



City of New York
Parks & Recreation

Michael R. Bloomberg, Mayor
Adrian Benepe, Commissioner

2003 Annual Report
Natural Resources Group
Forest Restoration Team



City of New York
Parks & Recreation

The Arsenal
Central Park
New York, NY 10021

Dear Friends and Partners,

It is my pleasure to offer this report to you and to acknowledge the hard work and dedication of the Forest Restoration Team, part of Parks & Recreation's Natural Resources Group (NRG).

This report chronicles not only the 2003 accomplishments of NRG's Forest Restoration Team, but also presents highlights of the past fifteen years of forest restoration in Parks. Performed with the help of numerous public and private partners, these restoration efforts have made an enormous contribution to the health and sustainability of over 5,000 acres of forested parkland.

When I was appointed as NRG's Director in 1984, I never imagined that I would ultimately oversee the planting of the 250,000th tree in a Parks Department natural area. I look forward to the years ahead as Parks & Recreation partners with all of you to protect, preserve, and restore the forests of New York City.

Sincerely,

Adrian Benepe
Commissioner

Dear Stakeholder,

The City of New York Parks & Recreation Natural Resources Group (NRG) Forest Restoration Team (the Team) had another exciting and productive year in 2003. Despite declines in both staff and grant funding, we were able to make significant progress on all our projects, while maintaining our commitment to sustaining the region's biodiversity, utilizing 79 plant species. This year's plantings pushed the citywide forest restoration planting total to over 250,000 trees. For 2003, we planted a total of 14,962 trees and shrubs, along with 29,135 herbaceous plants.

Total grant funds outstanding were \$2,212,000 at year end, including City match. Five additional grants were awarded in 2003, totaling \$457,000. The Team is working on 11 projects, inclusive of joint ventures, and is very thankful for the support of its many partners and funders.

Parks has jurisdiction over and manages more than 28,000 acres of land, of which over 5,000 acres (18%) are forest. The Team's primary responsibility is the stewardship, protection, and restoration of these forested lands. While it is difficult to quantify everything the Team has accomplished this year in fulfillment of its mission, there are several areas where the Team has excelled.

Invasive Plant Control

Protecting the City's forests from invasive non-native plants is at the heart of most of the Team's work. Of the many threats to the City's forests, invasive plants are perhaps the most damaging. Some species, such as porcelainberry (*Ampelopsis brevipedunculata*) can grow up to twenty feet a year, rapidly engulfing, and eventually killing large mature trees. Other species, like Japanese honeysuckle (*Lonicera japonica*), smother tree seedlings, preventing the forest from renewing itself. Using a variety of treatment types and intensities, the Team this year removed invasive plants from over 100 acres of forest. While performing these treatments, members of the Queens crew discovered an oriental bittersweet (*Celastrus orbiculatus*) vine with a diameter of 6.7 inches, very likely the largest ever found in New York State.

NRG Forestry: Year 2003 in Review

	2003	2002	% Change
Trees and Shrubs Planted (containers, B&B)	14,962	19,529	-23.40%
Herbaceous Planted	29,135	38,954	-25.20%
Erosion Control (sq. ft.)	28,798	27,220	5.80%
Plants Potted	12,820	7,922	61.80%
Acres Restored	31.2	34.4	-9.30%
Acres Maintained	40	41	-2.50%
Outstanding Grants (\$, year end)	2,212,000	2,403,836	-8%
Number of Projects	11	14	-21.40%
Number of Volunteer Events	29	24	20.80%
Number of Volunteers	414	276	50%
Number of Employees (year end)	9	11	-18%

Planting

After invasive removal, planting is the most important aspect of the Team's work. Plants provide both the structure and function necessary to accomplish the goals of habitat enhancement, erosion control, non-point source pollution reduction, biodiversity, and sustainability. We planted fewer trees and shrubs this year, due primarily to a decrease in the acreage and number of sites ready for planting as well as the availability of funds for plant material. The Forestry Team planted 14,962 trees and shrubs, and 800 bareroot tree seedlings. We decreased our plantings of herbaceous material as well, to 29,135 plants, a 25.2% decline from last year. Altogether, we planted 79 species of plants this year, which, while 26 fewer than last year, is still significantly more than many other restoration programs, and a testament to Parks' commitment to sustaining the region's biodiversity.

Research

Ecosystem restoration, a growing and dynamic field, presents many opportunities for research. While research is not the Team's primary focus, studying our past work allows us to improve our techniques, and enhance our future success. Recognizing the importance of existing inventory data, the Team began a multi-year project to convert and digitize NRG vegetation inventories conducted in 1986 through 1990. These surveys form the basis for many of our current projects and management strategies. With assistance from NRG's GIS lab, the inventory maps are being digitized as well, to enhance the usefulness of the data. The Team also completed its fifth year of research into the revegetation of fill sites, specifically at Givans Creek Woods in the Bronx. Results are applicable to thousands of acres of land throughout the City.

Stewardship

The Team made great strides this year to increase community-based stewardship of Park's natural areas. Four hundred fourteen volunteers participated in 29 Team-sponsored events throughout the year. This initiative, while stretching our available resources, went a long way toward mitigating the loss of several full time staff positions. Additionally, NRG began what we hope is a long term collaboration with Partnerships for Parks, a joint initiative of Parks and the City Parks Foundation. The Natural Areas Stewardship Initiative will encourage greater public participation in the stewardship of the City's natural areas, and ultimately train a cadre of Citizen Stewards in the care and management of these sites.

A quarter of a million trees! The number boggles the mind. In the 15 years since forest restoration began in New York City Parks, a long and distinguished succession of programs has planted a combined 250,000 trees in the forests of New York City. Few other programs in other cities come close. As the proud inheritors of this legacy, NRG's Forest Restoration Team will work tirelessly to preserve, protect, and restore the City's forests in the years to come. In the 15 years since Parks began restoring its forests, almost 1,000 acres of Parks' forests have been treated, improved, or restored through the support and generosity of numerous funders. This represents only 19% of Parks' forested lands, and about a third of the acreage that needs restoring. Repeated droughts, disease, insect outbreaks, and severe storms have only conspired to increase the acreage requiring stewardship. It is our sincere hope that this applied effort can continue, bringing us ever closer to our vision of a healthy, diverse, self-sustaining forest.

Respectfully submitted,



Timothy J. Wenskus
Senior Forester, Natural Resources Group
May, 2004

1) Fort Tryon/Fort Washington

The Team began work this year on the NYS Environmental Protection Fund project in Fort Tryon and Fort Washington parks in northern Manhattan. This \$132,000 project will stabilize steep eroding slopes and remove non-native invasive plants from 15 acres. We planted 800 bareroot trees in the spring, and over the summer, removed .75 acre of Norway maples. This is the first forest restoration project ever in this section of Fort Washington.

2) Alley Pond Bond Act

The Team planted 4,904 native trees and shrubs in Alley Pond Park, Queens. We also installed 1,200 square feet of erosion control fabric, and planted 2,689 herbaceous groundcover plants to prevent sedimentation into the kettle ponds, the Parks' showcase natural feature. To further protect adjacent slopes throughout the kettle pond area, we extended the log fence constructed in 2001 by 121 linear feet. This work was funded in part by the NYS Clean Water/Clean Air Bond Act.

3) Riverdale Bond Act

The capital construction portion of this \$600,000 NYS Clean Water/Clean Air Bond Act project in the Bronx was completed this Fall. The reconfigured stream channel should allow for a decrease in in-stream velocity and greater infiltration. Continuing the first landscape scale restoration project in the park since the early 1990's, crews treated invasive plants on 4.2 acres of the park. As part of a 24,293 square foot slope stabilization, the Team planted 2,144 trees and shrubs, 12,795 herbaceous plants, and 1,248 pounds of native groundcover seed.

4) Seton Falls Bond Act

This \$550,000 NYS Clean Water/Clean Air Bond Act project neared its completion this year. An additional 5,369 herbaceous plugs were planted in the wetland, and Team members cleared an additional 1.6 acres of invasive plants in the upland portions of the park. In all, 1,124 trees and shrubs were planted.

5) Inwood Non-Point Source

Work continued on this \$360,000 non-point source pollution (sediment) reduction project this year, funded by New York State DEC, through Section 319 of the Federal Clean Water Act. In addition to installing 240 linear feet of coir cribbing, our foresters stabilized a 2,100 square foot gully on the west side of Inwood Hill Park. Several additional gullies will be targeted over the next 18 months. This grant includes a capital project which was bid out for Spring 2004 construction.

6) Cunningham Park

The Team began restoring portions of the forest in the southeast portion of Cunningham Park this year. The initial focus has been on the removal of Norway maple (*Acer platanoides*), and oriental bitter-sweet (*Celastrus orbiculatus*). Over two acres were treated in 2003. A grant for \$10,000 from the New York City Environmental Fund to support Spring and Fall planting is expected to be available in the spring.



1) The steep slopes of Fort Washington Park



2) Newly planted trees at Alley Pond Park



3) Slope stabilization at Riverdale Park



4) Summer youth plant wetland grasses at Seton Falls Park



5) Students planting trees in Inwood Hill Park

7) Cork Tree Study

The Team, in conjunction with the Forest Park Administrator's office, hosted a graduate student from the Yale University School of Forestry and Environmental Studies over the summer. She researched the spread of the invasive Amur cork tree (*Phellodendron amurense*) in Forest Park from 1989 to 2003.

8) Technical Assistance

Beginning in March, the Team began providing technical assistance to the Van Cortlandt/Pelham Bay Park Administrator's office. One day a month, Team members work side by side with VC/PB staff to restore sections of the meadows and forests in the two parks. To date, four sites have been treated.

9) West Farms NOAA

Team members assisted with the final portion of this community based project which expired in October. NRG planted 7,425 square feet of coir mats with *Spartina alterniflora*, and installed them along the banks of the Bronx River at Lafayette Ave., just north of Soundview Park.



7) Global Positioning System (GPS) unit used in the cork tree study

10) Entitation Project

One of the Team's unfunded initiatives has been the salvaging of old inventory data. From 1986-1990, NRG conducted systematic ecological inventories of many of the City's largest natural areas. This process was called Entitation. Rapidly changing technology has left these inventories in danger of being lost or unusable. Existing digital files are being converted to current formats, and where needed, the data is being re-digitized. The associated maps are being digitized as well, and will eventually be linked to the digitized inventory. This project is about 30% complete.

11) Bronx River Bond Act

The Forestry Team continued treating invasive trees and shrubs in sections of the floodplain forest. Staff, working with neighborhood volunteers, stabilized 2,660 square feet of eroding slopes in the surrounding uplands. We planted 2,103 woody and 1,008 herbaceous plants, along with 100 pounds of native groundcover seed. This \$1.7 million Clean Water/Clean Air Bond Act project will go into capital construction in 2004.



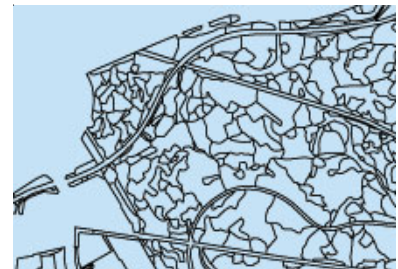
9) Installing coir mats at the Lafayette Ave. site

12) Four Sparrow Marsh

We are restoring the woodland buffer on the edge of this Clean Water/Clean Air Bond Act project in Brooklyn. This work represents approximately 11% of the entire project, and will continue through 2004. Our foresters planted a total of 395 containerized trees and shrubs this year. The final tree and shrub planting, as well as herbaceous planting, will occur in the spring.

13) Natural Areas Stewardship Initiative

In conjunction with Partnerships for Parks, NRG is trying to encourage greater public participation in the stewardship of the City's natural areas through the hosting of volunteer events and the development of Citizen Steward workshops. These workshops focus on both the City's natural areas and some of the finer points of restoration work and natural areas management. The Team has made substantial contributions to program planning and curriculum development. The first workshops will be held in Spring 2004.



10) Portion of digitized entitation map



8) Japanese knotweed along the Bronx River



12) Tree planting at Four Sparrow Marsh

14) Givans Creek Woods

The Team continued its long term research and reforestation work at Givans Creek Woods, the Bronx. Various species and treatments are being tested for survivability and effectiveness on this challenging site. Planted in 1999-2000, this site will be monitored for at least five years. Results of this work may have major implications for future tree planting in the City, as many of the City's remaining available planting sites are on a fill-derived substrate.

15) Nursery

The Team uses thousands of trees and shrubs every year in its plantings. Often, neither sufficient funding nor adequate quantities of stock are available. To partially mitigate these variations, the staff potted a total of 12,820 bareroot trees and shrubs this year, up 62% from last year due primarily to a drastic decline in plant material funding. These plants will be grown at the Team's three field nursery sites. On-hand plant inventory at year end is approximately the same as last year.



14) Planted trees at start of fourth growing season

16) Invasive Plants

The Team treated and removed invasive non-native plants at 14 park properties, focusing on 16 vine and shrub species. The Team performs intense localized eradications at specific sites, as well as landscape scale sweeps of large areas. There are almost 1,000 acres of parkland infested to varying degrees with invasive plant species. As resources become available, the Team hopes to target as many of these areas as possible.

17) Parks Opportunity Program (POP)

As part of the City's Job Opportunity Program Initiative, the Team hired and trained several restoration technicians. Starting in February, several POP participants worked side by side with the Team, four days a week, learning all aspects of forest restoration work. Others worked in the office on various data entry projects. We are grateful to have had the opportunity to train these five seasonal participants, and look forward to additional opportunities in the future.



15) Trees at the Alley Pond nursery

18) Professional Outreach

Team members lectured and presented at many different venues throughout the year. Conference and poster presentations included the 23rd ESRI International User Conference, the Urban Ecology Collaborative, the New England Invasive Plant Summit, a delegation from the Tongass National Forest, the U.S. Forest Service, the Seton Falls Preservation Coalition luncheon, and the Queens County Bird Club. University presentations included classes at Columbia University and the University of Pennsylvania.

19) Donation

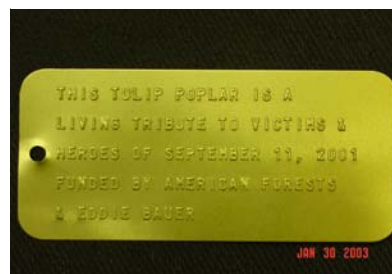
In partnership with Parks' Central Forestry division, the Team received 400 large trees generously donated by Eddie Bauer and American Forests as a living memorial to 9/11. These trees were planted this spring, in a number of parks, including Inwood, Alley Pond, Bronx River and Riverdale. The Team is grateful for the donation of these trees.



16) New York State's largest oriental bittersweet.



17) POP participant installing erosion fabric



19) Tag from donated tree

15 Years of Forest Restoration in Pictures



Site shortly after planting



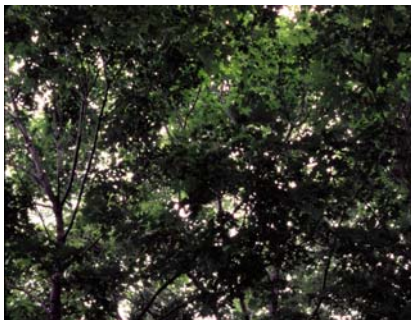
The site in 1993



Long-eared owl (*Asio otus*)

Rodman's Neck - Pelham Bay Park, Bronx

A 2.5 acre oldfield in the northeastern section of Rodman's Neck was an unmowed field. In 1989, the Van Cortlandt/ Pelham Bay Administrator's office decided to plant this meadow, surrounded on 3 sides by forest, to reduce the fragmentation of the Park's forest. Several hundred Eastern white pine (*Pinus strobus*) were planted to quickly reforest the site, and act as a nurse crop for the slower growing hardwood species surrounding the site. The site was weeded annually for invasive non-native vines. By 2003, the sweetgum (*Liquidamber styraciflua*) saplings had matched the height of the pines, and began to provide important habitat for forest wildlife such as owls.



Norway maple canopy in 1991



Site shortly after planting in 1992



The site in 1996

Unit 117A - Inwood Hill Park, Manhattan

This site had been overrun by invasive Norway maple (*Acer platanoides*), which had killed the entire native groundcover layer and suppressed all the native tree regeneration. The maples were moving into the Clove, Inwood Hill's most precious natural area. This species was gradually and selectively removed over a period of 6 years by UFEP staff. Tulip poplar (*Liriodendron tulipifera*) trees were planted, which today are four inches in diameter, and reach 30 feet tall. NRG's Forest Restoration Team recently planted a shrub layer beneath these trees.



Dense vineland prior to restoration



Site in 1997, 2 years after planting



Closed canopy, summer 2003

Unit 107 - Alley Pond Park, Queens

This 53 acre site was almost totally infested with non-native invasive vines and shrubs such as multiflora rose (*Rosa multiflora*) and oriental bittersweet (*Celastrus orbiculatus*). The Urban Forest and Education Program (UFEP) began treating the site in 1991, and by the time the project ended in 1996, had treated 14 acres of this unit. NRG's Forest Restoration Team picked up the site in 1998, and to date has restored another 18 acres, planting 27,054 trees and shrubs.



Site during planting



Site in 1996



Site visit in February, 2003

Betsy Site - Pelham Bay Park, Bronx

This 7 acre site was the largest contiguous site restored by UFEP. This section of forest had been completely overrun by porcelainberry (*Ampelopsis brevipedunculata*). Almost no trees were left alive. UFEP foresters cleared the site in stages from 1993-1995, and planted it from 1994-1996, with over 11,000 trees. Maintenance of the site, along with additional planting as needed, has been the responsibility of the Van Cortlandt/Pelham Bay Administrator's office.



Dumped cars in 1990



1996, 2 years after planting



Inspecting the site January, 2004

Southwest Latourette - Latourette Park, Staten Island

For many years, the pristine wilderness of Staten Island was a car dumper's paradise. UFEP removed over 50 cars, and installed bollards, berms, and guardrail to prevent future dumping. Throughout the 1990's, they planted approximately 10,000 trees and shrubs on multiple sites in the area. Over 30 acres in the Park were intensively treated for invasive plants. Protectors of Pine Oak Woods have maintained some of the sites.



During capital construction



Site during planting

Woodland Buffer - Four Sparrow Marsh Preserve, Brooklyn

The woodland buffer adjacent to this salt marsh was used as a dumping ground and dirt bike course prior to its acquisition by Parks. In 2002, as part of a NYS Clean Water/Clean Air Bond Act project, NRG restored the salt marsh. Concurrently, the debris was removed from the woodland buffer, and additional topsoil was added. In spring of 2003, 395 native trees and shrubs were planted by NRG's Forest Restoration Team. In 2004, there will be additional native trees and shrubs planted throughout the woodland.

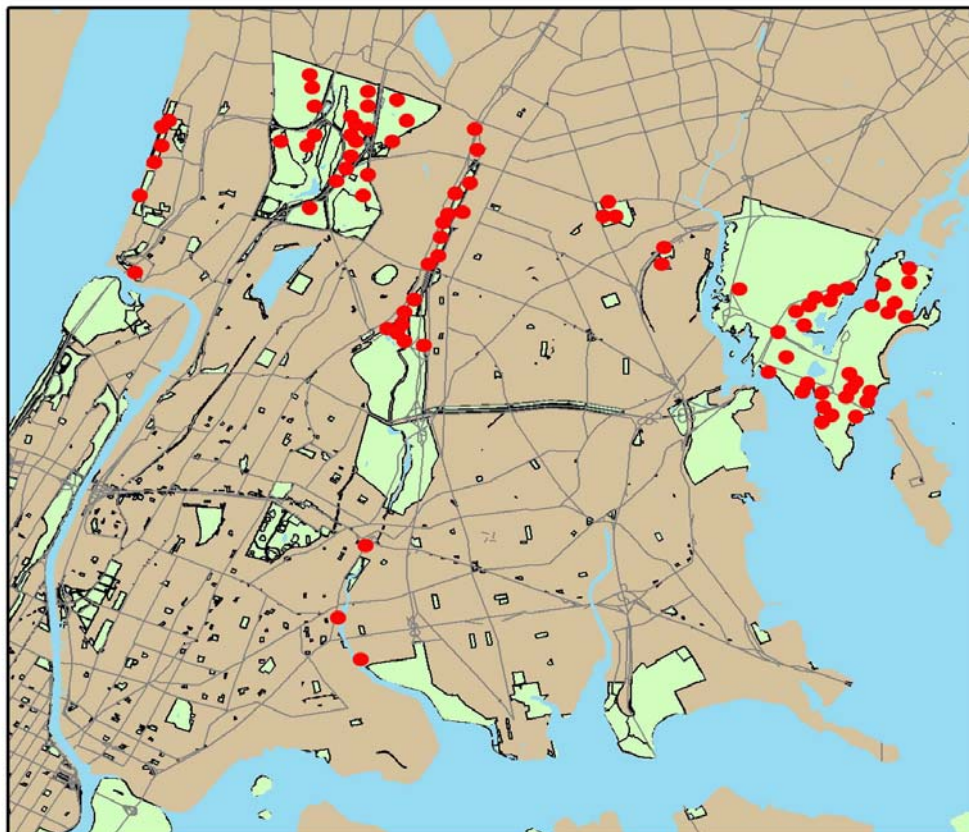
Fifteen Years of Forest

	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>
Trees and Shrubs Planted * (containerized)	911	2,090	3,776	12,823	16,049	18,518	19,306
Bareroot Trees Planted *	0	8,600	206	43,872	21,603	1,300	1,557
Herbaceous Planted *	0	870	2,374	5,803	4,644	0	116
Acres Restored	1.3	4	11	23.4	36.2	43.1	49
Number of Employees (all programs)	7	7	23	27	28	29	24
Restoration Programs **	A,B	A,B	A,B,C	A,C	A,C	A,C,E	A,C,E
Species Planted	28	46	31	62	64	47	51

* Planting associated with capital projects not included.

**Active Programs

- A. Van Cortlandt/ Pelham Bay Administrator's Office
- B. NRG Central Restoration Board/ Adopt-A-Park
- C. Urban Forest and Education Program (UFEP)
- D. NRG Forest Restoration Team
- E. Prospect Park Alliance
- F. Other (Bronx River Alliance, Urban Park Rangers, Forest Park, Greenbelt, etc.)



Bronx - Forest restoration in New York City began in 1989 in Pelham Bay Park in the Bronx. Since restoration began, the Van Cortlandt/Pelham Bay Administrator's office has maintained a near continuous presence in the forest. Other programs restoring forests in the Bronx include UFEP, NRG Central Restoration Board, NRG Forest Restoration Team, Bronx River Restoration, Bronx River Alliance, and Wave Hill.

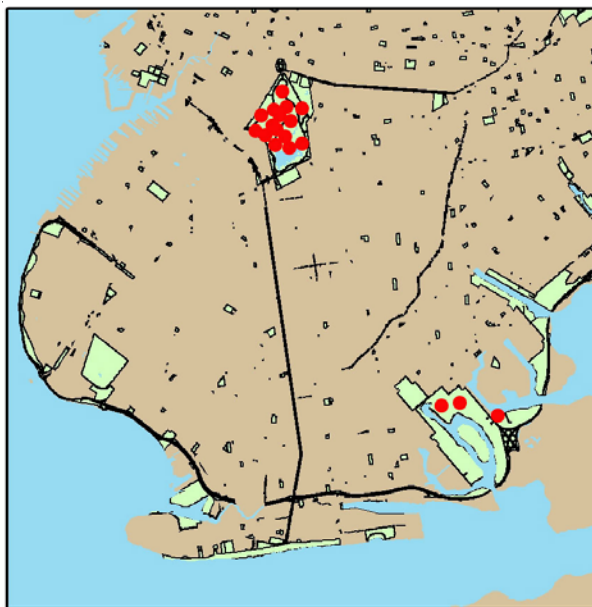
Forest Restoration Sites in the Bronx

Restoration in New York City

<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>TOTAL</u>
11,339	1,332	3,859	7,841	13,026	19,556	21,704	16,705	168,835
94	0	0	100	5,125	1,850	5,484	800	90,591
0	0	1,034	6,462	14,549	35,137	39,606	29,135	139,730
18.7	6.1	6.5	12.8	26	31	34.4	31.2	334.7
19	5	5	7	11	11	15	12	
A,C,E	A,C,E,F	A,D,E,F	A,D,E,F	A,D,E,F	A,D,E,F	A,D,E,F	A,D,E,F	
36	18	26	34	59	91	105	79	

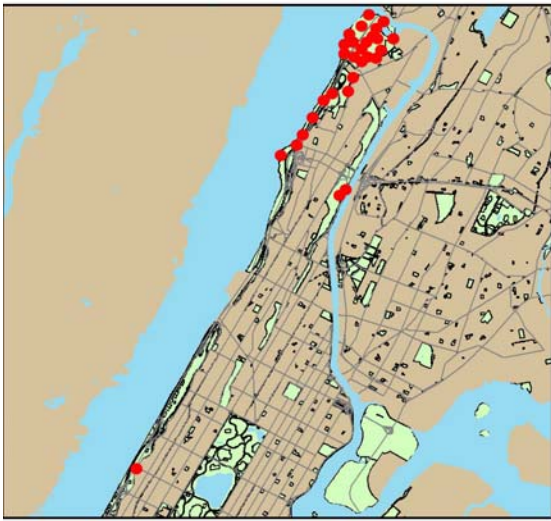
Fifteen Years of Forest Restoration

Funded through a variety of sources, forest restoration projects have occurred in all five Boroughs of New York City. From 1989 to 2003, 334.7 acres of forest were restored, which included the planting of 259,426 trees and shrubs (168,835 containerized and 90,591 bareroot). Following are summaries of forest restoration projects with maps showing locations of the restored sites.



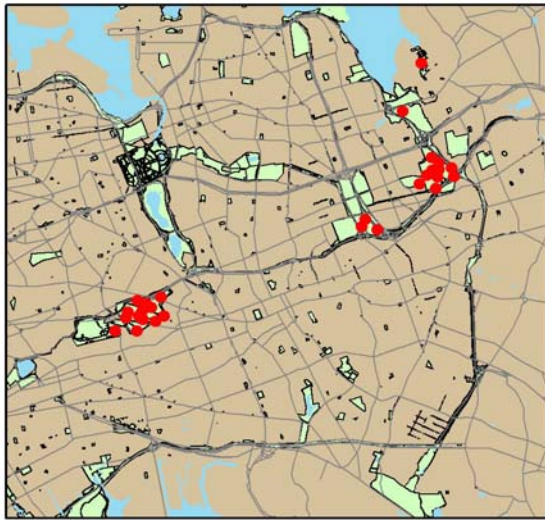
Forest Restoration Sites in Brooklyn

Brooklyn - Most of the forest restoration in Brooklyn has occurred in Prospect Park. Over the years, the Prospect Park Alliance, with 3 years of assistance from UFEP, has planted tens of thousands of trees, shrubs, and herbaceous plants. UFEP also performed work at Marine Park, and NRG's Forest Restoration Team recently began work at Four Sparrow Marsh Preserve.



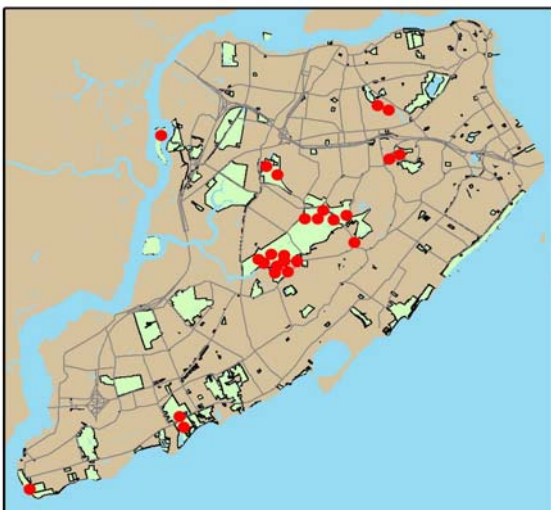
Forest Restoration Sites in Manhattan

Manhattan - The majority of the forest restoration work in Manhattan has been in the northern half of the borough. Inwood Hill Park has had projects by UFEP, the NRG Forest Restoration Team, and the Northern Manhattan Park's Administrator's office. Work has also occurred in Fort Tryon, Fort Washington, Highbridge, and Riverside parks.



Forest Restoration Sites in Queens

Queens - Forest restoration has occurred in many parks in Queens, including Forest Park, Alley Pond Park, Cunningham Park, and Udall's Cove. Programs have included UFEP, NRG Central Restoration Board, NRG Forest Restoration Team, and the Forest Park Administrator's office.



Forest Restoration Sites in Staten Island

Staten Island - The borough with the largest acreage of natural area has had a long history of restoration. UFEP, Protectors of Pine Oak Woods, and the Greenbelt Administrator's office have performed forest restoration work in the borough. Major restoration projects have occurred in Clove Lakes, High Rock, Conference House, Willowbrook, Wolfe's Pond, Northeast and Southwest Latourette Park.

Management Discussion of Major Projects

The NRG Forestry Team performs restoration in more than a dozen locations throughout the City. The bulk of the work, however, is funded for four main project areas, summarized below:

Queens

An additional 5.7 acres of forest in Alley Pond Park were treated in 2003. As part of the \$550,000 Clean Water/Clean Air Bond Act project, due to end in 2004, the Team cleared Oriental bittersweet and multiflora rose from a degraded section of the forest. We planted 4,780 native trees and shrubs to complete the restoration of the site. Maintenance continued as well, to ensure that the sites restored from 1999-2002 remained in good condition. In one location, mountain bikers had adapted to the cedar log fence constructed in 2001 by attempting to create a new trail, which necessitated construction of an additional 110 linear feet of cedar log fence by the crew. Slope stabilization work to protect the Park's vernal and kettle ponds also continued with the installation of 1,200 square feet of jute mat, and the planting of 2,689 herbaceous plugs.

The Team began a restoration project in Cunningham Park this year. As part of a \$10,000 grant from the New York City Environmental Fund, 1.7 acres of Norway maple were treated in the southeast section of the Park. This invasive species has created such a dense canopy, that native plants are not able to survive in the shade beneath it. This significantly effects the water quality in the forest's vernal ponds as well as the habitat for wildlife. Two sites were cleared for spring planting, and additional acreage will be treated in 2004.

Our projects in Queens would not have been possible without the support of several volunteer and community groups. Large groups from Mineola High School, Martin DePorres High School, and New York University provided valuable help with our spring and fall planting. The grow-out station at John Bowne High School graciously supplied several hundred trees for our projects. We were also privileged to have the assistance of the Department's Parks Conservation Corps (PCC) and Ranger Conservation Corps (RCC) crews. Overall, volunteer man-hours on the Team's Queens projects increased by almost 50%.

Bronx

The highlight of the Team's work in the Bronx in 2003 was the construction and restoration of the wetland on the lower reach of Alderbrook in Riverdale Park. In addition to the capital construction of the wetland, we extended last year's planting area by another 1.1 acre, removing invasive plants such as porcelainberry (*Ampelopsis brevipedunculata*), multiflora rose (*Rosa multiflora*), and Japanese knotweed (*Polygonum cuspidatum*), and planting 2,144 trees and shrubs. An additional 2.7 acres were swept to reduce the seed sources of these invasive plants. The Team also cleared Norway maples (*Acer platanoides*) and Sycamore maples (*Acer pseudoplatanus*) from a steep eroding slope adjacent to the brook, and installed over half an acre (24,293 square feet) of erosion control fabric. 12,795 herbaceous plugs and 1,248 pounds of native groundcover seed completed the slope stabilization. A \$600,000 Clean Water/Clean Air Bond Act grant funded this restoration. Wave Hill Forest Program staff, as well as community volunteers, helped the Team throughout the year.

At Seton Falls Park, there were additional plantings of herbaceous plants, both in the recently constructed wetland, and on adjacent slopes. We swept 3.6 acres of the forest for invasive plants such as Norway maple, porcelainberry, and smooth buckthorn (*Rhamnus frangula*). Two additional sections of forest, totalling 0.25 acres, were treated to remove Japanese honeysuckle (*Lonicera japonica*). These sites were planted with 1,124 native trees and shrubs. This work was funded by a \$550,000 grant from the Clean Water/Clean Air Bond Act.

A new initiative this year was a collaboration with the Van Cortland/ Pelham Bay Park Administrator's office. One day a month, the Forestry Team worked side by side with VC/PB staff to restore sections of their parks. The butterfly meadow on Vault Hill in Van Cortland Park, and two sections of Hunter Island in Pelham Bay Park were treated to remove invasive plants, and preserve rare plant communities.

The Team also spent two days in Spuyten Duyvil Park, in the westernmost section of the Bronx. This Park has had little in the way of natural areas maintenance, and had become invaded by Porcelainberry and Oriental bittersweet. The Teams' work was aimed primarily at saving the trees from strangulation, and reducing the seed source of the two species. NRG applied for a grant to fund a more thorough treatment of the Park's forests.

Bronx River

As part of the \$1.7 million Clean Water/Clean Air Bond Act project along the Bronx River, the Team began a major sweep for non-native invasive plants. Throughout the entire project area, Amur cork tree (*Phellodendron amurense*), shrub honeysuckle (*Lonicera mackii*), and Oriental bittersweet were treated. The Team, early in the project design, identified Amur cork as a major potential colonizer of sites to be disturbed during the 2004 construction. Approximately 8 acres of forest were treated in 2003, focusing mostly on seed bearing individuals, with the ultimate goal of extirpating the species from the floodplain. Seed sources of the other species were treated as well.

The Team has been slowly treating and restoring several acres of upland slopes bordering and surrounding the Bond Act site for a number of years. This spring, with help from Neighborhood Initiatives Development Corporation volunteers, we planted 440 trees and shrubs, all in areas which will remain undisturbed during this summer's construction. This planting has all but completed the work begun on these sites in the summer of 1999.

Additionally, the Team intensively treated a half acre area between the Bond Act site and the MTA Metro-North Railroad. Invasive non-native shrub honeysuckle, planted along the right-of-way as erosion control, was invading the forest, shading out the native groundcover plants and native tree seedlings, and providing an arbor for Oriental bittersweet and porcelainberry. We elected, in this instance, to remove all the invasives from the site at once, stabilize the slopes with 4,700 square feet of jute mat, and plant. In addition to 1,008 herbaceous plants for erosion control, the Team planted 100 pounds of native groundcover seed, and 1,797 containerized trees and shrubs. Of this total, 122 were large 6-8 foot tall trees donated by American Forests and Eddie Bauer.

Throughout the year, the Team partnered with the Bronx River Alliance to manage the forest for the benefit of both wildlife and Park patrons. Joint ventures included hazard tree removal, invasive species control, and placement of large woody debris for habitat.

North Manhattan

Inwood Hill Park remained a major focus in North Manhattan. The crew continued removing invasive species from Inwood, Riverside, Fort Tryon, and Fort Washington Parks, intensively treating and restoring over 10 acres of forest. These sites were all subsequently planted with appropriate native species.

The Team also continued work on the New York State DEC \$360,000 non-point source sediment reduction project this year, funded through Section 319 of the federal Clean Water Act. Team members installed 240 linear feet of 6-inch pre-vegetated coir logs, and 500 square feet of jute mat to stabilize steep eroding slopes. Throughout the project area, the Team planted 4,640 trees and shrubs, and 6,200 herbaceous plants. This grant also includes a capital project in Inwood which was finally bid and awarded for summer 2004 construction.

The Team began work on the Fort Tryon/Fort Washington project this year. Funded for \$132,000 by the DEC through the Environmental Protection Fund, this project will reduce non-point source erosion and sedimentation into the Hudson River by stabilizing and vegetating steep eroded slopes in Fort Tryon and Fort Washington Parks. The work this year consisted mostly of removing invasive non-native Norway maple (*Acer platanoides*) and sycamore maple (*Acer pseudoplatanus*) from 2 1/2 acres in the two parks. These species are notorious for creating dense shade beneath their canopy, that inhibits the germination and growth of almost all other plants. Hopefully, these removals will create conditions suitable for native plants to come in on their own. On these steep slopes, the Team planted 493 trees and shrubs, and 99 herbaceous plants, with the expectation that more planting will follow in 2004. Some of the project sites in Fort Washington Park have extremely limited access, so work on this project may be a bit slow.

The final work on the North Manhattan Bond Act site in Riverside Park was completed early this year. One hundred forty-five square feet of additional jute mat, and 120 linear feet of coir logs were installed at the site. An additional 639 herbaceous plants were planted to replenish two areas of the site where initial plant survival was low.

Volunteers from Columbia University, New York Cares, the High School for Environmental Studies, and the Mayor's Office participated in numerous planting events throughout the year. A significant amount of the plant material for these plantings was provided by the Greenacre Foundation, through the North Manhattan Parks Administrator's Office, supplemented by trees and shrubs from the Team's nurseries.

Supplemental Information

Comparison to Previous Years

2003 compared to 2002

Plant numbers were down, due primarily to the decreased availability of plant money and prepared planting sites. Grant funds outstanding at year end are down 8% to \$2,212,000 from \$2,403,836 in 2002, reflecting the expiration of 2 grants. The average life of the remaining grants is up slightly, to 1.4 years from 1.3 in 2002, however three large multi-year grants are nearing their expiration dates.

Outlook for 2004

Plant numbers may decline in 2004 as the funding available for the purchase of plant material have declined drastically due to grant expirations. \$1,500,000 in grants are due to expire in 2004, exclusive of extensions, with the funding weighted heavily toward Capital expenditures. A significant amount of Personal Services (PS) money is included as well.

Grants

2003 Grants Under Management

1996 Clean Water/Clean Air Bond Act: Alley Kettle, Riverdale, Seton Falls; NYS Environmental Protection Fund: Fort Tryon/Fort Washington; Inwood 319.

Other 2003 Projects, Including Grant Funded Joint Ventures

1996 Clean Water/Clean Air Bond Act : Bronx River, Four Sparrow Marsh; and Givans Creek.

Grants Expiring in 2003

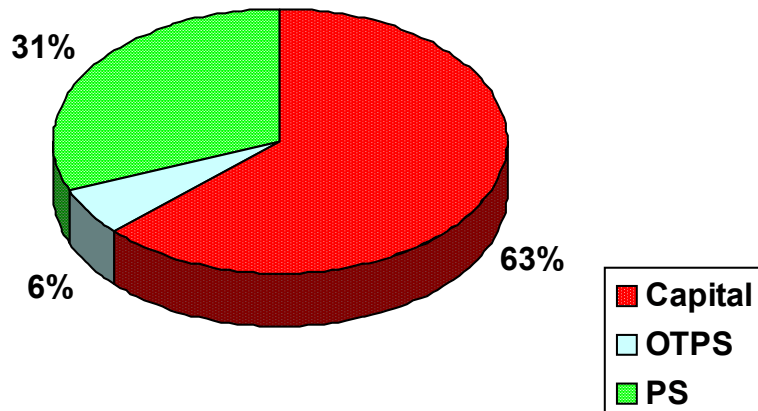
1996 Clean Water/Clean Air Bond Act Northern Manhattan Parks, NOAA West Farms.

New Grants Awarded in 2003

New York City Environmental Fund: Cunningham Park; NYS Environmental Protection Fund: Riverdale Park, Bronx River Water-front Enhancement, Highbridge mapping.

Budget

At year end, the Team's outstanding grant total stood at \$2,212,000. Of this total, 31% (\$690,900) goes toward Personnel Services (PS). Sixty-three percent (\$1,395,000) is contractually obligated to be spent on capital construction work. This leaves 6% (\$126,100) for Other Than Personnel Services (OTPS). These are the funds which are available for the purchase of plants, erosion control materials, and equipment.



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 and installed in the ground at the site for which it was purchased.

Grants - In this report, grants are carried at full value until they expire. 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. Projects where the Forestry Team contributes less than 65% are so identified.

Area Reporting - Many areas require multiple treatments of the same square footage. The 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. The numbers for "Acres Restored", including prior years, have been restated to reflect the current definition of "restored" as reported to the Mayor's Office.

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

Acres Maintained - Many restored sites require periodic maintenance, ranging in frequency from 3X/year for recently planted sites to 1X/ every other year for sites planted more than 5 years ago. This usually takes the form of weeding, though, on occasion, additional planting is required. Many funders fail to provide for this work.

2. History

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, who planted 170,000 trees and treated over 600 acres for invasive plants. This funding ran out in 1996. A small crew was kept on in 1997 through private grants, performing mostly research and maintenance. The current Forestry Team was created with a combination of City, State, Federal, 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 around the City, in their respective park districts.

3. Joint Venture Projects

The following are projects in which the Forestry Team participated during the 2002 calendar year, but did not assume the lead role, or account for more than 65% of the project work:

Bronx River Bond Act 17% share

Four Sparrow Marsh Bond Act 11% share

For the above projects, only treatments and plantings performed by Forestry Team staff are included in this report.

4. Maintenance

Each acre planted represents a significant investment by the funder. Restoration sites need to be swept for recurrences of invasive plants, especially vines. The Team sweeps planted sites annually for the first 2 years, and at 18-month intervals until the tree canopy closes, usually 5-7 years after planting. Funders often do not provide for this crucial aftercare, but the Team continues to take care of restored areas to the best of its ability.

5. Invasive Species Treated

Norway maple (*Acer platanoides*), sycamore maple (*Acer pseudoplatanus*), ailanthus (*Ailanthus altissima*), garlic mustard (*Alliaria petiolata*), porcelainberry (*Ampelopsis brevipedunculata*), mugwort (*Artemisia vulgaris*), oriental bittersweet (*Celastrus orbiculatus*), black swallow-wort (*Cynanchum nigrum*), Japanese honeysuckle (*Lonicera japonica*), various shrub honeysuckles (*Lonicera mackii*, *L. tatarica*), Japanese stilt grass (*Microstegium vimineum*), white mulberry (*Morus alba*), Amur cork tree (*Phellodendron amurense*), Japanese knotweed (*Polygonum cuspidatum*), European buckthorn (*Rhamnus frangula*), jetbead (*Rhodotypos scandens*), multiflora rose (*Rosa multiflora*), and wisteria (*Wisteria floribunda*).

NRG Forest Restoration: 1998 - 2003, Summary of Operations

	2003	2002	2001	2000	1999	1998
Trees and Shrubs Planted	14,962	19,529	18,237	11,241	6,410	2,141
Bareroot Trees Planted	800	5,484	1,750	5,125	100	0
Herbaceous Planted	29,135	38,954	33,753	14,549	6,456	1,034
Number of Species Planted	79	105	91	59	34	26
Plants Potted	12,820	7,922	8,575	4,100	1,200	0
Acres Restored	31.2	34.4	31	26	12.8	6.5
Acres Maintained	40	41	44	38	22	9
Number of Projects	11	14	13	12	7	5
Number of Volunteer Events	29	24	20	18	8	5
Number of Employees (year end)	9	11	9	9	4	2
Grants Outstanding (\$, year end)	2,212,000	2,403,836	2,656,111	2,061,013	745,000	225,000

2003 NRG Forest Restoration Team Sponsors



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



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



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



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



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

Forest Restoration Team Members Year End 2003

Tim Wenskus
Adam Thornbrough
Willie Crocker
Cathy Justice
Richard Love
Dan Mayer
Macceau Medozile
Rochelle Reed
Tony Rho

JTP: Lakenya Deboure

Volunteer Groups Assisting The Team During 2003

The Team could not have achieved all that it did in 2003, without the assistance of numerous community and volunteer groups.

Alley Pond Environmental Center
Boy Scout Troop 111
Bronx River Alliance
City Parks Foundation
Columbia University
Friends of Spuyten Duyvil
High School for Environmental Studies
John Bowne High School
John F. Kennedy High School
Martin DePorres High School
Mineola High School
Neighborhood Initiatives Development Corporation
New York Cares
New York University
Parks Conservation Corps
Partnerships for Parks
Ranger Conservation Corps
Seton Falls Preservation Coalition
Sustainable South Bronx
Wave Hill Summer Forest Project

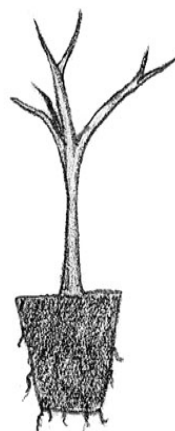
Types of Plant Material Used



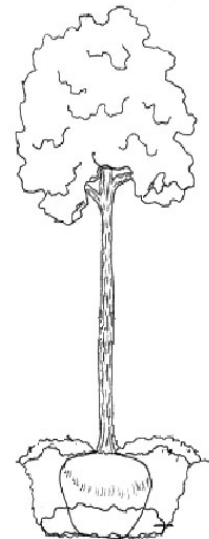
Herbaceous plugs



Bareroot tree seedlings



Containerized tree



B&B tree

Complete List of Woody and Herbaceous Species Planted During Calendar Year 2003

Tree and Shrub Species Planted

American holly (*Ilex opaca*)
American sycamore (*Platanus occidentalis*)
Arrowwood viburnum (*Viburnum dentatum*)
Bitternut hickory (*Carya cordiformis*)
Black birch (*Betula lenta*)
Black cherry (*Prunus serotina*)
Black chokeberry (*Aronia melanocarpa*)
Black oak (*Quercus velutina*)
Black walnut (*Juglans nigra*)
Black willow (*Salix nigra*)
Chestnut oak (*Quercus prinus*)
Chokeberry (*Aronia arbutifolia*)
Common blackberry (*Rubus allegheniensis*)
Eastern hornbeam (*Carpinus caroliniana*)
Eastern white pine (*Pinus strobus*)
Elderberry (*Sambucus canadensis*)
Flowering dogwood (*Cornus florida*)
Green ash (*Fraxinus pensylvanica*)
Gray birch (*Betula populifolia*)
Gray dogwood (*Cornus racemosa*)
Hackberry (*Celtis occidentalis*)
Lowbush blueberry (*Vaccinium angustifolium*)
Northern red oak (*Quercus rubra*)
Persimmon (*Diospyros virginiana*)
Pin oak (*Quercus palustris*)
Pinkster azelea (*Rhododendron periclimenoides*)
Pussy willow (*Salix discolor*)
Red maple (*Acer rubrum*)
Red-osier dogwood (*Cornus sericea*)
River birch (*Betula nigra*)
Scarlet oak (*Quercus coccinea*)
Serviceberry (*Amelanchier canadensis*)
Silky dogwood (*Cornus amomum*)
Silver maple (*Acer saccharinum*)
Spicebush (*Lindera benzoin*)
Sugar maple (*Acer saccharum*)
Sweetgum (*Liquidambar styraciflua*)
Sweet pepperbush (*Clethra alnifolia*)
Tulip poplar (*Liriodendron tulipifera*)
White ash (*Fraxinus americana*)
White oak (*Quercus alba*)
Willow oak (*Quercus phellos*)

Photo Credits: Mike Feller (cover), Tim Wenskus, Paul Kortebein, Adam Thornbrough, Dan Mayer, Chris Syrett, Doug Still, Wai Ming Chan, Tony Rho, Tali Vardi

Editor: Tim Wenskus

Contributors: Adam Thornbrough, Paul Kortebein, Tim Wenskus, Dan Mayer, Bill Tai

First Edition: 5/10/04

Second Printing: June 2004

Herbaceous Species Planted

Appalachian sedge (*Carex apalachica*)
Arrow arum (*Peltandra virginica*)
Awl-fruited sedge (*Carex stipata*)
Blue flag iris (*Iris versicolor*)
Blue stemmed goldenrod (*Solidago caesia*)
Broad-leaved cattail (*Typha latifolia*)
Canada anemone (*Anemone canadensis*)
Cardinal flower (*Lobelia cardinalis*)
Deer-tongue grass (*Panicum clandestinum*)
Flattened sedge (*Danthonia compressa*)
Foamflower (*Tiarella cordifolia*)
Fox sedge (*Carex vulpinoides*)
Fringed sedge (*Carex crinita*)
Heart-leaved aster (*Aster cordifolius*)
Indian grass (*Sorghastrum nutans*)
Junegrass (*Danthonia spicata*)
Mountain mint (*Pycnanthemum virginianum*)
Narrow-leaved cattail (*Typha angustifolia*)
Path rush (*Juncus tenuis*)
Pennsylvania sedge (*Carex pensylvanica*)
Pointed broom-sedge (*Carex scoparia*)
Rough avens (*Geum canadense*)
Rue anemone (*Anemonella thalictroides*)
Sessile-leaved bellwort (*Uvularia sessilifolia*)
Shallow sedge (*Carex lurida*)
Soft rush (*Juncus effusus*)
Soft-stem bulrush (*Scirpus validus*)
Swan's sedge (*Carex swanii*)
Thin-fruit sedge (*Carex flaccosperma*)
Tussock sedge (*Carex stricta*)
Virginia creeper (*Parthenocissus quinquefolia*)
Virginia wild rye (*Elymus virginicus*)
White avens (*Geum virginianum*)
White snakeroot (*Eupatorium rugosum*)
White wood aster (*Aster divaricatus*)
Wild columbine (*Aquilegia canadensis*)
Woodland sunflower (*Helianthus divaricatus*)

Seed Species Sown

Annual rye (*Lolium multiflorum*)
Bottlebrush grass (*Elymus hystrix*)
Buckwheat (*Fagopyrum esculentum*)
Canada wild rye (*Elymus canadensis*)
Deertongue grass (*Panicum clandestinum*)
Eastern gammagrass (*Tripsicum dactyloides*)
Oats (*Avena sativa*)
Path rush (*Juncus tenuis*)
Virginia wild rye (*Elymus virginicus*)
Woodland sunflower (*Helianthus divaricatus*)