.82
Chestnut oak	0.6	0.25	0.7	0.47	0.9	0.52	1.5	1.1	2.7	1.69	2	1.33	0	.	3.8	3.64
Northern red oak	0.1	0.13	0.7	0.33	1.2	0.95	1.5	1.07	0.7	0.7	4.8	2.63	13.1	6.47	14.5	4.32
Black locust	0.8	0.36	1.9	0.94	0.6	0.44	4.2	2.61	0	.	3.5	2.25	2.9	2.74	0	.

	White willow	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1.9	1.89
	Costal plain willow	0	.	1.6	1.58	2.2	2.13	1.5	1.11	0	.	0	.	0	.	0	.
	Sandbar willow	0	.	0	.	0	.	0.5	0.47	0	.	0	.	0	.	0	.
	Willow	0.1	0.12	0	.	0	.	0	.	0	.	0	.	1.5	1.52	0	.
	Sassafras	6.5	3.69	1.9	1.07	1.8	0.84	1.5	0.8	0.7	0.67	1	0.94	0	.	0	.
	Japanese snowbell	0	.	0	.	0.3	0.32	0	.	0	.	0	.	0	.	0	.
	Yew	0	.	0	.	0	.	0	.	0	.	0	.	2.6	2.5	0	.
	Northern white cedar	0	.	0	.	0	.	0	.	0	.	5.7	0	1.5	1.52	5.5	0
	American basswood	0	.	0	.	0	.	0.9	0.84	3.2	3.07	0	.	0	.	0	.
	Eastern hemlock	0	.	0	.	0.5	0.54	0	.	0	.	0	.	0	.	3.3	1.57
	American elm	0.3	0.18	0.9	0.89	0.9	0.68	0	.	0	.	0	.	0	.	0	.
	Chinese elm	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1.9	1.89
	Siberian elm	0.1	0.13	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Slippery elm	0.4	0.34	0.3	0.28	0	.	0	.	0	.	0	.	0	.	0	.
	Elm	0.1	0.13	0	.	0	.	0.9	0.84	0	.	0	.	0	.	0	.
	Dead tree	10.1	1.63	8.6	1.59	10.6	2.29	7.2	2.52	8.5	3.91	6.3	2.46	7	4	0	.
	Japanese zelkova	0	.	0	.	0.9	0.33	1.4	0	1.3	1.3	0	.	0	.	0	.

		DBH CLASSES (cm)															
		61.1 - 68.6		68.7 - 76.2		76.3 - 83.8		83.9 - 91.4		91.5 - 99.1		99.2 - 106.7		106.8 - 114.3		114.4 - 121.9	
LANDUSE	SPECIES COMMON NAME	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Small lot SF	Silver maple	0	.	66.7	32.29	0	.	100	0	0	.	0	.	0	.	0	.
	White mulberry	0	.	33.3	32.29	0	.	0	.	0	.	0	.	0	.	0	.
Large lot SF	Horsechestnut	0	.	0	.	0	.	0	.	0	.	100	0	0	.	0	.
	White ash	33.3	27.66	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Tulip tree	33.3	27.66	50	35.94	50	35.94	0	.	0	.	0	.	0	.	0	.
	White mulberry	0	.	50	35.94	50	35.94	0	.	0	.	0	.	0	.	0	.
	American sycamore	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0	.
	White oak	0	.	0	.	0	.	0	.	100	0	0	.	0	.	0	.
	Northern red oak	33.3	27.66	0	.	0	.	0	.	0	.	0	.	0	.	0	.
Open space	Red maple	7.7	7.53	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Silver maple	0	.	0	.	33.3	27.38	0	.	0	.	0	.	0	.	0	.
	American beech	0	.	16.7	15.81	0	.	0	.	0	.	0	.	0	.	0	.
	Tulip tree	38.5	15.73	33.3	20.91	33.3	27.38	33.3	15.81	0	.	100	0	0	.	0	.
	White mulberry	7.7	7.53	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Eastern cottonwood	0	.	0	.	0	.	33.3	31.62	0	.	0	.	0	.	0	.

	White oak	7.7	7.53	0	.	33.3	27.38	0	.	0	.	0	.	0	.	0	.
	Northern red oak	23.1	12.29	33.3	15.81	0	.	33.3	15.81	100	0	0	.	0	.	0	.
	Dead tree	15.4	13.78	16.7	12.5	0	.	0	.	0	.	0	.	0	.	0	.
Institutions	White ash	0	.	20	19.18	0	.	0	.	0	.	0	.	0	.	0	.
	Tulip tree	0	.	0	.	0	.	0	.	0	.	0	.	100	0	100	0
	White oak	0	.	40	17.35	0	.	0	.	0	.	0	.	0	.	0	.
	Pin oak	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Northern red oak	0	.	40	17.35	0	.	0	.	0	.	0	.	0	.	0	.
CITY TOTAL	Red maple	5	4.88	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Silver maple	0	.	28.2	13.66	15.5	12.72	49.4	0	0	.	0	.	0	.	0	.
	Horsechestnut	0	.	0	.	0	.	0	.	0	.	63.4	0	0	.	0	.
	American beech	0	.	3.1	2.9	0	.	0	.	0	.	0	.	0	.	0	.
	White ash	8.6	7.15	5.8	5.52	0	.	0	.	0	.	0	.	0	.	0	.
	Tulip tree	33.5	12.45	11.4	5.4	42.3	23.07	10.7	5.08	0	.	36.6	0	100	0	100	0
	White mulberry	5	4.88	19.4	14.18	26.8	19.24	0	.	0	.	0	.	0	.	0	.
	American sycamore	0	.	0	.	0	.	18.5	0	0	.	0	.	0	.	0	.
	Eastern cottonwood	0	.	0	.	0	.	10.7	10.15	0	.	0	.	0	.	0	.
	White oak	5	4.88	11.5	4.99	15.5	12.72	0	.	63.4	0	0	.	0	.	0	.
	Pin oak	9.4	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Northern red oak	23.6	10.7	17.6	5.77	0	.	10.7	5.08	36.6	0	0	.	0	.	0	.
	Dead tree	10	8.93	3.1	2.29	0	.	0	.	0	.	0	.	0	.	0	.

		DBH CLASSES (cm)															
		122 - 129.5		129.6 - 137.2		137.3 - 144.8		144.9 - 152.4		152.5 - 160		160.1 - 167.6		167.7 - 175.3		175.4 - 182.9	
LANDUSE	SPECIES COMMON NAME	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Large lot SF	White ash	50	35.94	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Tulip tree	50	35.94	0	.	0	.	0	.	0	.	0	.	0	.	0	.
CITY TOTAL	White ash	50	35.94	0	.	0	.	0	.	0	.	0	.	0	.	0	.
	Tulip tree	50	35.94	0	.	0	.	0	.	0	.	0	.	0	.	0	.

#6. PERCENT OF THE POPULATION BY CONDITION CLASS FOR TREES IN BALTIMORE COUNTY URDL

	E		G		F		P		C		D		K		MEAN
SPECIES COMMON NAME	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	
Boxelder	49.4	4.3	37.4	4.77	8.2	2.56	2	1.01	0	.	2	1.24	1	1.1	0.917
Japanese maple	61.7	27.84	38.3	27.84	0	.	0	.	0	.	0	.	0	.	0.979
Norway maple	54.9	13.33	34.2	9.96	5.7	3.48	3.3	3.1	1.9	1.16	0	.	0	.	0.944
Red maple	49.1	4.99	32.8	4.57	15.3	1.96	1.9	1.03	0.5	0.47	0.5	0.43	0	.	0.946
Silver maple	30.5	8.25	50.4	10.2	19	11.29	0	.	0	.	0	.	0	.	0.947
Sugar maple	63.4	0	36.6	0	0	.	0	.	0	.	0	.	0	.	0.97
Horsechestnut	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Tree of heaven	87.8	1.6	11.2	1.36	1	0.49	0	.	0	.	0	.	0	.	0.98
Roundleaf serviceberry	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Yellow birch	25	8.89	25	8.89	25	26.68	0	.	25	8.89	0	.	0	.	0.785
River birch	40	0	53.3	0	6.7	0	0	.	0	.	0	.	0	.	0.961
Paper birch	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
American hornbeam	42.8	2.9	43.4	2.13	11	2.9	0	.	0	.	2.8	2.13	0	.	0.906
Bitternut hickory	67.6	0	32.4	0	0	.	0	.	0	.	0	.	0	.	0.982
Pignut hickory	28	10.83	28	10.83	44.1	10.83	0	.	0	.	0	.	0	.	0.916
Mockernut hickory	57.1	22.68	14.3	15.09	0	.	14.3	10.47	14.3	10.47	0	.	0	.	0.849
American chestnut	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
Southern catalpa	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Northern catalpa	83.3	0	16.7	0	0	.	0	.	0	.	0	.	0	.	0.992
Eastern redbud	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Atlantic white cedar	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
Flowering dogwood	63.4	0	36.6	0	0	.	0	.	0	.	0	.	0	.	0.97
Dogwood	32	5.86	38	6.93	23	7.25	3.6	1.87	0	.	3.4	0	0	.	0.9
Hawthorn	65.2	12.39	23.2	8.26	11.6	4.13	0	.	0	.	0	.	0	.	0.945
Common persimmon	0	.	50	35.94	50	35.94	0	.	0	.	0	.	0	.	0.885
American beech	56.5	8.55	28.9	8.04	13.4	2.44	1.2	1.03	0	.	0	.	0	.	0.957
White ash	36.2	3.54	34.2	5.07	16.8	2.7	7.3	2.52	2.2	1.54	1.1	1.17	2.2	1.27	0.879
Singleleaf ash	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Black ash	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Green ash	25	15.4	75	15.4	0	.	0	.	0	.	0	.	0	.	0.963
Ash	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Honeylocust	22.7	0	54.6	0	22.7	0	0	.	0	.	0	.	0	.	0.932
American holly	47	4.03	28.9	9.3	19.9	8.49	0	.	4.1	1.78	0	.	0	.	0.915
Holly	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Butternut	0	.	50	0	0	.	0	.	50	0	0	.	0	.	0.66
Black walnut	42.9	20.12	42.9	15.09	14.3	5.03	0	.	0	.	0	.	0	.	0.953

Juniper	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
Eastern red cedar	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Ligustrum	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Sweetgum	40.2	3.39	37.7	2.29	17.7	3.19	3.3	2.98	1.1	0.86	0	.	0	.	0.907
Tulip tree	34.4	9.14	45.1	6.78	16.2	3.83	2.1	1.54	0	.	2.2	1.37	0	.	0.932
Magnolia	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0.62
Crabapple	22	2.34	58.5	1.52	15.8	1.77	3.7	3.55	0	.	0	.	0	.	0.929
White mulberry	40	6.23	33.1	5.97	18.7	5.23	5.2	3.51	0	.	3	2.71	0	.	0.89
Black tupelo	23.8	3.26	52.8	4.87	18.3	3.48	3.1	1.67	0	.	2	1.41	0	.	0.899
Eastern hophornbeam	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Other species	0	.	75	21.78	0	.	25	21.78	0	.	0	.	0	.	0.868
Norway spruce	60.7	7.49	0	.	28.8	3.75	10.5	3.75	0	.	0	.	0	.	0.881
Black spruce	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Blue spruce	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Spruce	71	0	0	.	29	0	0	.	0	.	0	.	0	.	0.941
Red pine	0	.	11.1	5.27	11.1	5.27	55.6	5.27	11.1	10.54	11.1	5.27	0	.	0.597
Eastern white pine	48.7	25.79	38.5	19.34	12.8	6.45	0	.	0	.	0	.	0	.	0.961
Scotch pine	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Virginia pine	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
London planetree	95.8	0.85	4.2	0.85	0	.	0	.	0	.	0	.	0	.	0.995
American sycamore	62.7	8.39	29.6	11.52	3.8	2.64	0	.	3.8	2.64	0	.	0	.	0.944
Balsam poplar	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Eastern cottonwood	25.6	3.31	68	4.97	0	.	6.4	8.28	0	.	0	.	0	.	0.939
Quaking aspen	50	0	25	0	0	.	25	0	0	.	0	.	0	.	0.893
Sweet cherry	26.5	5.89	46.3	4.44	14.6	4.38	5.5	3.45	1.8	1.01	5.3	2.48	0	.	0.862
Black cherry	37	6.35	36.9	4.61	16.2	2.93	6.7	2.71	0	.	3.2	2.28	0	.	0.891
Cherry	15.4	8.37	65	9.07	19.6	8.82	0	.	0	.	0	.	0	.	0.923
Common pear	73.2	19.08	26.8	19.08	0	.	0	.	0	.	0	.	0	.	0.981
Pear	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
White oak	26.9	9.11	60.8	8.71	12.4	6.06	0	.	0	.	0	.	0	.	0.944
Swamp white oak	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Shingle oak	0	.	33.3	0	66.7	0	0	.	0	.	0	.	0	.	0.863
Pin oak	0	.	82.7	0	17.3	0	0	.	0	.	0	.	0	.	0.883
Willow oak	18.6	8.96	44.1	4.42	37.3	5.31	0	.	0	.	0	.	0	.	0.907
Chestnut oak	16.4	6.06	70.4	11.24	0	.	8.8	5.74	0	.	4.4	4.67	0	.	0.888
Northern red oak	8.1	4.84	45.9	6.2	43.8	4.98	2.2	2.1	0	.	0	.	0	.	0.885
Black locust	31.2	3.04	57.2	5.49	11.7	6.43	0	.	0	.	0	.	0	.	0.948
White willow	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0.62
Costal plain willow	5.3	0.39	42.1	4.34	26.3	1.97	10.5	0.79	15.8	1.18	0	.	0	.	0.792
Sandbar willow	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Willow	50	35.57	0	.	0	.	50	35.57	0	.	0	.	0	.	0.81

Sassafras	56.3	4.63	20.1	2.31	14.3	1.96	6.7	2.98	2.6	0	0	.	0	.	0.918
Japanese snowbell	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Yew	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Northern white cedar	40.2	0	29.9	0	29.9	0	0	.	0	.	0	.	0	.	0.959
American basswood	27.3	0	72.7	0	0	.	0	.	0	.	0	.	0	.	0.969
Eastern hemlock	0	.	0	.	50	35.94	50	35.94	0	.	0	.	0	.	0.72
American elm	40	2.85	60	2.85	0	.	0	.	0	.	0	.	0	.	0.97
Chinese elm	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Siberian elm	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Slippery elm	0	.	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0.907
Elm	63.4	0	0	.	0	.	0	.	0	.	36.6	0	0	.	0.476
Dead tree	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
Japanese zelkova	74.9	0	25.1	0	0	.	0	.	0	.	0	.	0	.	0.978

#7. PERCENT OF THE POPULATION BY CONDITION CLASS FOR TREES IN THE BALTIMORE COUNTY URDL

		E		G		F		P		C		D		K		MEAN
LANDUSE	SPECIES COMMON NAME	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	
Small lot SF	Japanese maple	50	36.32	50	36.32	0	.	0	.	0	.	0	.	0	.	0.975
	Norway maple	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Red maple	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Silver maple	20	19.28	40	25.33	40	28.47	0	.	0	.	0	.	0	.	0.908
	Tree of heaven	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	American hornbeam	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0	.	0.983
	Dogwood	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Hawthorn	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	American beech	50	0	0	.	50	0	0	.	0	.	0	.	0	.	0.91
	White ash	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Honeylocust	25	0	50	0	25	0	0	.	0	.	0	.	0	.	0.93
	Holly	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Ligustrum	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Tulip tree	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	White mulberry	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0.975
	Black tupelo	25	0	75	0	0	.	0	.	0	.	0	.	0	.	0.963
	Black spruce	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Blue spruce	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Spruce	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Eastern cottonwood	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Black cherry	50	36.32	50	36.32	0	.	0	.	0	.	0	.	0	.	0.975
	Cherry	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Northern red oak	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Black locust	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Sassafras	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	American basswood	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Dead tree	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
	Total	47.2	10.75	32.1	7.46	17	6.35	0	.	0	.	0	.	3.8	1.47	0.916
Industrial	Tree of heaven	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Roundleaf serviceberry	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	American hornbeam	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Northern catalpa	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Eastern white pine	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	London planetree	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	American sycamore	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1

	Pin oak	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Black locust	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Northern white cedar	33.3	0	33.3	0	33.3	0	0	.	0	.	0	.	0	.	0.923
	Total	87.5	7.46	10	4.5	2.5	3.3	0	.	0	.	0	.	0	.	0.991
Attached Dwelli	Japanese maple	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Norway maple	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Red maple	50	36.93	0	.	50	36.93	0	.	0	.	0	.	0	.	0.91
	Silver maple	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	White ash	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	American holly	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Balsam poplar	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Black cherry	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Total	69.2	17.91	15.4	15.14	15.4	13.76	0	.	0	.	0	.	0	.	0.965
Large lot SF	Boxelder	83.3	18.3	16.7	18.3	0	.	0	.	0	.	0	.	0	.	0.992
	Norway maple	28.6	7.76	57.1	20.53	0	.	14.3	13.44	0	.	0	.	0	.	0.917
	Red maple	16.7	16.94	83.3	16.94	0	.	0	.	0	.	0	.	0	.	0.958
	Silver maple	25	15.56	75	15.56	0	.	0	.	0	.	0	.	0	.	0.963
	Sugar maple	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Horsechestnut	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Tree of heaven	50	17.97	50	17.97	0	.	0	.	0	.	0	.	0	.	0.975
	American hornbeam	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Bitternut hickory	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0.975
	Pignut hickory	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	American chestnut	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Flowering dogwood	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Dogwood	66.7	31.94	0	.	33.3	31.94	0	.	0	.	0	.	0	.	0.94
	Common persimmon	0	.	50	35.94	50	35.94	0	.	0	.	0	.	0	.	0.885
	American beech	76.9	5.95	15.4	7.66	7.7	1.7	0	.	0	.	0	.	0	.	0.978
	White ash	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Singleleaf ash	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	American holly	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Sweetgum	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Tulip tree	25	22.01	50	17.97	12.5	8.98	12.5	12.71	0	.	0	.	0	.	0.905
	Crabapple	33.3	15.97	0	.	33.3	15.97	33.3	31.94	0	.	0	.	0	.	0.813
	White mulberry	35.7	11.24	42.9	13.6	7.1	5.54	14.3	9.62	0	.	0	.	0	.	0.911
	Black tupelo	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Norway spruce	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Black spruce	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1

	Eastern white pine	40	30.19	45	22.64	15	7.55	0	.	0	.	0	.	0	.	0.95
	American sycamore	66.7	27.66	33.3	27.66	0	.	0	.	0	.	0	.	0	.	0.983
	Black cherry	0	.	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0.907
	Cherry	25	22.01	50	25.41	25	22.01	0	.	0	.	0	.	0	.	0.93
	Common pear	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	White oak	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Willow oak	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Chestnut oak	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Northern red oak	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Black locust	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0	.	0.983
	Sassafras	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Yew	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	American basswood	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Eastern hemlock	0	.	0	.	50	35.94	50	35.94	0	.	0	.	0	.	0.72
	Slippery elm	0	.	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0.907
	Elm	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Dead tree	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
	Total	40.3	7.64	38.9	4.58	11.8	3.48	4.2	1.89	0	.	0	.	4.9	1.92	0.895
Commercial	Silver maple	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Northern catalpa	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Scotch pine	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	London planetree	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Sweet cherry	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0	.	0.983
	Pear	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Japanese zelkova	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Total	80	15.01	20	15.01	0	.	0	.	0	.	0	.	0	.	0.99
Open space	Boxelder	36.1	4.09	45.8	4.96	11.1	3.49	2.8	1.37	0	.	2.8	1.69	1.4	1.49	0.908
	Norway maple	51.6	22.34	35.5	14.82	9.7	5.88	0	.	3.2	1.96	0	.	0	.	0.945
	Red maple	56.2	6.02	32.3	6.35	6.9	1.9	3.1	1.68	0.8	0.77	0.8	0.71	0	.	0.948
	Silver maple	46.2	12.68	38.5	6.89	15.4	8.25	0	.	0	.	0	.	0	.	0.953
	Sugar maple	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Tree of heaven	33.3	31.62	33.3	15.81	33.3	15.81	0	.	0	.	0	.	0	.	0.923
	Yellow birch	25	8.89	25	8.89	25	26.68	0	.	25	8.89	0	.	0	.	0.785
	River birch	40	0	53.3	0	6.7	0	0	.	0	.	0	.	0	.	0.961
	Paper birch	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	American hornbeam	20	6.84	60	5.02	13.3	6.84	0	.	0	.	6.7	5.02	0	.	0.888
	Pignut hickory	33.3	12.91	33.3	12.91	33.3	12.91	0	.	0	.	0	.	0	.	0.923
	Mockernut hickory	57.1	22.68	14.3	15.09	0	.	14.3	10.47	14.3	10.47	0	.	0	.	0.849
	Southern catalpa	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95

Eastern redbud	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Atlantic white cedar	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
Flowering dogwood	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Dogwood	12.8	7.14	53.8	9.83	28.2	9.36	5.1	2.65	0	.	0	.	0	.	0.903
Hawthorn	25	26.68	50	17.78	25	8.89	0	.	0	.	0	.	0	.	0.93
American beech	47.1	13.93	41.2	12.9	9.8	3.98	2	1.71	0	.	0	.	0	.	0.954
White ash	33.8	4.54	41.2	6.86	13.2	2.55	4.4	1.57	2.9	2.09	1.5	1.58	2.9	1.71	0.878
Black ash	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Green ash	25	15.4	75	15.4	0	.	0	.	0	.	0	.	0	.	0.963
Ash	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
American holly	28.6	6.96	50	16.07	14.3	14.66	0	.	7.1	3.08	0	.	0	.	0.904
Black walnut	42.9	20.12	42.9	15.09	14.3	5.03	0	.	0	.	0	.	0	.	0.953
Juniper	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
Eastern red cedar	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Sweetgum	23.7	4.96	42.4	3.16	27.1	4.89	5.1	4.57	1.7	1.32	0	.	0	.	0.9
Tulip tree	39.6	11.54	42.7	8.3	15.6	5.08	1	1.03	0	.	1	1.06	0	.	0.938
Magnolia	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0.62
Crabapple	50	35.57	50	35.57	0	.	0	.	0	.	0	.	0	.	0.975
White mulberry	40.9	6.65	31.8	10.05	18.2	7.44	0	.	0	.	9.1	8.19	0	.	0.872
Black tupelo	21.4	4.44	48.6	6.52	22.9	4.75	4.3	2.33	0	.	2.9	1.97	0	.	0.893
Eastern hophornbeam	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Other species	0	.	75	21.78	0	.	25	21.78	0	.	0	.	0	.	0.868
Norway spruce	50	17.78	0	.	25	8.89	25	8.89	0	.	0	.	0	.	0.86
Red pine	0	.	11.1	5.27	11.1	5.27	55.6	5.27	11.1	10.54	11.1	5.27	0	.	0.597
Eastern white pine	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Scotch pine	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Virginia pine	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
London planetree	85.7	2.9	14.3	2.9	0	.	0	.	0	.	0	.	0	.	0.993
American sycamore	55.6	9.17	33.3	14.67	5.6	3.83	0	.	5.6	3.83	0	.	0	.	0.938
Eastern cottonwood	36.4	4.7	54.5	7.06	0	.	9.1	11.76	0	.	0	.	0	.	0.938
Sweet cherry	20	7.04	42.9	5.29	22.9	6.85	8.6	5.39	2.9	1.58	2.9	3.17	0	.	0.862
Black cherry	39.5	9.01	28.9	5.45	18.4	4.56	10.5	4.28	0	.	2.6	1.71	0	.	0.889
Cherry	25	16.64	37.5	16.34	37.5	18.6	0	.	0	.	0	.	0	.	0.914
Common pear	50	35.57	50	35.57	0	.	0	.	0	.	0	.	0	.	0.975
White oak	37.5	13.11	41.7	12.31	20.8	10.22	0	.	0	.	0	.	0	.	0.942
Swamp white oak	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Shingle oak	0	.	33.3	0	66.7	0	0	.	0	.	0	.	0	.	0.863
Pin oak	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
Willow oak	22.2	10.68	33.3	5.27	44.4	6.33	0	.	0	.	0	.	0	.	0.903
Chestnut oak	9.5	6.56	76.2	12.16	0	.	9.5	6.21	0	.	4.8	5.05	0	.	0.884
Northern red oak	0	.	52.2	10.11	43.5	9.2	4.3	4.23	0	.	0	.	0	.	0.879

	Black locust	30.8	7.76	53.8	10.72	15.4	13.7	0	.	0	.	0	.	0	.	0.945
	White willow	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0.62
	Costal plain willow	5.3	0.39	42.1	4.34	26.3	1.97	10.5	0.79	15.8	1.18	0	.	0	.	0.792
	Sandbar willow	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Willow	50	35.57	0	.	0	.	50	35.57	0	.	0	.	0	.	0.81
	Sassafras	40	13.47	36	6.73	12	5.69	12	8.67	0	.	0	.	0	.	0.915
	Japanese snowbell	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Northern white cedar	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	American elm	40	2.85	60	2.85	0	.	0	.	0	.	0	.	0	.	0.97
	Chinese elm	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Siberian elm	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Elm	0	.	0	.	0	.	0	.	0	.	100	0	0	.	0.13
	Dead tree	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
	Total	30.7	2.58	36.2	1.97	13.9	1.27	4	0.53	1.1	0.36	1.3	0.39	12.8	1.56	0.795
Large trans	Boxelder	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Tree of heaven	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Northern catalpa	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Sweetgum	70	0	30	0	0	.	0	.	0	.	0	.	0	.	0.985
	White mulberry	33.3	33.12	0	.	66.7	33.12	0	.	0	.	0	.	0	.	0.88
	Black cherry	33.3	0	66.7	0	0	.	0	.	0	.	0	.	0	.	0.967
	Total	66.7	6.26	23.8	4.47	9.5	1.79	0	.	0	.	0	.	0	.	0.971
Institutions	Boxelder	85.7	17.7	14.3	17.7	0	.	0	.	0	.	0	.	0	.	0.993
	Norway maple	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Red maple	46.7	11.59	33.3	8.35	20	4.62	0	.	0	.	0	.	0	.	0.947
	Silver maple	75	0	25	0	0	.	0	.	0	.	0	.	0	.	0.988
	Tree of heaven	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0.975
	American hornbeam	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Bitternut hickory	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Dogwood	0	.	0	.	0	.	0	.	0	.	100	0	0	.	0.13
	American beech	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	White ash	57.1	7.81	0	.	14.3	13.52	28.6	15.61	0	.	0	.	0	.	0.866
	Honeylocust	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	American holly	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Butternut	0	.	50	0	0	.	0	.	50	0	0	.	0	.	0.66
	Sweetgum	66.7	16.07	33.3	16.07	0	.	0	.	0	.	0	.	0	.	0.983
	Tulip tree	22.2	20.51	66.7	18.55	0	.	0	.	0	.	11.1	8.74	0	.	0.87
	Crabapple	19	0	66.7	0	14.3	0	0	.	0	.	0	.	0	.	0.941
	White mulberry	50	36.15	0	.	50	36.15	0	.	0	.	0	.	0	.	0.91
	Black tupelo	25	9.04	50	18.07	25	9.04	0	.	0	.	0	.	0	.	0.93

Norway spruce	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Spruce	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
Quaking aspen	50	0	25	0	0	.	25	0	0	.	0	.	0	.	0.893
Sweet cherry	16.7	18.4	66.7	13.91	0	.	0	.	0	.	16.7	6.96	0	.	0.822
Black cherry	11.1	1.79	55.6	8.93	22.2	3.57	0	.	0	.	11.1	14.28	0	.	0.836
White oak	16.7	17.04	83.3	17.04	0	.	0	.	0	.	0	.	0	.	0.958
Pin oak	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Northern red oak	22.2	13.24	44.4	9.94	33.3	5.36	0	.	0	.	0	.	0	.	0.918
Black locust	0	.	75	15.65	25	15.65	0	.	0	.	0	.	0	.	0.918
Sassafras	63.6	0	13.6	0	13.6	0	4.5	0	4.5	0	0	.	0	.	0.923
Dead tree	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
Japanese zelkova	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Total	37.6	5.14	36.5	5.14	12.9	2.33	2.2	1.18	1.1	0.67	2.2	1.19	7.3	2.85	0.85
CITY TOTAL	39.6	2.18	33.9	1.65	13	1.11	2.9	0.39	0.8	0.21	1	0.27	8.9	0.97	0.813

#8. PERCENT OF POPULATION BY DBH AND CONDITION CLASSES FOR TREES IN THE URDL

			CONDITION CLASSES																
			E		G		F		P		C		D		K		MEAN
		DBH CLASS	---		---		---		---		---		---		---		---
LANDUSE	SPECIES COMMON NAME	(cm)	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	
Small lot SF	Japanese maple	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		30.6 - 38.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Norway maple	30.6 - 38.1	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Red maple	15.3 - 22.9	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
		45.8 - 53.3	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Silver maple	15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		30.6 - 38.1	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		68.7 - 76.2	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
		83.9 - 91.4	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Tree of heaven	7.7 - 15.2	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	American hornbeam	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		7.7 - 15.2	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Dogwood	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Hawthorn	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	American beech	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		15.3 - 22.9	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	White ash	23.0 - 30.5	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Honeylocust	0.0 - 7.6	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0.975
		15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		45.8 - 53.3	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Holly	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		38.2 - 45.7	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Ligustrum	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		38.2 - 45.7	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Tulip tree	53.4 - 61.0	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	White mulberry	30.6 - 38.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		68.7 - 76.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Black tupelo	0.0 - 7.6	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0.975
		7.7 - 15.2	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95

	Black spruce	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Blue spruce	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		38.2 - 45.7	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Spruce	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Eastern cottonwood	0.0 - 7.6	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Black cherry	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		7.7 - 15.2	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Cherry	15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		38.2 - 45.7	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Northern red oak	45.8 - 53.3	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Black locust	0.0 - 7.6	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Sassafras	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	American basswood	30.6 - 38.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Dead tree	7.7 - 15.2	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		30.6 - 38.1	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
	Total	0.0 - 7.6	71.4	7.7	28.6	7.7	0	.	0	.	0	.	0	.	0	.	0.986
		7.7 - 15.2	54.5	22.8	36.4	21	0	.	0	.	0	.	0	.	9.1	8.49	0.891
		15.3 - 22.9	33.3	22.2	44.4	15.1	22.2	9.66	0	.	0	.	0	.	0	.	0.938
		23.0 - 30.5	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
		30.6 - 38.1	33.3	16.1	50	17.1	0	.	0	.	0	.	0	.	16.7	16.1	0.808
		38.2 - 45.7	75	22.2	25	22.2	0	.	0	.	0	.	0	.	0	.	0.988
		45.8 - 53.3	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
		53.4 - 61.0	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
		68.7 - 76.2	33.3	32.3	0	.	66.7	32.3	0	.	0	.	0	.	0	.	0.88
		83.9 - 91.4	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Industrial	Tree of heaven	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Roundleaf serviceberry	0.0 - 7.6	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		7.7 - 15.2	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	American hornbeam	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Northern catalpa	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Eastern white pine	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	London	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1

	planetree																		
	American sycamore	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Pin oak	15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Black locust	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Northern white cedar	38.2 - 45.7	0	.	50	0	50	0	0	.	0	.	0	.	0	.	0.885
		53.4 - 61.0	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Total	0.0 - 7.6	94.4	0	5.6	0	0	.	0	.	0	.	0	.	0	.	0.997
		7.7 - 15.2	93.8	0	6.3	0	0	.	0	.	0	.	0	.	0	.	0.997
		15.3 - 22.9	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0	.	0.983
		38.2 - 45.7	0	.	50	0	50	0	0	.	0	.	0	.	0	.	0.885
		53.4 - 61.0	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Attached Dwelli	Japanese maple	53.4 - 61.0	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Norway maple	23.0 - 30.5	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Red maple	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		38.2 - 45.7	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Silver maple	45.8 - 53.3	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		53.4 - 61.0	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	White ash	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	American holly	38.2 - 45.7	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Balsam poplar	38.2 - 45.7	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Black cherry	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Total	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		23.0 - 30.5	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		38.2 - 45.7	60	35.4	0	.	40	35.4	0	.	0	.	0	.	0	.	0.928
		45.8 - 53.3	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		53.4 - 61.0	50	36.9	50	36.9	0	.	0	.	0	.	0	.	0	.	0.975
Large lot SF	Boxelder	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		30.6 - 38.1	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Norway maple	0.0 - 7.6	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		7.7 - 15.2	33.3	16	33.3	16	0	.	33.3	31.9	0	.	0	.	0	.	0.857
		15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		23.0 - 30.5	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		30.6 - 38.1	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1

Red maple	7.7 - 15.2	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	23.0 - 30.5	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	45.8 - 53.3	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Silver maple	23.0 - 30.5	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	30.6 - 38.1	50	35.9	50	35.9	0	.	0	.	0	.	0	.	0	.	0.975
	45.8 - 53.3	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Sugar maple	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Horsechestnut	99.2 -106.7	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Tree of heaven	0.0 - 7.6	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0.975
	30.6 - 38.1	50	35.9	50	35.9	0	.	0	.	0	.	0	.	0	.	0.975
American hornbeam	15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Bitternut hickory	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Pignut hickory	7.7 - 15.2	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
American chestnut	45.8 - 53.3	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
Flowering dogwood	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Dogwood	0.0 - 7.6	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Common persimmon	7.7 - 15.2	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	53.4 - 61.0	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
American beech	0.0 - 7.6	71.4	14.7	14.3	17.6	14.3	2.93	0	.	0	.	0	.	0	.	0.967
	7.7 - 15.2	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0	.	0.983
	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	23.0 - 30.5	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
White ash	61.1 - 68.6	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	122.0 -129.5	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Singleleaf ash	30.6 - 38.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
American holly	23.0 - 30.5	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Sweetgum	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Tulip tree	15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	23.0 - 30.5	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	45.8 - 53.3	50	35.9	50	35.9	0	.	0	.	0	.	0	.	0	.	0.975
	61.1 - 68.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	68.7 - 76.2	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82

	76.3 - 83.8	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	122.0 -129.5	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0.62
Crabapple	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	15.3 - 22.9	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	30.6 - 38.1	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0.62
White mulberry	0.0 - 7.6	66.7	27.7	33.3	27.7	0	.	0	.	0	.	0	.	0	.	0.983
	7.7 - 15.2	50	35.9	0	.	0	.	50	35.9	0	.	0	.	0	.	0.81
	15.3 - 22.9	33.3	27.7	66.7	27.7	0	.	0	.	0	.	0	.	0	.	0.967
	23.0 - 30.5	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0.62
	30.6 - 38.1	0	.	50	35.9	50	35.9	0	.	0	.	0	.	0	.	0.885
	38.2 - 45.7	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	68.7 - 76.2	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	76.3 - 83.8	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Black tupelo	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Norway spruce	53.4 - 61.0	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
Black spruce	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Eastern white pine	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	23.0 - 30.5	20	19.9	80	19.9	0	.	0	.	0	.	0	.	0	.	0.96
	30.6 - 38.1	0	.	33.3	0	66.7	0	0	.	0	.	0	.	0	.	0.863
	38.2 - 45.7	50	35.9	0	.	50	35.9	0	.	0	.	0	.	0	.	0.91
	45.8 - 53.3	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
American sycamore	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	30.6 - 38.1	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	83.9 - 91.4	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Black cherry	15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	30.6 - 38.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	38.2 - 45.7	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
Cherry	0.0 - 7.6	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	7.7 - 15.2	50	35.9	0	.	50	35.9	0	.	0	.	0	.	0	.	0.91
	23.0 - 30.5	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Common pear	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
White oak	23.0 - 30.5	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	30.6 - 38.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	91.5 - 99.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Willow oak	15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Chestnut oak	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1

	Northern red oak	61.1 - 68.6	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Black locust	23.0 - 30.5	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0.975
		38.2 - 45.7	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Sassafras	15.3 - 22.9	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Yew	45.8 - 53.3	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	American basswood	23.0 - 30.5	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Eastern hemlock	15.3 - 22.9	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0.62
		53.4 - 61.0	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Slippery elm	0.0 - 7.6	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		7.7 - 15.2	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Elm	23.0 - 30.5	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Dead tree	15.3 - 22.9	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		23.0 - 30.5	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		38.2 - 45.7	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		45.8 - 53.3	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
	Total	0.0 - 7.6	55	19.4	35	19.1	10	2.59	0	.	0	.	0	.	0	.	0.964
		7.7 - 15.2	65.4	12.7	11.5	5.18	15.4	10.1	7.7	5.75	0	.	0	.	0	.	0.937
		15.3 - 22.9	33.3	10.5	44.4	9.15	7.4	4.01	3.7	3.7	0	.	0	.	11.1	6.2	0.839
		23.0 - 30.5	33.3	13.5	58.3	15.9	0	.	4.2	4.42	0	.	0	.	4.2	4.42	0.913
		30.6 - 38.1	35.3	10.6	41.2	8.76	17.6	10.2	5.9	6.11	0	.	0	.	0	.	0.925
		38.2 - 45.7	28.6	15.8	14.3	11.7	28.6	15.8	0	.	0	.	0	.	28.6	15.8	0.656
		45.8 - 53.3	25	15.6	50	18	12.5	11.9	0	.	0	.	0	.	12.5	11.9	0.828
		53.4 - 61.0	0	.	33.3	31.9	66.7	31.9	0	.	0	.	0	.	0	.	0.863
		61.1 - 68.6	33.3	27.7	66.7	27.7	0	.	0	.	0	.	0	.	0	.	0.967
		68.7 - 76.2	0	.	50	35.9	50	35.9	0	.	0	.	0	.	0	.	0.885
		76.3 - 83.8	50	35.9	50	35.9	0	.	0	.	0	.	0	.	0	.	0.975
		83.9 - 91.4	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		91.5 - 99.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		99.2 -106.7	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		122.0 -129.5	0	.	50	35.9	0	.	50	35.9	0	.	0	.	0	.	0.785
Commercial	Silver maple	38.2 - 45.7	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Northern catalpa	30.6 - 38.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Scotch pine	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	London planetree	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Sweet cherry	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1

		23.0 - 30.5	0	.	100	0	0	.	0	.	0	.	0	.	0	.		0.95
	Pear	30.6 - 38.1	100	0	0	.	0	.	0	.	0	.	0	.	0	.		1
	Japanese zelkova	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.		1
		23.0 - 30.5	100	0	0	.	0	.	0	.	0	.	0	.	0	.		1
	Total	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.		1
		7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.		1
		15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.		1
		23.0 - 30.5	50	0	50	0	0	.	0	.	0	.	0	.	0	.		0.975
		30.6 - 38.1	50	37.3	50	37.3	0	.	0	.	0	.	0	.	0	.		0.975
		38.2 - 45.7	0	.	100	0	0	.	0	.	0	.	0	.	0	.		0.95
Open space	Boxelder	0.0 - 7.6	45.5	5.36	33.3	6.89	12.1	5.22	3	2.17	0	.	3	2.41	3	3.12		0.893
		7.7 - 15.2	30.8	11.7	46.2	6.33	15.4	6.98	3.8	2.99	0	.	3.8	2.99	0	.		0.901
		15.3 - 22.9	10	9.96	90	9.96	0	.	0	.	0	.	0	.	0	.		0.955
		23.0 - 30.5	50	35.6	50	35.6	0	.	0	.	0	.	0	.	0	.		0.975
		53.4 - 61.0	100	0	0	.	0	.	0	.	0	.	0	.	0	.		1
	Norway maple	0.0 - 7.6	56.3	27.2	25	15.6	12.5	7.78	0	.	6.3	3.89	0	.	0	.		0.926
		7.7 - 15.2	63.6	22.6	27.3	16.9	9.1	5.64	0	.	0	.	0	.	0	.		0.97
		15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.		0.95
		38.2 - 45.7	0	.	100	0	0	.	0	.	0	.	0	.	0	.		0.95
	Red maple	0.0 - 7.6	57.1	5.71	26.2	6.63	14.3	4.13	2.4	2.18	0	.	0	.	0	.		0.952
		7.7 - 15.2	58.6	14.6	24.1	16.7	6.9	4.89	3.4	2.94	3.4	3.46	3.4	2.94	0	.		0.911
		15.3 - 22.9	57.9	11.6	36.8	12.1	0	.	5.3	4.49	0	.	0	.	0	.		0.962
		23.0 - 30.5	46.2	14.7	38.5	13.2	7.7	6.94	7.7	7.58	0	.	0	.	0	.		0.938
		30.6 - 38.1	73.3	9.51	26.7	9.51	0	.	0	.	0	.	0	.	0	.		0.987
		38.2 - 45.7	25	21.8	75	21.8	0	.	0	.	0	.	0	.	0	.		0.963
		45.8 - 53.3	50	17.8	50	17.8	0	.	0	.	0	.	0	.	0	.		0.975
		53.4 - 61.0	33.3	27.4	66.7	27.4	0	.	0	.	0	.	0	.	0	.		0.967
		61.1 - 68.6	0	.	100	0	0	.	0	.	0	.	0	.	0	.		0.95
	Silver maple	0.0 - 7.6	75	15.4	25	15.4	0	.	0	.	0	.	0	.	0	.		0.988
		7.7 - 15.2	25	0	25	0	50	0	0	.	0	.	0	.	0	.		0.898
		15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.		1
		23.0 - 30.5	0	.	100	0	0	.	0	.	0	.	0	.	0	.		0.95
		30.6 - 38.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.		0.95
		53.4 - 61.0	0	.	100	0	0	.	0	.	0	.	0	.	0	.		0.95
		76.3 - 83.8	100	0	0	.	0	.	0	.	0	.	0	.	0	.		1
	Sugar maple	30.6 - 38.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.		0.95
	Tree of heaven	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.		1
		7.7 - 15.2	0	.	100	0	0	.	0	.	0	.	0	.	0	.		0.95

	15.3 - 22.9	0	.	0	.	100	0	0	.		0	.		0	.		0	.	0.82
Yellow birch	0.0 - 7.6	50	35.6	0	.	50	35.6	0	.		0	.		0	.		0	.	0.91
	7.7 - 15.2	0	.	100	0	0	.	0	.		0	.		0	.		0	.	0.95
	15.3 - 22.9	0	.	0	.	0	.	0	.	10	0		0	0	.		0	.	0.37
River birch	0.0 - 7.6	0	.	0	.	100	0	0	.		0	.		0	.		0	.	0.82
	7.7 - 15.2	50	0	50	0	0	.	0	.		0	.		0	.		0	.	0.975
	15.3 - 22.9	40	0	60	0	0	.	0	.		0	.		0	.		0	.	0.97
	23.0 - 30.5	0	.	100	0	0	.	0	.		0	.		0	.		0	.	0.95
	30.6 - 38.1	50	0	50	0	0	.	0	.		0	.		0	.		0	.	0.975
Paper birch	30.6 - 38.1	0	.	100	0	0	.	0	.		0	.		0	.		0	.	0.95
American hornbeam	0.0 - 7.6	20	4.93	50	0	20	10.3	0	.		0	.	1	0	7.53		0	.	0.852
	7.7 - 15.2	20	15.1	80	15.1	0	.	0	.		0	.		0	.		0	.	0.96
Pignut hickory	0.0 - 7.6	0	.	100	0	0	.	0	.		0	.		0	.		0	.	0.95
	7.7 - 15.2	40	29.6	40	19.7	20	9.86	0	.		0	.		0	.		0	.	0.944
	15.3 - 22.9	0	.	0	.	100	0	0	.		0	.		0	.		0	.	0.82
	23.0 - 30.5	100	0	0	.	0	.	0	.		0	.		0	.		0	.	1
	30.6 - 38.1	0	.	0	.	100	0	0	.		0	.		0	.		0	.	0.82
Mockernut hickory	0.0 - 7.6	75	17.8	0	.	0	.	25	17.8		0	.		0	.		0	.	0.905
	7.7 - 15.2	0	.	0	.	0	.	0	.	10	0		0	0	.		0	.	0.37
	15.3 - 22.9	0	.	100	0	0	.	0	.		0	.		0	.		0	.	0.95
	53.4 - 61.0	100	0	0	.	0	.	0	.		0	.		0	.		0	.	1
Southern catalpa	0.0 - 7.6	0	.	100	0	0	.	0	.		0	.		0	.		0	.	0.95
	7.7 - 15.2	0	.	100	0	0	.	0	.		0	.		0	.		0	.	0.95
Eastern redbud	0.0 - 7.6	100	0	0	.	0	.	0	.		0	.		0	.		0	.	1
Atlantic white cedar	45.8 - 53.3	0	.	0	.	100	0	0	.		0	.		0	.		0	.	0.82
Flowering dogwood	0.0 - 7.6	0	.	100	0	0	.	0	.		0	.		0	.		0	.	0.95
Dogwood	0.0 - 7.6	7.4	5.98	55.6	13.2	33.3	13.3	3.7	2.37		0	.		0	.		0	.	0.898
	7.7 - 15.2	27.3	15.7	45.5	12.2	18.2	11.5	9.1	6.65		0	.		0	.		0	.	0.91
	15.3 - 22.9	0	.	100	0	0	.	0	.		0	.		0	.		0	.	0.95
Hawthorn	0.0 - 7.6	50	35.6	50	35.6	0	.	0	.		0	.		0	.		0	.	0.975
	7.7 - 15.2	0	.	50	0	50	0	0	.		0	.		0	.		0	.	0.885
American beech	0.0 - 7.6	47.8	18.3	43.5	15.6	4.3	4.44	4.3	3.37		0	.		0	.		0	.	0.954
	7.7 - 15.2	33.3	16.9	50	12.5	16.7	7.45	0	.		0	.		0	.		0	.	0.945
	15.3 - 22.9	50	35.6	50	35.6	0	.	0	.		0	.		0	.		0	.	0.975
	23.0 - 30.5	100	0	0	.	0	.	0	.		0	.		0	.		0	.	1
	30.6 - 38.1	100	0	0	.	0	.	0	.		0	.		0	.		0	.	1

	38.2 - 45.7	50	0	0	.	50	0	0	.	0	.	0	.	0	.	0.91
	45.8 - 53.3	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	68.7 - 76.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
White ash	0.0 - 7.6	52.4	11	19	9.19	14.3	4.74	0	.	4.8	4.79	4.8	5.01	4.8	5.01	0.846
	7.7 - 15.2	9.1	7.34	90.9	7.34	0	.	0	.	0	.	0	.	0	.	0.955
	15.3 - 22.9	9.1	4.85	45.5	21.6	9.1	4.85	18.2	8.88	9.1	4.85	0	.	9.1	4.85	0.744
	23.0 - 30.5	28.6	19.3	14.3	14.5	42.9	11.2	14.3	12.3	0	.	0	.	0	.	0.861
	30.6 - 38.1	40	7.53	50	7.11	10	2.46	0	.	0	.	0	.	0	.	0.957
	38.2 - 45.7	25	15.4	50	17.8	25	23.5	0	.	0	.	0	.	0	.	0.93
	45.8 - 53.3	66.7	15.8	33.3	15.8	0	.	0	.	0	.	0	.	0	.	0.983
	53.4 - 61.0	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Black ash	0.0 - 7.6	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Green ash	7.7 - 15.2	50	35.6	50	35.6	0	.	0	.	0	.	0	.	0	.	0.975
	15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Ash	0.0 - 7.6	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
American holly	0.0 - 7.6	16.7	16.3	50	26.5	33.3	26.2	0	.	0	.	0	.	0	.	0.915
	7.7 - 15.2	40	17.1	40	11.4	0	.	0	. 2	0	5.69	0	.	0	.	0.854
	15.3 - 22.9	33.3	0	66.7	0	0	.	0	.	0	.	0	.	0	.	0.967
Black walnut	7.7 - 15.2	50	35.6	0	.	50	35.6	0	.	0	.	0	.	0	.	0.91
	15.3 - 22.9	25	26.7	75	26.7	0	.	0	.	0	.	0	.	0	.	0.963
	23.0 - 30.5	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Juniper	7.7 - 15.2	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
Eastern red cedar	7.7 - 15.2	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	30.6 - 38.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Sweetgum	0.0 - 7.6	30.8	9.78	23.1	10.1	23.1	11	23.1	16.9	0	.	0	.	0	.	0.859
	7.7 - 15.2	33.3	11.4	33.3	8.37	33.3	6.32	0	.	0	.	0	.	0	.	0.923
	15.3 - 22.9	9.1	5.76	72.7	7.44	9.1	5.76	0	.	9.1	7.98	0	.	0	.	0.89
	23.0 - 30.5	18.8	11.7	43.8	8.21	37.5	14.8	0	.	0	.	0	.	0	.	0.911
	30.6 - 38.1	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0.975
	45.8 - 53.3	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	53.4 - 61.0	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Tulip tree	0.0 - 7.6	33.3	20.9	33.3	20.9	33.3	7.9	0	.	0	.	0	.	0	.	0.923
	7.7 - 15.2	70.6	13.7	23.5	12.5	0	.	0	.	0	.	5.9	6.07	0	.	0.937
	15.3 - 22.9	45.5	18.7	36.4	13	9.1	7.44	9.1	9.26	0	.	0	.	0	.	0.931
	23.0 - 30.5	33.3	14.2	50	15.7	16.7	11	0	.	0	.	0	.	0	.	0.945
	30.6 - 38.1	31.3	15.8	37.5	11.5	31.3	11.5	0	.	0	.	0	.	0	.	0.925
	38.2 - 45.7	36.4	18.6	45.5	15.1	18.2	9.91	0	.	0	.	0	.	0	.	0.945
	45.8 - 53.3	40	20.5	60	20.5	0	.	0	.	0	.	0	.	0	.	0.97
	53.4 - 61.0	12.5	12.4	75	14.7	12.5	10.7	0	.	0	.	0	.	0	.	0.94
	61.1 - 68.6	40	24.8	40	17.1	20	13.9	0	.	0	.	0	.	0	.	0.944

	68.7 - 76.2	50	35.6	50	35.6	0	.	0	.	0	.		0	.	0	.		0.975
	76.3 - 83.8	0	.	100	0	0	.	0	.	0	.		0	.	0	.		0.95
	83.9 - 91.4	0	.	0	.	100	0	0	.	0	.		0	.	0	.		0.82
	99.2 -106.7	0	.	100	0	0	.	0	.	0	.		0	.	0	.		0.95
Magnolia	7.7 - 15.2	0	.	0	.	0	.	100	0	0	.		0	.	0	.		0.62
Crabapple	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.		0	.	0	.		1
	15.3 - 22.9	0	.	100	0	0	.	0	.	0	.		0	.	0	.		0.95
White mulberry	0.0 - 7.6	57.1	5.03	28.6	10.5	14.3	12.7	0	.	0	.		0	.	0	.		0.96
	7.7 - 15.2	28.6	17.7	28.6	17.7	14.3	9.63	0	.	0	.	2	8.6	19.3	0	.		0.711
	15.3 - 22.9	25	8.89	50	17.8	25	8.89	0	.	0	.		0	.	0	.		0.93
	23.0 - 30.5	50	0	0	.	50	0	0	.	0	.		0	.	0	.		0.91
	38.2 - 45.7	100	0	0	.	0	.	0	.	0	.		0	.	0	.		1
	61.1 - 68.6	0	.	100	0	0	.	0	.	0	.		0	.	0	.		0.95
Black tupelo	0.0 - 7.6	23.7	6.65	39.5	8.67	28.9	6.49	5.3	3.36	0	.		2.6	2.73	0	.		0.885
	7.7 - 15.2	13.3	4.77	66.7	7.74	13.3	4.77	6.7	6.57	0	.		0	.	0	.		0.917
	15.3 - 22.9	11.1	10.8	66.7	17.5	11.1	10.8	0	.	0	.	1	1.1	10.8	0	.		0.85
	23.0 - 30.5	50	16.8	33.3	19.4	16.7	16.8	0	.	0	.		0	.	0	.		0.953
	30.6 - 38.1	0	.	50	35.6	50	35.6	0	.	0	.		0	.	0	.		0.885
Eastern hophornbeam	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.		0	.	0	.		1
Other species	0.0 - 7.6	0	.	100	0	0	.	0	.	0	.		0	.	0	.		0.95
	7.7 - 15.2	0	.	50	35.6	0	.	50	35.6	0	.		0	.	0	.		0.785
	23.0 - 30.5	0	.	100	0	0	.	0	.	0	.		0	.	0	.		0.95
Norway spruce	0.0 - 7.6	0	.	0	.	50	0	50	0	0	.		0	.	0	.		0.72
	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.		0	.	0	.		1
	38.2 - 45.7	100	0	0	.	0	.	0	.	0	.		0	.	0	.		1
Red pine	0.0 - 7.6	0	.	33.3	0	0	.	33.3	0	0	.	3	3.3	0	0	.		0.567
	7.7 - 15.2	0	.	0	.	0	.	100	0	0	.		0	.	0	.		0.62
	15.3 - 22.9	0	.	0	.	100	0	0	.	0	.		0	.	0	.		0.82
	23.0 - 30.5	0	.	0	.	0	.	0	.	10	0	0	0	.	0	.		0.37
	30.6 - 38.1	0	.	0	.	0	.	100	0	0	.		0	.	0	.		0.62
	38.2 - 45.7	0	.	0	.	0	.	100	0	0	.		0	.	0	.		0.62
Eastern white pine	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.		0	.	0	.		1
	30.6 - 38.1	100	0	0	.	0	.	0	.	0	.		0	.	0	.		1
Scotch pine	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.		0	.	0	.		1
Virginia pine	53.4 - 61.0	0	.	0	.	100	0	0	.	0	.		0	.	0	.		0.82
London planetree	0.0 - 7.6	80	0	20	0	0	.	0	.	0	.		0	.	0	.		0.99
	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.		0	.	0	.		1
	23.0 - 30.5	100	0	0	.	0	.	0	.	0	.		0	.	0	.		1

American sycamore	0.0 - 7.6	42.9	16.2	28.6	10.5	14.3	12.7	0	.	1	4.3	12.7	0	.	0	.	0.87
	7.7 - 15.2	66.7	23.7	33.3	23.7	0	.	0	.		0	.	0	.	0	.	0.983
	15.3 - 22.9	66.7	27.4	33.3	27.4	0	.	0	.		0	.	0	.	0	.	0.983
	23.0 - 30.5	50	0	50	0	0	.	0	.		0	.	0	.	0	.	0.975
Eastern cottonwood	7.7 - 15.2	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
	23.0 - 30.5	40	0	60	0	0	.	0	.		0	.	0	.	0	.	0.97
	38.2 - 45.7	0	.	50	35.6	0	.	50	35.6		0	.	0	.	0	.	0.785
	45.8 - 53.3	50	0	50	0	0	.	0	.		0	.	0	.	0	.	0.975
	83.9 - 91.4	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
Sweet cherry	0.0 - 7.6	19	12.1	52.4	11.5	14.3	5.12	4.8	4.9		4.8	2.96	4.8	5.12	0	.	0.859
	7.7 - 15.2	22.2	10.1	22.2	10.1	33.3	12.9	22.2	10.1		0	.	0	.	0	.	0.844
	15.3 - 22.9	25	26.7	50	17.8	25	8.89	0	.		0	.	0	.	0	.	0.93
	30.6 - 38.1	0	.	0	.	100	0	0	.		0	.	0	.	0	.	0.82
Black cherry	0.0 - 7.6	43.5	11.6	28.3	7.24	13	4.32	15.2	5.43		0	.	0	.	0	.	0.905
	7.7 - 15.2	33.3	14.5	19	9.16	38.1	11	4.8	4.06		0	.	4.8	4.06	0	.	0.862
	15.3 - 22.9	0	.	66.7	15.8	0	.	0	.		0	.	3 3.3	15.8	0	.	0.677
	23.0 - 30.5	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
	30.6 - 38.1	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
	38.2 - 45.7	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
	45.8 - 53.3	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
Cherry	0.0 - 7.6	40	24.8	20	18.9	40	27.9	0	.		0	.	0	.	0	.	0.918
	7.7 - 15.2	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
	15.3 - 22.9	0	.	0	.	100	0	0	.		0	.	0	.	0	.	0.82
	23.0 - 30.5	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
Common pear	7.7 - 15.2	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
	23.0 - 30.5	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
White oak	0.0 - 7.6	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
	7.7 - 15.2	50	0	50	0	0	.	0	.		0	.	0	.	0	.	0.975
	15.3 - 22.9	0	.	60	30.1	40	30.1	0	.		0	.	0	.	0	.	0.898
	23.0 - 30.5	25	20.9	62.5	21.6	12.5	12.2	0	.		0	.	0	.	0	.	0.946
	38.2 - 45.7	50	25.2	0	.	50	25.2	0	.		0	.	0	.	0	.	0.91
	53.4 - 61.0	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
	61.1 - 68.6	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
	76.3 - 83.8	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
Swamp white oak	53.4 - 61.0	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
Shingle oak	0.0 - 7.6	0	.	50	0	50	0	0	.		0	.	0	.	0	.	0.885
	7.7 - 15.2	0	.	0	.	100	0	0	.		0	.	0	.	0	.	0.82
Pin oak	0.0 - 7.6	0	.	0	.	100	0	0	.		0	.	0	.	0	.	0.82

Willow oak	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	7.7 - 15.2	0	.	50	0	50	0	0	.	0	.	0	.	0	.	0.885
	15.3 - 22.9	0	.	50	0	50	0	0	.	0	.	0	.	0	.	0.885
	23.0 - 30.5	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	45.8 - 53.3	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	53.4 - 61.0	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Chestnut oak	0.0 - 7.6	20	18	80	18	0	.	0	.	0	.	0	.	0	.	0.96
	7.7 - 15.2	0	.	50	0	0	.	50	0	0	.	0	.	0	.	0.785
	15.3 - 22.9	0	.	33.3	27.4	0	.	33.3	27.4	0	.	3	3.3	27.4	0	.	0.567
	23.0 - 30.5	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	30.6 - 38.1	25	23.5	75	23.5	0	.	0	.	0	.	0	.	0	.	0.963
	38.2 - 45.7	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	53.4 - 61.0	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Northern red oak	0.0 - 7.6	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	7.7 - 15.2	0	.	50	35.6	50	35.6	0	.	0	.	0	.	0	.	0.885
	23.0 - 30.5	0	.	66.7	15.8	33.3	15.8	0	.	0	.	0	.	0	.	0.907
	30.6 - 38.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	38.2 - 45.7	0	.	66.7	31.6	33.3	31.6	0	.	0	.	0	.	0	.	0.907
	45.8 - 53.3	0	.	50	25.2	50	25.2	0	.	0	.	0	.	0	.	0.885
	53.4 - 61.0	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	61.1 - 68.6	0	.	66.7	27.4	33.3	27.4	0	.	0	.	0	.	0	.	0.907
	68.7 - 76.2	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	83.9 - 91.4	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0.62
	91.5 - 99.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Black locust	7.7 - 15.2	33.3	15.8	66.7	15.8	0	.	0	.	0	.	0	.	0	.	0.967
	15.3 - 22.9	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	23.0 - 30.5	40	11.4	60	11.4	0	.	0	.	0	.	0	.	0	.	0.97
White willow	53.4 - 61.0	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0.62
Costal plain willow	7.7 - 15.2	0	.	55.6	0	33.3	0	0	.	1	1.1	0	0	.	0	.	0.842
	15.3 - 22.9	14.3	0	14.3	0	28.6	0	14.3	0.002	8.6	0	0	.	0	.	0.707
	23.0 - 30.5	0	.	66.7	15.8	0	.	33.3	15.8	0	.	0	.	0	.	0.84
Sandbar willow	23.0 - 30.5	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Willow	0.0 - 7.6	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0.62
	45.8 - 53.3	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
Sassafras	0.0 - 7.6	27.3	17.6	27.3	9.11	18.2	7.89	27.3	17.2	0	.	0	.	0	.	0.85
	7.7 - 15.2	71.4	20.3	28.6	20.3	0	.	0	.	0	.	0	.	0	.	0.986
	15.3 - 22.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	23.0 - 30.5	33.3	27.4	33.3	27.4	33.3	27.4	0	.	0	.	0	.	0	.	0.923

		30.6 - 38.1	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		38.2 - 45.7	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Japanese snowbell	15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Northern white cedar	45.8 - 53.3	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	American elm	0.0 - 7.6	50	35.6	50	35.6	0	.	0	.	0	.	0	.	0	.	0.975
		7.7 - 15.2	40	0	60	0	0	.	0	.	0	.	0	.	0	.	0.97
		15.3 - 22.9	33.3	15.8	66.7	15.8	0	.	0	.	0	.	0	.	0	.	0.967
	Chinese elm	53.4 - 61.0	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Siberian elm	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Elm	0.0 - 7.6	0	.	0	.	0	.	0	.	0	.	10	0	0	0	.	0.13
	Dead tree	0.0 - 7.6	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		7.7 - 15.2	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		15.3 - 22.9	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		23.0 - 30.5	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		30.6 - 38.1	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		38.2 - 45.7	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		45.8 - 53.3	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		61.1 - 68.6	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		68.7 - 76.2	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
	Total	0.0 - 7.6	32.3	3.83	29.2	3.02	14.1	1.69	5.2	1.09	0.9	0.5	1.5	0.51	16.9	2.68	0.753
		7.7 - 15.2	31.3	3.83	36.1	2.95	13.6	1.78	3.8	0.94	1.3	0.6	1.9	0.85	12	2.18	0.798
		15.3 - 22.9	21.5	3.5	44.8	4.72	10.4	2.26	3.7	1.25	3.1	1.45	1.8	1.03	14.7	3.47	0.762
		23.0 - 30.5	31	4.31	42.2	4.85	15.5	4.55	2.6	1.42	0.9	0.84	0	.	7.8	2.54	0.858
		30.6 - 38.1	39.7	6.73	39.7	6.39	13.2	4.4	1.5	1.47	0	.	0	.	5.9	3.48	0.892
		38.2 - 45.7	29.3	8.26	41.5	8.31	17.1	5.73	4.9	3.48	0	.	0	.	7.3	3.96	0.857
		45.8 - 53.3	38.5	7.65	38.5	8.09	19.2	7.6	0	.	0	.	0	.	3.8	3.84	0.908
		53.4 - 61.0	25.9	9.37	55.6	11.1	14.8	6.68	3.7	3.7	0	.	0	.	0	.	0.931
		61.1 - 68.6	23.1	12.3	46.2	13.8	15.4	9.41	0	.	0	.	0	.	15.4	13.8	0.795
		68.7 - 76.2	33.3	20.9	16.7	15.8	33.3	15.8	0	.	0	.	0	.	16.7	12.5	0.765
		76.3 - 83.8	66.7	27.4	33.3	27.4	0	.	0	.	0	.	0	.	0	.	0.983
		83.9 - 91.4	0	.	33.3	31.6	33.3	15.8	33.3	15.8	0	.	0	.	0	.	0.797
		91.5 - 99.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		99.2 -106.7	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
Large trans	Boxelder	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Tree of heaven	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
		7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1
	Northern catalpa	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	1

	Sweetgum	0.0 - 7.6	66.7	0	33.3	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.983
		7.7 - 15.2	75	0	25	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.988
	White mulberry	0.0 - 7.6	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.82
		15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
	Black cherry	0.0 - 7.6	33.3	0	66.7	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.967
	Total	0.0 - 7.6	57.1	9.13	28.6	6.08	14.3	3.04	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.96
		7.7 - 15.2	83.3	0	16.7	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.992
		15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
Institutions	Boxelder	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
		7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
		15.3 - 22.9	50	36.1	50	36.1	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.975
		23.0 - 30.5	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
	Norway maple	7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
	Red maple	0.0 - 7.6	66.7	16.1	0	.	33.3	16.1	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.94
		7.7 - 15.2	35.7	9.84	42.9	6.43	21.4	5.42	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.94
		15.3 - 22.9	42.9	7.81	42.9	15.6	14.3	13.5	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.953
		23.0 - 30.5	50	36.1	50	36.1	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.975
		30.6 - 38.1	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
		45.8 - 53.3	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.82
	Silver maple	0.0 - 7.6	50	0	50	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.975
		7.7 - 15.2	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
		15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
	Tree of heaven	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
		7.7 - 15.2	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.95
	American hornbeam	15.3 - 22.9	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.82
	Bitternut hickory	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
	Dogwood	0.0 - 7.6	0	.	0	.	0	.	0	.	0	.	10	0	0	0	0	.	0	.	0	.	0.13
	American beech	45.8 - 53.3	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
	White ash	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
		7.7 - 15.2	66.7	32.1	0	.	33.3	32.1	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.94
		15.3 - 22.9	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0.62
		38.2 - 45.7	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
		68.7 - 76.2	0	.	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0.62
	Honeylocust	30.6 - 38.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0.95
	American holly	0.0 - 7.6	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
		15.3 - 22.9	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1
		23.0 - 30.5	100	0	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	0	.	1

Butternut	0.0 - 7.6	0	.	0	.	0	.	0	.	10	0	0	0	.	0	.	0.37
	7.7 - 15.2	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
Sweetgum	0.0 - 7.6	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
	7.7 - 15.2	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
	15.3 - 22.9	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
Tulip tree	7.7 - 15.2	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
	15.3 - 22.9	0	.	0	.	0	.	0	.		0	.	10	0	0	0	.	0.13
	23.0 - 30.5	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
	38.2 - 45.7	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
	45.8 - 53.3	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
	53.4 - 61.0	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
	106.8 -114.3	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
	114.4 -121.9	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
Crabapple	0.0 - 7.6	18.8	0	62.5	0	18.8	0	0	.		0	.	0	.	0	.	0.935
	7.7 - 15.2	20	0	80	0	0	.	0	.		0	.	0	.	0	.	0.96
White mulberry	0.0 - 7.6	50	36.1	0	.	50	36.1	0	.		0	.	0	.	0	.	0.91
Black tupelo	0.0 - 7.6	0	.	66.7	16.1	33.3	16.1	0	.		0	.	0	.	0	.	0.907
	7.7 - 15.2	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
Norway spruce	23.0 - 30.5	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
Spruce	0.0 - 7.6	0	.	0	.	100	0	0	.		0	.	0	.	0	.	0.82
Quaking aspen	0.0 - 7.6	0	.	50	0	0	.	50	0		0	.	0	.	0	.	0.785
	7.7 - 15.2	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
Sweet cherry	0.0 - 7.6	0	.	66.7	16.1	0	.	0	.		0	.	3	3.3	16.1	0	.	0.677
	7.7 - 15.2	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
	15.3 - 22.9	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
	23.0 - 30.5	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
Black cherry	0.0 - 7.6	0	.	0	.	100	0	0	.		0	.	0	.	0	.	0.82
	15.3 - 22.9	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
	23.0 - 30.5	20	5.78	60	17.4	0	.	0	.		0	.	2	0	23.1	0	.	0.796
	30.6 - 38.1	0	.	0	.	100	0	0	.		0	.	0	.	0	.	0.82
White oak	0.0 - 7.6	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
	7.7 - 15.2	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
	15.3 - 22.9	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
	23.0 - 30.5	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
	68.7 - 76.2	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
Pin oak	61.1 - 68.6	0	.	100	0	0	.	0	.		0	.	0	.	0	.	0.95
Northern red oak	7.7 - 15.2	100	0	0	.	0	.	0	.		0	.	0	.	0	.	1
	15.3 - 22.9	0	.	50	0	50	0	0	.		0	.	0	.	0	.	0.885
	38.2 - 45.7	0	.	0	.	100	0	0	.		0	.	0	.	0	.	0.82
	53.4 - 61.0	0	.	66.7	16.1	33.3	16.1	0	.		0	.	0	.	0	.	0.907

		68.7 - 76.2	50	36.1	50	36.1	0	.	0	.	0	.	0	.	0	.	0.975
	Black locust	0.0 - 7.6	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		7.7 - 15.2	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		38.2 - 45.7	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
		45.8 - 53.3	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Sassafras	0.0 - 7.6	73.7	0	10.5	0	10.5	0	5.3	0	0	.	0	.	0	.	0.956
		7.7 - 15.2	0	.	50	0	0	.	0	.	5	0	0	0	.	0	.	0.66
		15.3 - 22.9	0	.	0	.	100	0	0	.	0	.	0	.	0	.	0.82
	Dead tree	0.0 - 7.6	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		7.7 - 15.2	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		15.3 - 22.9	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		23.0 - 30.5	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		30.6 - 38.1	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
		45.8 - 53.3	0	.	0	.	0	.	0	.	0	.	0	.	100	0	0
	Japanese zelkova	30.6 - 38.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
	Total	0.0 - 7.6	45.5	13.3	28.8	11.3	15.2	3.81	3	1.65	1.5	1.62	3	2.31	3	2.25	0.881
		7.7 - 15.2	45.2	6.1	35.7	5.95	9.5	4.74	0	.	2.4	2.57	0	.	7.1	4.7	0.879
		15.3 - 22.9	24	8.13	40	7.85	16	7.94	4	4.29	0	.	4	3.42	12	7.12	0.781
		23.0 - 30.5	37.5	13.5	43.8	16.5	0	.	0	.	0	.	6.3	6.54	12.5	12.3	0.799
		30.6 - 38.1	37.5	14.1	25	17.5	12.5	12.6	0	.	0	.	0	.	25	17.5	0.715
		38.2 - 45.7	25	15.7	25	15.7	50	31.3	0	.	0	.	0	.	0	.	0.898
		45.8 - 53.3	20	14.2	40	17.4	20	19.2	0	.	0	.	0	.	20	19.2	0.744
		53.4 - 61.0	0	.	75	15.7	25	15.7	0	.	0	.	0	.	0	.	0.918
		61.1 - 68.6	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		68.7 - 76.2	20	19.2	60	25.2	0	.	20	19.2	0	.	0	.	0	.	0.894
		106.8 -114.3	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
		114.4 -121.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
CITY TOTAL		0.0 - 7.6	45.2	3.28	27.1	2.73	11.7	1.17	3.5	0.69	0.7	0.39	1.4	0.47	10.4	1.61	0.779
		7.7 - 15.2	45.9	3.26	30.4	2.68	10.2	1.45	2.7	0.7	1	0.5	1.1	0.47	8.6	1.59	0.817
		15.3 - 22.9	29.7	3.9	41.8	3.56	11.6	2.14	3	1.04	1.6	0.74	1.5	0.73	10.9	2.24	0.782
		23.0 - 30.5	33.3	4.26	44.5	4.97	11.3	2.63	2.4	1.23	0.5	0.48	0.9	0.98	7.2	2.52	0.861
		30.6 - 38.1	37.8	5.29	40.8	5.28	11	3.19	1.9	1.41	0	.	0	.	8.5	3.91	0.882
		38.2 - 45.7	38.9	7.5	30.4	5.55	22.3	6.18	2	1.4	0	.	0	.	6.3	2.46	0.855
		45.8 - 53.3	23.3	4.89	35.6	5.53	34.1	4.77	0	.	0	.	0	.	7	4	0.878
		53.4 - 61.0	24	6.19	47.7	7.9	26.4	5.14	1.9	1.89	0	.	0	.	0	.	0.925
		61.1 - 68.6	23.6	10.7	56.5	11.4	10	6.1	0	.	0	.	0	.	10	8.93	0.823
		68.7 - 76.2	26	15.2	25.6	8.69	39.6	14.5	5.8	5.52	0	.	0	.	3.1	2.29	0.831
		76.3 - 83.8	57.7	23.1	42.3	23.1	0	.	0	.	0	.	0	.	0	.	0.981

83.9 - 91.4	0	.	78.6	10.2	10.7	5.08	10.7	5.08	0	.	0	.	0	.	0.853
91.5 - 99.1	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
99.2 -106.7	63.4	0	36.6	0	0	.	0	.	0	.	0	.	0	.	0.97
106.8 -114.3	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
114.4 -121.9	0	.	100	0	0	.	0	.	0	.	0	.	0	.	0.95
122.0 -129.5	0	.	50	35.9	0	.	50	35.9	0	.	0	.	0	.	0.785

#9. DENSITY ESTIMATES FOR CITY TREES BY SPECIES IN THE BALTIMORE COUNTY URDL

SPECIES	TREES (/ha)			CARBON (kg/ha)			CARBON SEQ (kg/yr/ha)			NET CARBON SEQ (kg/yr/ha)		LEAF AREA (m2/ha)			LEAF BIOMASS (kg/ha)			TREE VALUE (U.S.$/ha)	
COMMON NAME	%	N	SE	%	N	SE	%	N	SE	N	SE	%	N	SE	%	N	SE	%	N	SE
Red maple	9.1	14.06	3.35	7.8	2122.73	548.25	9.5	76.14	16.75	70.51	15.28	12.9	2259.504	569.973	12.8	152.17	38.38	6.9	10,008.73	2551.84
Dead tree	8.7	13.47	2.33	5.2	1399.77	318.83	0	0	0	-164.67	52.07	0	0	0	0	0	0	0	0	0
Tulip tree	5.7	8.73	1.96	19.4	5262.88	1412.87	11.8	93.73	21.6	71.39	18.14	17.8	3117.391	716.752	15.4	183.76	42.25	15.6	22,534.93	8272.64
Black cherry	5.2	7.98	1.81	1.9	505.33	231.65	3.4	27.47	9.56	23.16	9.38	1.7	303.377	88.238	2	23.53	6.84	1.4	2,022.75	820.84
Boxelder	4.2	6.51	2.53	1.1	287.44	112.81	2.3	18.23	6.52	17.4	6.22	2.2	386.41	147.373	3	35.35	13.48	0.9	1,325.04	510.64
Tree of heaven	4.2	6.5	4.84	0.5	127.86	66.6	1.4	11.27	5.65	10.94	5.54	1.2	203.778	108.065	1.3	15.2	8.06	0.4	598.52	304.25
Black tupelo	4.2	6.49	2.11	0.7	196.6	69.22	1.5	12.03	4.48	11.64	4.35	2.2	392.588	141.173	1.1	13.58	4.88	0.8	1,119.07	458.68
White ash	4	6.12	2.1	7.1	1930.14	845.94	5.1	40.57	16.97	33.4	14.9	5	869.116	314.402	4.2	49.38	17.86	5.5	7,870.96	3886
Sweetgum	3.9	6.01	2.38	1.4	366.22	137.79	1.7	13.37	4.82	12.85	4.64	3	519.682	197.563	2	23.86	9.07	1.4	2,047.95	834.87
American beech	3.6	5.62	1.99	2.2	604.62	252.24	2.7	21.28	7.4	20.42	7.07	4.4	780.429	267.423	2.8	33.26	11.4	1.3	1,893.13	701.57
Sassafras	3.1	4.83	2.9	0.5	138.81	62.72	0.9	7.47	3.25	7.16	3.08	1	172.794	78.577	0.7	8.5	3.86	0.5	736.53	365.59
White mulberry	2.9	4.41	1.17	4.7	1263.51	739.67	5.9	46.75	24.08	41.74	21.14	2	350.288	119.465	2.2	25.62	8.74	6.5	9,397.94	5248.68
Silver maple	2.5	3.92	1.15	6.5	1768.81	841.11	6.2	49.27	20.36	39.03	14.37	5.5	967.193	355.407	4.3	50.9	18.71	8.2	11,899.55	5230.17
Dogwood	2.4	3.67	1.09	0.2	60.25	20.88	1	7.88	3	7.69	2.92	0.9	158.054	56.384	0.8	9.22	3.29	0.5	712.29	319.56
Sweet cherry	2.4	3.63	1.42	0.6	154.4	78.5	1.6	12.91	6.76	12.3	6.44	0.7	116.069	56.498	0.8	8.98	4.37	1	1,425.49	807.06
Norway maple	2.3	3.48	1.23	1	281.25	115.98	2	16.11	6.13	15.35	5.78	2.4	425.457	166.169	1.9	22.96	8.97	1.3	1,841.85	860.08
Crabapple	2	3.1	2.64	0.2	51.5	31.14	0.7	5.23	3.13	4.41	2.86	0.3	59.84	43.22	0.4	5.16	3.73	0.5	659.74	393.2
Northern red oak	2	3.07	0.81	11.3	3052.22	835.63	7.4	58.61	17.31	49.26	13.88	6.3	1103.924	358.361	7.4	87.96	28.55	8.6	12,459.25	4894.19
White oak	1.7	2.69	0.69	6.1	1653.62	575.35	5.4	42.99	13.97	38.26	12	3.6	623.27	197.843	3.8	45.34	14.39	7.6	10,944.38	4286
Eastern white pine	1.7	2.69	1.52	0.9	249.18	162.44	1.9	15.12	9.72	13.81	8.77	3	523.371	324.966	2.8	33.66	20.9	2.9	4,210.64	2620.89
American hornbeam	1.5	2.35	1.12	0.1	33.55	17.06	0.5	4.04	2.07	3.95	2.03	1.5	257.87	162.953	1.3	15.53	9.82	0.2	251.57	131.94
Black locust	1.4	2.21	0.85	1.2	334.47	188.3	1.5	11.98	5.86	10.86	5.14	1.4	242.29	110.991	1.1	13.04	5.98	1.2	1,767.84	1138.46
American sycamore	1.1	1.73	0.76	1.5	394.7	297.81	1.6	12.7	7.92	11.47	6.83	1.6	284.466	133.004	1.2	13.78	6.44	1.4	1,973.15	1536.8
American holly	1	1.61	0.77	0.5	135.09	81.49	1	7.58	4.08	6.7	3.46	0.6	97.515	56.337	1.1	13.04	7.53	0.8	1,179.28	678.54
Cherry	1	1.6	0.69	0.9	249.69	213.59	1.8	14.71	11.16	13.74	10.32	0.7	120.65	72.994	0.8	9.34	5.65	1.1	1,537.57	1247.33
London planetree	1	1.59	1.03	0.1	29.99	17.35	0.3	2.48	1.5	2.42	1.46	0.5	91.439	50.958	0.3	3.99	2.23	0.2	355.25	248.57
Holly	1	1.53	1.53	0.6	161.32	161.31	1.1	8.98	8.98	8.34	8.34	0.5	81.212	81.209	0.9	10.86	10.86	1.1	1,545.15	1545.09
Chestnut oak	1	1.51	0.63	1.9	505.05	348.3	1.7	13.91	7.96	13.18	7.68	1.3	224.554	146.344	1.5	17.65	11.5	0.9	1,279.57	711.21
Honeylocust	0.9	1.35	1.23	1	272.02	247.3	1.5	12.35	11.19	10.03	8.98	0.3	54.804	49.678	0.5	5.74	5.2	1.3	1,900.55	1628.3
Costal plain willow	0.8	1.26	1.2	0.2	62.08	54.46	0.5	4.24	3.92	3.76	3.45	0.2	27.363	26.82	0.1	1.69	1.66	0.4	584.45	559.25
Northern catalpa	0.7	1.11	0.81	0.2	48.8	39.32	0.4	3.54	2.56	3.38	2.42	0.2	35.098	24.149	0.2	2.14	1.47	0.3	370.74	341.23
Eastern cottonwood	0.7	1.04	0.73	1.3	366	344.22	0.8	6.48	5.95	6.15	5.71	1.8	320.432	316.662	1.9	23.12	22.85	0.5	765.44	716.05
River birch	0.6	1	1	0.4	101.74	101.72	0.5	4.19	4.19	4.12	4.12	0.8	131.692	131.669	0.9	10.21	10.21	0.2	304.26	304.2
Japanese maple	0.5	0.8	0.46	0.9	235.82	166.44	1.3	10.55	6.43	9.63	5.82	1	173.958	105.582	0.8	9.79	5.94	1.8	2,586.05	1754.11

Pignut hickory	0.5	0.71	0.32	0.2	50.65	30.62	0.3	2.5	1.24	2.4	1.19	0.2	36.321	15.951	0.1	0.69	0.3	0.2	249.42	155.9
Willow oak	0.5	0.71	0.44	0.7	183.17	144.74	0.5	4.23	2.59	3.99	2.43	0.9	164.123	110.955	1.2	14.56	9.84	0.3	493.5	310.7
American elm	0.4	0.66	0.5	0.1	18.99	13.91	0.2	1.36	0.97	1.34	0.96	0.2	38.866	30.434	0.2	2.83	2.21	0.1	159.74	122.19
Black spruce	0.4	0.65	0.4	0.1	34.51	22.31	0.4	3.54	2.18	3.39	2.09	0.2	33.603	21.039	0.5	6.34	3.97	0.4	565.89	372.09
Northern white cedar	0.4	0.64	0.58	0.4	102.75	92.78	0.4	3.16	2.9	2.65	2.41	0.5	81.463	80.004	1.3	15.67	15.39	2.2	3,189.84	2906.74
Norway spruce	0.4	0.63	0.35	0.5	138.59	95.13	0.6	4.9	2.95	3.91	2.24	0.7	130.204	83.034	1.8	21.7	13.84	1	1,445.25	908.77
Ligustrum	0.4	0.61	0.61	0.4	114.28	114.28	0.8	6.48	6.48	6.03	6.03	0	3.72	3.72	0	0.34	0.34	0.8	1,128.29	1128.25
Blue spruce	0.4	0.61	0.61	0.4	110.75	110.75	0.7	5.6	5.6	5.17	5.17	0.8	146.416	146.41	2.1	24.84	24.84	1	1,454.17	1454.12
Red pine	0.4	0.6	0.44	0.2	67.17	60.22	0.2	1.25	0.94	0.94	0.67	0.5	87.527	86.391	1.1	12.87	12.7	0.1	110.49	90.23
Hawthorn	0.4	0.57	0.37	0	8.23	6.07	0.2	1.21	0.88	1.19	0.86	0.1	11.915	8.232	0	0.43	0.3	0	65.06	47.32
Balsam poplar	0.4	0.56	0.56	0.7	197.3	197.29	1.1	8.53	8.53	7.76	7.76	0.7	126.507	126.499	0.8	9.13	9.13	1.1	1,605.18	1605.08
Quaking aspen	0.3	0.5	0.5	0	3.02	3.02	0	0.36	0.36	0.35	0.35	0	6.99	6.989	0	0.55	0.55	0	12.09	12.08
Japanese zelkova	0.3	0.5	0.39	0.2	60.63	42.96	0.6	4.49	3.45	4.25	3.29	0.3	47.974	34.545	0.3	3.58	2.58	0.7	995.44	719.09
Mockernut hickory	0.3	0.47	0.29	0.3	87.71	80.27	0.2	1.85	1.47	1.78	1.41	0.1	24.451	18.214	0.1	1.4	1.04	0.1	169.18	145.47
Black walnut	0.3	0.47	0.34	0.1	30.87	26.23	0.2	1.59	1.22	1.57	1.2	0.3	50.904	38.616	0.3	4.08	3.09	0.1	155.66	109.69
Scotch pine	0.3	0.44	0.38	0	7.73	6.22	0.1	0.56	0.48	0.54	0.47	0.2	31.816	30.98	0.3	3.07	2.99	0.1	152.37	134.55
Spruce	0.3	0.43	0.33	0	3.9	3.66	0.1	0.84	0.79	0.82	0.77	0.1	9.725	9.29	0.1	1.65	1.58	0	60.63	58.86
American basswood	0.3	0.42	0.33	0.3	69.36	57.45	0.5	3.94	3.12	3.67	2.89	1	181.093	159.946	0.4	5.29	4.67	0.8	1,128.19	915.66
Roundleaf serviceberry	0.2	0.38	0.38	0	2.46	2.46	0	0.31	0.31	0.31	0.31	0	2.646	2.646	0	0.2	0.2	0	11.74	11.74
Pin oak	0.2	0.38	0.24	0.7	198.11	187.02	0.7	5.72	4.48	4.96	3.79	0.4	61.505	45.452	0.5	5.57	4.11	1.1	1,596.27	1402.98
Bitternut hickory	0.2	0.35	0.26	0	10	9.39	0.2	1.58	1.48	1.54	1.44	0	7.406	5.291	0	0.47	0.33	0.1	169.24	165.36
Slippery elm	0.2	0.34	0.34	0	2.32	2.32	0	0.29	0.29	0.28	0.28	0.1	16.173	16.172	0.1	0.72	0.72	0	12.4	12.4
Yellow birch	0.2	0.27	0.21	0	7.39	7.27	0	0.33	0.29	0.29	0.25	0	7.095	6.23	0	0.29	0.26	0	13.73	11.84
Green ash	0.2	0.27	0.16	0	6.96	4.37	0.1	0.68	0.48	0.66	0.47	0.1	18.411	13.084	0.1	1.2	0.85	0.1	108.62	74.16
Other species	0.2	0.27	0.13	0	12.89	10.86	0.1	0.63	0.41	0.61	0.4	0.1	19.564	13.404	0.1	1.46	1	0	46.67	33.3
Butternut	0.2	0.25	0.25	0	2.78	2.78	0	0.24	0.24	0.23	0.23	0	3.49	3.49	0	0.19	0.19	0	10.76	10.76
Common pear	0.2	0.25	0.15	0.1	18.63	12.19	0.2	1.56	1.09	1.5	1.04	0.2	41.878	28.223	0.3	3.12	2.1	0.2	227.55	159.47
Common persimmon	0.1	0.23	0.16	0.4	107.68	106.63	0.5	3.64	3.51	3.22	3.1	0.3	44.384	41.148	0.3	3.31	3.07	0.5	756.38	752.38
Eastern hemlock	0.1	0.23	0.16	0.2	67.38	63.75	0.3	2.27	1.95	1.58	1.35	0.5	88.913	87.659	0.7	8.26	8.14	0.5	661.9	606.72
Southern catalpa	0.1	0.2	0.2	0	2.76	2.76	0	0.22	0.22	0.22	0.22	0	1.134	1.134	0	0.06	0.06	0	14.2	14.2
Eastern red cedar	0.1	0.2	0.2	0.1	27.86	27.86	0.1	0.88	0.88	0.82	0.82	0.3	53.236	53.227	1.2	14.79	14.79	0.3	442.73	442.65
Shingle oak	0.1	0.2	0.2	0	1.25	1.25	0	0.15	0.15	0.15	0.15	0	1.554	1.554	0	0.14	0.14	0	6.37	6.36
Pear	0.1	0.19	0.19	0.1	37.66	37.65	0.3	2.33	2.33	2.18	2.18	0.3	53.827	53.823	0.3	4.01	4.01	0.3	497.06	497.03
Sugar maple	0.1	0.18	0.13	0.1	20.93	18.11	0.2	1.69	1.23	1.61	1.16	0.2	38.081	27.521	0.2	2.29	1.66	0.1	194.21	161.84
Flowering dogwood	0.1	0.18	0.13	0	0.62	0.44	0	0.12	0.08	0.12	0.08	0	5.308	5.044	0	0.31	0.29	0	3.09	2.22
Elm	0.1	0.18	0.13	0.1	13.84	13.75	0.1	1.12	1.11	1.06	1.06	0.2	27.482	27.472	0.2	1.87	1.87	0.1	188.37	188.22
Black ash	0.1	0.13	0.09	0	0.26	0.18	0	0.06	0.04	0.06	0.04	0	3.565	3.157	0	0.21	0.19	0	1.89	1.33
Willow	0.1	0.13	0.09	0.2	44.28	44.16	0.2	1.69	1.67	1.52	1.5	0.1	14.541	14.126	0.1	0.9	0.87	0.2	311.4	310.77
Horsechestnut	0.1	0.11	0.11	1.6	426.72	426.68	1.1	8.71	8.71	7.09	7.09	0.6	96.553	96.544	0.6	6.75	6.75	1.7	2,454.64	2454.4
American chestnut	0.1	0.11	0.11	0.3	79.36	79.35	0.4	2.94	2.94	2.19	2.19	0.1	24.989	24.987	0.1	1.14	1.14	0.3	431.35	431.3

Singleleaf ash	0.1	0.11	0.11	0.1	30.41	30.41	0.1	0.78	0.78	0.76	0.76	0	4.864	4.863	0	0.39	0.39	0.1	83.83	83.82
Yew	0.1	0.11	0.11	0.1	33.55	33.54	0.1	1.12	1.12	0.99	0.99	0.4	69.57	69.563	0.6	7.68	7.68	0.4	542.06	542
Paper birch	0	0.07	0.07	0.1	21.36	21.36	0.1	0.99	0.99	0.94	0.94	0.1	21.786	21.782	0.1	1.52	1.52	0.1	134.74	134.72
Eastern redbud	0	0.07	0.07	0	0.09	0.09	0	0.04	0.04	0.04	0.04	0	2.09	2.089	0	0.13	0.13	0	3.14	3.14
Atlantic white cedar	0	0.07	0.07	0.1	21.84	21.83	0.1	0.56	0.56	0.44	0.44	0.1	18.846	18.843	0.4	4.71	4.71	0.2	321.69	321.64
Ash	0	0.07	0.07	0	0.25	0.25	0	0.04	0.04	0.04	0.04	0	3.133	3.133	0	0.28	0.28	0	1.01	1.01
Juniper	0	0.07	0.07	0	1.48	1.48	0	0.18	0.18	0.17	0.17	0	3.282	3.282	0.1	0.91	0.91	0	24.76	24.75
Magnolia	0	0.07	0.07	0	0.66	0.66	0	0.06	0.06	0.05	0.05	0	0.128	0.128	0	0.01	0.01	0	1.87	1.87
Eastern hophornbeam	0	0.07	0.07	0	0.15	0.15	0	0.05	0.05	0.05	0.05	0	1.229	1.229	0	0.08	0.08	0	3.35	3.35
Virginia pine	0	0.07	0.07	0.1	25.06	25.05	0.1	0.76	0.76	0.52	0.52	0.1	19.18	19.177	0.2	1.85	1.85	0.2	335.05	335
Swamp white oak	0	0.07	0.07	0.3	74.56	74.55	0.2	1.91	1.91	1.74	1.74	0.2	27.145	27.14	0.2	2.49	2.49	0.4	618.86	618.76
White willow	0	0.07	0.07	0.2	66.2	66.19	0.2	1.24	1.24	0.27	0.27	0.1	14.088	14.086	0.1	0.87	0.87	0.2	270.39	270.35
Sandbar willow	0	0.07	0.07	0	12.5	12.5	0.1	0.42	0.42	0.41	0.41	0	3.804	3.804	0	0.23	0.23	0	34.49	34.49
Japanese snowbell	0	0.07	0.07	0	2.65	2.65	0	0.36	0.36	0.35	0.35	0	3.185	3.184	0	0.24	0.24	0	49.3	49.29
Chinese elm	0	0.07	0.07	0.2	41.46	41.46	0.1	1.14	1.14	1.05	1.05	0.2	33.366	33.361	0.3	3.79	3.79	0.3	457.84	457.76
Siberian elm	0	0.07	0.07	0	0.05	0.05	0	0.02	0.02	0.02	0.02	0	1.455	1.455	0	0.1	0.1	0	0.58	0.58

#10. PER AREA ESTIMATES FOR TREES IN THE BALTIMORE COUNTY URDL

LANDUSE	SPECIES COMMON NAME	TREES/AREA (no./ha)		CARBON/AREA (kg/ha)		NET CARBON SEQ/AREA (kg/yr/ha)		CARBON SEQ/AREA (kg/yr/ha)		LEAF AREA/AREA (m2/ha)		LEAF BIOMASS/AREA (kg/ha)		TREE VALUE/AREA (U.S. $/ha)	
		MEAN	SE	MEAN	SE	MEAN	SE	MEAN	SE	MEAN	SE	MEAN	SE	MEAN	SE
Small lot SF	Silver maple	7	3.41	5531.8	3677.37	141.5	86.4	102.4	58.19	2374.1	1358.89	125	71.52	36,780	22336
	Holly	7	6.96	732.8	732.74	40.8	40.79	37.9	37.89	368.9	368.88	49.3	49.31	7,019	7018
	Honeylocust	5.6	5.57	1117.1	1117.07	50.5	50.53	40.5	40.47	224.3	224.31	23.5	23.49	7,270	7270
	Black tupelo	5.6	5.57	88.4	88.44	15.4	15.39	15	14.98	398.4	398.38	13.8	13.78	1,711	1711
	American hornbeam	4.2	4.18	26.4	26.35	8.1	8.13	8	7.98	691.2	691.18	41.6	41.64	419	419
	Japanese maple	2.8	1.91	407	361.35	26.6	19.96	25	18.59	400.2	279.23	22.5	15.72	4,927	4120
	Red maple	2.8	1.91	980	870.88	45.3	34.98	36	26.95	580.7	513.09	39.1	34.55	7,329	6152
	Dogwood	2.8	1.91	91.8	63.23	16.1	11.04	15.7	10.77	258.2	194.02	15.1	11.31	1,772	1218
	Dead tree	2.8	1.91	479.8	467.64	0	0	-131.9	128.59	0	0	0	0	0	0
	American beech	2.8	2.78	142.7	142.69	15.7	15.68	14.3	14.25	639.1	639.12	27.2	27.23	1,422	1422
	Ligustrum	2.8	2.78	519.1	519.09	29.4	29.44	27.4	27.39	16.9	16.9	1.5	1.54	5,125	5125
	White mulberry	2.8	2.78	2669.9	2669.76	84.7	84.74	74.5	74.47	391.1	391.04	28.6	28.6	19,186	19185
	Blue spruce	2.8	2.78	503.1	503.05	25.5	25.46	23.5	23.49	665.1	665.04	112.8	112.83	6,605	6605
	Cherry	2.8	2.78	964.9	964.82	50	49.98	46.2	46.2	293.8	293.79	22.7	22.73	5,603	5603
	Black cherry	2.8	1.91	23.7	22.22	6.9	5.88	6.8	5.78	89	76.13	6.9	5.9	238	194
	Norway maple	1.4	1.39	376	375.98	19.3	19.33	17.9	17.85	524.8	524.75	28.3	28.32	3,258	3258
	Tree of heaven	1.4	1.39	13.1	13.11	3.9	3.93	3.9	3.86	70.3	70.26	5.2	5.24	107	107
	Hawthorn	1.4	1.39	11.3	11.32	3.6	3.58	3.5	3.52	16.5	16.47	0.6	0.59	190	190
	White ash	1.4	1.39	247.5	247.5	19.1	19.12	16.7	16.69	83.5	83.46	4.7	4.74	1,937	1937
	Tulip tree	1.4	1.39	854.5	854.45	30.4	30.38	22.3	22.3	494.7	494.66	29.2	29.16	7,333	7332
	Spruce	1.4	1.39	16.6	16.61	3.6	3.59	3.5	3.51	42.1	42.15	7.2	7.15	267	267
	Black spruce	1.4	1.39	88.4	88.39	8.3	8.31	8	7.95	78.9	78.87	14.9	14.88	1,502	1502
	Eastern cottonwood	1.4	1.39	0.7	0.71	0.6	0.59	0.6	0.58	14.6	14.57	1.1	1.05	55	55
	Northern red oak	1.4	1.39	1114.6	1114.59	40.8	40.79	30.2	30.24	487.6	487.54	38.8	38.85	7,591	7591
	Black locust	1.4	1.39	2	1.97	1.1	1.14	1.1	1.12	40.7	40.68	2.2	2.19	55	55
	Sassafras	1.4	1.39	3.5	3.49	1.5	1.53	1.5	1.5	68.7	68.66	3.4	3.38	69	69
	American basswood	1.4	1.39	253.6	253.6	13.4	13.44	12.4	12.45	719.2	719.13	21	21	4,006	4006
	Total	73.8	26.18	17260.3	5758.95	702.3	211.41	462.7	179.89	10032.3	2877.89	686.3	186.84	131,774	39187
Industrial	Tree of heaven	56.2	56.15	548.2	548.21	57.2	57.16	56.7	56.72	1000.6	1000.58	74.6	74.63	1,310	1310
	Northern catalpa	9	8.98	120.5	120.54	11.5	11.48	11.4	11.38	231.5	231.44	14.1	14.09	289	289
	Northern white cedar	6.7	6.74	1078.4	1078.32	33.8	33.81	28.1	28.1	935.8	935.79	180	179.96	33,828	33826
	Roundleaf serviceberry	4.5	4.49	28.8	28.81	3.6	3.64	3.6	3.62	31	30.95	2.3	2.34	137	137
	American hornbeam	2.2	2.25	3.8	3.78	0.9	0.94	0.9	0.93	10.2	10.17	0.6	0.61	35	35

	Eastern white pine	2.2	2.25	71.8	71.8	7.4	7.42	7.1	7.13	459.5	459.5	29.6	29.55	2,325	2325
	London planetree	2.2	2.25	19.8	19.75	2.4	2.39	2.4	2.37	138.7	138.68	6.1	6.06	88	88
	American sycamore	2.2	2.25	87	87.04	12.2	12.2	11.8	11.83	836.1	836.1	40.5	40.51	1,969	1969
	Pin oak	2.2	2.25	129.4	129.35	16.1	16.13	15.6	15.58	241.3	241.27	21.8	21.83	2,366	2366
	Black locust	2.2	2.25	61.2	61.21	4.6	4.62	4.6	4.58	469.3	469.24	25.3	25.26	186	186
	Total	89.9	75.55	2148.9	1257.73	149.8	86.6	142.2	84.42	4354	2357.59	394.9	214.39	42,533	33632
Attached Dwelli	Balsam poplar	6.3	6.28	2212.9	2212.73	95.6	95.63	87	87.03	1418.9	1418.78	102.4	102.37	18,003	18002
	Red maple	4.2	2.82	1024.3	966.37	53.5	43	44	34.07	401.1	301.47	27	20.3	7,922	7158
	Silver maple	4.2	4.19	1934.8	1934.64	61.2	61.16	53.7	53.72	1671.7	1671.6	88	87.98	17,274	17273
	Black cherry	4.2	4.19	54.6	54.64	13.8	13.85	13.6	13.57	144.3	144.33	11.2	11.19	491	491
	Japanese maple	2.1	2.09	1639.8	1639.73	52.7	52.65	46.3	46.34	962.8	962.78	54.2	54.19	16,840	16839
	Norway maple	2.1	2.09	412.7	412.65	27.5	27.5	25.9	25.86	710.5	710.42	38.3	38.34	3,893	3893
	White ash	2.1	2.09	12.1	12.09	4	3.97	3.9	3.88	22.8	22.8	1.3	1.3	170	170
	American holly	2.1	2.09	830.3	830.25	37.9	37.91	30	29.98	555.9	555.86	74.3	74.31	5,999	5999
	Total	27.2	9.51	8121.5	4065.77	346.1	154.3	304.4	131.52	5888	2501.78	396.7	176.99	70,592	35030
Large lot SF	Eastern white pine	16.2	10.56	1654.1	1141.57	99.5	68.28	90.5	61.58	3235	2265.34	208	145.68	27,234	18376
	White mulberry	11.3	4	3691.4	3096.73	145.4	104.32	129.4	91.07	886.9	395.45	64.9	28.93	26,207	21260
	American beech	10.5	8.99	474.4	339.23	33.2	23.3	32.2	22.69	816	693.2	34.8	29.54	2,787	2042
	Tulip tree	6.5	3.07	8752.2	4731.41	129.6	65.88	35.5	58.75	2958.8	1554.45	174.4	91.63	26,512	14952
	Norway maple	5.7	3.62	572.1	365.38	33.7	19.47	32.4	18.76	701.7	431	37.9	23.26	3,087	1766
	Dead tree	5.7	3.01	1504.9	948.86	0	0	-264.4	208.6	0	0	0	0	0	0
	Boxelder	4.9	3.37	500.5	425	33.3	27.69	31.5	26.03	526.9	473.18	48.2	43.29	2,751	2490
	Red maple	4.9	2.71	1021	657.25	42.8	24.39	39.9	22.19	1204.7	618.76	81.1	41.67	6,832	4949
	Silver maple	3.2	1.93	1158.9	673.19	42.8	27.37	39.1	24.96	988.2	691.24	52	36.38	5,824	3745
	Tree of heaven	3.2	1.93	467.4	328.75	25.7	17.29	23.9	16.01	478.2	431.47	35.7	32.18	2,823	1970
	Cherry	3.2	1.53	154.9	125.12	17.8	11.26	17.1	10.75	248.3	211.83	19.2	16.39	1,212	994
	Dogwood	2.4	1.78	86.5	80.4	11	10.19	10.6	9.85	84.6	69.32	4.9	4.04	1,118	1096
	Crabapple	2.4	1.78	226.7	191.46	14.8	10.35	9.6	6.94	110.6	77.34	9.5	6.67	1,811	1338
	Black spruce	2.4	1.78	105.9	76.77	12	8.38	11.6	8.08	114.3	83.66	21.6	15.79	1,656	1201
	American sycamore	2.4	1.35	2379.4	2083.56	63.7	54.08	55.6	46.19	715.9	649.32	34.7	31.46	11,594	10732
	Black cherry	2.4	2.43	658.3	658.24	38.9	38.89	34.3	34.26	312.1	312.05	24.2	24.2	3,772	3771
	White oak	2.4	1.35	3123.3	2826.24	93.2	72.38	81.2	61.69	992.9	749.57	72.2	54.53	21,238	17679
	Black locust	2.4	2.43	774.2	774.09	20.1	20.05	19.5	19.51	261.6	261.55	14.1	14.08	1,739	1739
	Slippery elm	2.4	2.43	16.3	16.3	2	2.02	2	1.99	113.9	113.87	5.1	5.1	87	87
	Bitternut hickory	1.6	1.62	66	65.97	10.4	10.41	10.1	10.13	29.8	29.85	1.9	1.88	1,164	1164
	Common persimmon	1.6	1.12	758.2	750.81	25.6	24.73	22.7	21.84	312.5	289.74	23.3	21.61	5,326	5298
	White ash	1.6	1.12	5826.5	4917.24	39.4	32.08	17.6	29.65	1037.7	843.52	59	47.93	23,474	18432
	Eastern hemlock	1.6	1.12	474.5	448.86	16	13.77	11.1	9.51	626.1	617.25	58.1	57.33	4,661	4272
	Sugar maple	0.8	0.81	21.7	21.71	4.6	4.6	4.5	4.5	105.7	105.66	6.4	6.37	257	257
	Horsechestnut	0.8	0.81	3004.8	3004.46	61.4	61.35	49.9	49.92	679.9	679.81	47.5	47.54	17,284	17282

	American hornbeam	0.8	0.81	34.5	34.45	4.6	4.63	4.5	4.48	99.1	99.06	6	5.97	582	582
	American chestnut	0.8	0.81	558.8	558.77	20.7	20.69	15.4	15.4	176	175.94	8	8.03	3,037	3037
	Pignut hickory	0.8	0.81	24.6	24.57	1.9	1.87	1.8	1.83	0.8	0.75	0	0.01	86	86
	Flowering dogwood	0.8	0.81	2.4	2.42	0.5	0.48	0.5	0.48	35.5	35.46	2.1	2.06	13	13
	Singleleaf ash	0.8	0.81	214.1	214.12	5.5	5.47	5.3	5.32	34.2	34.24	2.7	2.75	590	590
	American holly	0.8	0.81	124.5	124.54	9.5	9.53	9	9.03	73.4	73.43	9.8	9.82	1,416	1416
	Sweetgum	0.8	0.81	1	1.02	0.4	0.45	0.4	0.44	8.5	8.47	0.4	0.39	39	39
	Black tupelo	0.8	0.81	26.3	26.32	1.8	1.77	1.7	1.75	19.1	19.08	0.7	0.66	126	126
	Norway spruce	0.8	0.81	623.6	623.5	17.3	17.26	11.4	11.41	516.5	516.48	86.1	86.08	5,476	5476
	Common pear	0.8	0.81	69.3	69.32	7	6.96	6.7	6.68	182.3	182.31	13.6	13.6	929	929
	Willow oak	0.8	0.81	70.5	70.5	5.8	5.78	5.5	5.5	120.2	120.2	10.7	10.66	1,051	1051
	Chestnut oak	0.8	0.81	35.2	35.23	6.4	6.38	6.2	6.22	54	53.95	4.2	4.24	560	560
	Northern red oak	0.8	0.81	1340.6	1340.5	19.2	19.16	18.2	18.24	193.6	193.63	15.4	15.43	2,560	2560
	Sassafras	0.8	0.81	45.5	45.49	2.5	2.51	2.4	2.43	14.6	14.63	0.7	0.72	171	171
	Yew	0.8	0.81	236.2	236.19	7.9	7.88	7	6.97	489.9	489.82	54.1	54.1	3,817	3816
	American basswood	0.8	0.81	95.3	95.27	6.9	6.9	6.5	6.51	160.3	160.31	4.7	4.68	1,734	1734
	Elm	0.8	0.81	96.8	96.82	7.8	7.85	7.5	7.46	193.5	193.44	13.2	13.18	1,325	1325
	Total	116.5	28.06	41073.5	9995.29	1142.3	265.78	657.6	226.89	19913.7	4351	1371.1	296.36	223,964	51865
Commercial	London planetree	12.4	12.35	185.9	185.87	17.6	17.63	17.2	17.17	554.2	554.2	24.2	24.2	3,065	3065
	Sweet cherry	7.4	7.41	796.4	796.31	76.3	76.25	73	73	345	344.94	26.7	26.69	9,313	9313
	Scotch pine	4.9	4.94	79	79.03	6.3	6.28	6.1	6.1	410.3	410.29	39.5	39.54	1,765	1764
	Japanese zelkova	4.9	4.94	427	426.93	42.4	42.38	40.6	40.63	379.1	379.04	28.3	28.27	7,975	7974
	Silver maple	2.5	2.47	464.7	464.66	20.3	20.35	18.5	18.54	158.3	158.27	8.3	8.33	7,414	7413
	Northern catalpa	2.5	2.47	502.8	502.75	31.2	31.2	29.2	29.21	182.3	182.32	11.1	11.1	4,509	4508
	Pear	2.5	2.47	498.9	498.88	30.8	30.84	28.9	28.86	713.1	713.1	53.2	53.19	6,586	6585
	Total	37.1	19.58	2954.6	1444.68	224.9	121.08	213.5	115.51	2742.3	1214.25	191.3	85.83	40,625	19511
Open space	Dead tree	48.5	9.93	3798.5	1105.02	0	0	-297.3	102.73	0	0	0	0	0	0
	Red maple	40.2	10.38	6023.6	2077.07	187.3	51.99	178.8	49.69	6716.1	2251.27	452.3	151.61	23,953	8412
	Tulip tree	29.7	8.4	11914.1	3249.84	234.9	60.83	220.8	57.44	10130.2	2962.05	597.2	174.61	41,203	11126
	Black cherry	23.5	5.91	881.7	416.83	55.1	17.18	51.3	16.18	748.2	225.23	58	17.47	4,565	2323
	Boxelder	22.3	10.99	824.8	420.88	48.6	21.88	46.4	21.02	1122.3	545.33	102.7	49.89	2,641	1180
	Black tupelo	21.6	7.76	781.1	307.72	36.5	13.42	35.2	13.01	1383.7	514.27	47.9	17.79	3,162	1206
	White ash	21	9.24	3336.9	1816.04	118	71.59	107.3	63.17	2922.2	1330.44	166	75.59	17,016	13136
	Sweetgum	18.2	8.07	1626.5	638.9	49.7	20.13	47.5	19.19	1834.4	802.72	84.2	36.85	7,850	3705
	American beech	15.8	6.48	1853.8	1027.65	51.9	24.65	50.4	23.81	2125.6	901.47	90.6	38.41	4,388	2336
	Dogwood	12.1	4.49	127.2	49.15	12.9	4.6	12.7	4.52	414	164.99	24.1	9.62	759	360
	Sweet cherry	10.8	5.56	266.5	179.69	21.4	13.47	20.2	12.56	191.2	122.09	14.8	9.45	1,932	1341
	Norway maple	9.6	4.87	344.3	233.17	19.8	11.11	19.3	10.79	665.9	374.88	35.9	20.23	1,448	945
	Sassafras	7.7	4.02	538.1	280.59	20.3	9.81	19.7	9.58	543.5	309.95	26.7	15.24	1,755	814
	White oak	7.4	2.39	3145.1	1096.28	82.7	29.12	77.4	26.75	1305.9	530.04	95	38.56	15,056	7070

Northern red oak	7.1	2.21	7793.7	2646.98	121	39.4	105.8	34.02	3006.6	1312.02	239.6	104.54	18,098	7497
White mulberry	6.8	3.38	668.1	421.47	28.5	15.67	26.4	14.6	459	232.86	33.6	17.03	6,144	3553
Chestnut oak	6.5	2.88	2326.3	1620.24	60.5	36.79	57.2	35.49	1009	679.9	79.3	53.43	5,583	3288
Costal plain willow	5.9	5.57	288.8	253.37	19.7	18.24	17.5	16.04	127.3	124.77	7.9	7.7	2,719	2602
American sycamore	5.6	3.29	229.6	152.78	12.1	7.56	12	7.44	517.9	297.11	25.1	14.39	737	472
River birch	4.6	4.64	473.3	473.23	19.5	19.5	19.2	19.16	612.7	612.56	47.5	47.48	1,415	1415
American hornbeam	4.6	2.75	37.4	22.54	4.3	2.53	4.2	2.5	336.2	248.77	20.3	14.99	152	91
American holly	4.3	2.94	105.1	94.94	6.4	5.23	6.3	5.14	128.8	105.29	17.2	14.08	395	344
Silver maple	4	2.39	758.9	502.63	17.7	9.18	16.5	8.54	437.8	228.54	23	12.03	2,937	1781
Black locust	4	2.87	346.2	272.11	16.8	11.63	16.3	11.39	425.2	361.42	22.9	19.46	1,651	984
Eastern cottonwood	3.4	3.1	1702	1601.4	29.6	27.68	28	26.55	1475.8	1473.13	106.5	106.29	3,505	3331
American elm	3.1	2.34	88.3	64.72	6.3	4.52	6.2	4.45	180.8	141.59	13.2	10.3	743	568
Pignut hickory	2.8	1.39	219.4	141.55	10.4	5.63	10	5.39	168.5	74.2	3.2	1.41	1,103	723
Red pine	2.8	2.06	312.5	280.18	5.8	4.38	4.4	3.13	407.2	401.92	59.9	59.11	514	420
Willow oak	2.8	1.97	805.6	671.77	15.8	11.44	14.9	10.73	684.1	510.05	60.7	45.25	1,601	1268
Cherry	2.5	1.04	71.1	63.54	5.5	4.19	5.3	4	96.4	72.03	7.5	5.57	614	559
Mockernut hickory	2.2	1.33	408.1	373.42	8.6	6.82	8.3	6.56	113.8	84.74	6.5	4.86	787	677
Black walnut	2.2	1.6	143.6	122.05	7.4	5.69	7.3	5.59	236.8	179.65	19	14.4	724	510
London planetree	2.2	1.88	66.4	46.81	4.4	3.09	4.3	3.03	175.6	123.66	7.7	5.4	542	422
Yellow birch	1.2	0.97	34.4	33.82	1.5	1.34	1.4	1.16	33	28.98	1.4	1.2	64	55
Hawthorn	1.2	0.97	26.7	25.74	2	1.81	1.9	1.78	38.6	34.39	1.4	1.24	108	103
Green ash	1.2	0.75	32.4	20.32	3.2	2.24	3.1	2.16	85.7	60.87	5.6	3.97	505	345
Other species	1.2	0.61	60	50.53	2.9	1.91	2.8	1.86	91	62.36	6.8	4.65	217	155
Norway spruce	1.2	0.97	104.8	98.89	4.9	4.14	4.5	3.76	107.1	89.55	17.8	14.93	1,273	1195
Tree of heaven	0.9	0.69	27	26.45	1.7	1.58	1.7	1.54	59.8	56.57	4.5	4.22	77	74
Southern catalpa	0.9	0.93	12.8	12.84	1	1.01	1	1	5.3	5.27	0.3	0.28	66	66
Eastern red cedar	0.9	0.93	129.6	129.61	4.1	4.1	3.8	3.8	247.7	247.63	68.8	68.79	2,060	2059
Eastern white pine	0.9	0.69	37.8	37.51	1.7	1.59	1.6	1.51	114.8	110.03	7.4	7.08	671	646
Shingle oak	0.9	0.93	5.8	5.8	0.7	0.69	0.7	0.68	7.2	7.23	0.7	0.66	30	30
Black ash	0.6	0.43	1.2	0.85	0.3	0.19	0.3	0.19	16.6	14.69	1	0.87	9	6
Crabapple	0.6	0.43	22.5	21.29	1.8	1.6	1.7	1.55	11	8.77	1	0.76	298	291
Common pear	0.6	0.43	40.9	33.47	2.7	2.12	2.6	2.04	74.4	52.26	5.5	3.9	445	417
Willow	0.6	0.43	206	205.45	7.9	7.77	7.1	6.98	67.6	65.72	4.2	4.06	1,449	1446
Sugar maple	0.3	0.31	83	83.03	4.8	4.82	4.5	4.49	107.3	107.33	6.5	6.47	734	733
Paper birch	0.3	0.31	99.4	99.36	4.6	4.59	4.4	4.36	101.4	101.34	7.1	7.09	627	627
Eastern redbud	0.3	0.31	0.4	0.41	0.2	0.17	0.2	0.17	9.7	9.72	0.6	0.62	15	15
Atlantic white cedar	0.3	0.31	101.6	101.58	2.6	2.62	2.1	2.06	87.7	87.66	21.9	21.92	1,497	1496
Flowering dogwood	0.3	0.31	1.3	1.31	0.2	0.22	0.2	0.22	1.3	1.26	0.1	0.07	6	6
Ash	0.3	0.31	1.2	1.17	0.2	0.19	0.2	0.19	14.6	14.57	1.3	1.31	5	5
Juniper	0.3	0.31	6.9	6.89	0.9	0.86	0.8	0.79	15.3	15.27	4.2	4.24	115	115
Magnolia	0.3	0.31	3.1	3.08	0.3	0.27	0.3	0.25	0.6	0.6	0	0.04	9	9
Eastern hophornbeam	0.3	0.31	0.7	0.68	0.2	0.22	0.2	0.21	5.7	5.72	0.4	0.37	16	16

	Scotch pine	0.3	0.31	8.2	8.21	0.4	0.39	0.4	0.38	3.9	3.93	0.4	0.38	89	89
	Virginia pine	0.3	0.31	116.6	116.55	3.5	3.53	2.4	2.44	89.2	89.22	8.6	8.6	1,559	1559
	Swamp white oak	0.3	0.31	346.9	346.84	8.9	8.9	8.1	8.12	126.3	126.26	11.6	11.59	2,879	2879
	Pin oak	0.3	0.31	1.6	1.61	0.4	0.36	0.4	0.35	1.7	1.74	0.2	0.16	26	26
	White willow	0.3	0.31	308	307.92	5.8	5.76	1.2	1.25	65.5	65.53	4	4.05	1,258	1258
	Sandbar willow	0.3	0.31	58.2	58.17	2	1.95	1.9	1.91	17.7	17.7	1.1	1.09	160	160
	Japanese snowbell	0.3	0.31	12.3	12.35	1.7	1.7	1.6	1.64	14.8	14.81	1.1	1.1	229	229
	Northern white cedar	0.3	0.31	49.2	49.15	1.2	1.25	1.1	1.14	6.8	6.83	1.3	1.31	1,388	1387
	Chinese elm	0.3	0.31	192.9	192.87	5.3	5.3	4.9	4.87	155.2	155.2	17.6	17.64	2,130	2130
	Siberian elm	0.3	0.31	0.2	0.25	0.1	0.08	0.1	0.08	6.8	6.77	0.5	0.46	3	3
	Elm	0.3	0.31	0.4	0.42	0	0.02	0	0	0	0.03	0	0	1	1
	Total	385.1	52.04	54440.3	7461.06	1419	183.31	1028.6	151.4	42494.1	6291.44	2810.5	408.98	195,709	30185
Large trans	Sweetgum	24.7	24.71	136.8	136.75	32.1	32.08	32	31.95	1390.7	1390.55	63.8	63.84	2,272	2272
	Tree of heaven	7.4	5.27	64.3	60.77	18.1	16.07	18	16.02	215.1	192.72	16	14.37	472	416
	White mulberry	7.4	5.27	106.9	102.7	16.9	13.95	16.8	13.87	581.4	534.77	42.5	39.12	1,693	1524
	Black cherry	7.4	7.41	23.3	23.28	8.9	8.88	8.8	8.85	182.2	182.15	14.1	14.13	294	294
	Boxelder	2.5	2.47	10.2	10.19	3.9	3.85	3.8	3.84	75	74.98	6.9	6.86	50	49
	Northern catalpa	2.5	2.47	8.5	8.46	3.2	3.19	3.2	3.17	24	23.96	1.5	1.46	88	88
	Total	51.9	43.96	349.8	242.67	82.9	62.66	82.6	62.43	2468.2	1841.87	144.9	99.68	4,870	3406
Institutions	Red maple	34.7	22.35	3480.3	2036.14	139.4	77.23	134.8	74.73	4455.5	2441.03	300.1	164.39	14,536	6590
	Sassafras	25.5	25.46	147.4	147.42	22.4	22.41	20.8	20.75	359	358.97	17.7	17.66	2,960	2960
	Crabapple	24.3	24.3	134	134.03	25.4	25.4	24.7	24.68	386.7	386.65	33.3	33.33	3,135	3135
	Dead tree	15	6.66	2444	1188.5	0	0	-316.6	216.12	0	0	0	0	0	0
	Tulip tree	10.4	4.95	11767.6	9357.64	167.9	118.29	129.3	84.35	3803.8	2023.77	224.2	119.3	76,843	69044
	Black cherry	10.4	9.28	1951.2	1777.38	62.8	61.23	37	64.73	499.8	497.99	38.8	38.62	3,617	3382
	Northern red oak	10.4	5.22	8714.8	4882.89	193.6	109.44	160	86.98	2989.1	1771.71	238.2	141.17	60,503	39751
	Boxelder	8.1	6.99	355.7	277.39	26	20.51	25	19.8	606.4	543.05	55.5	49.68	3,365	2473
	White ash	8.1	5.14	3054.2	2494.92	46.7	32.77	35.4	23.18	677.9	451.2	38.5	25.64	4,058	2838
	Sweet cherry	6.9	4.8	342.6	301.22	23.6	18.93	22.6	18.07	453	395.61	35.1	30.61	2,846	2523
	White oak	6.9	3.82	4944.7	3131.71	111	65.62	93.5	54.12	1866.4	1127.57	135.8	82.02	43,444	28923
	Silver maple	4.6	4.63	145.1	145.1	11.6	11.59	11	10.98	454.7	454.61	23.9	23.93	2,260	2260
	Black tupelo	4.6	3.61	50.8	44.18	5	3.82	5	3.77	43.9	30.57	1.5	1.06	415	288
	Quaking aspen	4.6	4.63	28	27.96	3.3	3.3	3.3	3.25	64.7	64.71	5.1	5.1	112	112
	Black locust	4.6	2.73	1337.5	1306.94	45.2	41.15	36.7	32.76	598.9	525.01	32.2	28.26	10,538	10101
	American holly	3.5	3.47	192.4	192.34	13.6	13.63	12.9	12.86	91	91.03	12.2	12.17	3,319	3318
	Sweetgum	3.5	2.54	70.5	64.36	5	4.41	4.7	4.15	315.8	313.71	14.5	14.4	1,924	1878
	Tree of heaven	2.3	2.31	16.4	16.41	3.1	3.06	3	3.02	74.9	74.86	5.6	5.58	138	138
	Butternut	2.3	2.31	25.7	25.74	2.2	2.2	2.2	2.17	32.3	32.31	1.8	1.79	100	100
	White mulberry	2.3	1.6	9	7.75	2.1	1.63	2	1.54	17.7	12.51	1.3	0.92	203	148
	Norway spruce	2.3	2.31	254.8	254.74	12.8	12.82	12.2	12.23	313.2	313.2	52.2	52.2	3,648	3647

	Norway maple	1.2	1.16	59.6	59.61	3.4	3.35	3.3	3.31	35.1	35.14	1.9	1.9	258	258
	American hornbeam	1.2	1.16	134.2	134.18	5.5	5.51	5.3	5.28	171.3	171.24	10.3	10.32	380	380
	Bitternut hickory	1.2	1.16	5.8	5.79	0.9	0.92	0.9	0.91	29.3	29.33	1.8	1.84	36	36
	Dogwood	1.2	1.16	3.9	3.91	0.1	0.11	0	0.01	2	1.97	0.1	0.11	3	3
	American beech	1.2	1.16	994.1	994.06	18.2	18.16	17.5	17.47	619.8	619.74	26.4	26.41	2,231	2231
	Honeylocust	1.2	1.16	241.6	241.53	11.3	11.32	10.4	10.37	50.2	50.19	5.3	5.26	2,778	2778
	Spruce	1.2	1.16	2.2	2.21	0.4	0.45	0.4	0.44	4.1	4.13	0.7	0.7	17	17
	Pin oak	1.2	1.16	1728.8	1728.61	39.5	39.48	32.9	32.89	375.1	375.02	33.9	33.94	12,856	12855
	Japanese zelkova	1.2	1.16	263	262.99	11.9	11.94	10.9	10.92	179.3	179.27	13.4	13.37	3,644	3643
	Total	206	66.94	42899.9	15466.43	1014.1	293.98	541	228.03	19571	5651.06	1361.2	369.5	260,166	115325
CITY TOTAL		154.1	16.71	27121.5	3023.18	797.4	80.59	535.5	67.49	17548.4	1759.98	1189.9	115.98	144,294	18605

#11. PERCENT NATIVE LIVE TREE SPECIES WITHIN THE BALTIMORE COUNTY URDL

LANDUSE	STATE	Africa	Asia	Australia	Europe	Eurasia	North America	North America +	Americas	Americas +	South America	Unknown
Small lot SF	49	0	13.7	0	0	2	64.7	5.9	0	13.7	0	0
Industrial	17.5	0	62.5	0	0	0	35	0	0	0	0	2.5
Attached Dwelli	84.6	0	7.7	0	0	7.7	84.6	0	0	0	0	0
Large lot SF	65.7	0	13.1	0	0.7	6.6	70.8	5.8	0	2.9	0	0
Commercial	6.7	0	13.3	0	0	33.3	13.3	6.7	0	0	0	33.3
Open space	82.9	0	2.6	0	0.4	6.4	84.5	4.2	0	0.8	0	1
Large trans	66.7	0	28.6	0	0	0	71.4	0	0	0	0	0
Institutions	74.5	0	3	0	1.2	4.2	77.6	13.9	0	0	0	0
CITY TOTAL	70.5	0	9.3	0	0.4	5.7	75.3	5.7	0	2.3	0	1.3

#12. LEAF AREA AND BIOMASS BY DBH CLASS FOR TREES WITHIN THE BALTIMORE COUNTY URDL

		DBH CLASSES (cm)											
		0.0 - 7.6 cm				7.7 - 15.2 cm				15.3 - 22.9 cm			
		LEAF AREA (km2)		LEAF BIOMASS (mt)		LEAF AREA (km2)		LEAF BIOMASS (mt)		LEAF AREA (km2)		LEAF BIOMASS (mt)	
LANDUSE	SPECIES COMMON NAME	N	SE	N	SE	N	SE	N	SE	N	SE	N	SE
Small lot SF	Japanese maple	0	.	0	.	1.51	1.51	84.74	84.73	0	.	0	.
	Norway maple	0	.	0	.	0	.	0	.	0	.	0	.
	Red maple	0	.	0	.	0	.	0	.	0.62	0.62	41.55	41.54
	Silver maple	0	.	0	.	0	.	0	.	1.92	1.92	101.29	101.29
	Tree of heaven	0	.	0	.	0.63	0.63	47.28	47.28	0	.	0	.
	American hornbeam	3.96	3.96	238.56	238.56	2.28	2.28	137.08	137.08	0	.	0	.
	Dogwood	0	.	0	.	2.33	1.75	135.86	102.08	0	.	0	.
	Hawthorn	0	.	0	.	0.15	0.15	5.34	5.34	0	.	0	.
	American beech	0.77	0.77	32.94	32.94	0	.	0	.	4.99	4.99	212.76	212.76
	White ash	0	.	0	.	0	.	0	.	0	.	0	.
	Honeylocust	0.15	0.15	16.07	16.07	0	.	0	.	0.07	0.07	7.68	7.68
	Holly	0.07	0.07	9.28	9.28	0	.	0	.	0.85	0.85	113.82	113.81
	Ligustrum	0	.	0	.	0.14	0.14	12.94	12.94	0	.	0	.
	Tulip tree	0	.	0	.	0	.	0	.	0	.	0	.
	White mulberry	0	.	0	.	0	.	0	.	0	.	0	.
	Black tupelo	0.92	0.92	31.78	31.78	0.43	0.43	14.73	14.73	2.25	2.25	77.8	77.8
	Black spruce	0	.	0	.	0	.	0	.	0.71	0.71	134.25	134.25
	Blue spruce	0	.	0	.	0	.	0	.	2.53	2.53	428.46	428.45
	Spruce	0	.	0	.	0.38	0.38	64.51	64.51	0	.	0	.
	Eastern cottonwood	0.13	0.13	9.48	9.48	0	.	0	.	0	.	0	.
	Black cherry	0.68	0.68	52.96	52.96	0.12	0.12	9.31	9.31	0	.	0	.
	Cherry	0	.	0	.	0	.	0	.	0.49	0.49	37.59	37.58
	Northern red oak	0	.	0	.	0	.	0	.	0	.	0	.
	Black locust	0.37	0.37	19.76	19.76	0	.	0	.	0	.	0	.
	Sassafras	0.62	0.62	30.47	30.47	0	.	0	.	0	.	0	.
	American basswood	0	.	0	.	0	.	0	.	0	.	0	.
	Dead tree	0	.	0	.	0	0	0	0	0	.	0	.
	Total	7.68	7.44	441.32	414.93	7.96	4.47	511.8	271.32	14.43	9.34	1155.2	592.2
Industrial	Tree of heaven	1.2	1.2	89.57	89.57	2.55	2.55	190.27	190.25	0	.	0	.
	Roundleaf serviceberry	0.04	0.04	3.07	3.07	0.08	0.08	5.73	5.73	0	.	0	.
	American hornbeam	0.04	0.04	2.3	2.3	0	.	0	.	0	.	0	.

	Northern catalpa	0.12	0.12	7.61	7.61	0.74	0.74	45.23	45.22	0	.		0	.	
	Eastern white pine	0	.	0	.	0	.	0	.	1.72	1.72	110.8	110.8		
	London planetree	0.52	0.52	22.71	22.71	0	.	0	.	0	.		0	.	
	American sycamore	0	.	0	.	0	.	0	.	3.14	3.13	151.89	151.88		
	Pin oak	0	.	0	.	0	.	0	.	0.9	0.9	81.88	81.87		
	Black locust	0	.	0	.	1.76	1.76	94.73	94.72	0	.		0	.	
	Northern white cedar	0	.	0	.	0	.	0	.	0	.		0	.	
	Total	1.92	1.92	125.26	125.25	5.13	5.13	335.95	335.93	5.76	5.76	344.57	344.55		
Attached Dwelli	Japanese maple	0	.	0	.	0	.	0	.	0	.		0	.	
	Norway maple	0	.	0	.	0	.	0	.	0	.		0	.	
	Red maple	0	.	0	.	0.42	0.42	28.56	28.56	0	.		0	.	
	Silver maple	0	.	0	.	0	.	0	.	0	.		0	.	
	White ash	0.09	0.09	4.98	4.98	0	.	0	.	0	.		0	.	
	American holly	0	.	0	.	0	.	0	.	0	.		0	.	
	Balsam poplar	0	.	0	.	0	.	0	.	0	.		0	.	
	Black cherry	0.17	0.17	13.11	13.11	0.39	0.39	29.94	29.94	0	.		0	.	
	Total	0.26	0.26	18.09	18.09	0.81	0.55	58.5	39.45	0	.		0	.	
Large lot SF	Boxelder	0	.	0	.	0.4	0.29	36.69	26.09	0.17	0.17	15.42	15.42		
	Norway maple	0.12	0.12	6.38	6.38	0.56	0.48	30.03	25.64	0.41	0.41	22.29	22.29		
	Red maple	0	.	0	.	0.07	0.07	4.58	4.58	2.37	1.68	159.6	112.83		
	Silver maple	0	.	0	.	0	.	0	.	0	.		0	.	
	Sugar maple	0	.	0	.	0.65	0.65	39.08	39.08	0	.		0	.	
	Horsechestnut	0	.	0	.	0	.	0	.	0	.		0	.	
	Tree of heaven	0.06	0.06	4.68	4.68	0	.	0	.	0	.		0	.	
	American hornbeam	0	.	0	.	0	.	0	.	0.61	0.61	36.64	36.64		
	Bitternut hickory	0	.	0	.	0.15	0.15	9.23	9.23	0.04	0.04	2.29	2.29		
	Pignut hickory	0	.	0	.	0	0	0.09	0.09	0	.		0	.	
	American chestnut	0	.	0	.	0	.	0	.	0	.		0	.	
	Flowering dogwood	0.22	0.22	12.65	12.65	0	.	0	.	0	.		0	.	
	Dogwood	0.1	0.1	6	6	0.03	0.03	1.89	1.89	0.38	0.38	22.4	22.4		
	Common persimmon	0	.	0	.	0.14	0.14	10.49	10.48	0	.		0	.	
	American beech	0.97	0.94	41.22	39.9	1.44	1.44	61.47	61.46	1.83	1.83	77.85	77.85		
	White ash	0	.	0	.	0	.	0	.	0	.		0	.	
	Singleleaf ash	0	.	0	.	0	.	0	.	0	.		0	.	
	American holly	0	.	0	.	0	.	0	.	0	.		0	.	
	Sweetgum	0.05	0.05	2.39	2.39	0	.	0	.	0	.		0	.	
	Tulip tree	0	.	0	.	0	.	0	.	0.15	0.15	8.71	8.71		
	Crabapple	0	.	0	.	0.17	0.17	14.29	14.29	0.21	0.21	18.1	18.1		
	White mulberry	0.24	0.15	17.38	10.71	0.42	0.3	30.99	21.84	1.07	0.63	78.54	46.08		

	Black tupelo	0	.	0	.	0.12	0.12	4.05	4.05	0	.	0	.
	Norway spruce	0	.	0	.	0	.	0	.	0	.	0	.
	Black spruce	0	.	0	.	0.24	0.24	45.2	45.2	0.46	0.46	87.25	87.24
	Eastern white pine	0.12	0.12	7.74	7.74	0.21	0.21	13.76	13.76	1.09	1.09	70.08	70.08
	American sycamore	0	.	0	.	0	.	0	.	0.22	0.22	10.73	10.73
	Black cherry	0	.	0	.	0	.	0	.	0.22	0.22	16.83	16.83
	Cherry	0.05	0.05	3.74	3.74	0.18	0.15	13.69	11.58	0	.	0	.
	Common pear	0	.	0	.	0	.	0	.	1.12	1.12	83.49	83.48
	White oak	0	.	0	.	0	.	0	.	0	.	0	.
	Willow oak	0	.	0	.	0	.	0	.	0.74	0.74	65.47	65.46
	Chestnut oak	0	.	0	.	0.33	0.33	26.03	26.03	0	.	0	.
	Northern red oak	0	.	0	.	0	.	0	.	0	.	0	.
	Black locust	0	.	0	.	0	.	0	.	0	.	0	.
	Sassafras	0	.	0	.	0	.	0	.	0.09	0.09	4.42	4.42
	Yew	0	.	0	.	0	.	0	.	0	.	0	.
	American basswood	0	.	0	.	0	.	0	.	0	.	0	.
	Eastern hemlock	0	.	0	.	0	.	0	.	0.05	0.05	4.87	4.87
	Slippery elm	0.29	0.29	12.91	12.91	0.41	0.41	18.39	18.39	0	.	0	.
	Elm	0	.	0	.	0	.	0	.	0	.	0	.
	Dead tree	0	.	0	.	0	.	0	.	0	0	0	0
	Total	2.22	1.29	115.07	62.97	5.52	1.96	359.93	115.33	11.23	3.2	784.98	234.99
Commercial	Silver maple	0	.	0	.	0	.	0	.	0	.	0	.
	Northern catalpa	0	.	0	.	0	.	0	.	0	.	0	.
	Scotch pine	0	.	0	.	1.36	1.36	130.93	130.92	0	.	0	.
	London planetree	0.23	0.23	10.04	10.04	0	.	0	.	1.61	1.6	70.09	70.08
	Sweet cherry	0	.	0	.	0	.	0	.	0.82	0.82	63.31	63.31
	Pear	0	.	0	.	0	.	0	.	0	.	0	.
	Japanese zelkova	0	.	0	.	0	.	0	.	0.89	0.89	66.42	66.41
	Total	0.23	0.23	10.04	10.04	1.36	1.36	130.93	130.92	3.31	2.21	199.82	140.42
Open space	Boxelder	1.05	0.52	96.3	47.84	4.26	2.22	389.48	202.74	3.61	2.11	330.25	193.21
	Norway maple	1.08	0.6	58.43	32.22	2.77	1.38	149.3	74.62	1.19	0.84	64.05	45.14
	Red maple	3.35	1.42	225.57	95.31	5.86	2.28	394.78	153.26	7.81	4.02	526	271.03
	Silver maple	0.06	0.04	3.17	1.91	0.56	0.56	29.48	29.47	0.64	0.64	33.92	33.92
	Sugar maple	0	.	0	.	0	.	0	.	0	.	0	.
	Tree of heaven	0.03	0.03	2.25	2.25	0.21	0.21	15.78	15.78	0.31	0.31	23.45	23.45
	Yellow birch	0.15	0.12	6.21	4.83	0.14	0.14	5.97	5.97	0.01	0.01	0.54	0.54
	River birch	0.03	0.03	2.57	2.57	1.26	1.26	97.93	97.91	1.82	1.82	141.23	141.21
	Paper birch	0	.	0	.	0	.	0	.	0	.	0	.
	American hornbeam	2.12	1.73	127.61	104.13	1.01	0.63	60.87	37.95	0	.	0	.

Pignut hickory	0.01	0.01	0.23	0.23	0.68	0.41	13	7.82	0.38	0.38	7.33	7.32
Mockernut hickory	0.11	0.08	6.06	4.73	0	0	0.07	0.07	0.22	0.22	12.77	12.77
Southern catalpa	0.01	0.01	0.3	0.3	0.04	0.04	2.32	2.32	0	.	0	.
Eastern redbud	0.09	0.09	5.79	5.79	0	.	0	.	0	.	0	.
Atlantic white cedar	0	.	0	.	0	.	0	.	0	.	0	.
Flowering dogwood	0.01	0.01	0.68	0.68	0	.	0	.	0	.	0	.
Dogwood	1.81	0.95	105.4	55.69	1.9	1.09	110.69	63.74	0.15	0.15	8.57	8.57
Hawthorn	0.08	0.06	2.9	2.03	0.28	0.28	10.01	10.01	0	.	0	.
American beech	2.92	1.76	124.32	75	6.24	3.59	265.7	153.09	2.04	1.52	86.81	64.93
White ash	1.34	0.7	75.97	39.59	2.12	0.98	120.2	55.41	1.93	1.08	109.71	61.59
Black ash	0.15	0.14	9.19	8.14	0	.	0	.	0	.	0	.
Green ash	0	.	0	.	0.67	0.55	43.45	35.92	0.13	0.1	8.54	6.55
Ash	0.14	0.14	12.22	12.22	0	.	0	.	0	.	0	.
American holly	0.25	0.14	32.78	18.98	0.42	0.34	56.47	45.42	0.53	0.53	71.03	71.02
Black walnut	0	.	0	.	0.25	0.23	19.74	18.3	1.4	1.11	112.38	88.59
Juniper	0	.	0	.	0.14	0.14	39.48	39.47	0	.	0	.
Eastern red cedar	0	.	0	.	0.02	0.02	6.75	6.75	0	.	0	.
Sweetgum	0.11	0.06	5.18	2.77	1.2	0.8	54.94	36.56	2.16	1.31	99.06	60.2
Tulip tree	0.12	0.1	6.91	6.09	2.66	1.22	156.7	72.06	3.9	1.82	230.18	107.54
Magnolia	0	.	0	.	0.01	0.01	0.37	0.37	0	.	0	.
Crabapple	0.02	0.02	2.12	2.12	0	.	0	.	0.08	0.08	6.74	6.74
White mulberry	0.28	0.19	20.43	13.97	1.68	1.03	123.14	75.38	0.87	0.67	63.29	48.79
Black tupelo	1.7	0.64	58.67	21.99	1.83	0.82	63.28	28.22	2.89	1.4	99.88	48.47
Eastern hophornbeam	0.05	0.05	3.47	3.47	0	.	0	.	0	.	0	.
Other species	0.02	0.02	1.76	1.76	0.49	0.48	36.75	35.88	0	.	0	.
Norway spruce	0.08	0.08	12.66	12.65	0.1	0.1	17.46	17.46	0	.	0	.
Red pine	0.02	0.02	2.25	2.25	0.01	0.01	1.28	1.28	0.02	0.02	3.56	3.56
Eastern white pine	0.04	0.04	2.86	2.86	0	.	0	.	0	.	0	.
Scotch pine	0	.	0	.	0	.	0	.	0.04	0.04	3.53	3.53
Virginia pine	0	.	0	.	0	.	0	.	0	.	0	.
London planetree	0.06	0.06	2.67	2.67	0	.	0	.	0.7	0.7	30.7	30.69
American sycamore	0.18	0.11	8.66	5.2	0.62	0.48	30.22	23.03	2.44	1.7	118.11	82.46
Eastern cottonwood	0	.	0	.	0.07	0.07	4.74	4.74	0	.	0	.
Sweet cherry	0.6	0.32	46.7	24.37	0.39	0.33	30	25.6	0.58	0.41	44.87	31.54
Black cherry	1.54	0.54	119.34	42.04	1.65	0.48	128	37.5	0.71	0.62	55.2	47.98
Cherry	0.08	0.04	6.51	3.34	0.16	0.16	12.35	12.35	0.27	0.27	20.89	20.89
Common pear	0	.	0	.	0.35	0.35	26.38	26.38	0	.	0	.
White oak	0.06	0.06	4.58	4.58	0.13	0.13	9.12	9.11	0.43	0.32	31.25	23.45
Swamp white oak	0	.	0	.	0	.	0	.	0	.	0	.
Shingle oak	0.01	0.01	0.48	0.48	0.06	0.06	5.69	5.69	0	.	0	.
Pin oak	0.02	0.02	1.47	1.47	0	.	0	.	0	.	0	.

	Willow oak	0.05	0.04	4.77	3.64	0.04	0.04	3.32	3.31	1.34	1.34	118.7	118.68
	Chestnut oak	0.26	0.14	20.77	11.22	0.2	0.2	15.84	15.84	0.4	0.32	31.54	24.77
	Northern red oak	0.01	0.01	0.78	0.78	0.21	0.15	16.85	11.88	0	.	0	.
	Black locust	0	.	0	.	0.89	0.82	47.91	43.98	0.33	0.24	17.85	12.77
	White willow	0	.	0	.	0	.	0	.	0	.	0	.
	Costal plain willow	0	.	0	.	0.16	0.16	9.93	9.92	0.74	0.74	45.7	45.7
	Sandbar willow	0	.	0	.	0	.	0	.	0	.	0	.
	Willow	0.02	0.02	1.1	1.1	0	.	0	.	0	.	0	.
	Sassafras	0.32	0.23	15.6	11.27	0.85	0.64	41.94	31.63	0.42	0.3	20.73	14.57
	Japanese snowbell	0	.	0	.	0	.	0	.	0.14	0.14	10.28	10.28
	Northern white cedar	0	.	0	.	0	.	0	.	0	.	0	.
	American elm	0.17	0.15	12.42	11.11	0.77	0.77	55.94	55.93	0.74	0.53	54.02	38.2
	Chinese elm	0	.	0	.	0	.	0	.	0	.	0	.
	Siberian elm	0.06	0.06	4.29	4.29	0	.	0	.	0	.	0	.
	Elm	0	0	0.02	0.02	0	.	0	.	0	.	0	.
	Dead tree	0	0	0	0	0	0	0	0	0	0	0	0
	Total	20.67	4.33	1264.43	247.66	43.36	7.43	2723.63	444.9	41.39	8.1	2642.65	545.31
Large trans	Boxelder	0.21	0.21	19.49	19.49	0	.	0	.	0	.	0	.
	Tree of heaven	0.06	0.06	4.48	4.48	0.55	0.55	41.09	41.09	0	.	0	.
	Northern catalpa	0.07	0.07	4.14	4.14	0	.	0	.	0	.	0	.
	Sweetgum	0.44	0.44	20.05	20.05	3.51	3.51	161.33	161.32	0	.	0	.
	White mulberry	0.12	0.12	9.04	9.04	0	.	0	.	1.53	1.53	111.78	111.77
	Black cherry	0.52	0.52	40.14	40.13	0	.	0	.	0	.	0	.
	Total	1.42	1.15	97.34	74.61	4.07	4.06	202.42	202.41	1.53	1.53	111.78	111.77
Institutions	Boxelder	0.25	0.25	22.48	22.48	0.2	0.2	18.75	18.74	0.94	0.71	86.13	64.5
	Norway maple	0	.	0	.	0.15	0.15	8.34	8.34	0	.	0	.
	Red maple	0.52	0.36	34.73	24.05	4.83	3.58	325.02	241.31	5.08	3.33	342.41	224.59
	Silver maple	0.23	0.23	12.22	12.22	0.6	0.6	31.35	31.35	1.17	1.17	61.66	61.66
	Tree of heaven	0.03	0.03	2.19	2.19	0.3	0.3	22.36	22.36	0	.	0	.
	American hornbeam	0	.	0	.	0	.	0	.	0.75	0.75	45.37	45.36
	Bitternut hickory	0.13	0.13	8.11	8.11	0	.	0	.	0	.	0	.
	Dogwood	0.01	0.01	0.5	0.5	0	.	0	.	0	.	0	.
	American beech	0	.	0	.	0	.	0	.	0	.	0	.
	White ash	0.02	0.02	1.39	1.39	0.24	0.17	13.55	9.41	0.06	0.06	3.59	3.58
	Honeylocust	0	.	0	.	0	.	0	.	0	.	0	.
	American holly	0.02	0.02	2.19	2.19	0	.	0	.	0.18	0.18	23.41	23.41
	Butternut	0	0	0.19	0.19	0.14	0.14	7.66	7.66	0	.	0	.
	Sweetgum	0.01	0.01	0.4	0.4	0.25	0.25	11.42	11.41	1.13	1.13	51.94	51.94
	Tulip tree	0	.	0	.	1	1	58.95	58.95	0	0	0.08	0.08

	Crabapple	1.13	1.13	97.81	97.8	0.57	0.57	48.79	48.78	0	.	0	.
	White mulberry	0.08	0.06	5.7	4.02	0	.	0	.	0	.	0	.
	Black tupelo	0.15	0.1	5.08	3.55	0.05	0.05	1.59	1.59	0	.	0	.
	Norway spruce	0	.	0	.	0	.	0	.	0	.	0	.
	Spruce	0.02	0.02	3.08	3.08	0	.	0	.	0	.	0	.
	Quaking aspen	0.07	0.07	5.85	5.85	0.21	0.21	16.56	16.55	0	.	0	.
	Sweet cherry	0.06	0.04	4.44	3.15	0.22	0.22	16.99	16.99	0.46	0.46	35.65	35.64
	Black cherry	0.09	0.09	6.75	6.75	0	.	0	.	0.16	0.16	12.04	12.04
	White oak	0.05	0.05	3.57	3.57	0.1	0.1	7.06	7.06	0.75	0.75	54.77	54.77
	Pin oak	0	.	0	.	0	.	0	.	0	.	0	.
	Northern red oak	0	.	0	.	0.93	0.93	74.01	74	2.26	2.26	179.9	179.89
	Black locust	0.01	0.01	0.28	0.28	0.33	0.33	17.65	17.65	0	.	0	.
	Sassafras	1.1	1.1	54	53.99	0.37	0.37	17.98	17.98	0.12	0.12	5.67	5.66
	Dead tree	0	0	0	0	0	0	0	0	0	0	0	0
	Japanese zelkova	0	.	0	.	0	.	0	.	0	.	0	.
	Total	3.96	2.09	270.97	146.07	10.47	5.42	698.03	369.36	13.06	6.57	902.61	461.07
CITY TOTAL		38.35	9.24	2342.51	529.61	78.68	12.39	5.021.19	770.58	90.72	15.71	6141.6	1032.86

		DBH CLASSES (cm)											
		23 - 30.5 cm				30.6 - 38.1 cm				38.2 - 45.7 cm			
		LEAF AREA (km2)		LEAF BIOMASS (mt)		LEAF AREA (km2)		LEAF BIOMASS (mt)		LEAF AREA (km2)		LEAF BIOMASS (mt)	
LANDUSE	SPECIES COMMON NAME	N	SE	N	SE	N	SE	N	SE	N	SE	N	SE
Small lot SF	Japanese maple	0	.	0	.	2.11	2.11	118.48	118.48	0	.	0	.
	Norway maple	0	.	0	.	4.73	4.73	255.52	255.51	0	.	0	.
	Red maple	0	.	0	.	0	.	0	.	0	.	0	.
	Silver maple	0	.	0	.	1.62	1.62	85.42	85.42	0	.	0	.
	White ash	0.75	0.75	42.78	42.78	0	.	0	.	0	.	0	.
	Honeylocust	0	.	0	.	0	.	0	.	0	.	0	.
	Holly	0	.	0	.	0	.	0	.	2.41	2.41	321.81	321.8
	Ligustrum	0	.	0	.	0	.	0	.	0.01	0.01	0.92	0.92
	Tulip tree	0	.	0	.	0	.	0	.	0	.	0	.
	White mulberry	0	.	0	.	0.89	0.89	65.36	65.36	0	.	0	.
	Blue spruce	0	.	0	.	0	.	0	.	3.47	3.47	589.48	589.46
	Cherry	0	.	0	.	0	.	0	.	2.16	2.16	167.5	167.49
	Northern red oak	0	.	0	.	0	.	0	.	0	.	0	.
	American basswood	0	.	0	.	6.49	6.49	189.42	189.41	0	.	0	.

	Dead tree	0	.	0	.	0	0	0	0	0	.	0	.
	Total	0.75	0.75	42.78	42.78	15.84	9.14	714.21	411.56	8.06	4.49	1079.71	664.02
Industrial	Northern white cedar	0	.	0	.	0	.	0	.	2.35	2.35	452.01	451.98
	Total	0	.	0	.	0	.	0	.	2.35	2.35	452.01	451.98
Attached Dwelli	Japanese maple	0	.	0	.	0	.	0	.	0	.	0	.
	Norway maple	2.73	2.73	147.47	147.46	0	.	0	.	0	.	0	.
	Red maple	0	.	0	.	0	.	0	.	1.12	1.12	75.32	75.31
	Silver maple	0	.	0	.	0	.	0	.	0	.	0	.
	American holly	0	.	0	.	0	.	0	.	2.14	2.14	285.81	285.79
	Balsam poplar	0	.	0	.	0	.	0	.	5.46	5.46	393.71	393.69
	Total	2.73	2.73	147.47	147.46	0	.	0	.	8.71	6.09	754.84	509.45
Large lot SF	Boxelder	0	.	0	.	2.66	2.66	243.77	243.75	0	.	0	.
	Norway maple	2.33	2.33	125.57	125.55	0.89	0.89	48.24	48.23	0	.	0	.
	Red maple	2.93	2.93	197.24	197.22	0	.	0	.	0	.	0	.
	Silver maple	1.72	1.72	90.76	90.75	2.59	2.22	136.12	116.78	0	.	0	.
	Horsechestnut	0	.	0	.	0	.	0	.	0	.	0	.
	Tree of heaven	0	.	0	.	2.87	2.65	214.29	197.68	0	.	0	.
	American chestnut	0	.	0	.	0	.	0	.	0	.	0	.
	Common persimmon	0	.	0	.	0	.	0	.	0	.	0	.
	American beech	0.77	0.77	32.94	32.94	0	.	0	.	0	.	0	.
	White ash	0	.	0	.	0	.	0	.	0	.	0	.
	Singleleaf ash	0	.	0	.	0.21	0.21	16.86	16.86	0	.	0	.
	American holly	0.45	0.45	60.27	60.26	0	.	0	.	0	.	0	.
	Tulip tree	0.92	0.92	54.47	54.47	0	.	0	.	0	.	0	.
	Crabapple	0	.	0	.	0.3	0.3	26.13	26.13	0	.	0	.
	White mulberry	0.65	0.65	47.78	47.78	1.01	0.97	74.1	71.14	0.21	0.21	15.58	15.58
	Norway spruce	0	.	0	.	0	.	0	.	0	.	0	.
	Eastern white pine	8.17	6.74	525.23	433.66	3.7	3.7	238.04	238.01	4.22	3.08	271.31	197.98
	American sycamore	0	.	0	.	0.18	0.18	8.87	8.87	0	.	0	.
	Black cherry	0	.	0	.	0.94	0.94	72.72	72.71	0.76	0.76	59.03	59.02
	Cherry	1.3	1.3	100.49	100.48	0	.	0	.	0	.	0	.
	White oak	0.16	0.16	11.55	11.55	1.55	1.55	112.42	112.41	0	.	0	.
	Northern red oak	0	.	0	.	0	.	0	.	0	.	0	.
	Black locust	0.6	0.6	32.26	32.26	0	.	0	.	1.01	1.01	54.19	54.18
	Yew	0	.	0	.	0	.	0	.	0	.	0	.
	American basswood	0.98	0.98	28.74	28.73	0	.	0	.	0	.	0	.
	Eastern hemlock	0	.	0	.	0	.	0	.	0	.	0	.
	Elm	1.19	1.19	80.89	80.89	0	.	0	.	0	.	0	.

	Dead tree	0	0	0	0	0	.	0	.		0	0	0	0
	Total	22.18	9.07	1388.21	560.02	16.91	7.68	1191.56		534.04	6.2	3.29	400.11	212.37
Commercial	Silver maple	0	.	0	.	0	.	0	.		0.52	0.52	27.58	27.58
	Northern catalpa	0	.	0	.	0.6	0.6	36.75		36.75	0	.	0	.
	Sweet cherry	0.32	0.32	25.06	25.06	0	.	0	.		0	.	0	.
	Pear	0	.	0	.	2.36	2.36	176.1		176.09	0	.	0	.
	Japanese zelkova	0.36	0.36	27.19	27.19	0	.	0	.		0	.	0	.
	Total	0.69	0.69	52.25	52.25	2.96	2.37	212.86		175.84	0.52	0.52	27.58	27.58
Open space	Boxelder	1.03	0.77	94.13	70.17	0	.	0	.		0	.	0	.
	Norway maple	0	.	0	.	0	.	0	.		1.16	1.16	62.7	62.69
	Red maple	8.52	3.19	573.49	215.02	13.47	6.06	907.39		408.25	8.64	4.8	581.81	323.01
	Silver maple	0.45	0.45	23.85	23.85	0.75	0.75	39.31		39.3	0	.	0	.
	Sugar maple	0	.	0	.	1	1	60.18		60.17	0	.	0	.
	River birch	0.68	0.68	52.77	52.76	1.9	1.9	147.43		147.41	0	.	0	.
	Paper birch	0	.	0	.	0.94	0.94	65.96		65.95	0	.	0	.
	Pignut hickory	0.14	0.14	2.63	2.63	0.35	0.35	6.69		6.69	0	.	0	.
	Mockernut hickory	0	.	0	.	0	.	0	.		0	.	0	.
	Atlantic white cedar	0	.	0	.	0	.	0	.		0	.	0	.
	American beech	1.09	0.82	46.53	34.86	0.08	0.08	3.6		3.6	1.61	1.61	68.5	68.49
	White ash	6.33	4.39	359.85	249.24	6.77	4.13	384.89		234.62	3.59	2.1	203.79	119.28
	Black walnut	0.56	0.56	44.51	44.5	0	.	0	.		0	.	0	.
	Eastern red cedar	0	.	0	.	2.28	2.28	633.51		633.4	0	.	0	.
	Sweetgum	8.79	4.1	403.55	188.14	3.34	3.34	153.28		153.25	0	.	0	.
	Tulip tree	9.73	3.85	573.47	226.81	10.86	4.28	639.94	252.58	1	2.09	4.59	712.96	270.37
	White mulberry	0.12	0.12	9.13	9.13	0	.	0	.		1.11	1.11	81.21	81.19
	Black tupelo	4.87	2.72	168.42	93.91	1.59	1.46	55.16		50.33	0	.	0	.
	Other species	0.33	0.33	24.67	24.66	0	.	0	.		0	.	0	.
	Norway spruce	0	.	0	.	0	.	0	.		0.82	0.82	136	135.97
	Red pine	0.47	0.47	68.57	68.56	0.78	0.78	114.14		114.12	2.5	2.5	367.49	367.43
	Eastern white pine	0	.	0	.	1.02	1.02	65.83		65.82	0	.	0	.
	Virginia pine	0	.	0	.	0	.	0	.		0	.	0	.
	London planetree	0.87	0.87	38.01	38	0	.	0	.		0	.	0	.
	American sycamore	1.58	1.58	76.52	76.51	0	.	0	.		0	.	0	.
	Eastern cottonwood	2.57	2.57	185.31	185.28	0	.	0	.		2.07	2.05	149.22	147.56
	Sweet cherry	0	.	0	.	0.21	0.21	16.14		16.13	0	.	0	.
	Black cherry	1.24	0.71	96.12	55.37	0.66	0.66	51.29		51.28	0.46	0.46	35.98	35.97
	Cherry	0.38	0.38	29.64	29.64	0	.	0	.		0	.	0	.
	Common pear	0.34	0.34	25.24	25.23	0	.	0	.		0	.	0	.
	White oak	4.8	2.92	349.31	212.52	0	.	0	.		3.14	1.7	228.32	123.46

	Swamp white oak	0	.	0	.	0	.	0	.	0	.	0	.
	Willow oak	0.62	0.62	55.3	55.29	0	.	0	.	0	.	0	.
	Chestnut oak	1.02	0.76	80.48	59.91	2.95	1.87	231.47	146.75	1.42	1.14	111.29	89.66
	Northern red oak	2.32	1.69	184.56	134.39	1.86	1.86	148.42	148.39	3.67	2.76	292.04	220.2
	Black locust	2.74	2.54	147.26	136.69	0	.	0	.	0	.	0	.
	White willow	0	.	0	.	0	.	0	.	0	.	0	.
	Costal plain willow	0.28	0.26	17.5	16.11	0	.	0	.	0	.	0	.
	Sandbar willow	0.16	0.16	10.17	10.17	0	.	0	.	0	.	0	.
	Willow	0	.	0	.	0	.	0	.	0	.	0	.
	Sassafras	1.05	0.69	51.62	34.06	1.24	1.24	61.05	61.04	1.18	1.18	57.83	57.82
	Northern white cedar	0	.	0	.	0	.	0	.	0	.	0	.
	Chinese elm	0	.	0	.	0	.	0	.	0	.	0	.
	Dead tree	0	0	0	0	0	0	0	0	0	0	0	0
	Total	63.09	12.49	3792.62	758.01	52.06	9.76	3785.67	853.03	43.44	10.05	3089.13	742.71
Institutions	Boxelder	1.27	1.27	116.6	116.59	0	.	0	.	0	.	0	.
	Red maple	1.88	1.3	126.63	87.76	5.13	2.96	345.77	199.04	0	.	0	.
	American beech	0	.	0	.	0	.	0	.	0	.	0	.
	White ash	0	.	0	.	0	.	0	.	1.62	1.62	91.91	91.9
	Honeylocust	0	.	0	.	0.22	0.22	23.11	23.11	0	.	0	.
	American holly	0.21	0.21	27.92	27.92	0	.	0	.	0	.	0	.
	Tulip tree	2.6	2.6	153.06	153.05	0	.	0	.	0.8	0.8	47.31	47.31
	Norway spruce	1.38	1.38	229.58	229.56	0	.	0	.	0	.	0	.
	Sweet cherry	1.25	1.25	97.06	97.06	0	.	0	.	0	.	0	.
	Black cherry	1.03	1.02	79.71	79.1	0.93	0.93	71.94	71.94	0	.	0	.
	White oak	0.51	0.51	37.04	37.03	0	.	0	.	0	.	0	.
	Pin oak	0	.	0	.	0	.	0	.	0	.	0	.
	Northern red oak	0	.	0	.	0	.	0	.	1.05	1.05	83.93	83.92
	Black locust	0	.	0	.	0	.	0	.	1.94	1.94	104.26	104.26
	Dead tree	0	0	0	0	0	0	0	0	0	.	0	.
	Japanese zelkova	0	.	0	.	0.79	0.79	58.8	58.8	0	.	0	.
	Total	10.13	4.58	867.6	375.39	7.07	3.04	499.63	208.05	5.41	3.14	327.42	184.7
CITY TOTAL		99.57	16.36	6290.93	1027.34	94.86	15.89	6403.93	1120.91	74.7	13.6	6130.8	1239.49

DBH CLASSES (cm)		
45.8 - 53.3 cm	53.4 - 61 cm	61.1 - 68.6 cm

		LEAF AREA (km2)		LEAF BIOMASS (mt)		LEAF AREA (km2)		LEAF BIOMASS (mt)		LEAF AREA (km2)		LEAF BIOMASS (mt)	
LANDUSE	SPECIES COMMON NAME	N	SE	N	SE	N	SE	N	SE	N	SE	N	SE
Small lot SF	Red maple	4.62	4.62	311.28	311.27	0	.	0	.	0	.	0	.
	Silver maple	0	.	0	.	0	.	0	.	0	.	0	.
	Honeylocust	1.8	1.8	188.15	188.15	0	.	0	.	0	.	0	.
	Tulip tree	0	.	0	.	4.46	4.46	263.07	263.06	0	.	0	.
	White mulberry	0	.	0	.	0	.	0	.	0	.	0	.
	Northern red oak	4.4	4.4	350.49	350.47	0	.	0	.	0	.	0	.
	Total	10.82	6.31	849.92	478.71	4.46	4.46	263.07	263.06	0	.	0	.
Industrial	Northern white cedar	0	.	0	.	1.16	1.16	222.8	222.79	0	.	0	.
	Total	0	.	0	.	1.16	1.16	222.8	222.79	0	.	0	.
Attached Dwel	li Japanese maple	0	.	0	.	3.7	3.7	208.41	208.4	0	.	0	.
	Silver maple	3.48	3.48	183.28	183.27	2.95	2.95	155.09	155.08	0	.	0	.
	Total	3.48	3.48	183.28	183.27	6.65	4.52	363.5	248.2	0	.	0	.
Large lot SF	Red maple	2.03	2.03	136.67	136.66	0	.	0	.	0	.	0	.
	Silver maple	1.76	1.76	92.4	92.4	0	.	0	.	0	.	0	.
	Horsechestnut	0	.	0	.	0	.	0	.	0	.	0	.
	American chestnut	1.08	1.08	49.33	49.32	0	.	0	.	0	.	0	.
	Common persimmon	0	.	0	.	1.78	1.78	132.62	132.6	0	.	0	.
	White ash	0	.	0	.	0	.	0	.	1.32	1.32	74.89	74.89
	Tulip tree	2.63	1.83	155.08	107.84	0	.	0	.	2.58	2.57	151.79	151.78
	White mulberry	0	.	0	.	0	.	0	.	0	.	0	.
	Norway spruce	0	.	0	.	3.17	3.17	528.51	528.45	0	.	0	.
	Eastern white pine	2.35	2.35	151.02	151	0	.	0	.	0	.	0	.
	American sycamore	0	.	0	.	0	.	0	.	0	.	0	.
	White oak	0	.	0	.	0	.	0	.	0	.	0	.
	Northern red oak	0	.	0	.	0	.	0	.	1.19	1.19	94.73	94.72
	Yew	3.01	3.01	332.13	332.1	0	.	0	.	0	.	0	.
	Eastern hemlock	0	.	0	.	3.79	3.79	352.12	352.08	0	.	0	.
	Dead tree	0	0	0	0	0	.	0	.	0	.	0	.
	Total	12.85	4.66	916.63	390.63	8.74	7.13	1013.24	886.08	5.08	3.04	321.41	188.22
Open space	Boxelder	0	.	0	.	0.5	0.5	45.32	45.31	0	.	0	.
	Red maple	4.41	3.52	297.04	236.91	7.04	4.76	473.94	320.46	3.4	3.4	229.22	229.18
	Silver maple	0	.	0	.	0.78	0.78	40.85	40.84	0	.	0	.
	Mockernut hickory	0	.	0	.	0.73	0.73	41.76	41.75	0	.	0	.
	Atlantic white cedar	0.82	0.82	204	203.96	0	.	0	.	0	.	0	.

	American beech	2.45	2.45	104.55	104.54	0	.	0	.	0	.	0	.
	White ash	1.04	0.82	59.01	46.42	4.08	4.08	231.75	231.71	0	.	0	.
	Sweetgum	0.18	0.18	8.13	8.13	1.3	1.3	59.61	59.6	0	.	0	.
	Tulip tree	10.19	6.55	600.42	385.99	12.13	6.6	715.01	388.93	14.75	8.15	869.65	480.25
	White mulberry	0	.	0	.	0	.	0	.	0.21	0.21	15.3	15.3
	Virginia pine	0	.	0	.	0.83	0.83	80.04	80.02	0	.	0	.
	Eastern cottonwood	5.06	5.06	365.18	365.12	0	.	0	.	0	.	0	.
	Black cherry	0.7	0.7	54.05	54.04	0	.	0	.	0	.	0	.
	White oak	0	.	0	.	0.64	0.49	46.21	35.92	1.69	1.69	123.11	123.09
	Swamp white oak	0	.	0	.	1.18	1.18	107.85	107.83	0	.	0	.
	Willow oak	1.59	1.59	140.75	140.72	2.73	2.73	241.95	241.91	0	.	0	.
	Chestnut oak	0	.	0	.	3.14	3.14	246.64	246.59	0	.	0	.
	Northern red oak	5.82	3.55	463.99	282.97	3.29	2.48	262.49	197.64	3.37	1.96	268.52	155.98
	White willow	0	.	0	.	0.61	0.61	37.65	37.65	0	.	0	.
	Willow	0.61	0.61	37.76	37.75	0	.	0	.	0	.	0	.
	Northern white cedar	0.06	0.06	12.22	12.22	0	.	0	.	0	.	0	.
	Chinese elm	0	.	0	.	1.44	1.44	164.16	164.14	0	.	0	.
	Dead tree	0	0	0	0	0	.	0	.	0	0	0	0
	Total	32.92	10.55	2347.09	706.6	40.4	10.59	2795.23	705.21	23.43	8.99	1505.81	552.94
Institutions	Red maple	2.15	2.15	144.96	144.94	0	.	0	.	0	.	0	.
	American beech	2.73	2.73	116.14	116.13	0	.	0	.	0	.	0	.
	White ash	0	.	0	.	0	.	0	.	0	.	0	.
	Tulip tree	3.24	3.24	191.14	191.13	2.16	2.16	127.42	127.4	0	.	0	.
	White oak	0	.	0	.	0	.	0	.	0	.	0	.
	Pin oak	0	.	0	.	0	.	0	.	1.65	1.65	149.26	149.25
	Northern red oak	0	.	0	.	6.87	5.48	547.56	436.35	0	.	0	.
	Black locust	0.36	0.36	19.6	19.6	0	.	0	.	0	.	0	.
	Dead tree	0	0	0	0	0	.	0	.	0	.	0	.
	Total	8.48	6.24	471.84	333.09	9.03	5.77	674.97	447.54	1.65	1.65	149.26	149.25
CITY TOTAL		68.56	14.97	4768.77	1012.71	70.44	15.43	5332.81	1289.65	30.16	9.64	1976.48	602.86

		DBH CLASSES (cm)											
		68.7 -76.2 cm				76.3 - 83.8 cm				83.9 - 91.4 cm			
		LEAF AREA (km2)		LEAF BIOMASS (mt)		LEAF AREA (km2)		LEAF BIOMASS (mt)		LEAF AREA (km2)		LEAF BIOMASS (mt)	
LANDUSE	SPECIES COMMON NAME	N	SE	N	SE	N	SE	N	SE	N	SE	N	SE

Small lot SF	Silver maple	8.42	8.42	443.37	443.36	0	.	0	.	9.45	9.45	497.18	497.16
	White mulberry	2.63	2.63	192.7	192.7	0	.	0	.	0	.	0	.
	Total	11.06	8.69	636.08	473.5	0	.	0	.	9.45	9.45	497.18	497.16
Large lot SF	Horsechestnut	0	.	0	.	0	.	0	.	0	.	0	.
	White ash	0	.	0	.	0	.	0	.	0	.	0	.
	Tulip tree	2.85	2.85	168.22	168.2	2.61	2.61	154.06	154.05	0	.	0	.
	White mulberry	0.48	0.48	35.12	35.11	1.35	1.35	98.81	98.8	0	.	0	.
	American sycamore	0	.	0	.	0	.	0	.	3.99	3.99	193.31	193.29
	White oak	0	.	0	.	0	.	0	.	0	.	0	.
	Total	3.33	2.88	203.33	170.68	3.96	2.9	252.88	180.22	3.99	3.99	193.31	193.29
Open space	Silver maple	0	.	0	.	0.83	0.83	43.87	43.86	0	.	0	.
	American beech	3.35	3.35	142.94	142.92	0	.	0	.	0	.	0	.
	Tulip tree	8.61	6.59	507.82	388.43	5.26	5.26	310.18	310.13	2.03	2.03	119.63	119.61
	Eastern cottonwood	0	.	0	.	0	.	0	.	3.97	3.97	286.54	286.49
	White oak	0	.	0	.	1.27	1.27	92.15	92.14	0	.	0	.
	Northern red oak	4.94	4.1	393.59	326.41	0	.	0	.	0.93	0.93	74.19	74.17
	Dead tree	0	0	0	0	0	.	0	.	0	.	0	.
	Total	16.91	8.32	1044.35	519.26	7.36	5.45	446.2	324.71	6.93	4.92	480.36	343.86
Institutions	White ash	1.04	1.04	58.95	58.95	0	.	0	.	0	.	0	.
	Tulip tree	0	.	0	.	0	.	0	.	0	.	0	.
	White oak	6.8	4.86	494.63	353.49	0	.	0	.	0	.	0	.
	Northern red oak	2.03	1.67	161.98	133.02	0	.	0	.	0	.	0	.
	Total	9.87	5.84	715.56	431.04	0	.	0	.	0	.	0	.
CITY TOTAL		41.17	13.68	2599.32	841.88	11.33	6.17	699.08	371.37	20.37	11.37	1170.84	634.64

		DBH CLASSES (cm)											
		91.5 - 99.1 cm				99.2 - 106.7 cm				106.8 - 114.3 cm			
		LEAF AREA (km2)		LEAF BIOMASS (mt)		LEAF AREA (km2)		LEAF BIOMASS (mt)		LEAF AREA (km2)		LEAF BIOMASS (mt)	
LANDUSE	SPECIES COMMON NAME	N	SE	N	SE	N	SE	N	SE	N	SE	N	SE
Large lot SF	Horsechestnut	0	.	0	.	4.17	4.17	291.88	291.85	0	.	0	.
	White ash	0	.	0	.	0	.	0	.	0	.	0	.
	Tulip tree	0	.	0	.	0	.	0	.	0	.	0	.

	White oak	4.39	4.39	319.42	319.39	0	.	0	.	0	.	0	.
	Total	4.39	4.39	319.42	319.39	4.17	4.17	291.88	291.85	0	.	0	.
Open space	Tulip tree	0	.	0	.	1.94	1.94	114.53	114.51	0	.	0	.
	Northern red oak	1.56	1.56	124.14	124.12	0	.	0	.	0	.	0	.
	Total	1.56	1.56	124.14	124.12	1.94	1.94	114.53	114.51	0	.	0	.
Institutions	Tulip tree	0	.	0	.	0	.	0	.	3.46	3.46	204.04	204.02
	Total	0	.	0	.	0	.	0	.	3.46	3.46	204.04	204.02
CITY TOTAL		5.95	4.66	443.56	342.66	6.12	4.6	406.41	313.51	3.46	3.46	204.04	204.02

		DBH CLASSES (cm)											
		114.4 - 121.9 cm				122 - 129.5 cm				129.6 - 137.2 cm			
		LEAF AREA (km2)		LEAF BIOMASS (mt)		LEAF AREA (km2)		LEAF BIOMASS (mt)		LEAF AREA (km2)		LEAF BIOMASS (mt)	
LANDUSE	SPECIES COMMON NAME	N	SE	N	SE	N	SE	N	SE	N	SE	N	SE
Large lot SF	White ash	0	.	0	.	5.05	5.05	287.08	287.05	0	.	0	.
	Tulip tree	0	.	0	.	6.42	6.42	378.43	378.39	0	.	0	.
	Total	0	.	0	.	11.47	8.04	665.5	467.26	0	.	0	.
Institutions	Tulip tree	3.46	3.46	204.04	204.02	0	.	0	.	0	.	0	.
	Total	3.46	3.46	204.04	204.02	0	.	0	.	0	.	0	.
CITY TOTAL		3.46	3.46	204.04	204.02	11.5	8.04	665.5	467.26	0	.	0	.

#13. PERCENT GROUND COVERAGES FOR EACH LANDUSE WITHIN THE BALTIMORE COUNTY URDL

	PERCENT COVERAGE																											
	PLANT SPACE		CEMENT		TAR		BARE SOIL		ROCK		DUFF/MULCH		HERBS		GRASS		WILD GRASS		WATER		SHRUB		OTHER		BUILDING		TREE	
LANDUSE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Small lot SF	30	1.07	6	0.3	3.2	0.34	2.9	0.2	1	0.1	8	0.5	6.2	0.5	51	1	0	0	0	0	7.5	0.3	0	0	21	0.9	11	0.4
Industrial	18	2.25	10	1.8	28	2.54	18	2.5	0	0	1.4	0.2	9.1	1.8	10	1.8	9.1	1.8	0	0	2.7	0.5	0	0	14	2	8.2	1.4
Attached Dwelli	31	1.38	9	0.7	13	1.66	4.2	0.4	0	0.1	2.1	0.3	1.1	0.1	42	1.6	0	0	0	0.1	3	0.2	0	0	28	1.7	3.6	0.3
Large lot SF	32	1.12	2	0.1	4.1	0.48	2.3	0.1	1	0.2	6.8	0.5	15	0.9	52	1.4	1.7	0.3	6	0.7	9	0.4	0	0	9.4	0.8	22	0.9
Commercial	18	2.29	2	0.2	59	2.88	0.5	0.1	0	0	1	0.1	11	2	2.5	0.3	12	2	0	0	1.5	0.2	0	0	14	2	4.5	0.5
Open space	27	0.85	2	0.3	2.2	0.19	7.6	0.4	3	0.3	23	0.7	24	0.7	19	0.7	10	0.6	5	0.4	15	0.5	0	0	4.1	0.4	38	0.8
Large trans	37	2.36	1	0.2	27	2.13	10	2	11	1.5	0	0	9	1.2	42	2.6	0	0	0	0	2.5	0.5	0	0	0	0	3.5	0.5
Institutions	43	1.66	3	0.3	6.2	0.74	4.9	0.3	0	0	8.2	0.7	19	1.3	50	1.7	4.7	0.9	0	0	4.5	0.3	0	0	4.3	0.6	24	1.3
CITY TOTAL	30	0.5	4	0.2	12	0.39	5.7	0.3	2	0.1	9	0.2	13	0.4	36	0.5	4.6	0.3	2	0.1	7.4	0.2	0	0	12	0.4	18	0.3

#14. CARBON STORAGE, GROSS SEQUESTRATION AND NET SEQUESTRATION BY DBH CLASS FOR THE URDL

DBH CLASS	CLASS LOWER LIMIT cm	CLASS UPPER LIMIT cm	CARBON STORAGE m-tons	CARBON GROSS SEQ. m-tons/year	CARBON NET SEQ. m-tons/year	NUMBER OF TREES	PER TREE STORAGE kg	PER TREE GROSS SEQ. kg/year	PER TREE NET SEQ. kg/year
1	0	7.62	7,722.77	1,474.47	1,397.91	2,296,145	3.36	0.64	0.61
2	7.63	15.24	35,288.89	3,485.51	3,153.50	1,639,635	21.52	2.13	1.92
3	15.25	22.86	68,945.59	4,115.02	3,278.36	934,112	73.81	4.41	3.51
4	22.87	30.48	94,062.80	3,841.31	2,834.28	584,681	160.88	6.57	4.85
5	30.49	38.1	122,518.98	4,190.45	2,275.96	424,699	288.48	9.87	5.36
6	38.11	45.72	126,606.49	3,795.40	2,531.08	296,428	427.11	12.8	8.54
7	45.73	53.34	127,486.73	3,209.28	844.59	192,009	663.96	16.71	4.4
8	53.35	60.96	133,486.02	2,900.44	2,478.56	153,973	866.94	18.84	16.1
9	60.97	68.58	78,060.12	1,391.44	843.05	58,482	1,334.77	23.79	14.42
10	68.59	76.2	150,278.22	2,961.50	1,483.86	95,306	1,576.80	31.07	15.57
11	76.21	83.82	34,236.44	609.13	548.31	18,819	1,819.25	32.37	29.14
12	83.83	91.44	56,856.50	1,019.52	837.86	27,224	2,088.47	37.45	30.78
13	91.45	99.06	30,720.53	569.58	493.31	7,953	3,862.76	71.62	62.03
14	99.07	106.68	26,534.05	497.76	409.13	7,953	3,336.36	62.59	51.44
15	106.69	114.3	20,653.28	264.85	186.91	5,483	3,766.78	48.3	34.09
16	114.31	121.92	23,509.17	285.55	196.89	5,483	4,287.65	52.08	35.91
17	121.93	129.54	52,717.86	365.26	-302.73	10,077	5,231.50	36.25	-30.04
TOTAL			1189684.42	34,976.48	23,490.81	6,758,462			

#15. ENERGY ANALYSIS OF TREES IN THE BALTIMORE COUNTY URDL

	HEAT (MBtus avoided)						HEAT (MWhs avoided)						COOL (MWhs avoided)			
	SHADE		WINDBREAK		CLIMATE		SHADE		WINDBREAK		CLIMATE		SHADE		CLIMATE	
LANDUSE	X	SE	X	SE	X	SE	X	SE	X	SE	X	SE	X	SE	X	SE
Small lot SF	-211462	93386	60477	60475	438569	204458	-3187	1408	915	915	6666	3106	4283	2364	5560	2268
Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Attached Dwelli	-63390	31544	2847	2847	371512	282714	-955	475	43	43	5640	4291	1607	832	2825	2039
Large lot SF	-65069	35927	19163	19161	184807	94054	-981	541	290	290	2808	1429	302	179	2047	1153
Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Open space	-28611	14021	19634	13930	164362	90464	-431	211	297	211	2497	1374	981	476	2911	1219
Large trans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Institutions	-13710	9471	4692	4692	70198	54682	-207	143	71	71	1066	830	379	375	741	517
CITY TOTAL	-382242	106268	106814	65180	1229448	376497	-5761	1602	1617	987	18677	5717	7552	2585	14084	3519

#16. AVOIDED CARBON EMISSIONS THROUGH ENERGY EFFECTS OF TREES IN THE BALTIMORE COUNTY URDL

	HEAT (t C avoided)						COOL (t C avoided)			
	SHADE		WINDBREAK		CLIMATE		SHADE		CLIMATE	
LANDUSE	X	SE	X	SE	X	SE	X	SE	X	SE
Small lot SF	-3735	1650	1069	1069	7752	3614	719	397	933	381
Industrial	0	0	0	0	0	0	0	0	0	0
Attached Dwelli	-1120	557	50	50	6566	4996	270	140	474	342
Large lot SF	-1149	635	339	339	3266	1662	51	30	344	194
Commercial	0	0	0	0	0	0	0	0	0	0
Open space	-505	248	347	246	2905	1599	165	80	489	205
Large trans	0	0	0	0	0	0	0	0	0	0
Institutions	-242	167	83	83	1241	966	64	63	124	87
CITY TOTAL	-6752	1877	1887	1152	21729	6654	1268	434	2364	591

#17. ASIAN LONGHORNED BEETLE SUSCEPTIBILITY WITHIN THE BALTIMORE COUNTY URDL

	PERCENT LEAF AREA				LEAF AREA (km^2)				NO. OF TREES				TREE VALUE (U.S. $)			
LANDUSE	KNOWN HOST	GENERA HOST	IMMUNE	UNKNOWN	KNOWN HOST	GENERA HOST	IMMUNE	UNKNOWN	KNOWN HOST	GENERA HOST	IMMUNE	UNKNOWN	KNOWN HOST	GENERA HOST	IMMUNE	UNKNOWN
Small lot SF	51	8.8	8.5	31.7	49.448	8.485	8.27	30.679	241981	40330	67217	336085	619,844,261	258,588,995	81,910,765	312,195,119
Industrial	33.2	5.5	55	6.3	5.415	0.905	8.984	1.022	25268	8423	244259	58959	8,406,895	8,872,351	140,469,743	1,731,964
Attached Dwelli	90.6	0	0	9.4	20.854	0	0	2.174	98278	0	0	8190	252,623,244	0	0	23,463,175
Large lot SF	38.1	11.3	27.4	23.2	47.203	14.002	34.013	28.835	251931	100773	156197	181391	525,172,475	321,547,467	284,481,316	263,995,544
Commercial	64.6	0	15	20.5	5.862	0	1.358	1.859	81810	0	16362	24543	87,331,623	0	5,842,039	41,330,753
Open space	40.4	15.5	2.7	41.4	161.912	62.229	10.744	165.78	1593997	303063	78680	1188941	698,713,147	465,937,953	87,140,287	593,490,724
Large trans	10.4	23.6	8.7	57.3	0.731	1.652	0.611	4.019	28080	21060	21060	77220	976,537	4,810,609	1,341,435	6,706,020
Institutions	42.1	26.8	2	29.1	39.002	24.863	1.858	26.992	509910	98692	27415	268662	211,879,108	554,306,393	18,012,260	448,316,806
CITY TOTAL	42.9	14.6	8.6	34	330.427	112.135	65.838	261.36	2831255	572341	611190	2143990	2,404,947,290	1,614,063,769	619,197,845	1,691,230,106

#18. GYPSY MOTH SUSCEPTIBILITY WITHIN THE BALTIMORE COUNTY URDL

	PERCENT LEAF AREA				LEAF AREA (km2)				NO. OF TREES				TREE VALUE (U.S. $)			
LANDUSE	SUSCEPTIBLE	RESISTANT	IMMUNE	UNKNOWN	SUSCEPTIBLE	RESISTANT	IMMUNE	UNKNOWN	SUSCEPTIBLE	RESISTANT	IMMUNE	UNKNOWN	SUSCEPTIBLE	RESISTANT	IMMUNE	UNKNOWN
Small lot SF	12.2	41.5	46.2	0.2	11.812	40.158	44.748	0.163	40330	282311	336085	26887	113,832,013	307,093,394	802,121,325	49,492,407
Industrial	5.5	34.5	60	0	0.905	5.629	9.792	0	8423	244259	84227	0	8,872,351	14,278,136	136,330,466	0
Attached Dwelli	24.1	37.7	38.2	0	5.549	8.677	8.801	0	24569	49139	32759	0	70,411,056	113,988,154	91,687,209	0
Large lot SF	8.2	48.3	43.5	0	10.217	59.91	53.927	0	55425	398051	236815	0	180,618,800	435,171,649	779,406,353	0
Commercial	0	53.5	32.6	13.8	0	4.862	2.963	1.255	0	49086	57267	16362	0	58,480,084	49,621,231	26,403,100
Open space	21.6	36.9	41.2	0.2	86.537	147.963	165.166	0.998	547845	1494919	1107347	14570	578,003,342	506,158,530	756,910,618	4,209,620
Large trans	56.3	19.1	24.5	0	3.951	1.342	1.72	0	70200	49140	28080	0	6,455,695	2,317,971	5,060,934	0
Institutions	30.6	39.1	29.3	0.9	28.414	36.26	27.193	0.849	241248	466047	191902	5483	577,842,569	161,700,133	475,709,852	17,262,014
CITY TOTAL	19.1	39.6	40.8	0.4	147.385	304.8	314.31	3.265	988040	3032952	2074482	63302	1,536,035,828	1,599,188,051	3,096,847,989	97,367,141

#19. EMERALD ASH BORER SUSCEPTIBILITY WITHIN THE BALTIMORE COUNTY URDL

	PERCENT LEAF AREA			LEAF AREA (km2)			NO. OF TREES			TREE VALUE (U.S. $)		
LANDUSE	KNOWN HOST	IMMUNE	UNKNOWN	KNOWN HOST	IMMUNE	UNKNOWN	KNOWN HOST	IMMUNE	UNKNOWN	KNOWN HOST	IMMUNE	UNKNOWN
Small lot SF	0.8	99.2	0	0.806	96.076	0	13443	672169	0	18,701,581	1,253,837,559	0
Industrial	0	100	0	0	16.325	0	0	336909	0	0	159,480,954	0
Attached Dwelli	0.4	99.6	0	0.089	22.939	0	8190	98278	0	665,457	275,420,962	0
Large lot SF	5.4	94.6	0	6.678	117.375	0	15116	675176	0	149,909,506	1,245,287,296	0
Commercial	0	100	0	0	9.079	0	0	122715	0	0	134,504,416	0
Open space	7.2	92.8	0	28.654	372.01	0	212727	2951954	0	165,329,000	1,679,953,110	0
Large trans	0	100	0	0	7.012	0	0	147420	0	0	13,834,601	0
Institutions	3.5	96.5	0	3.212	89.504	0	38380	866299	0	19,223,592	1,213,290,976	0
CITY TOTAL	5.1	94.9	0	39.439	730.322	0	287857	5870920	0	353,829,135	5,975,609,874	0

#20. DUTCH ELM DISEASE SUSCEPTIBILITY WITHIN THE BALTIMORE COUNTY URDL

	PERCENT LEAF AREA			LEAF AREA (km2)			NO. OF TREES			TREE VALUE (U.S. $)		
LANDUSE	KNOWN HOST	IMMUNE	UNKNOWN	KNOWN HOST	IMMUNE	UNKNOWN	KNOWN HOST	IMMUNE	UNKNOWN	KNOWN HOST	IMMUNE	UNKNOWN
Small lot SF	0	100	0	0	96.882	0	0	685612	0	0	1,272,539,140	0
Industrial	0	100	0	0	16.325	0	0	336909	0	0	159,480,954	0
Attached Dwelli	0	100	0	0	23.028	0	0	106468	0	0	276,086,419	0
Large lot SF	1.5	98.5	0	1.915	122.139	0	20155	670137	0	8,801,031	1,386,395,771	0
Commercial	0	100	0	0	9.079	0	0	122715	0	0	134,504,416	0
Open space	0.4	99.6	0	1.705	398.959	0	32055	3132627	0	7,013,105	1,838,269,006	0
Large trans	0	100	0	0	7.012	0	0	147420	0	0	13,834,601	0
Institutions	0	100	0	0	92.716	0	0	904679	0	0	1,232,514,567	0
CITY TOTAL	0.5	99.5	0	3.62	766.14	0	52209	6106567	0	15,814,135	6,313,624,874	0