2001 Annual Report

City of New York Parks & Recreation

Natural Resources Group

Forest Restoration Team

Dear Stakeholder,

2001 was another banner year for the NRG Forestry Team. We achieved new 5-year highs in the "Trees Planted", " Herbaceous Planted", and "Number of Projects" categories, planting a total of 91 species, our highest level yet of biodiversity. NRG Foresters installed over a half-mile of state-of-the-art streambank stabilization on our bioengineering projects.

Grants outstanding totaled $2,656,111 for the year, an increase of 28.8%, which includes City match. Two additional grants totaling $2,300,000 were matched during the year, and will commence work in 2002. As of February 1, $2,664,000 in new grants were applied for. The Team is currently working on 13 projects, up from 12 last year.

It is difficult to quantify everything the Forestry Team has accomplished this year while managing the 5,000 acres of forest in the City's 28,000 acre park system. There are six areas where the Team has excelled:

Invasive Exotic Species: Managing invasive exotic plants is one of the main functions of the Team. These non-native trees, shrubs, and vines disrupt natural systems, displace native vegetation, decrease biodiversity, and increase nutrient and sediment loads into surrounding water bodies. The Forestry Team treated invasive species on over 55 acres of parkland, in four boroughs.

NRG Forestry: Year 2001 in Review

	2001	2000	% Change
Trees and shrubs planted (containers, B&B)	18,237	11,241	62.2
Herbaceous planted	33,753	14,549	131.9
Erosion control fabric (sq. ft.)	26,570	25,200	5.4
Streambank stabilization (linear ft.)	2,960	1,400	111.4
Plants potted	8,575	6,600	29.9
Acres restored	12.8	12.1	5.5
Acres maintained	44	38	15.7
Grant money outstanding ($)	2,656,111	2,061,013	28.8
Number of projects	13	12	8.3
Number of employees	9	9	0
Number of volunteer events	20	18	11.1
Number of volunteers	250	200	25

Planting: The Forestry Team planted a record number of trees this year. This was due both to increased funding for plantings, and an increase in the acreage and number of sites ready to be planted. During the year, the Forestry Team planted 18,237 trees and shrubs, and 1,550 bareroot tree seedlings, a 62% increase from 2000. Also, we set a new record for our herbaceous plantings. Used for erosion control and streambank stabilization, the 33,753 plants were more than double last year's number. These plantings were comprised of an impressive 91 species, a testament to the complexity of the projects the team undertakes.

Erosion Control: Soil erosion decreases overall water quality and upland forest productivity. A major goal of the Natural Resources Group (NRG) is the reduction of sediment and nutrient loads into New York City watersheds. There are two basic approaches used by NRG to control erosion: cribbing and erosion control fabric. Cribbing is simply the use of medium diameter logs staked along the contour of a slope to prevent soil runoff, much like terracing. Just under 100 linear feet of cribbing were installed this year. Erosion fabric, usually jute or coir matting, is a biodegradable material that is unrolled over a steep slope and secured to the ground. The fabric holds the soil in place temporarily while thousands of plants are planted through it. After the fabric degrades, it is the roots of these plants that will hold the soil in place over the long term. In Alley Pond Park we installed approximately 6,000 square feet of erosion fabric around the kettle ponds in the park, and 11,800 square feet in Inwood Hill Park.

Bioengineering: Bioengineering is the use of live plants and inert materials to hold soil in place on a slope or stream bank. As the inert materials degrade, the roots of the growing plants help keep the soil from eroding. Materials used by NRG include coir (coconut fiber) logs, wooden stakes, coir mats, and turf staples. The plants used in stream bank treatments include dogwood (*Cornus spp.*), and willow

(*Salix spp.*) species, various bareroot trees and shrubs, and many species of herbaceous wetland plants. On the Bronx River this year, we installed over 2,960 linear feet of coir logs to protect the toe of the banks of the river. Of the treated length, almost 1,000 linear feet were double or triple stacked, for a record total of 4,400 linear feet installed. These were layered with live plant cuttings and bare root plants, and coir mats were installed along the top of the bank to protect disturbed areas seeded with native grasses.

Research: While research is not the Forestry Team's primary mandate, the field of ecosystem restoration is dynamic and still developing, and presents many opportunities. The Team's ongoing research into the revegetation of fill sites will be applicable to thousands of acres of land throughout the City. The Team is also providing technical and field assistance to researchers from St. Johns University and Lehman College.

Capital Projects and Design: The construction phase of the Alley Pond Bond Act is complete. A low cedar rail fence around Turtle Pond is complete, and 80 large trees and shrubs are strategicly located. Visually unobtrusive, the fence is designed to help protect the kettle pond, which supports a wide variety of wildlife. Likewise, the large ball and burlap trees and shrubs are designed to redirect foot traffic from sensitive slopes surrounding the ponds, as well as provide instant habitat for wildlife.

The North Manhattan Parks Bond Act design was finalized and bid out this year. This project will involve hydroseeding two acres of eroded hillside in Inwood Hill Park with native groundcover plants, and a high profile slope stabilization and bioengineering project in Riverside Park. The scope of design was also submitted for the Inwood Hill Park project funded by the DEC.

Future Goals: The Forestry Team has set standards for the year to come. Here are a few goals the Team is striving for in the year ahead:

1. Secure more Grants: The Team will never run out of sites to restore with 5,000 acres of forest in the City. We will attempt to secure sufficient funding to continue the 10-year tradition of forest restoration in Parks.
2. Increase Volunteers: More can be done to get the local communities involved in their parks natural areas. Legislation pending before congress will provide a cash match for each volunteer hour spent managing invasive species. The Team will attempt to increase community participation in its projects.
3. Maintain Existing Sites: Each acre planted represents a significant investment by the funder. Restoration sites need to be annually swept for invasive plants, especially vines, until closure of the tree canopy, usually 5-7 years after planting. Many funders fail to adequately provide for this crucial after-care, but the Team will continue to take care of the restored areas to the best of its ability.

Timothy J. Wenskus
Senior Forester, Natural Resources Group
March, 2002

1) Alley Pond Park

The construction phase of the Bond Act was completed this year. This involved the installation of a low cedar rail fence around the largest of the Park's three kettle ponds, Turtle Pond, as well as the strategic planting of a number of large trees and shrubs. The fence, approximately 3,500 linear feet long, is designed to help protect the kettle pond, which supports a wide variety of wildlife. To further protect the pond from sedimentation we installed just over 6,000ft.^{2} of erosion control fabric throughout the year on the bare slopes surrounding the ponds. In this fabric we planted 6,387 herbaceous plants. We also removed over three acres of invasive species, and planted 3,330 native trees and shrubs. We were also able to rehabilitate several areas that had been damaged due to pedestrian and bicycle access.

2) Bronx River, Shoelace

The Forestry Team stabilized a total of 2,960 linear feet of streambank. This involved installing 4,400 linear feet of coir log, planting over 1,200 trees and shrubs, and just over 5,000 herbaceous wetland plants. 675 square feet of prevegetated coir mat were also installed. This is part of a $190,920 grant from NOAA.

3) Invasives

The Forestry Team treated over 55 acres of parkland for invasive exotic plant species. This involved sweeps for seed sources and satellite populations through large areas of forest as well as intense localized eradication of severely infested areas. The top four species treated this year were bush honeysuclke (*Lonicera mackii),* porcelainberry (*Ampelopsis brevipedunculata*), multiflora rose (*Rosa multiflora*), and oriental bittersweet (*Celastrus orbiculatus*).

4) National Fish and Wildlife Foundation

The Forestry Team received a $200,000 grant for plant material for our North Manhattan projects. To date this grant has supported the purchase of thousands of trees and shrubs, and tens of thousands of herbaceous plants to improve wildlife habitat in these parks.

5) Northern Manhattan Bond Act

The Forestry Team planted 9,949 trees and shrubs this year as well as 14,714 herbaceous groundcover plants which were planted into 11,800ft.^{2} of erosion fabric. Over 10 acres of invasive plants were treated, and an additional 12 acres were swept for satellite populations of invasive plants. The $700,000 Clean Water/ Clean Air Bond Act project also entered its capital phase this year. The design was completed, and the construction contract was awarded for a 2002 start.

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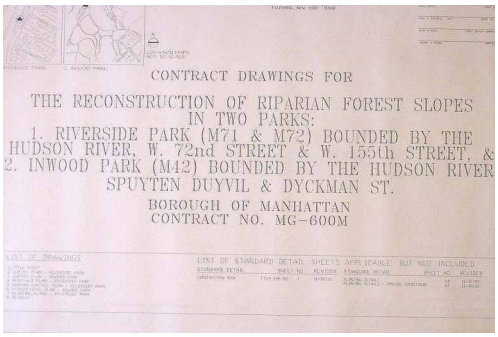
5) 
CONTRACT DRAWINGS FOR
THE RECONSTRUCTION OF RIPARIAN FOREST SLOPES IN TWO PARKS:
1. RIVERSIDE PARK (M71 & M72) BOUNDED BY THE HUDSON RIVER, W. 72nd STREET & W. 155th STREET, &
2. INWOOD PARK (M42) BOUNDED BY THE HUDSON RIVER SPUYTEN DUYVIL & DYCKMAN ST.
BOROUGH OF MANHATTAN
CONTRACT NO. MG-600M

6) Nursery

The Team uses thousands of trees and shrubs every year in its plantings. Often the quantities needed are not available commercially. This year, 8,575 bareroot trees and shrubs were potted up at the Team's 3 field nurseries to ensure an adequate plant supply for our needs. This is a 30% increase over 2000.

7) Woodlawn

The MTA Metro-North railroad, as part of a major bridge reconstruction, contributed $40,000 in materials to restore a two acre parcel along the Bronx River adjacent to the Woodlawn station. To date, half an acre of invasive plants has been cleared, and 900 linear feet of streambank have been stabilized.

8) Seton Falls Bond

The Forestry Team restored almost an acre of forest overtaken by invasive vines and shrubs. We planted 528 native trees and shrubs, including several State-listed rare oaks produced by NRG's Rare and Endangered Plant program. A groundbreaking for this project was held in August. The capital portion of this $550,000 Clean Air/Clean Water Bond Act project completed design and went out to bid this fall.

9) Givans Creek

The Team continued its research into the revegetation of fill sites. As the plantings have reached their second growing season, we are beginning to see if any of the treatments encourage higher plant survival. The goal of this long term research is to determine if there is a cost effective method of establishing tree cover on Parks 1,000 acres of filled land.

10) SER & AAG

The Forestry Team presented at two major conferences this year. In March, the Team presented the first year data on the Givans Creek research at the Association of American Geographers annual meeting in New York City. This fall, we presented two papers at the Society for Ecological Restoration in Niagara Falls, Ontario. The papers documented ten years of invasive plant management on Parks properties, and the premier of the year 2 data for the Givans Creek research.

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11) URP

Team members, assisted by Parks Conservation Corps summer staff, installed almost 200 linear feet of water bars into a badly eroding trail. 300 square feet of brush packing and coir mat were installed on a steep eroding slope at the south end of Seton Falls Park. This project is funded with $23,380 from the Urban Resources Partnership of the Natural Resources Conservation Service.

12) Bronx River Forest

The Forestrt Team stabilized 2,800 square feet of steep eroding slope with jute mat assisted by a Youth Employment Program summer crew. This fall, almost 3,000 herbaceous groundcover plants were planted into the jute mat. This project was funded in-house, however future funding for this site will come as part of the Bronx River Bond Act project.

13) Pralls Island

The Forestry Team supplied technical assistance to NRG's Salt Marsh Restoration Team for the forestry and invasive species portions of this habitat enhancement project, funded by the Clean Air/Clean Water Bond Act.

14) AP News Story

In June, the Forestry Team was the feature in a full length Associated Press news article which was picked up by over 432 papers nationwide. The article was well received.

15) Rutgers University

In October, the Forestry Team's work at Inwood Hill Park was showcased as part of a workshop on invasive plants conducted by the Center for Urban restoration Ecology and led by Dr. Stephen Handel of Rutgers University.

16) Twin Fields/ Forest Park

While not specifically a forestry project, the Team provided substantial assistance to the Twin Fields Kettle Pond Restoration on numerous occasions. Crews assisted with mass plantings of herbaceous wetland plants, and helped correct a substantial drainage problem.

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Management Discussion of Major Projects

While the Forestry Team worked on 13 different projects during the course of the year, the majority of the projects were at 3 locations. The following is a summary of these projects.

Alley Pond Park

This park is unique in that it is one of the only glacial kettle moraine ecosystem remnants left in the City. The Bond Act project for this park was designed to protect this valuable natural resource. As mentioned previously, the construction phase of the Bond Act was completed during this past year. The fence that was installed provides a psychological barrier to pedestrians and bicyclists and directs them off of the sensitive slopes surrounding the kettle ponds. This fence, in conjunction with the erosion control fabric that was installed, will aid in reducing sediment loads into the ponds and help improve the water quality of Alley Creek. Ultimately, however, it is the newly planted tree, shrub and herbaceous layers that will provide the long-term soil stabilization for these slopes. This project was funded by the New York State Clean Water/ Clean Air Bond Act for $550,000.

Aside form the Bond Act work, we have been active in restoring other areas of the Park as well. This restoration often involves the control of invasive exotic plant species. During the year 2001 we were able restore over three acres of land that had previously been entirely dominated by the invasive species multiflora rose (*Rosa multiflora*). We accomplished this by completely removong the offending species and replacing it with a variety of the appropriate native trees and shrubs. We were also able to rehabilitate several areas that had been damaged due to pedestrian and bicycle access. In these cases log cribbing was installed on the severely eroded paths and topsoil was added to provide a rooting medium for the plants that we placed there. The Team is active in maintaining a number of previous restorations. This often takes the form of patrolling for and treating satellite populations of invasive species, such as Asiatic bittersweet (*Celastrus orbiculatus*), glossy buckthorn (*Rhamnus frangula*), Norway maple (*Acer platanoides*) and Japanese honeysuckle (*Lonicera japonica*). Finally, it should be mentioned that these projects would not have had as great of an impact without the support of the local communities. We have worked with several groups who have aided us in our restoration efforts and who consistently applaud our efforts. Their continued support is vital to the success of our work on the park.

North Manhattan Parks

The Forestry Team spent a considerable amount of time on invasive plant removal, sweeps for invasive weeds in areas to be planted, and in maintenance of areas planted in previous years. Resprouting porcelainberry (*Ampelopsis brevipedunculata*) became a nuisance in some of the previously cleared areas and several days were devoted to the removal of this very hardy and fast growing weed. We also began clearing the last large section of invasives on the highest ridge of the park. This two acre site, typical of many of the Park's more degraded sites, is predominantly Amur honeysuckle (*Lonicera mackii*), porcelainberry, and White Mulberry (*Morus alba*). We will continue to clear this section through winter of 2001/2002 and begin planting in spring 2002. In addition, substantial effort was expended spot treating satellite populations of Norway (*Acer platanoides*) and Sycamore Maples (*Acer psuedoplatanus*) throughout the park. The maples, by blocking any further regeneration under their dense canopies, cause

highly accelerated erosion. While most of the large seed bearing trees within the park have been removed, some still remain, and periodic sweeps are necessary to keep them from causing further damage to the Park's ecology. Several days were also spent working in Ft. Tryon Park clearing several eroded slopes of invasive maples.

Over the summer, members of the Parks Conservation Corps assisted the Forestry Team in installing 2,500 square feet of jute matting along an eroding slope above the salt marsh. In the fall, The Team, in conjunction with a Parks Americorps crew, installed nearly 5,000 square feet of jute mat on a heavily eroded slopes and on the margins of several of the park's paths. In all, we installed 14,714 native wildflower and grass plugs.

A ten year high total of 9,949 2-3' containerized trees and shrubs were planted as part of these erosion control, habitat enhancement, and ecosystem restoration projects. Funding included $200,000 from the National Fish and Wildlife Foundation and $700,000 from the Clean Water/ Clean Air Bond Act. A $360,000 grant from the NYS Department of Environmental Conservation has been awarded, but the contract has not yet been signed.

The capital portion of the Bond Act project completed the design phase, and construction was successfully bid out. The work will involve hydroseeding a large, steep, eroded slope in Inwood with native grasses and groundcover plants. A state of the art bioengineering demonstration project will be constructed in Riverside Park, along with interpretive signage. Construction will begin in Spring 2002, pending successful contract registration.

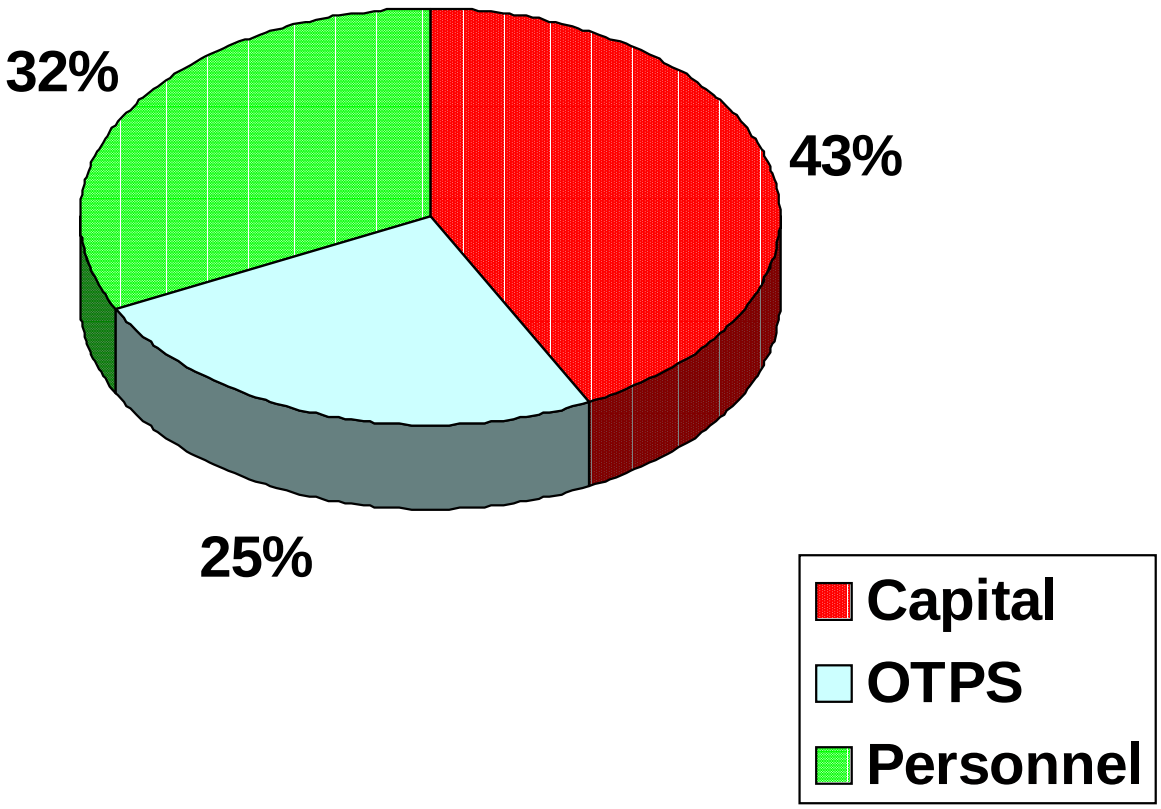
Bronx River

The Forestry Team worked on 3 projects along the Bronx River this year. As part of a major bridge reconstruction project, MTA Metro-North railroad donated $40,000 in materials to stabilize and restore a section of the river adjacent to the Woodlawn station. To date, all materials have been received, but the work will not be complete until next year. We have stabilized 900 feet of streambank, and treated half an acre of invasive vines and shrubs.

As a kick start to the upcoming Bronx River Bond Act project, the Team stabilized 2,800 square feet of eroding slope just north of Kazimirov Boulevard. Foresters planted 3000 native herbaceous groundcover plants through the jute mat on this slope. Funding was mostly in-house, and some overrun from other projects. Additional slope stabilization will occur in 2002.

The majority of the work on the River was for the NOAA Shoelace grant. This grant supports the stabilization of almost one mile of eroding streambank along the "shoelace" section of the River. A small capital project constructed several boulder veins from the shoreline out into the river. These will reshape the channel, moving the deepest, fastest, and most erosive currents away from the shore and into the middle of the channel. A total of 4,400 linear feet of coir log were installed along 2,960 linear feet of the east bank to protect the bank from further erosion, and to provide a rooting matrix for the more than 5,000 wetland plants which were planted. Additionally, several thousand square feet of coir mat were installed along the top of the banks to protect disturbed areas, 1,500 native trees and shrubs were planted, and 675 square feet of prevegetated coir mat were installed. Work on this project, funded by NOAA with $190,920 from Bronx congressman Jose E. Serrano, will continue through 2002.

Forestry Team Grant Budget Detail



Ten of the 13 projects that the Forestry Team managed during calendar year 2001 were solely grant funded. These grants typically contain very specific conditions as to what, where, or how a project is to be accomplished. Of the $2,656,111 total, $1,130,697 (43%) is contractually obligated to be spent on capital construction work. A total of $672,414 (25%) has or will be spent on Other Than Personnel Services (OTPS) over the lives of the grants. This leaves $853,000 (32%) available for personnel salaries for the duration of the grants. The current average duration of Forestry Team managed grants is 1.8 years.

Grants managed by the Forestry Team during calendar 2001 were: 1996 Clean Water/Clean Air Bond Act: Seton Falls, Alley Kettle, North Manhattan Parks; National Fish and Wildlife Foundation - Hudson River Parks, NOAA - Bronx River Shoelace, Urban Resources Partnership - Seton Falls, NYS DEC 319 funds - Inwood Hill Park, Metro-North mitigation - Woodlawn, and Hudson River Improvement Fund - interpretive signage.

Notes:

1. Summary of Significant Accounting Policies

Joint Ventures - Where NRG supplies all the plant material, all plants planted are credited to NRG. Where others provide some or all of the plants, NRG reports only those planted by NRG staff.

Planting - a tree is counted as "planted" only when utilized at the site for which it was purchased.

Grants - In this report, grants are carried at full value until they expire. The differing City, State, and Federal fiscal years, coupled with lags in reporting from the various purchasing, vouchering and payment systems of the City make it difficult to precisely determine the grant value at any precise moment in time.

A grant is considered a Forestry Team grant if over 65% of the project (including field work, scoping, design, construction supervision, materials, salaries) is conducted by Forestry Team staff.

Area Reporting - Many areas require multiple treatments of the same square footage. The treated area of these retreatments is reported as a separate category in monthly reports and is not included here. Retreatments are not included in any category other than the "Initial Treatment" the first time the area is treated.

Measurement - The reported linear footage or square footage of material such as cribbing or biologs installed may at times exceed the linear feet listed as treated. These products are often installed in multiple layers over the same area.

2. Safe Harbor Statement

Forest Restoration, as with any natural resource business, is subject to significant variations in funding and production. Impacts due to drought, flood, fire, insects and disease and vandalism can and do occur. Operations can be impacted by changes in funding, administration, regulation, or policy from any agency of several levels of government. Every effort is made to minimize these impacts throughout the planning, implementation, and follow-up processes.

3. History and Significant Competitors

Prior to 1990, forest restoration was performed partly by an NRG team, and partly on a park by park basis by individual districts. A substantial private grant in 1991 created forest restoration crews in each borough, which planted 170,000 trees and treated over 600 acres for invasive plants. This funding ran out in 1996. A skeleton crew was kept on in 1997 through private grants, performing mostly research and maintenance. The current Forestry Team was created with a combination of State, Federal, City, and private funds in 1998. Current funding focuses on three boroughs, although projects have occurred in all five boroughs as resources allow. There are currently three other groups performing forest restoration work, but all are limited by design to their respective park districts.

NRG Forestry Team Sponsors

State of New York, Department of State
Randy, A. Daniels, Secretary of State

National Fish and Wildlife Foundation
John Berry, Executive Director

New York/ New Jersey Harbor Estuary Program
Robert Nyman, Director

City Parks Foundation
David Rivel, Executive Director

City of New York Parks and Recreation
Natural Resources Group
Adrian Benepe, Commissioner
Michael J. Feller, Deputy Chief

City of New York
Michael R. Bloomberg, Mayor
Gifford Miller, Speaker

State of New York
Department of Environmental Conservation
Erin M. Crotty, Commissioner

MTA Metro- North Railroad
Peter Cannito, President

Natural Resources Conservation Service
Pearlie S Reed, Chief

National Oceanic and Atmospheric Administration
Vice Admiral Conrad C. Lautenbacher, Jr., USN (Ret.),
NOAA Administrator

Hudson River Foundation
Edward A. Ames, Chairman

Forest Restoration: 1997-2001, Summary of Operations

	2001	2000	1999	1998	1997
Trees and Shrubs Planted	18,237	11,241	6,410	2,141	232
Bareroot Trees Planted	1,750	5,125	100	0	0
Bareroot Trees Potted	8,575	5,900	1,200	0	0
Herbaceous Planted	33,753	14,549	6,456	1,034	0
Number of Species Planted	91	59	34	26	18
Volunteer Events	20	18	8	5	3
Employees	9	9	4	2	2
Acres Restored	12.8	12.1	6.5	2.8	3.2
Acres Maintained	44	38	22	9	11
Number of Projects	13	12	7	5	3
Grants Outstanding	$2,656,111	$2,061,013	$745,000	$225,000	$180,000

APEC Nursery

Greenbelt Nursery


Cement Plant Nursery


Main Office - Arsenal North

Field Office - Fort Totten


Field Office - Inwood

Complete List of all Woody and Herbaceous Species Planted During Calendar Year 2001

Ferns Planted

Christmas fern (*Polystichum acrostichoides*)
Cinnamon fern (*Osmunda Cinamonea*)
Hay-Scented fern (*Dennstaedtia punctilobula*)
Lady fern (*Athryium felix-femina*)
Marginal wood fern (*Dryopteris marginalis*)
New York fern (*Thelypteris noveboracensis*)
Royal fern (*Osmunda regalis*)
Sensitive fern (*Onoclea sensibilis*)

Herbaceous Species Planted

Appalacian sedge (*Carex appalachica*)
Avens (*Geum canadense*)
Black bulrush (*Scirpus atrovirens*)
Blue stemmed goldenrod (*Solidago caesia*)
Cardinal flower (*Lobelia cardinalis*)
Crinkled sedge (*Carex crinita*)
False Solomon's seal (*Polygonatum multiflorum*)
Flattened sedge (*Danthonia compressa*)
Fox sedge (*Carex vulpinoidea*)
Greene's rush (*Juncus greenei*)
Heart leaf aster (*Astrer cordifolia*)
Hollow stemmed joe-pye weed (*Eupatorium fistulosum*)
Hyssop-leaved boneset (*Eupatorium hyssopifolium*)
Joe pye-weed (*Monarda fistulosum*)
Junegrass (*Danthonia spicata*)
New York ironweed (*Veronica noveboracensis*)
Path rush (*Juncus tenuis*)
Pennsylvania sedge (*Carex pensylvanica*)
Riverbank wild rye (*Elymus riparius*)
Rough -stemmed goldenrod (*Solidago rugosa*)
Sedge (*Carex lurida*)
Smooth aster (*Aster laevis*)
Soft rush (*Juncus effusis*)
Solomon's seal (*Smilacina racemosa*)
Switchgrass (*Panicum virgatum*)
Thicket sedge (*Carex abscondita*)
Viginia creeper (*Parthenocissus quinquefolia*)
White snakeroot (*Eupatorium rugosum*)
White wood aster (*Aster divaricatus*)
Woodrush (*Luzula multiflora*)
Woolgrass (*Scirpus cyperinus*)

City of New York
Parks & Recreation
Natural Resources Group
Michael R. Bloomberg, Mayor
Adrian Benepe, Commissioner
Michael J. Feller, Deputy Chief

Tree & Shrub Species Planted

American sycamore (*Platanus occidentalis*)
Arrowwood viburnum (*Viburnum dentatum*)
Bitternut hickory (*Carya cordiformis*)
Black birch (*Betula lenta*)
Black cherry *(Prunus serotina)*
Black gum *(Nyssa sylvatica)*
Black oak (*Quercus velutina*)
Black walnut (*Juglans nigra*)
Boxelder (*Acer negundo*)
Chestnut oak (*Quercus prinus*)
Chokeberry (*Aronia arbutifolia*)
Cottonwood (*Populus deltoides*)
Eastern hornbeam (*Carpinus caroliniana*)
Eastern red cedar (*Juniperis virginiana*)
Eastern redbud (*Cercis canadensis*)
Elderberry (*Sambucus canadensis*)
Flowering dogwood (*Cornus florida*)
Green ash (*Fraxinus pensylvanica*)
Grey-twig dogwood (*Cornus racemosa*)
Hackberry (*Celtis occidentalis*)
Highbush blueberry *(Vaccinium corymbosum)*
Hophornbeam (*Ostrya virginiana)*
Inkberry (*Ilex glabra*)
Lowbush blueberry (*Vaccinium angustifolium*)
Maple-leaved viburnum (*Viburnum acerfolium*)
Mountian laurel (*Kalmia latifolia*)
New Jersey tea (*Ceanothus americanus*)
Northern red oak (*Quercus rubra*)
Persimmon (*Diospyros virginiana*)
Pin oak (*Quercus palustris*)
Pinkster azalea *(Rhododendron peryclimenoides)*
(*Quercus x heterophylla*)
(*Quercus x schociana*)
Red maple (*Acer rubrum*)
Red- osier dogwood *(Cornus sericea)*
River birch (*Betula nigra*)
Sassafras (*Sasafrass albidum*)
Serviceberry (*Amelanchier canadensis*)
Shagbark hickory (*Carya ovata*)
Silky dogwood (*Cornus amomum*)
Silver maple (*Acer saccharinum*)
Spicebush (*Lindera benzoin*)
Sugar maple (*Acer saccharum*)
Swamp white oak (*Quercus bicolor*)
Sweet pepperbush (*Clethera alnifolia*)
Sweetgum (*Liquidamber stryaciflua*)
Tulip poplar (*Liriodendron tulipifera*)
White ash (*Fraxinus americana)*
White oak (*Quercus alba*)
Willow (*Salix spp.)*
Winterberry (*Ilex verticillata*)
Witchhazel (*Hamemilis virginiana*)

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