SECTION NINE: Inventory Data Collection

Gathering accurate data is the key to having a GIS that will be informative and useful. With the power and versatility of the OASIS web site, it is important that the data collected be complete as well as correct. This information will not only be used by Citizen Pruners, it will be used by anyone with a connection to the internet. So the data should be as detailed as possible to cover as many needs as possible. Of the 16 criteria that will be collected on the inventory form, some will be universally helpful (such as tree location) and others will be for more specific uses (such as foliage transparency).

Once the data is collected, it will be sent to CMAP to be put into the OASIS web page. A separate theme will be created for trees. The tree theme can be clicked on or off, to show the locations of the trees. By clicking on an individual tree, it will bring up the tree's information that was collected in the inventory.

Two different inventory techniques will be combined for this program. The NYC street tree census and USDA Forest Service tree information sheet. These two are being used because the combination will yield the greatest informational results for the OASIS database and for scientific analysis.

The New York City Street Tree Census was conducted from July 1995 to July 1996. It produced the most comprehensive effort in Parks' history to enumerate every tree along the 33,278 blocks in New York City. Over 700 volunteers, as well as Parks employees, accounted for the species, size, and condition of 498,470 trees in all five boroughs. Parks has been using this data for tree maintenance and planting programs citywide. The borough breakdown is as follows:

Borough	# Trees	% of total
Bronx	47,995	9.6%
Brooklyn	112,400	22.5%
Manhattan	45,793	9.2%
Queens	217,111	43.6%
Staten Island	75,171	15.1%

The census showed that New York City's urban forest tends towards monoculture, meaning that only a few species account for most of the total species planted. When only a few species dominate, the entire urban forest is susceptible to being destroyed by a particular insect or disease. For example, at the turn of the century, Dutch Elm disease wiped out the urban forests of many American cities that were heavily planted with susceptible elm species. Diversity ensures the overall survival of the urban forest, since it's likely only a few species would succumb to a particular infestation.

In New York, Norway maples and London plane trees together comprise over 40% of the city's total tree population. Unfortunately, Norway maples are one of the favorite host species for the Asian Longhorned Beetle, and are among the trees threatened by this invasive pest. Most of New York City's London plane trees are affected by anthracnose, a chronic fungus, which weakens the trees significantly and reduces their ability to withstand heat and drought.

The Parks Department is currently working on converting this data into their own GIS database. Eventually we hope to incorporate this data into the OASIS web site as a basis for our data collections and future tree information updates. The data you collect will be merged with this data on OASIS.

Information from Inventory

Trees are dynamic. They come in many shapes, sizes and species. Many of these differences help us determine what special needs a tree may have, or it may also tell us why certain trees grow better in certain places. Many different factors add up to how well a tree will do in a given environment. As such, there will be many things we need to measure in order to find out more about our urban trees as individuals and as a population. The list of factors that we will be collecting are called inventory variables. They will help give us insight into what kinds of trees are growing on our streets, how well they are doing, how big they are growing, and how long are they living. Combining this data with a GIS will enable us to see where they exist in physical space, and allow us to draw conclusions from the data by asking questions through queries. The USDA NE Research Station will also use this data to do an in depth, scientific analysis of the urban forest, by quantifying a tree's value with respect to heat islands and pollution mitigation.

Instructions

What is a Street Tree? The first issue to be addressed is what to count as a street tree. The answer is simple, count all trees growing within 15 feet from the street edge as street trees. Remember by definition, a tree is a woody plant with an erect perennial trunk at least 3 inches in diameter at breast height, with a definitely formed crown and at lease 13 feet in height. If any part of the trunk falls inside this distance, count the tree. Street trees are usually located between the street curb and the sidewalk, but they may grow in the sidewalk or on a front lawn. Also count trees that are growing in medians.

Trees that occur in dense stands and appear to be "wild" or "natural" growth should not be counted as street trees. This is important for determining which trees fall under NYC Parks jurisdiction.

Block: Record each block at the top of the Tree Inventory Form. Use a separate data table for each block, and record all trees located on that block.

Address: Record trees by building addresses. Assume property lines are located halfway between buildings. Some trees will be in front of a building and easy to address; others will be on the side of a building that fronts another street. Always use a building's front street address for a tree, with further clarification regarding the tree's location indicated in the LOCATION column (explained below).

Location: This column clarifies the position of trees not located in the fronts of buildings, and also indicates any unusual address locations. Abbreviations are as follows:

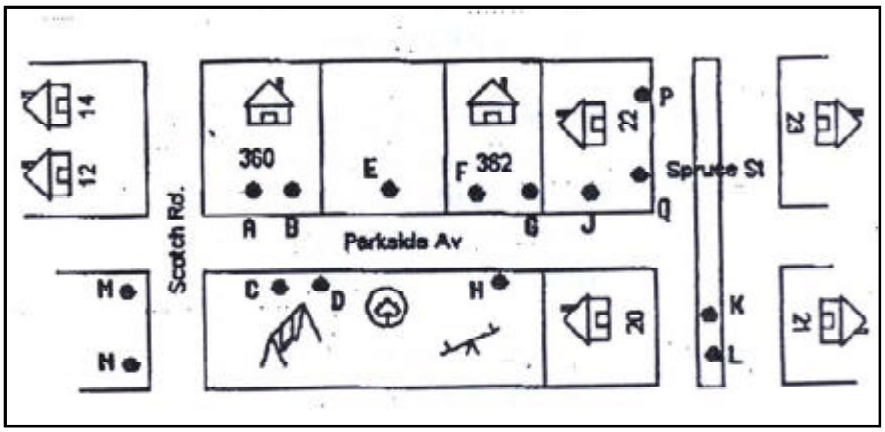
Front: (F) for trees located in front of an address
Side: (S) for trees located on the side of a building
Medians: (M) for trees located in medians or center strips, traffic islands, squares, or sitting areas (use the building address across the street from the median trees)
Adjacent: (A) for a tree's address if the closest building address is adjacent to the tree's location
Across: (X) for a trees's address if the closest building address is across the street from the tree
Rear: (R) for trees located in the rear of a building
Designated: (D) for a tree's address if the address needs to be designated or assigned

The following page contains examples of how to use the address and location in order to uniquely identify trees on a sample block.

Locating a Tree

We will be recording the locations of trees by three seperate attributes, in order to pinpoint their locations in geographic space. The first is Street Address and the second is Location Number. By using these two methods, each tree will have a unique number associated with it, to make finding it and keeping track of it in a database, much more simple. The third way will be marking down the tree's actual location on the maps that we created of the neighborhood. By marking the tree's location down on the map, we can later digitize the point into the already existing OASIS map, thus giving a percise visiual location to conenside with the Street Address and Location Number in the database. Location Number will include a two digit bouro number, a four digit Block number, a four digit Lot number, and the tree's ID number. An example of a tree in Manhattan (01 bouro number) in front of a building who's Block number is 0214 and who's Lot number is 0045 would be: 01-0214-0045-01F

The following is an example of tree sites. Listed are the addresses and short forms of location.



Tree A - 360 Parkside Ave 01F

Tree B - 360 Parkside Ave 02F

Tree C - 360 Parkside Ave 01X

Tree D - 360 Parkside Ave 02X

Tree E - 362 Parkside Ave 01A

Tree F - 362 Parkside Ave 01F

Tree G - 362 Parkside Ave 02F

Tree H - 362 Parkside Ave 01X

Tree J - 22 Spruce St 01S

Tree K - 21 Spruce St 02M

Tree L - 21 Spruce St 01M

Tree M - 10 Scotch Rd 02D

Tree N - 10 Scotch Rd 01D

Tree P - 22 Spruce St 02F

Tree Q - 22 Spruce St 01F

Species: Using the leaf key provided, identify each tree and enter its code (found in parenthesis after tree name) under the SPECIES column. If you do not recognize a tree, take a sample and enter a question mark. If you do recognize a tree, and it is not one of the species shown on the back, enter its name in the SPECIES column.

DBH: Diameter at Breast Height (4.5ft) record the value to the nearest 1/10th inch. If a tree trunk has more than one main stem below breast height, mark a "B" (for branched) under the SIZE column. If the tree is growing in a planting tub, indicate "P". Then measure the diameter at breast height of every stem, 3" and greater, of that tree and record this information in the same column.

Height: Height to top of tree, measured in feet. Tree height must be recorded for all trees, including dead trees. Height can be measured using a Biltmore stick.

Age: There is a positive correlation between tree girth and age. Growing rate, however, varies from species to species. Tree health, soil, climatic and site conditions can have a significant effect on the rate of annual growth. Check the table provided to find the factor you need to multiply the tree's DBH by, in order to determine the age. If the species is not there, use the average factor of 4. This is a rough estimate of a tree's age which, unlike core boring, leaves the tree unharmed.

Canopy: Canopy width, or crown width, is measured in feet by walking from one edge of the tree's drip line to the other in two perpendicular directions. Two measurements can be taken by walking N-S and E-W widths.

Condition: Decide which of the following condition categories best describes each tree, and record the corresponding letter.

> **Excellent (E):** full well-balanced crown and limb structure; leaves normal size and color; no dead or broken branches; trunk solid; bark intact.
> **Good (G):** crown uneven or misshapen; some mechanical damage to bark or trunk; some signs of insects or disease; leaves somewhat below normal size and quantity; some dead or broken branches
> **Poor (P):** large dead limbs with over one-half of the tree already dead or removed; large cavities; drastic deformities; leaves significantly below normal size and quantity; severe insect or disease damage.
> **Dead (D):** dead tree, leaves absent; twigs brittle.

Pit Size: Dimensions of the tree pit in feet. If tree is in a continuous strip or in a lawn, mark **(L)**

Pit Condition: Select on of the following conditions for the tree pit and record the letter.

> **Good (G):** Pit has no visible problems, good soil conditions or mulch present.
> **Fair (F):** Pit condition is marginal. Some problems present, such as trash.
> **Planted (P):** Flowers or plants are present in the pit, no weeds.
> **Compacted (C):** Pit soil is compacted.
> **Standing Water (S):** Poor drainage, water is still present on the surface of the soil.
> **Weeds (W):** Pit is over grown with weeds and other non-planted vegetation.
> **Bad (B):** Pit is in poor condition for reason not listed above, such as being paved over, or tree has out grown the size of the current tree pit.

Tree Guard: Is there a tree guard present?

Tree Grate: Is there a tree grate present?

Remove Guard: Does the tree guard hinder the trees growth and need to be removed?

Expand Grate: Does the tree grate hinder the trees growth and need to be expanded?

Ground to Crown Height: Height to base of live crown measured in feet. Record dead trees as 0. Use Biltmore sitck to measure the height if necessary.

Foliage Density: The percent of the crown volume (defined by crown width and height) that is occupied by leaves. Take into account the natural form of the crown for the particular species. Two perpendicular measures of 2 dimensional foliage density are made and the average result is recorded. Estimate to nearest 5%.

Comments: Add any comments about the tree and its surroundings that you feel are important.