Trees Count 2002: Summary Report

A Pilot Project of

Friends Of The Don EAST

Friends of the Don East, February 2003

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Executive Summary

Friends of the Don East (FODE) carried out the pilot "Trees Count" project in the summer of 2002 with funding from the Toronto Atmospheric Fund. The project tested the Neighbour*woods*© tree inventory program developed at the University of Toronto by Dr. Andrew Kenney and Danijela Puric-Mladenovic to encourage and assist communities to evaluate the state of their urban forests and create strategic plans to protect and enhance them.

The project was coordinated by a part-time FODE staff member. It attracted the interest of over 60 volunteers, 29 of whom underwent training and 24 of whom participated in the project. The volunteers carried out five successful inventories covering 376 trees in four east Toronto neighbourhoods. They also identified 129 locations suitable for tree planting. The project was warmly welcomed by homeowners and succeeded in its objective of obtaining permission to inventory both private and public trees.

The project won the support and cooperation of several members of Toronto City Council and the City's Foresty Services Division. It also obtained a high level of media interest with 14 separate stories, several of them published in more than one newspaper, newsletter or magazine.

The inventory data was successfully entered into the Neighbour*woods*© software and a comprehensive 108-page report was produced that described the composition of the urban forest in the inventoried areas, including the condition and value of the trees, candidate heritage trees, species diversity and basal and leaf area.

The sample inventory indicated that the urban canopy in the neighbourhoods examined is dominated by Norway Maples, a non-native invasive species with negative impacts on natural areas such as Toronto's ravines. In addition, the maturity of many trees, while contributing to neighbourhood aesthetic and real estate values and relief during heat waves, means that many parts of Toronto will soon face potentially significant tree loss.

These key conclusions, while based on a small sample and requiring validation by a larger study, suggest both a huge near-term requirement to plant replacement trees and a corresponding opportunity to reduce the extensive presence of Norway maples and improve the diversity of the existing canopy with more native species. These present significant issues for individual property owners, neighbourhoods, and the City of Toronto that will need broad implementation support over the next 30 years.

The success of the project confirmed the utility of the Neighbourwoods protocol as an effective way to include lay volunteers in the collection of valuable data about Toronto's urban forest. It also supports the continuation and extension of the Trees Count project to gather comprehensive information about the urban forest of specific Toronto neighbourhoods and assist the residents of these communities to formulate strategic management plans to protect and enhance their urban forests.

1.0 Introduction

During the summer of 2002, Friends of the Don East (FODE) carried out the "Trees Count" program in several communities in the Don River watershed with funding provided by the Toronto Atmospheric Fund. This was a pilot project designed to test the practical implementation of Neighbour*woods*©, a tree inventory program developed at the University of Toronto by Dr. Andrew Kenney and Danijela Puric-Mladenovic to encourage and assist communities to evaluate the state of their urban forests and create strategic plans to protect and enhance them.

The inventory was conducted by volunteers and FODE staff. Dr. Kenney and Danijela Puric-Mladenovic subsequently analyzed the collected data and produced a detailed 108-page summary report which includes detailed data on each of the trees examined in the study. This report is attached as an appendix.

1.1 The Value of Trees

The value of trees in an urban setting has been well-established and widely-recognized. Trees provide extensive economic, social and environmental benefits, and their importance to Toronto is increasing over time as a result of a number of major trends including:

- increasing number and density of the human population
- intensifying urban heat island effects
- impacts of global climatic changes

The health burden of air pollution in Toronto is large and growing. Toronto Public Health reported in 2000 that "air pollution adds about 1,000 early-deaths and 5,500 admissions to hospitals". It also calculated that "in Toronto, nitrogen dioxide (NO2) is the air pollutant with the greatest adverse impact on human health, being responsible for almost 40% of air-related premature mortality and 60% of cardiorespiratory admissions to hospital."

Table 1 outlines some of the key benefits of the trees in our urban forest. These values have inspired numerous groups and individuals, including the Toronto municipal government, to participate in and support the planting of trees. The City of Toronto plants trees on city property in front of homes whose owners request them. The City has also appointed Councillor Joe Pantalone as its "Tree Advocate" and provides his office with funds to expand the urban forest of Toronto. The City and others also support such organizations as LEAF to provide subsidized backyard trees to homeowners.

All of these tree planting programs are very important and should be vigorously supported and continued. However, tree planting programs are only one part of a three "P" approach (planting new trees, protecting existing trees, preserving plantable spots) to ensuring a healthy urban forest that provides the maximum environmental, social and economic benefits to Toronto. Equally critical is the protection of existing trees.

Table 1

Some Benefits From Our Urban Forest

Improving Air Quality: Sulphur dioxide, nitrous oxide, carbon dioxide and ozone are absorbed by the stomata in the leaves and dissolved in the moisture of the leaf tissue. Inhalable particulates are trapped by the leaf surfaces and bark, removing them from the air and keeping them out of our lungs.

Reducing Summer Heat: This cooling effect is achieved by the evaporation of water from the surfaces of leaves, by the shade trees provide, and by trees' ability to reduce wind velocity. Moisture from the surfaces of leaves and from within the plant create a cooling effect when it is evaporated, much the same as a refrigerator or air conditioner functions. The shade also reduces the amount of heat absorbed by roads, sidewalks and buildings that would otherwise be re-radiated into the environment, increasing the urban heat island effect.

Improving Water Quality: Rainwater intercepted by tree crowns can be re-evaporated into the air. Depending on the intensity and duration of the storm, the canopy may eventually become saturated and water will begin to fall through to the ground. This, however, happens with less energy than would be the case without a canopy to intercept the rainfall. Some water will also flow from tree crowns down the stem and can infiltrate the soil via the root system. The combined effects will reduce soil erosion, retain the water "on site" to be used by the vegetation, and reduce the wash of pollutants from hard surfaces and lawns into the storm sewer system

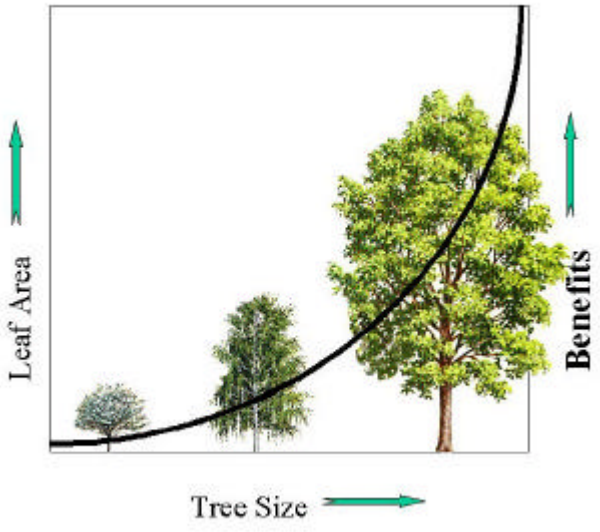
Improving Wildlife Habitat: Trees and shrubs along streets, in parks, and in our yards provide crucial nesting and other life functions habitat for resident bird populations, as well as stopovers for migratory birds. Fruit and seed bearing plants can provide food for birds and small mammals and even humans. A diversity of plants in the urban forest will contribute to increased diversity of natural predators on problem insects.

Increasing Property Values: Evidence from Canada and the United States suggest that residential properties with substantial tree cover may sell for between 5% to 25% more than similar properties without trees. Similarly, homes in well-treed communities tend to sell more quickly. Well-located trees can also substantially reduce energy costs for home heating and air conditioning.

Better Mental Health: Research in hospitals has shown that patients in rooms that overlook green space tend to recover more quickly than those with rooms that overlook hard surfaces.

While newly-planted trees are a sound investment in the future health of our City, they will have to survive and grow for many years before they are able to provide the same amount of benefits as existing mature trees.

The benefits of trees rise exponentially as their size and leaf area increase. It is estimated that one large mature tree provides cooling and air conditioning benefits equal to 2500 newly-planted trees. By inventoring the existing trees, Trees Count focuses attention on the benefits of protecting the trees already present in our urban forest.



In addition to planting trees and protecting existing ones, there is a crucial third "P" in the urban forest equation. We must preserve suitable locations to plant new trees. There are increasing pressures to pave over or build over lands that could support trees and other vegetation. When front lawns are replaced with parking pads, the opportunity to plant trees in that location is eliminated. Consequently, ensuring the full health, social, environmental and economic benefits of our urban forests requires a "3-P" program –protect existing trees, plant new trees, and preserve plantable spaces. The Trees Count program specifically serves all of these goals.

1.2 Neighbour*woods*©

The Neighbour*woods*© program was developed in 2001 at the University of Toronto by Dr. Andrew Kenney and Danijela Puric-Mladenovic, with funding provided by the Ontario Ministry of the Environment. It was formally introduced to the Toronto community in September 2001 at an all-day workshop sponsored by LEAF, the Urban Forest Network and the Ministry of the Environment.

The Neighbour*woods*© program was developed to provide a starting point from which community groups can begin to protect and enhance their urban forests. It provides a standardized and cost-effective procedure for collecting information on tree location, species, size and condition, as well as site characteristics and potential conflicts with other urban infrastructure. It is designed to be used by laypersons and volunteers and requires only limited training. However, it allows for the rapid collection of about 30 significant pieces of information essential to understanding the health of each tree examined.

A simple coding system ensures that each tree is identified with a unique alpha-numeric code. This is supplemented with the street and house number. Data is gathered on the tree species, its diameter at breast height (DBH) and its height class, as well as the percentage of surface area within its dripline that is paved, hardened or otherwise compacted. The condition of the tree is gauged using 16 parameters related to the crown, trunk and root system. Each of these is scored visually on a scale of 0 to 3. Thus the symmetry of the crown is scored as follows: 0 - crown is symmetrical; 1 - crown is slightly asymmetrical due to restricted growing space or lack of light; 2 - crown is asymmetrical, lopsided or unbalanced; 3 - crown is severely asymmetrical to the point where it is obviously putting stress on the main stem or root system. In addition to the 16 measures of condition of the tree, five types of conflicts are noted -- with overhead wires, buildings, other trees, traffic signs, and indications of effects on nearby sidewalks and parking lots. The latter conflicts are graded as none, existing or potential.

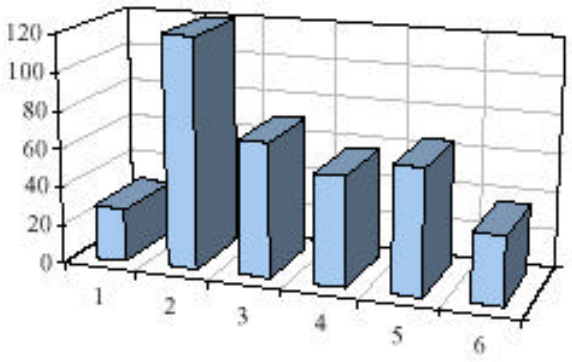
At the same time as the tree inventory data is being gathered, the participants in the inventory note locations where new trees could be planted, including how large a tree can be accommodated in each potential site.

The accumulated data from the inventory work is entered into a computer program which generates a wide variety of summary tables and graphs that provide invaluable information for urban forest decision-makers and the community. The summary data describes the composition of the community forest by tree size, tree condition, basal and leaf area, and distribution of species and genera. Graphs (see sample) are generated comparing private and publicly-owned trees, deciduous and conifers, and native and non-native species. This data can be made available for individual neighbourhoods, streets and specific trees. The program also generates lists of plantable spots, of individual trees that could pose a hazard, and of candidate heritage trees. The sample attached as Appendix A is the report generated from the tree inventory work carried out during the pilot project in the Don Watershed in 2002.

Figure - 1. Proportion of municipally owned trees vs privately owned trees

The summary report also explains the significance of the inventory's findings, and the extent to which the community's urban forest compares with objectives of a healthy urban forest. It describes the range of species and overall biodiversity of the community forest, thus providing guidance to the community on what species are over-represented, and others that might be the most suitable species for new plantings. Particularly significant outputs of the Neighbour*woods*© program are graphs illustrating features of the community forest (see sample).

Figure - 2. Number of trees in each of six diameter classes



In many urban areas, the majority of the trees are of one or two species. This means the community's forest is particularly susceptible to damage from a blight or disease affecting the predominant species. The street trees in many communities may also have all been planted in the same year (or even the same week) and thus a canopy that appears healthy today may be devastated very quickly as all of the trees reach the point where they must be removed.

The summary reporting capability of Neighbour*woods*© means that the collected inventory data is immediately useful to decision-makers to guide the development of strategic plans, ensure prompt action on problem trees, facilitate planting programs, and provide the community with a composite picture of the characteristics and significance of its urban forest.

2.0 The Trees Count Project

Early in 2002, staff of Friends of the Don East (FODE) met with Dr. Andy Kenney and put together a proposal for a pilot test of the Neighbour*woods*© program in a small part of the watershed of the Don River in east Toronto. Support for the proposal was sought and received from the City of Toronto Forestry Services Department and the office of the Tree Advocate, and the proposal was subsequently submitted to the Toronto Atmospheric Fund (TAF) for consideration for funding in 2002. The application to TAF was successful and funding of $21,405 was awarded in May of 2002 for a pilot project to be completed by February 2003.

2.1 Project Objectives

Trees Count 2002 was the first community implementation of the Neighbour*woods*© program. It set out to ground-test the program and determine its utility in enhancing public support of and participation in strategic urban forestry planning. Friends of the Don East, working in close cooperation with City officials and the designers of Neighbour*woods*©, attempted to answer a number of critical questions related to the program and its implementation. These questions included:

- Can volunteers be recruited to carry out the inventory work?
- Will volunteers have the ability to conduct the inventory and produce credible data?
- What volunteer training will be required?
- How much staff training will be required?
- How efficient are volunteer teams in conducting the inventory?
- What equipment will be useful in carrying out the project?
- Will homeowners welcome the inventory and allow access to their properties to conduct the inventory?
- What steps do project staff and volunteers need to take to successfully involve homeowners?
- What information and knowledge do homeowners want/need to improve their stewardship of the urban forest?
- What are the prospects for community involvement in and ownership over an inventory project?
- Will the community media take an interest in and help facilitate public knowledge of the project?
- What problems will be encountered with collection and translation of the data?
- Will the summary information generated by the Neighbour*woods*© software be useful?

Other pilot program objectives included the development of working relationships with City forestry officials, the identification of one or more neighbourhoods where a full-scale implementation of Trees Count appears feasible, the identification/development of appropriate educational materials, and the production of a comprehensive final reports to our funder (the Toronto Atmospheric Fund), the Board of Directors of Friends of the Don East, our partners, and the Don Watershed community.

We also saw the pilot project as an opportunity to increase public awareness of the importance of trees, especially of preserving and protecting the existing urban forest and land areas suitable for the planting of additional trees. This included focusing attention on the benefits of trees and a healthy urban forest and empowering communities to increase their involvement in the long term management of their urban forests.

2.2 Project Implementation

Funding for the project was confirmed on May 20, 2002. Prior to that date, an attempt had been made to find a project coordinator from among the students enrolled in the Masters of Forestry program at the University of Toronto. A suitable candidate was identified but the individual chose an alternate position. Consequently, when funding was confirmed, a search was initiated and the position advertised. This resulted in a delay in the hoped-for beginning of the project and made it impossible to launch work among schools and elementary students prior to their summer break.

There were 53 applications received for the position of project coordinator and the search committee selected and interviewed six candidates. Allan Sinclair, an activist in the Urban Forestry Network, was selected as the project coordinator in mid-June and confirmed at the FODE Board of Directors meeting on June 24. All other applicants were contacted, thanked for their interest and invited to participate in the program as volunteers. Several chose to do so. One of the applicants was subsequently employed to create a costume for the project mascot.

During the first month, the coordinator worked with Dr. Kenney to familiarize himself with the Neighbour*woods*© protocol, and liaised with the Forestry Services Department of the City of Toronto. The coordinator spent about 25 hours reviewing the protocol, clarifying its application with Dr. Kenney, and in direct hands-on training with Dr. Kenney. Fortunately, the coordinator was already competent in tree species identification, so the training period was focused on the design, objectives and methodology of the Neighbour*woods*© protocol. Subsequent experience would show that competence in dendrology is a critical skill required of the coordinator.

Contacts were made with community media and with members of Toronto City Council whose wards lie within the Don Valley area, and initial work was undertaken to identify actual locations for the pilot inventory work.

The Trees Count project was officially launched at a public meeting on Saturday, July 27 attended by about 15 people. The timing during a summer weekend made it impossible for many interested individuals to participate including four City councillors (Jack Layton, Case Ootes, Joe Pantalone, Jane Pitfield) who conveyed their regrets. The meeting was publicized through the media, via the Urban Forestry Network, to members of FODE, and through other community organizations. The media was also invited to attend, and a reporter from the *Mirror* chain of community newspapers did so. At the meeting, the coordinator presented details of the Neighbour*woods*© program and volunteers were recruited to participate in the actual inventory process.

2.3 Media Coverage

In late June, FODE issued the summer edition of *At the Forks* magazine and distributed 6000 copies across the Don Watershed. The magazine carried a front page story on "Trees Count" as well as a two-page centrespread which explained the program and how volunteers could get involved, as well as providing detailed information on the benefits from our urban forest. The first outside publicity for the program was an article that appeared in early July in the newsletter of the Urban Forestry Network. This was subsequently reprinted in the newsletter of the Toronto Community Gardening Network.

The project set a goal of at least eight media articles on Trees Count in 2002. This was easily achieved and surpassed. After the three items noted above, the project received such extensive coverage during the summer period that we were forced to stop seeking media coverage in early September because we were being inundated with volunteers whose numbers swelled after each media story appeared.

The first article in the community media appeared in the *Town Crier* on July 25. It was published in seven neighbourhood editions of the *Crier* – Bayview Mills, Bloor Annex, Forest Hill, Greater Beach, Leaside Rosedale, North Toronto and Willowdale. Authored by the general editor of the *Crier*, it included a summary of the benefits of the urban forest, as well as information on how residents could volunteer.

During the month of August, the *Mirror* newspaper chain provided almost weekly coverage of the program (August 9, August 23, and August 30). In mid-August, the project coordinator was interviewed on *CBC Radio'*s "Ontario Now" program. The *Crier* provided further coverage in its September issue and *Mirror* coverage also continued, including an October column advocating support for the program.

In late September a large article on urban foresty appeared in the *Toronto Star*. This was followed in mid-October by a large article on urban forestry in the *Globe and Mail.* Neither mentioned Trees Count, but both focused attention on Dr. Kenney and his work promoting the urban forest, and on the activities of the City's Forestry Division headed by Richard Ubbens. The Trees Count coordinator had previously spoken with both reporters and had worked with Dr. Kenney, Mr. Ubbens and Councillor Pantalone to arrange a media conference at City Hall. This conference didn't proceed, partly because arrangements couldn't be concluded with all parties, and partly because by that point the pilot project was already overwhelmed with volunteers as a result of the media attention. While neither article in the major print media focused on Trees Count, it would appear that our efforts may have stimulated both reviews. Dr. Kenney and the project coordinator were also interviewed in October by Bob Hunter of *CITY-TV*.

Another two page centrespread was published in the Fall issue of *At the Forks* magazine. This included a report on the initial inventory work, as well as an article on the threat posed to tree health by parking pads and other impervious surfaces within the drip line of trees. The Winter issue of *At the Forks* included a four-page special report on Trees Count. In addition to the normal distribution of 6000 copies, an extra 1000 copies were produced for distribution to the inventoried neighbourhoods and in other locations. A list of the known media coverage of the program is provided below. Copies are included in Appendix B.

Date	**Media**	**Title of Story**
June	*At the Forks*	3 articles: Count Your Trees; Moving from Planting Trees to Planning Forests; Benefits from our Urban Forest
July	Urban Forest Network	Neighbourwoods being tested this summer in the Don Watershed
July 18	Toronto Community Garden Network	Neighbourwoods being tested this summer in the Don Watershed
July 24	*Town Crier* newspapers	Study underway to inventory city trees
Aug. 9	*Mirror* newspapers	Friends of the Don East survey urban forest
August	*CBC Radio* "Ontario Now"	Interview with project coordinator Allan Sinclair
Aug. 23	*Mirror* newspapers	Friends of Don counting trees for study on their health
Aug. 30	*Mirror* newspapers	East York tree inventory on this weekend
Sept. 6	*East York-Riverdale Mirror*	Tree Counters (page 1 photo and caption)
Sept.	*At the Forks*	2 articles: Pilot tree inventory warmly received in east Toronto neighbourhoods; Roots and pavement
Oct. 18	*Crier* - Joe Cooper column	We cannot afford to take our urban forest for granted
October	*CITY-TV*	Dr. Kenny and Coordinator interviewed by Bob Hunter
January	*At the Forks*	Four page supplement: East Toronto Tree Survey

2.4 Recruiting Volunteers

The Trees Count project depended heavily on the participation of volunteers. With only a single part-time staff person, it was clear that volunteers would be required to carry out the majority of the tasks. More importantly, the objective of the Neighbour*woods*© program is to permit community volunteers to evaluate the trees in their neighbourhoods and accumulate sufficient data to develop a strategic plan for protecting and enhancing their portion of the urban forest. Recruitment of volunteers was thus a central objective of the pilot project and a key measure of its success. We set an objective of 20 volunteers.

This turned out to be realistic in terms of how many volunteers could actually be involved in the limited amount of inventory work during the pilot project, but it underestimated the enthusiastic response from the public. More than 60 individuals volunteered to be part of the project and we were actually forced to abandon some of our publicity plans in order to avoid acquiring even more volunteers who energies could not actually be used in the inventory work.

Volunteers found out about the program from a variety of sources. Some had applied for the coordinator's position, or were members of the Urban Forest Network or FODE, but the great

majority contacted us after media exposure of the program. Each item of media coverage brought new phone calls from interested volunteers.

The enthusiasm was reflected in more than just the numbers. The individuals who participated gave many hours each to the project. They went through one or more two-hour training sessions and then gave up half of a weekend to actually participate in an inventory. Many spent five or more hours doing an inventory, and several came back for more than one of the inventory sessions.

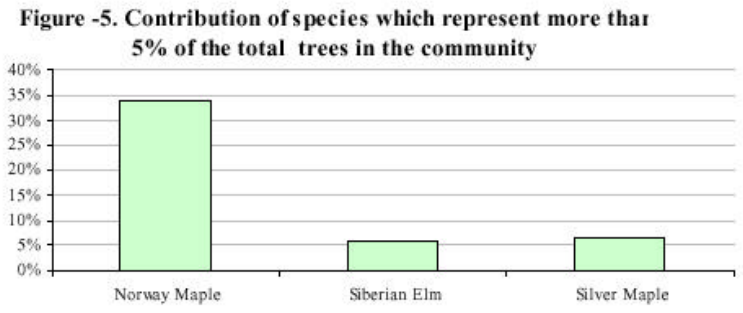
While a few of these volunteers had previously worked on FODE plantings or cleanups, the vast majority came into contact with us specifically because of Trees Count. They displayed a passion for trees, were eager to do something positive for their communities and learn more about trees in the process. It was also apparent that they immensely enjoyed doing the inventories. Indeed it was difficult to get them to stop for lunch or take other breaks. The program also obviously offered the volunteers a social opportunity to interact with others and make new friends.

2.5 Training the Volunteers

An initial training session for volunteers was set for August 1. This was the first of 12 small group training sessions conducted by the coordinator in August and September. A total of 29 volunteers went through one or more training sessions. Twenty-four of these, or 83%, actually participated in one or more inventory.

At the initial session, it became obvious that the most difficult part of the Neighbour*woods*© protocol would be the identification of the tree species. While our volunteers were very passionate about trees, some were not even aware of the basic division between conifers and deciduous species. Tree identification guides and simple keys helped us address these difficulties. However, for each inventory team, we ensured that at least one member of the team was proficient in tree identification.

Where there were any doubts as to the tree species, a sample of the leaves was taken in a labelled envelope for subsequent identification. We concluded that these procedures were a more practical solution to the species identification problem than attempting to develop extensive dendrology skills in each volunteer. At the same time, volunteers certainly learned the names and distinguishing features of many species as they conducted the inventories.



Species identification was also made easier by the fact that the biodiversity in Toronto's urban forest is limited. One species – Norway Maple – accounted for more than one-third of all the trees counted in the inventory work. A total of 45 species were encountered, but a third of these were only represented by one or two specimens. Twelve species accounted for nearly three-quarters of the inventoried trees.

We prepared some tree identification training materials including coloured photos of the most commonly encountered species. A manual of common species found in Toronto would be a useful addition to future inventory work.

Each training session lasted at least two hours and included both classroom explanations and a sample inventory of trees in a local park or street. Instructional materials were provided, and the purpose and procedure associated with recording each parameter was explained. While only a few volunteers participated in each session, this was not a conscious arrangement. Rather it reflected the fact that volunteers were available at different times and many were absent from the City entirely for extended periods during the summer. This was also the reason that twelve separate training sessions were offered. Even with this extensive schedule, many interested volunteers could not be accommodated in a training session. One positive result of the small numbers of participants in each session meant that everyone got an opportunity for hands-on training.

The remaining 25 parameters examined in the Trees Count inventories presented a substantial but not overwhelming challenge to the participating volunteers. Beyond the initial measurement of the diameter of the tree at breast height, each parameter requires a visual evaluation and judgement. Volunteers needed to learn some new 'tree language' (conks, pruning scars, crown, etc.), but quickly became adept at assigning each tree to one of the three or four categories offered by the protocol for each parameter.

We worked with teams of three or four individuals in each inventory team. At least one was knowledgeable in species identification. One person acted as data recorder, a task that was shared around during the inventory. Everyone participated in scoring the parameters, but the process quickly became quite rapid, with the recorder calling out the parameter and entering the scores suggested by the team leader. The third person provided a check on the evaluations of the leader. Disagreements were worked out with little difficulty and almost always involved one person seeing something that the others had missed.

Materials prepared from the Neighbour*woods*© manual were used to train the volunteers and assist them during the actual inventory process. These are indispensible and should form part of a formal training/implementing manual for volunteers and staff doing future inventories.

It would be helpful if a longer and more formal training were provided for volunteers for a future Trees Count project. Ideally, this would be led by Dr. Kenney or other persons trained in both dendrology (tree identification) and the Neighbour*woods*© protocols. Two hour evening sessions, such as were conducted this year, are helpful, but a more extensive training program would strengthen the

Volunteer Comments

"The pleasure of meeting other volunteers and the participation of street residents. The attention we were giving their trees was something mysterious but at the same time very significant about everyone's sense of connection."

"Excellent experience. I enjoyed the fellowship, keep up the good work."

"I'm not sure I have ever been treated better as a volunteer!"

"You have thought of everything, the duration of the count was right, and even planned a souvlaki lunch, which was super and tied nicely in with the Greektown neighbourhood theme."

"What I learned most was the number of obstacles that may hinder the growth of trees in urban areas. Also that without accurate information concerning the present condition of the forest how is it possible to improve its well being."

implementation of the program and make one or two person inventory teams possible. In the pilot project, the larger teams were more appropriate because of the need to combine varied skills, especially in dendrology.

The inventory experience confirms that the process can easily be conducted by teams of two individuals, but larger teams allow for training of new volunteers, and increase the enjoyment of participants and make the volunteer experience more attractive.

2.6 Project Equipment

Trees Count requires a minimum amount of equipment. We experimented with simple measuring tapes that required a mathematical calculation to translate circumferences into diameters, but switched to a tree calipers that automatically calculates the diameter of an object it is wrapped around. These calipers, at $75 each, were the most expensive piece of equipment necessary for the inventory work.

Photocopied data entry sheets were used to record tree information. We had hoped to utilize hand-held computer 'Palm Pilots' to allow direct digitization of the data, but were advised that the technology to allow this needed some further development. When such equipment becomes feasible to utilize, it will improve the overall efficiency of the inventory process, especially if it includes user friendly software designed for the Trees Count survey. Such software should be designed to move systematically through the parameters, prompting the user to enter appropriate information, and then moving automatically to the next parameter.

2.7 Obtaining Access to Private Property

Successfully involving homeowners and obtaining their permission to inventory all the trees on their property, both those owned by the City and those in their backyards, was another major objective of the Trees Count pilot project. We were pleased with the results obtained.

The process we adopted for each inventory had several steps. We began by distributing a simple one-page notice to the mailboxes of each home on the streets to be inventoried. This was done four or five days prior to the inventory. The flyer (see appendix C) included the logos of Friends of the Don East, Toronto Atmospheric Fund, City of Toronto Forestry Services and the University of Toronto Forestry Department.

The notice announced the inventory and asked for the homeowners' cooperation. Specifically the resident was asked to place the flyer in a visible location to indicate their support for the inventory and the granting of permission to examine the trees in their yard.

The second step was to re-visit the inventory areas the day prior to the inventory and place prominent lawn signs in the front of each home displaying a flyer. This step had two purposes – to make it easy for the inventory team to identify the participating homes, and to increase the visibility of the project activity for the media and for the neighbourhood

residents. During this process, homes not displaying the flyer were also directly approached to seek their participation.

The third step was the inventory process itself. We had one of the volunteers move ahead of the inventory team, knocking on doors and trying to secure any missing permissions. This person also acted as the announcer of the team's arrival, letting participating households know that the team was just down the street. In practice, the activity of the inventory team inevitably attracted the attention of much of the neighbourhood. Residents who hadn't paid attention to the flyer, or hadn't put it up in their windows, came out to ask the team to include their trees. In effect, the inventory became an "event" on the street and by the time it was completed, it is likely that everyone was talking about it.

As a result, the great majority of homes on the selected streets were actually included in the inventory. For the small number whose owners couldn't be contacted, it was not necessary to actually access all the yards in order to count all the trees. Where permission had not been obtained to enter a yard, the process allowed for the inventory work to be done visually from a neighbour's yard. In this situation, the only parameter that had to be estimated was the actual diameter of the tree. In a few cases where this was done, access was subsequently obtained, and we found that the estimates of tree diameter were very close. Indeed, one of the 'sports' that volunteers participated in during the inventory was guessing the DBH (diameter of the tree at breast height) before measuring it, so they quickly became quite adept at 'measuring' trees which could not actually be accessed.

As part of the project, a costume was prepared to create a Trees Count mascot (see photo). The mascot had originally been intended primarily as a means of involving elementary school students in the program, but the late start precluded this work. The late start in 2002 meant that schools had shut down before the mascot was created. By the time the schools re-opened, we were already achieving our homeowner-involvement objectives.

Nevertheless, the mascot became part of the festive atmosphere that accompanied the tree inventory team(s) down the street, and thus achieved its objective in a somewhat different way than originally anticipated. However, it was a challenging task to convince one of the volunteers to be the mascot, because they all wanted the much more active role of actually inventoring the trees.

The volunteers reported a great deal of enthusiasm from homeowners. A questionnaire directed to them after the inventory elicited many favourable comments on their experience. Some of their comments are included in the

"Judging from the response of some of the homeowners that I spoke to while counting trees, forest management is of great importance to a lot of people. It seems to be especially true for urban dwellers, which are far removed from the countryside. They have a desire to hold on to as much nature as they can."

"People care about their trees, they wanted to come out and talk, especially if they suspected that there may be a problem"

"A tree may at first glance look healthy, but in actual fact be under a lot of stress. The level of tree knowledge by the homeowner has a great effect on the health of the trees, and is vital to know how to respond to the weather, when to trim and water."

box below.

2.8 Street Inventories

Identifying the areas to conduct the inventory was an easier task than expected. While some data exists on City-owned trees, it is generally not up-to-date, and no data existed on privately-owned trees prior to this program. When the inventory work began, the City Forestry Division was engaged in combining the information from the various municipalities amalgamated. That work was expected to be completed in the fall of 2002.

Our primary objective in the pilot project was to test the inventory protocol in a variety of circumstances in the Don Watershed. Using maps, expert advice and local knowledge, we selected four east Toronto neighbourhoods for the test inventories. These fell roughly into the four quadrants formed by the north-south Don Valley and the east-west Bloor-Danforth transportation corridor.

Five inventories were carried out between August 24 and September 21. The first two were in the same neighbourhood, with one a 'dry-run' to make sure we sorted out any glitches prior to inviting the media on the following day. The inventories were carried out in the following locations:

Inventory #1 was our dry-run along Hopedale Ave and Minton Place in the East York ward of Deputy-mayor Case Ootes. This was done on August 24.

Inventory #2 was done on August 25 along Pepler Ave and Rivercourt Blvd, also in councillor Ootes ward.

Inventory #3 was done on September 8 in Cabbagetown on Sumach Street and Carlton north to Wellesley Street in councillor Pam McConnell's ward.

Inventory #4 was done on September 15 in South Leaside on Millwood Rd and Sutherland Drive west to Hanna and east on Randolph Road, in the ward of councillor Jane Pitfield.

Inventory #5 was done on September 22 in Riverdale on Hogarth and Bowden Aves north to Wolfrey and south on Hampton, in the ward of councillor Jack Layton. Among the homeowners who very warmly received us were MP Dennis Mills and his wife.

All of the councillors were notified in advance and provided with detailed information about the project and its objectives. Councillor Pitfield took time from her busy schedule to join us on September 15. Other councillors sent staff to greet us and/or provided letters of support.

A total of 376 trees were inventoried. This substantially exceeded our objective of examining 200 trees. In addition, 129 plantable spots were identified.

2.9 Efficiency of Inventory Work

The limited experience of the pilot project makes it somewhat difficult to determine what level of efficiency is achievable for the inventories. In the pilot, no team conducted more than one inventory, although some individuals were involved in more than one. This meant that for each team, the experience was essentially a novel one, and consequently proceeded at a slower pace than might be expected of a team that carried out inventories every day or every weekend, or even did so twice or more during a summer.

Team dynamics were different for each group, and the paid part-time staff person could not even participate in all teams (since more than one team was operating simultaneously on all inventories). While the presence of the coordinator on a team would likely improve its performance, we took the approach of allowing as much responsibility as possible to the volunteers and only intervening or providing advice as necessary. The actual inventories thus included a substantial on-the-job training component which necessarily reduced the number of trees they could cover in a single session.

We conducted inventories on five different days for up to five hours per day. In two cases, we had two teams in action at the same time, twice we had three teams and one inventory involved four teams. The total hours of inventory work amounted to 42 team-hours. During this time, the teams collected inventory data on 376 trees and identified a further 129 locations which could accommodate the planting of new trees. Thus the rate achieved was about 6.5 trees inventoried per team hour of work, plus 2 plantable spots identified.

The efficiency would certainly be improved with more training and more consistency in the teams and more experience by the participating individuals. The use of full-time paid staff would generate a further exponential improvement in efficiency. We have been advised by Dr. Kenney that paid staff achieve rates of 12-15 trees per hour.

2.10 Data Entry

The Neighbour*woods*© program does much more than simply facilitate the collection of data about trees. Computer support programs allow for very extensive analysis of collected data and the production of reports, tables and graphs to illustrate the findings at multiple levels of analysis.

We had hoped to use hand-held palm pilots to input the data directly onto a computer as it was collected during the inventory. Unfortunately that technology was not yet at a stage where that could be done, although it appears that it has now reached a useable stage. As a consequence, the data was entered by hand on data entry sheets, and subsequently transferred to a computer file.

The input of the data (about 12,000 pieces of information) occupied about 25 hours of time including double-checking for accuracy of entries. The process was complicated by initial problems in accessing the data entry forms which led to the identification of a need to update the entry forms. However, identifying and sorting out these glitches was a primary objective of the pilot project.

3.0 Public Response to the Project

The public response to the pilot project was very good. While we encountered a few individuals who did not want to have anything to do with the project, this was a rare occurrence. Far more common was an overwhelming enthusiasm that included offers of refreshments, recounting of entire histories of trees and gardens, and a very active interest in both the process of the inventory and its findings as they related to that homeowner's trees. Many residents came out to watch and assist the teams in any way they could.

Inevitably, some homes were not occupied when the Team or the advance workers arrived, and consequently we were unable to obtain permission to examine their privately-owned trees. However, as noted, this was usually overcome through observation from a distance. Once a team had measured a few trees, it became fairly easy to estimate their diameters, and the other parameters could also be observed at a distance.

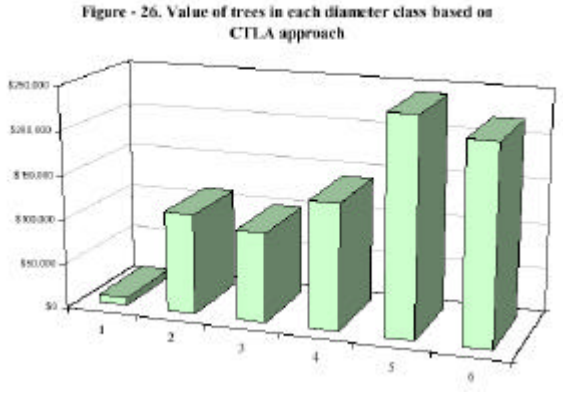
3.1 Additional Public Actitivies

FODE held their Annual General Meeting on November 17 at Todmorden Mills with Dr Andy Kenney as our guest speaker, approximately 80 individuals attended including former mayor Barbara Hall, Deputy Mayor Case Ootes and Councillor Jane Pitfield. A speech by Dr. Kenney re-enforced the importance of the urban forest. The presentation included some of the pilot project results, which led to a lengthy discussion period.

FODE also utilized our portable display boards to popularize the program and increase community interest. At present, we have samples of our flyer, lawn sign and copies of our media coverage in our local community papers and the FODE quarterly magazine At the Forks. Letters of support for the pilot project from Councillors Jack Layton, Case Ootes, Jane Pitfield, and Joe Pantalone are present. Enlarged photos of volunteers engaged in the data collection process have also been included. Circulation of the display is continuing.

4.0 Project Reports

The data was provided to Dr. Andy Kenny and Danijella Puric-Mladenovic at the University of Toronto and a very detailed report was generated. The first draft was received in mid-November, one month after submission of the final data. This was reviewed for accuracy and utility by the project coodinator and FODE staff who met subsequently with Dr. Kenney to discuss the output and provide suggestions for amendments. Subsequently, a second report was generated. It is attached as Appendix A and forms the bulk of this report.



While the size of our sample was small, the report clearly illustrates the immense power of the Neighbour*woods*© analysis in describing the composition and biodiversity of the urban forest and the condition of the trees. It also identifies candidate heritage trees and uses the Council of Tree and Landscaper Appraisers (CTLA) approach to identify the replacement value of the individual trees and the neighbourhood forest. The environmental benefits of the inventoried trees is illustrated by output on the basal and leaf area. Environmental benefits such as evaporatranspiration, interceptance of pollutants and other ecosystem processes are directly related to the size of the canopy of the urban forest.

4.1 Reporting Results to the Public

As Appendix D, we have attached a copy of the report produced in late January for distribution to the participating neighbourhoods. It identifies and discusses many of the key findings of the study including the disturbing level of dependence of the urban forest on a few non-native species that comprise an overwhelming portion of the basal leaf area, and which in many cases are nearing the end of their lives.

When information like this is combined with the obvious enthusiasm of homeowners for healthy trees, we believe that the Trees Count program will lead to strong action by inventoried communities to protect, enhance and plan the future of their respective portions of the urban forest of Toronto. And, these actions will be informed by good quality data that allows these communities to go from planting trees to planning forests.

The full statistical analysis (attached as Appendix A) is also being made available on the Friends of the Don East website. Since it includes detailed results for each tree inventoried, it should help address the interest of homeowners to acquire information regarding specific trees on their properties. This attention may make the website a popular destination and suggests that it should also contain material of assistance to homeowners in the care of their existing trees, and the selection of species for new plantings.

5.0 Conclusions

1. The pilot Trees Count project conducted in 2002 was very successful. Volunteers, property owners, the City, and the media all demonstrate significant enthusiasm for trees. FODE should seek to expand the Trees Count project to help capture this enthusiasm to help protect the urban canopy and contribute to the work of the Toronto Atmospheric Fund, the Office of the Tree Advocate, the City Forestry Services Division in protecting and enhancing our urban forest.

2. The experience has clearly shown the utility of the Neighbour*woods*© protocols and the ability of volunteers to use this methodology to collect useful data on the state of the urban forest. Neighbour*woods*© appears to provide a technical platform that engages and generates meaningful results for volunteers, property owners, community organizations like FODE, and the City. FODE should continue to work with Dr Kenney in a phase II to further improve the protocol, with specific efforts to improve data collection by incorporating hand-held 'palm pilots' in the data collection process.

3. The data collected from a limited sample of trees in east Toronto indicates that the urban canopy is dominated by Norway Maples, a non-native invasive species with negative impacts on natural areas such as Toronto's ravines. In addition, the maturity of many trees, while contributing to neighbourhood aesthetic and real estate values and relief during heat waves, means that many parts of Toronto will soon face potentially significant tree loss. These key conclusions, while based on a small sample and requiring validation by a larger study, suggest both a huge near-term requirement to plant replacement trees and a corresponding opportunity to reduce the extensive presence of Norway maples and improve the diversity of the existing canopy with more native species. These present significant issues for individual property owners, neighbourhoods, and the City of Toronto that will need broad implementation support over the next 30 years

4. It is also evident that there will be no shortage of volunteers to implement a larger-scale version of this project in 2003 and likely well beyond. The interest and indeed enthusiasm of the community in participating in a tree inventory is also well established, as is the willingness of the community media to provide timely support and publicity.

Appendix A

Neighbourwoods
Tree Inventory Report

Friends of the Don East
Trees Count Pilot Project

(report available on this website)

Appendix B

Media Coverage

(not available in the on-line version)

Appendix C

Flyer Distributed to Homes

(not available in the on-line version)

Appendix D

"East Toronto Tree Survey"

Report to the Homeowners Participating In Trees Count 2002

(report available on this website)