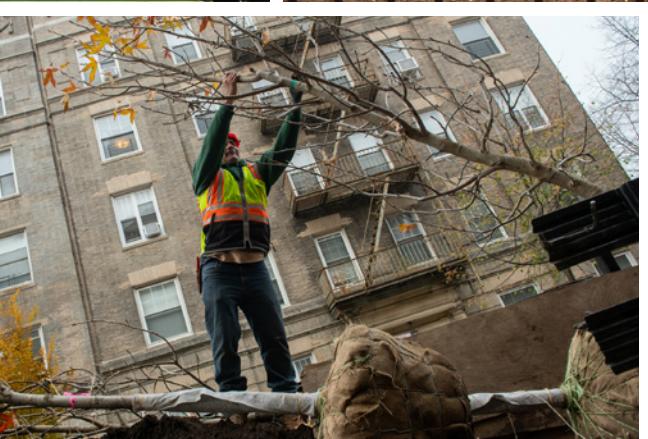




LEARNING AND GROWING: URBAN FORESTRY WORKFORCE TRAINING IN NYC



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Facilitators and Researchers: TYTHEdesign with project management by The Nature Conservancy.

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Cover photos by Jonathan Grassi and Michael Ostuni, The Nature Conservancy

Executive Summary

The New York City urban forest is a unique, complex, and verdant system that includes the more than seven million trees as well as the physical and social infrastructure on which they depend. The Nature Conservancy has taken a leadership role as a convener of Forest for All NYC, a coalition made up of over 90 organizations committed to supporting the city's urban forest. One goal of the coalition, as outlined in its *NYC Urban Forest Agenda*, is to expand urban forestry job, career, and leadership opportunities, particularly in marginalized communities and to those who live in areas most vulnerable to climate change effects.

To support Forest for All NYC's goal, The Nature Conservancy commissioned this report to understand the landscape of non-degree workforce training and internship programs provided by non-academic institutions that are serving the city's communities that have less robust access to formal education including people of color, lower-income individuals, residents of public housing, and people with limited English proficiency. While not intended to identify all programs offered to high school and college students, the report includes several programs related to urban forestry offered to students that were identified by respondents of this research project.

An urban forestry job involves working in some capacity with the urban forest, including through the full life cycle of trees, from seed to end use. Urban forestry jobs include planting, improving, maintaining, and caring for urban trees. It also includes promoting, teaching, studying urban trees, and utilizing the wood at the end of the trees' life cycle. Workforce development programs represent an important pathway to urban forestry and nature-based jobs. These need to be expanded, strengthened, and connected to each other to ensure the urban forest in New York City has a well-trained and diverse workforce to care for it.

Through surveys, interviews, and focus groups, this research project engaged respondents from a wide range of organizations offering urban forestry skills training and, to a lesser extent, employing individuals in the sector. Workforce development nonprofit organizations, park trusts, botanical gardens, and private employers, among others, participated in providing the quantitative and qualitative data regarding training programs as well as insights into the challenges and opportunities for workforce development in the urban forestry sector. All data collected were anonymized, so specific individuals and organizations are not attributed in the report.

This report may not capture all available urban forestry workforce training opportunities as some organizations may not have been identified during the research. Additionally, as data collection relied on participants self-selecting to complete the surveys, some organizations may have chosen not to identify their programs as related to urban forestry, even if they may teach some relevant skills.

~140
NYC-based
organizations and
employers were
identified as part
of the stakeholder
mapping process.

67
surveys
collected.

14
interviews
conducted.

14
focus group
participants
engaged.

36
programs
identified.

THE CURRENT LANDSCAPE

The research identified 36 programs, offered by 26 organizations, that provide skills training related to urban forestry. These programs are grouped into six general categories, organized by the audiences and purposes they serve:

- Core workforce training programs focus most explicitly on job skills training, assisting unemployed New Yorkers, predominantly from low-income and marginalized communities, to obtain employment.
- On-the-job upskilling programs are offered by employers to their workers to help them progress in their careers related to urban forestry.
- College internships offer students opportunities to learn urban forestry skills outside of their formal higher education.
- High school internships expose students to urban forestry and ecology skills and knowledge, particularly through paid summer experiences.
- Volunteer programs provide opportunities to the general public, particularly focusing on the care and maintenance of urban trees.
- Fee-based programs are offered by botanic gardens which charge tuition for courses potentially leading to completion of a certificate.

Taken as a whole, the available training programs in NYC provide many opportunities for New Yorkers of differing backgrounds and levels of interest to build skills in or gain exposure to urban forestry. However, no overall theme unites the disparate programs. The analysis of the landscape showed:

- Most training programs teach urban forestry skills and knowledge as part of a broader curriculum that may incorporate horticulture (the study of plants) or ecology among other areas. Programs teach a similar set of basic skills in topics such as tree and plant identification, and tree health. However, this project did not seek to measure the rigor or quality of instruction.
- Although all programs include aspects of urban forestry, only the volunteer programs focus exclusively on trees, with one offering a certification to care for urban trees. Outside of the volunteer opportunities, only one core workforce program offers a tree-specific training opportunity while another incorporates training in working with salvaged trees.

- While most programs admit 90% of applicants, those for high school and college students have lower admittance rates, below 30%, indicating a strong demand for urban forestry programs among these audiences.
- 21 programs offer stipends to participants, with all of the high school and college programs providing compensation.
- 9 of the 36 programs place participants into jobs upon completion of the training. The core workforce programs have placed individuals into entry-level jobs in groundskeeping and landscaping. The exact scale of sector-based placement could not be determined from the data gathered.
- 15 of the 26 organizations that offer skills training programs also serve as employers in the field.
- The programs' effectiveness in preparing individuals for available urban forestry jobs is a question requiring further research.

TRAINING PROGRAM CHALLENGES AND OPPORTUNITIES

Research respondents presented challenges and opportunities programs face in offering and expanding urban forestry skills training. While the report includes a comprehensive list, below are the major challenges, organized into four themes:

Jobs. Training program representatives view the limited number of full-time living wage jobs in urban forestry as the biggest impediment to offering or expanding training in urban forestry, a sector with a prevalence of temporary or seasonal work. Programs that focus on job placements expressed concern about not being able to place program graduates into stable jobs. One opportunity is to tailor training to the available full-time jobs, such as entry-level arboriculture roles.

Program capacity. Insufficient funding and staffing are the main operational capacity challenges, limiting organizations' abilities to expand training. In addition, the challenge of providing trainees with greenspace or trees to practice skills can hinder hands-on training. Respondents saw an opportunity in new sources of government funding for green-related programs becoming available for the next several years. Additionally, the opportunity to strengthen partnerships between programs to share resources is seen as another viable response to the capacity challenges.

Skills training standards. Training programs do not adhere to a shared set of skills standards, making assessing skills among program participants a challenge. Programs have an opportunity to build alignment and adopt an existing set of standards or co-create new curricula. Adopting skills standards may increase employment opportunities by streamlining employers' evaluation of prospective candidates.

Awareness of urban forestry. Urban forestry careers may not be widely known, especially among marginalized populations who may not have been exposed to the field. One response might be to introduce more K-12 students to the concepts, spaces, and skills of urban forestry. Additionally, organizations may spur increased interest among young people from historically marginalized communities by diversifying prominent urban forestry positions.

EMPLOYERS' PERSPECTIVE AND OPPORTUNITIES

While employers in the urban forestry sector were not the primary focus of this project, several employers offered insights that are valuable to better understand the role of training opportunities. While willing to hire individuals without previous experience or training, employers also expressed strong support for training programs to provide a basic set of skills, giving program graduates an advantage to enter the sector. In particular, the arborist position—a role that involves physically working with trees—was named as the most accessible entrypoint for individuals interested in entering the urban forestry sector.

Respondents identified several opportunities for employers to improve access to jobs and career paths in urban forestry. Employers might coordinate to standardize job titles across the sector as positions with similar skill requirements currently have very different names among employers. In addition, job requirements, particularly for certain entry-level positions, could be reframed away from minimum education requirements and towards skills that are better indicators of success in an urban forestry position. For a list of job titles in the urban forestry collected through the research, please refer to the box on page 28.

The general interest is high. This year we received an overwhelming number of applicants and we are only in our second year... I only see urban forestry growing in interest.

—Program representative

LOOKING FORWARD

Research respondents presented their larger vision for an urban forestry skills training program that provides greater access to skills and jobs for marginalized communities, is comprehensive and expansive, and serves as an important form of community building.

Forest for All NYC coalition members are well positioned to take steps to build on the findings in this report, including:

- Continuing to build connections between partner organizations to create new training collaborations, shared curricula or skills standards, and a possible consortium of organizations to offer a more comprehensive training opportunity.
- Hosting conversations among sector employers to create better alignment between training and available jobs and to discuss reframing job requirements and job titles to improve job placement opportunities for participants.
- Creating and publicizing a comprehensive directory of training programs to raise public awareness of opportunities to gain skills in the urban forestry sector.
- Collecting more information from training programs regarding the rigor of skills training to identify strengths and gaps in offerings.
- Initiating further research into the city's urban forestry labor market to understand employment trends and future opportunities.
- Working toward securing additional funding and expansion of urban forestry job training.

This research project clearly indicated an overwhelming interest across stakeholders, both among training programs and employers, to collaborate to strengthen training and employment opportunities, particularly for individuals who have historically not participated in urban forestry.

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INTRODUCTION



Photo: Jonathan Grassi, The Nature Conservancy

Approach to the Report

Guided by the principle that accessible training opportunities are fundamental to creating an equitable workforce, the Forest for All NYC coalition articulated the goal of expanding urban forestry career opportunities in the *NYC Urban Forest Agenda*. Action 2.2 in the *Agenda*, “Cultivate Urban Forest Careers,” states “expand urban forestry career and leadership opportunities to advance equity [...], with this effort targeted to communities that are underemployed and to those who live in areas most vulnerable to climate change effects (e.g., frontline communities).”¹ Workforce development programs in urban forestry skills are seen as representing an important pathway to urban forestry and nature-based jobs.²

After Forest for All NYC coalition members helped to define and shape the research project, The Nature Conservancy commissioned this report to assist the coalition to better understand the current landscape of non-degree workforce training and internship programs provided by non-academic organizations in New York City that serve marginalized communities.³

The guiding research questions that this report intends to address include:

- What is the current landscape of existing NYC urban forestry workforce development programs, including a consideration of which organizations offer training opportunities, what do the training programs entail, and who are the participants?
- Do individuals obtain sector-based jobs after the training?
- What experience and training are employers in the urban forestry sector looking for, particularly for entry-level positions?
- What challenges do programs face and what are the opportunities to improve or change urban forestry training as well as to strengthen career paths in urban forestry?

The primary intention of this report is to provide insights into the landscape of training opportunities and a vision for the future to the Forest for All NYC member organizations. Other audiences include individuals and organizations in the workforce development field in NYC or organizations potentially interested in workforce development training as well as funders and policymakers who are interested in understanding this sector. Offering insight into the existing landscape of training, this report is a starting point to build alignment in considering next steps to advance opportunities in the sector.



Photo: Michael Ostuni, The Nature Conservancy

DEFINITIONS FOR RESEARCH

This project began with the existing definition of the New York City urban forest as articulated in The Nature Conservancy report *State of the Urban Forest in NYC*:

New York City urban forest

The urban forest is a unique, complex, and verdant system that includes the more than seven million trees in NYC, and the physical and social infrastructure on which they depend. NYC contains close to as many trees as human residents. They grow across our whole landscape—in tree beds along our streets, in yards and courtyards, in landscaped parks, in forested natural areas, and beyond. The physical components of the system are interconnected natural and built parts of the ecosystem spanning public and private land; the social components include the people, behaviors, policies, programs, budgets, and investments that relate to the NYC urban forest.⁴



Photo: Michael Ostuni, The Nature Conservancy

The project team, including an advisory committee comprised of five Forest for All NYC coalition member organizations⁵ and supported by TYTHEdesign, then defined the following terms:

Urban forestry job

A job involved in working in some capacity with the urban forest, including through the full life cycle of trees, from seed to end use. Urban forestry jobs include planting, improving, maintaining and caring for urban trees. It also includes promoting, teaching, studying urban trees, and utilizing the wood at the end of the trees' life cycle. These jobs do not include all nature-based jobs.

Urban forestry workforce development program

An urban forestry workforce development program offers formal training in skills preparing participants for urban forestry jobs. The program should have an aim of helping participants attain an urban forestry job or, at minimum, provide training in skills needed to attain an urban forestry job. It must operate outside of a formal college degree program, be located within NYC, and serve populations high school-aged and up.

These definitions helped to define the boundaries of the research and to build a stakeholder map of organizations to engage. In addition, these definitions provided a framework for respondents to self-identify if their organization offers an urban forestry training program or if they are an employer in the sector. Through surveys distributed electronically, representatives from the identified organizations were asked to provide both quantitative and qualitative data about their programs. In addition, 14 one-on-one interviews and two focus groups engaging 14 individuals total were conducted to collect more qualitative information about the sector. For more information on research methodology, please see the Appendix.

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CURRENT LANDSCAPE OF SKILLS TRAINING PROGRAMS



Photo: Jonathan Grassi, The Nature Conservancy

Urban Forestry Skills Training Programs

Thirty-six training programs, offered by 26 organizations, were identified through the research. These programs have been divided into six broad categories to provide a framework for analysis and offer a basis for comparison. Programs grouped into a category share certain attributes: they tend to serve a similar audience and have a similar purpose for offering skills training to that audience. The categories, outlined below, are not strict divisions—a program may have attributes that bridge more than one category—but programs within each category are most similar to each other.

- Core workforce programs serve low-income⁶ or unemployed individuals often from marginalized communities in need of formal job training with the explicit purpose of helping participants find employment.
- On-the-job upskilling programs are offered by employers to workers with the purpose of providing them with additional skills training to potentially improve their career opportunities.
- College internships offer students opportunities to learn urban forestry skills outside of formal higher education.
- Programs for individuals enrolled in high school teach students urban forestry and ecology skills and knowledge, particularly through paid summer experiences.
- Volunteer opportunities are generally open to the public at large.
- Fee-based programs are offered by botanic gardens which charge tuition for courses potentially leading to completion of a certificate.

(The terms ‘core workforce program’ and ‘on-the-job upskilling program’ are used in this report to help define particular categories of training. The programs themselves do not use these names.)

The six categories are presented from the most formal job training programs to the least. The core workforce programs and on-the-job upskilling programs are focused on providing skills to improve job opportunities. Programs for individuals enrolled in college and high school are included as they provide urban forestry skills training outside the context of a formal degree and are intended to provide skills that may be utilized in an urban forestry-related job. Volunteer programs are generally the least intensive, not focused on job training, and serve the widest audiences, offering participants exposure to caring for city trees. The fee-based programs, while providing important job skills training, may be cost prohibitive for low-income individuals and therefore are not the focus of this research. These programs are listed last.

Nine of the 36 programs involve a partnership between organizations. These collaborations vary in the level of formality and shared responsibilities. In certain instances, two organizations work closely together to offer distinct components of a training program. In the case of two partnerships among the volunteer programs, one organization is hosting a new iteration of another organization’s existing program.

Of note, the majority of training programs described below do not explicitly use the term “urban forestry” when describing the skills taught. Instead they offer related skills and knowledge in horticulture and, to a lesser extent, arboriculture.

- Horticulture is the art and science of growing, handling, and processing fruits, vegetables, and ornamental plants.⁷
- Arboriculture is the practice and study of the care of trees and other woody plants in the landscape.⁸

URBAN FORESTRY SKILLS TRAINING PROGRAMS AND OPPORTUNITIES ACROSS NEW YORK CITY

The research identified 36 programs that provide skills training related to urban forestry. These programs are grouped into six general categories, generally organized by the audiences and purposes they serve. Taken as a whole, the available training programs located across New York City provide many opportunities for New Yorkers of differing backgrounds and levels of interest to build skills in or gain exposure to urban forestry.

- 8 Core workforce programs
- 4 On-the-job upskilling programs
- 4 Programs for college students
- 7 Programs for high school students
- 11 Volunteer opportunities
- 2 Fee-based programs



36 programs across **26** different organizations in NYC.



9 of **36** programs involve two different organizations in partnership.



21 of **36** programs offer payment or stipends to participants.



15 of **26** organizations offering training programs also hire for urban forestry-related positions.

*This map is a general visual representation and does not include every park or greenspace in the city. **Dots indicate the approximate locations of programs. Some programs also may convene at additional locations.

- Selected parks and greenspaces*
- Program locations**

MANHATTAN

Randall's Island Park Alliance

- Citizen Pruner Course
(in partnership with Trees New York)

Lower East Side Ecology Center

- Street Tree Care

City Parks Foundation

- Green Girls

The Trust for Governors Island

- Real Estate Pathways Fellowship

Friends of Governors Island

- Tree Crew

BROOKLYN

Brooklyn Greenway Initiative

- College internship

Brooklyn Workforce Innovation

- Brooklyn Woods

Brooklyn Botanic Garden

- Horticulture internship
- Certificate in Horticulture

St. Nicks Alliance

- Urban Greenscaping

Gowanus Canal Conservancy

- Green Team

Coney Island Beautification Project, Inc.

- Street Tree Care

STATEN ISLAND

Greenbelt Conservancy

- Greenbelt Conservation Corps



BRONX

Woodlawn Conservancy

- Bridge to Crafts Careers
- Landscape Restoration Program

Wave Hill

- Woodland Ecology Research
- Mentorship
- Forest Project

Van Cortlandt Park Alliance

- Urban Ecology Internship
- Volunteer program

Wildlife Conservation Society

- Project TRUE

New York Botanical Garden

- Career advancement for Botanical Garden Aides
- Internship program with Pace University
- Citizen Pruner Course (in partnership with Trees New York)
- Diploma in Horticulture

The HOPE Program

- Intervine

New Roots Community Garden

- Urban Farm and Gardening

ACROSS NEW YORK CITY

Green City Force

- Service Corps
- NYCHA Tree Inventory Project

New York City Department of Parks & Recreation

- Americorps
- Parks Opportunity Program
- Master Gardener Program with Brooklyn Botanic Garden
- Super Steward Advanced Volunteer Training

Natural Areas Conservancy

- CUNY Internship Program

Partnership for Parks

- My Parks

Trees New York

- Young Urban Forester Internship
- Citizen Pruner Course
- Tree Stewardship Training

CORE WORKFORCE PROGRAMS

The eight programs in this category offer skills training with the intention of preparing individuals for employment. In general, these programs are offered to low-income or unemployed New Yorkers, with numerous programs focusing on individuals 18 to 24 years old.

Five of the programs are offered by community-based organizations (CBOs) with extensive experience in workforce development training. These programs feature practical skills training, job readiness education (such as interview preparation, lessons in workplace behavior), formal job placement services, tracking of participant job placements, and provide additional job placement assistance for one year following completion of the program.

Two CBOs discussed below—St. Nicks Alliance and The Door—have partnered with other entities which provide urban forestry skills training. The CBO handles participant recruitment, job readiness training, and job placement services while another entity, such as a botanic garden or an instructor from a tree care company, provides the substantive instruction in urban forestry skills.

St. Nicks Alliance offers the **Urban Greenscaping⁹** program once once per year, which prepares individuals 18 to 24 years old for jobs in urban horticulture. Training approximately 15 individuals per year, the seven week training includes two weeks at the Brooklyn Botanic Garden (BBG), which partners with St. Nicks Alliance to provide participants with BBG's Horticulture Intensive certification. It also involves training experience at the Brooklyn Grange, a rooftop farm at the Brooklyn Navy Yard, as well as Domino Park.



8 core workforce programs.



On average, **45%** of applicants are accepted.



On average, **92%** of participants complete these programs.



5 of the **8** programs provide a stipend.



6 of the **8** programs track graduates for at least one year following the program completion.



7 of the 8 programs teach:

soil science • tree identification
horticulture • basic tool usage

Bridge to Crafts Careers Landscape Restoration Program is a collaboration between Woodlawn Conservancy and The Door, a CBO focused on youth development services. Originally focused on stone masonry skills, in recent years Woodlawn has expanded the program to include training in landscape restoration and care. During this 20 week program, about 30 trainees spend half of that time on-site at Woodlawn Cemetery where instructors from Davey Tree, a tree service company, provide instruction in arboriculture. The other 10 weeks are spent at The Door learning job readiness skills and obtaining certifications such as the Occupational Safety and Health Administration (OSHA) 30 hour general safety course.

Brooklyn Woods, a program of Brooklyn Workforce Innovations, trains approximately 60 individuals across five training cycles per year in woodworking and cabinetmaking skills and helps place graduates into jobs in the woodworking sector. Through a partnership with Tri-Lox, a company that specializes in the reclamation and use of wood for fabrication, Brooklyn Woods offers a training component focused on skills working with wood salvaged from damaged or felled city trees. In addition, Tri-Lox has hired several Brooklyn Woods graduates to work in its shop. This program is unique in focusing on the end of the lifecycle of a tree.

Intervine, offered by The HOPE Program, is a 10 week program that trains approximately 40 participants across three trainings annually for employment in horticulture and green infrastructure, which includes green roofs, solar power, and rain gardens. The program includes training in a variety of urban forestry-related skills including tree identification, basic pruning techniques, landscaping skills, and basic tool usage, among other topics. The program also offers a curriculum in environmental justice¹⁰ and literacy, and has the goal of equipping participants to obtain employment in the green economy.¹¹

Green City Force (GCF) offers a 6 to 10 month Americorps program, **Service Corps**, that trains individuals 18 to 24 who reside in New York City Housing Authority (NYCHA) public housing communities in skills for the green economy, including in urban forestry. Training occurs at so-called Eco-Hub sites that include various elements of sustainability including gardens, solar power and irrigation.

New York City Department of Parks & Recreation (NYC Parks) also offers an **Americorps** opportunity to three individuals per year for a 10 month term, and includes training and field work in caring for street trees and natural areas.

New Roots, a Bronx-based garden space operated by the International Rescue Committee, offers the **Urban Farm and Gardening** horticulture workforce skills training program. The program, enrolling approximately 20 individuals in one cycle per year, provides a foundation in horticulture and urban forestry skills, including tree identification and pruning techniques. This program centers Black and Indigenous People of Color (BIPOC) voices and is unique in that it has specifically recruited refugees as well as non-native English speakers as part of its cohort.

Brooklyn Botanic Garden's (BBG) **Horticulture Internship** program, on pause since 2018 but scheduled to return in 2024, is a comprehensive 8 month program that pairs approximately 15 trainees with BBG field staff to learn horticulture skills—garden maintenance, plant and weed identification and management—leading to BBG's Certificate in Horticulture. The intention of the program is to prepare participants for horticulture jobs and plans to recruit more heavily from marginalized communities for future cohorts.



Participants of The HOPE Program's Intervine training help plant trees on Governors Island.

Photo: Renee Ruhl, The HOPE Program

ON-THE-JOB UPSKILLING PROGRAMS

In contrast to training unemployed individuals, the three programs in this category are offered by employers to their workers to provide career-advancing skills training while employees earn a paycheck.



4 on-the-job upskilling programs.



On average, 89% of applicants are accepted.



On average, 92% of participants complete these programs.



All 4 programs teach tree identification and horticulture skills.

The single largest training program that includes urban forestry skills in the city, the **Parks Opportunity Program** (POP) offered by NYC Parks, is a transitional employment program for individuals receiving public benefits who are referred by the NYC Human Resources Administration (HRA). Training over 2500 individuals each year, POP offers one week of training that includes basic horticulture skills. Then participants are placed in the field in paid positions for 6 months, performing basic groundskeeping, maintenance, park cleaning, and landscaping. Following the program, participants receive job placement assistance, with many finding full-time employment with NYC Parks in roles that interact with the urban forest directly or indirectly.

NYC Parks also offers the **Master Gardener Program** to current employees who may be interested in pursuing horticulture-related positions within the agency. Through a partnership with the Brooklyn Botanic Garden, 20 NYC Parks employees per year have the opportunity to learn gardening and horticulture skills with the purpose of advancing their careers within the agency.

Green City Force (GCF) operates a social venture business that offers additional skills training as well as jobs in urban forestry to alumni of its Americorps program discussed in the section above. Over the last four years, GCF's social venture has been contracted by the New York City Housing Authority (NYCHA) to engage in the **NYCHA Tree Inventory Project**.

GCF Americorps alumni have conducted a tree inventory on NYCHA campuses, which support about 1000 acres of tree canopy.¹² Hiring alumni of its Americorps program on a temporary basis, GCF serves as the employer and offers specific skills training, including tree identification, mapping and data collection, to its employees. This is the only workforce program, outside of volunteer opportunities, with skills training focused exclusively on urban trees.

The **New York Botanical Garden** (NYBG) offers its entry level Botanical Garden Aides an opportunity for career advancement through on-the-job training and testing to achieve advancement at the NYBG.



Green City Force alumni learn tree identification skills in preparation for taking an inventory of trees on NYCHA campuses.

Photo: Leticia Barboza, NYCHA

PROGRAMS FOR COLLEGE STUDENTS

Four programs offer training opportunities to students enrolled in colleges in the city, but are not part of formal degree requirements. All offer compensation and are some of the most competitive programs to enter among all the urban forestry skills programs.

Natural Areas Conservancy (NAC), through its **CUNY Internship Program**, selects 20 interns from 100 applicants from City University of New York (CUNY) to gain skills and experience in forest ecology. Skills taught include plant identification, field ecology, monitoring and surveying methods. Although NAC does not have formal job placement services, it has created a network of program alumni and is connected to employers including NYC Parks.

The other three programs are very small:

- The Trust for Governors Island offers the **Real Estate Pathways Fellowship**, a year-long program for 2 CUNY seniors that focuses on horticulture and urban forestry.
- The **Brooklyn Greenway Initiative** started a four month internship in 2022 for two Brooklyn College students in horticulture skills.
- **New York Botanical Garden** partners with Pace University and places one college intern in its forestry department.

PROGRAMS FOR HIGH SCHOOL STUDENTS

Seven programs provide opportunities to participants in high school to learn skills related to urban ecology and incorporate aspects of urban forestry. These programs, which enroll between 10 to 30 teens, generally are competitive for admittance. All programs are affiliated with NYC Department of Youth and Community Development's Summer Youth Employment Program (SYEP), which assists in providing compensation to participants. In addition, these programs offer soft skills training—communication skills, interview skills, resume preparation—similar to the core workforce programs.



4 programs are specifically for college students.



On average, 23% of applicants are accepted.



Programs reported that all enrolled participants complete the trainings.



All programs provide stipends.



2 programs follow up with graduates for at least one year following completion.



All programs teach tree ecology and tree identification.

Trees New York offers the **Young Urban Forester Internship**,

a 7 week program for approximately 12 high school students in urban forest conservation, restoration, and planning, among other topics, with the purpose of exposing interns to environmental career opportunities. Field skills include tree identification, pruning, and tree care.

The Wildlife Conservation Society (WCS) offers **Project TRUE**, hosted at the Bronx Zoo. This program focuses on youth from traditionally underrepresented populations (women, Black and Latinx) in the Bronx, introducing 25 students over a summer to urban ecology research and possible careers in the field.



7 programs are specifically for high school students.



On average, **37%** of applicants are accepted.



All programs provide compensation, utilizing the City's SYEP program.



4 of the **7** programs refer participants to additional training or education opportunities.



2 programs follow up with graduates for at least one year following completion.



All programs teach tree ecology and tree identification.



Photo: S.I. Greenbelt - NYC Parks

Gowanus Canal Conservancy offers 10 paid high school apprenticeships per year in which students learn skills in gardening, green infrastructure maintenance, and plant identification. Participants explore themes including ecology, stormwater management, urban forestry, environmental justice, waste management, urban design, and horticulture.

Wave Hill offers two paid internships: a 14-month long **Woodland Ecology Research Mentorship** internship and a summer **Forest Project** internship providing students with knowledge and hands-on training in forest ecology and covering a wide range of urban forestry skills. The mentorship program offers up to nine college credits upon completion of three courses.

Van Cortlandt Park Alliance offers the **Urban Ecology Teen Internship**, also known as Urban Eco-Teens, to 10 high school students and provides paid work experience and training in landscaping skills and tree identification, among other skills.

City Parks Foundation runs a large-scale program serving 250 students per summer with the **Green Girls** program offered to middle and high school students, teaching science and math skills through learning the basics of tree care.

VOLUNTEER OPPORTUNITIES

New Yorkers have many opportunities to learn skills to care for the city's trees—this is the only category of training in which all programs focus solely on trees. The opportunities are listed below generally from the most formal offerings to casual single day events.

While other volunteer opportunities to work with trees most likely exist in the city, the following were identified through the research:

The **Citizen Pruner Course**, offered by Trees New York, is the most formal volunteer program offered, training 200 individuals per year through 12 hours of coursework in tree ID, biology and stewardship skills (this course does have a fee of \$100). **Randall's Island Park Alliance**, which currently has a partnership with Trees New York, will be building on that collaboration to formally offer the Citizen Pruner Course. Additionally, **New York Botanical Garden** is planning to partner with Trees New York to offer the Course at NYBG's Bronx location. These three opportunities are unique in the city, as they provide participants with a license from NYC Parks to legally prune NYC street trees, valid for 5 years.¹³

Trees New York also offers the **Tree Stewardship Training**, allowing volunteers to learn to care for street trees and work alongside educators in the community.

NYC Parks **Super Steward Advanced Volunteer Training** offers volunteers skills in plant identification, basic arboriculture, as well as resources in the form of grants and networking to facilitate community greening projects.

Friends of Governors Island offers the **Tree Crew** opportunity with the organization's arborist leading volunteers in tree projects. Volunteers develop skills in pruning, root care, and tree identification.

The Greenbelt Conservancy's **Greenbelt Conservation Corps** exposes volunteers to urban forestry through tree care and trail maintenance activities in Staten Island's Greenbelt parks and open space.



11 organizations offer volunteer opportunities focused on tree care.



4 of the 11 teach these skills :

tree ecology • knowledge of local flora and fauna • landscaping skills such as tree cutting, pruning, and leaf removal

Note: not all programs provided information.

Lower East Side Ecology Center offers a **Street Tree Care** program allowing volunteers to learn how to maintain tree beds during single day events.

Partnerships for Parks offers the **It's My Park** beautification program, providing volunteers the opportunity to care for trees. In addition, it offers workshops on park-related advocacy and horticulture.

Van Cortlandt Park Alliance hosts crews of volunteers to work in the park's forest.

Coney Island Beautification Project, Inc. provides a **Street Tree Care** volunteer opportunity to both adults and student-aged volunteers to learn how to maintain local trees through single day events.

FEE-BASED PROGRAMS

New York Botanical Garden (NYBG) and Brooklyn Botanic Garden (BBG) offer fee-based courses in horticulture. Following the completion of a series of classes, NYBG offers a **Diploma in Horticulture** through its School of Professional Horticulture while BBG offers its own **Certificate in Horticulture**. While these programs may offer financial aid, they generally charge participants tuition to gain the knowledge and skills in horticulture either for self-enrichment or to pursue a career. The research did not collect substantial information about these programs, as these are outside of the defined scope of the report, which is focused on programs available to groups underrepresented in urban forestry, including low-income individuals who may not be able to afford these opportunities.

Program Attributes

While the programs were grouped into the categories above to better understand their audiences and goals, in this section the survey data is considered across categories to identify common themes or key differences between program categories.

PROGRAM SIZE

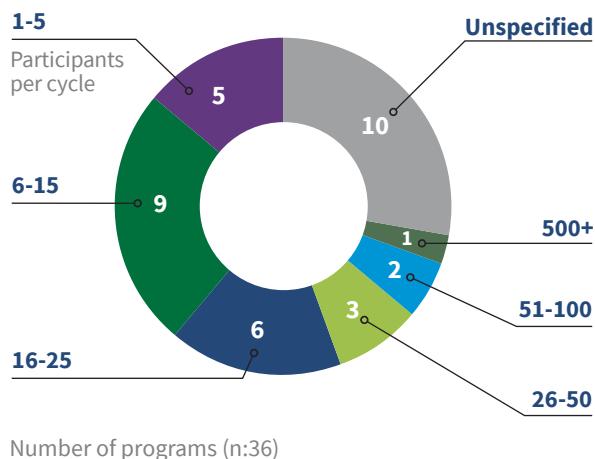
Program size varies greatly both within and between program categories, with nearly half of all programs serving between 6 and 25 individuals per training cohort. On one end of the spectrum, two organizations host only two college interns annually while, on the other end, NYC Parks' Parks Opportunity Program engages 2500 participants per year with a new cohort of trainees starting every week. Several organizations indicated that program size was limited by funding, capacity, and also job placement opportunities. Further research would be needed to provide more insight into the relationship between program size and the number of available jobs. This information might help support organizations to determine if expansion is worthwhile.

PROGRAM PARTICIPANTS

The six program categories, considered together, engage a broad spectrum of the public. While the research did not collect extensive demographic information, the data indicate that participants range widely by age, employment status, as well as economic and educational backgrounds. The accompanying table provides an overview of the particular audiences that programs engaged.

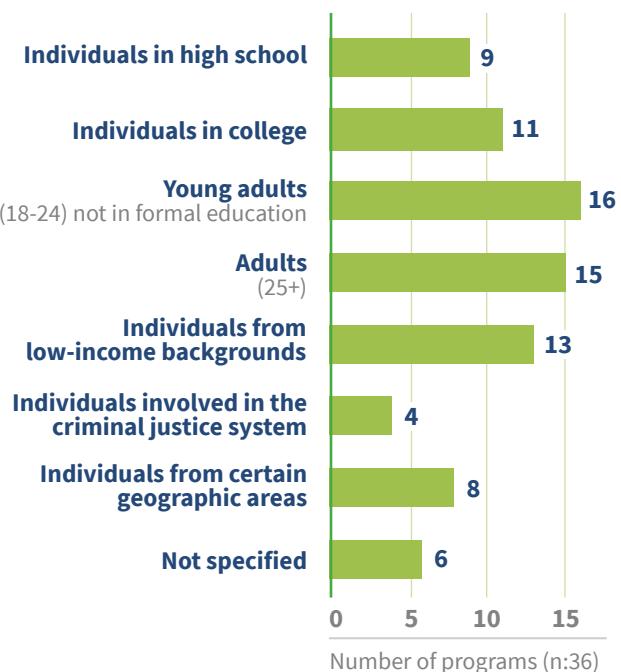
Sixteen of the 36 programs either focus on or at least include young adults (18 to 24 years olds) not currently in formal education. Three core workforce programs and three programs for high school students are specifically for young adults from low-income backgrounds, offering exposure to urban forestry to individuals from historically marginalized communities. No data on participant gender was collected, although respondents in the focus group noted the need to attract more women into both training programs and employment opportunities. Further research would be needed to understand the role of gender in the sector.

The number of programs, based on size



Program demographics

Categories not mutually exclusive

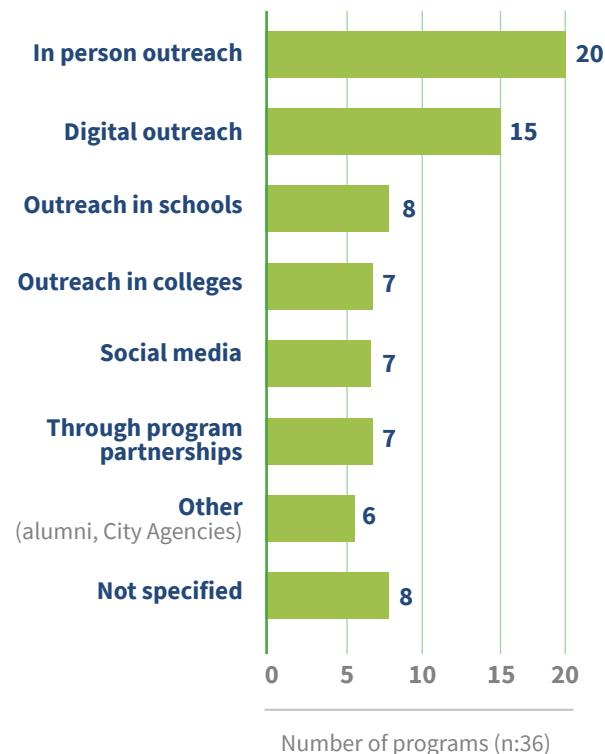


RECRUITMENT AND ADMITTANCE

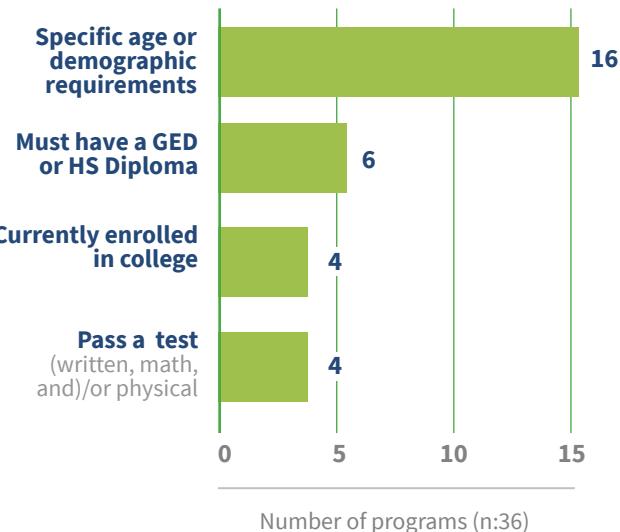
Recruitment strategies tend to incorporate both in-person and virtual outreach. The core workforce programs in urban forestry engage in recruitment methods similar to workforce programs in other sectors—they find candidates through referrals from other community based organizations, as well as engaging in general community outreach and advertising. They host information sessions, both in person and virtually, to attract applicants. The college and high school internship programs reach out to schools to recruit applicants. For example, Natural Areas Conservancy partners with CUNY professors to inform their students of the opportunities and to invite them to virtual information sessions.

The core workforce programs tend to have the greatest number of prerequisites for admittance. These may include unemployment status, a low-income background, a high school diploma or General Education Development (GED) certificate, the ability to pass a basic math and reading test, and an ability to commit to a multi-week or month training program. The BBG's Horticulture Internship is alone in requiring applicants to have a driver's license.

Recruitment strategies



Program prerequisites



The other categories seem to have fewer formal prerequisites. The college programs, such as the one offered by NAC, look for applicants with previous coursework or demonstrated interest in fields connected to ecology or forestry.

Among the 24 programs that provided data, the average program acceptance rate is 46%. The college and high school internship acceptance rates are much lower, falling between 20% and 30%, indicating that interest in skills training among students of various ages in urban forestry and ecology skills is very strong and may present an opportunity for expansion. However, a respondent from one of the core workforce programs noted particular challenges around sufficient recruitment. Further research is needed to understand effective recruitment strategies and to understand why certain programs may have success or difficulty attracting participants.

Once participants begin a program, they tend to finish—overall, programs reported over a 90% completion rate, with college programs reporting that all interns complete those programs. The research did not indicate the reasons for this high level of completion success but it bodes well for programs considering expanding their offerings and increasing enrollment.

PARTICIPANT COMPENSATION

More than half of the training programs offer some form of compensation to participants, either as an hourly wage or as a lump sum stipend. Various respondents indicated that offering compensation was very important to ensuring enrollment and completion of the program. Of the 21 programs that provide money to participants, the types of compensation are:

- 11 offer a \$15 to \$18 hourly wage
- 3 offer a \$19 to \$25 hourly wage
- 3 offer a \$1,000 to \$3,000 lump sum payment
- 1 offers a \$1,000 to \$2,000 monthly stipend
- 3 did not specify the amount

(The data gathered do not include the total number of hours worked, or allow for an hourly wage comparison across the set of program offerings.)

Among the core workforce programs, Brooklyn Woods and St. Nicks Alliance are the only two programs that do not provide compensation. All of the programs for college and high school students offer compensation. While anecdotal evidence collected for this project indicates that compensation is crucial to participants' enrollment in a program, additional research would be needed to better understand how stipends and pay actually affect enrollment and completion rates.

I don't think that training programs that aren't paid are a viable option if we want to attract NYCHA residents to be able to participate in them, because the age range that we're targeting for, they need income.

—Program representative



Participants in Woodlawn Cemetery's Bridge to Crafts Careers Program are instructed in horticulture and arboriculture skills.

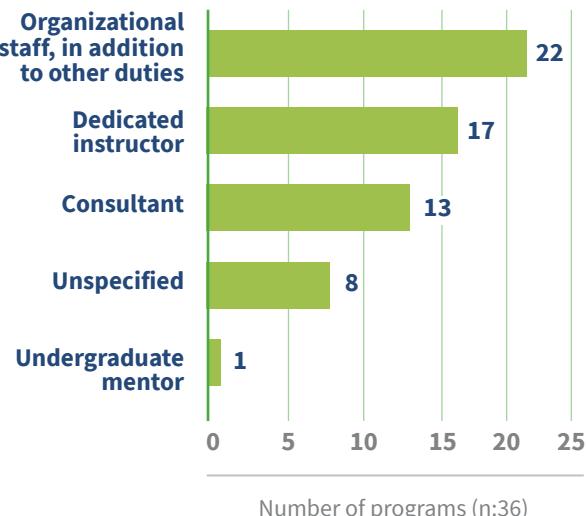
PROGRAM FINANCE AND OPERATIONS

The surveys asked broad questions about funding and therefore did not collect a significant amount of data regarding program finances. Funding sources for urban forestry programs seem to resemble sources for workforce programs in other sectors, with a majority of funding coming from the City of New York, along with corporate, foundation, and individual donations.

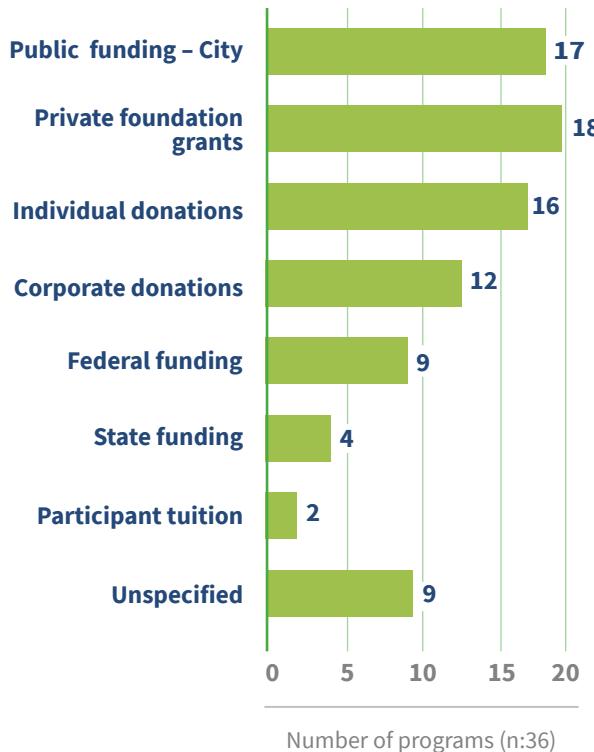
Most programs indicated budgets between \$200,000 and \$1 million. Survey data are limited but the core workforce programs tend to have larger budgets, which may reflect that these programs are more resource-intensive. Nineteen of the 36 programs indicated that they have dedicated budgets for their training programs. More research would be needed to better understand budget size and its connection to an organization's ability to expand offerings.

Among organizations that responded, program staff size is relatively small, with 19 programs run by 10 staff members or fewer. Twenty-two organizations shared that staff involved with training programs also have other organizational duties, indicating that staff members have to balance various roles. Numerous organizations named staffing as a limit to their ability to expand training opportunities. Thirteen organizations augment limited staff by working with outside partners or consultants to assist with offering the training. Woodlawn Conservancy's Bridge to Crafts Careers program is an example—a partner CBO, The Door, provides core workforce development services in recruitment, job readiness training and job placement, and a private tree care company, Davey Tree, provides an instructor to teach the technical field training in arboriculture and landscaping skills.

Staffing of programs



Funding sources for the trainings



URBAN FORESTRY SKILLS TAUGHT AND ADDITIONAL CERTIFICATIONS

Skills

The volunteer programs, particularly the Citizen Pruner Course, teach skills focused specifically on maintaining urban trees. The vast majority of programs, particularly the core workforce programs and college internships, are broader, and incorporate aspects of basic arboriculture skills and knowledge (tree identification, tree pruning) as part of curriculum that may also include education in ecology, landscape maintenance or horticulture, including gardening. Offering a wider set of skills and knowledge may increase the job opportunities available to program participants. Interviewees did note that certain skills, such as climbing and chainsaw skills, which would be particularly valuable to arborist jobs, are not generally taught. One interviewee noted that insurance to teach these skills can be an issue.

Certifications

The Citizen Pruner Course is the only program offering a tree-specific certificate or license. St. Nicks Alliance provides its trainees with a certificate from Brooklyn Botanic Garden in intensive horticulture. The other core workforce programs offer certificates of completion but not any standard certification related to urban forestry. Both BBG and the NYBG offer certificate programs in horticulture but, as these are fee-based programs, details were not collected as part of this research.

Nearly all the core workforce programs offer safety-related certifications such as the Occupational Safety and Health Administration (OSHA) 30 hour safety certificate. Many supplement with additional certifications in site safety training (SST 10 hour), first aid, and flagging. Three programs—Green City Force, NYC Parks' POP, and Woodlawn Cemetery's Bridge to Crafts Careers program—offer trainees the opportunity to obtain their driver's licenses. Both employers and program representatives named the importance of a driver's license for urban forestry jobs, either for the job itself, or as a means to accessing jobs outside of the city center.



Number of programs teaching the urban forestry skill listed:

- 26 Tree identification
- 23 Landscaping skills such as tree cutting, pruning, and leaf removal
- 22 Horticulture
- 22 Knowledge of local flora and fauna
- 21 Tree ecology
- 21 Knowledge of climate change issues
- 20 Basic tool usage (e.g. drills, saws)
- 17 Tree health diagnosis
- 17 Basic soil science
- 16 Community outreach
- 11 Basic math skills
- 11 Knowledge of environmental policies
- 9 Computer skills in data entry
- 7 Map reading
- 7 Computer skills in mapping, GIS, GPS
- 7 Urban farming
- 7 Tree removal/climbing
- 6 Skills not specified by program
- 1 Milling/Processing of lumber

Survey respondents provided these additional skills or topics:

- Advanced tool use for the manufacture of wood products
- Cultural uses of trees
- Research
- Hydroponics, greenhouses, rooftop gardening
- Pest management
- Trail management
- Urban infrastructure including combined sewer overflows
- Working with elected officials, fundraising, event planning, leadership, and organizational development

POST TRAINING AND JOB PLACEMENT

Nine of the 36 programs indicated participants are placed into jobs upon completion of the training. Among the core workforce programs, 4 programs provided their job placement rate, which averages 75%. While all of these programs indicated that they place some graduates into jobs in the broad urban forestry sector, the exact scale of sector-based placement could not be determined from the data.

- The Parks Opportunity Program (POP) by far has the most number of sector-based placements with hundreds of individuals placed over the last three years into positions with NYC Parks following the POP temporary assignment. The program also places individuals outside of urban forestry in roles at NYCHA.
- Woodlawn Conservancy's Bridge to Crafts Careers trainees are placed into jobs by its partner CBO, The Door. In 2021, 25 out of 32 participants were placed into jobs and 15 of those placements were in green sector jobs, including entry-level groundskeeper positions.
- St. Nicks Alliance handles job placements for individuals who receive horticulture training at the BBG. Out of 10 who completed the program in 2022, 7 were placed into sector-based jobs, including at a private landscaping company and also at Domino Park.
- Although the Natural Areas Conservancy's college internship program does not offer job placement services, NAC surveyed graduates of the program who reported to have found employment with wide variety of entities including public agencies such as NYC Parks, NY State Parks, Environmental Protection Agency, National Park Service, Monmouth County Park System, and New York State Department of Environmental Conservation; nonprofits such as Riverside Park Conservancy, NYC H2O, New York Botanical Garden, WCS/Project TRUE, as well as private companies.

Although 13 programs stated they track graduates for a year, no information is available through this research project indicating how long program graduates remain in their job placements. The most typical form of post-program support that organizations offer to program graduates is the opportunity to network. Natural Areas Conservancy shared that its alumni network is important, allowing individuals who complete the internship to share job openings.

Post-training support

Of the 36 programs:

17 programs offer participants networking opportunities.

13 programs track participants for at least one year following program completion.

10 programs refer participants to additional training or educational opportunities.

9 programs do not have a formal ongoing relationship with participants after program completion.

6 programs place participants directly into jobs.

6 programs help participants to obtain jobs with the training organization itself.

Training for NYC Parks' climber/pruner positions

In addition to the thousands of entry-level seasonal and temporary hires NYC Parks makes through its POP training program, the department hires for many full-time entry-level positions. Numerous respondents named the entry-level arborist position of climber/pruner as an accessible entrypoint to a career in urban forestry. The prerequisites for the position include a minimum of six months experience performing all kinds of tree work, including climbing and using equipment, and the successful completion of a practical exam to assess those skills. To help reduce this barrier, NYC Parks will start a Climber and Pruner Training program to prepare individuals for these positions with no degree requirement necessary. The 15 month program will serve 15 individuals in its inaugural year before increasing to 30 graduates, as well as offering a six month skill building bridge program to 40 additional individuals in 2024.¹⁴

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EMPLOYERS' PERSPECTIVE

While the research was not intended as a comprehensive survey of employers nor as a labor market analysis of job opportunities, insights and data were collected from some employers in the urban forestry sector to provide a fuller picture of opportunities and challenges for training programs in particular and for the sector in general.

Fifteen of the 26 organizations that offer skills training programs also serve as employers in the field. In addition, 13 survey respondents are exclusively employers and do not offer training programs. Of the employers engaged by the research, the majority are nonprofit organizations, with four private sector employers. A wide variety of organizations hire for urban forestry or horticulture positions, including NYC Parks, botanical gardens, park trusts and conservancies,

What we're looking for is enthusiasm and flexibility to learn different skills that they might not have yet. If they don't have a background in academic horticulture, it's not prohibitive.

—Employer

and cemeteries, as well as private sector tree care and landscaping companies. By far the largest employer of urban forestry-related workers is NYC Parks, although specific numbers were not collected for this research. Among the organizations surveyed, most indicated that they make one to five hires per year. Several respondents noted that private sector employers, which include tree service and landscaping companies, are often based outside the city on Long Island, in Westchester, or New Jersey. While they may have contracts in the city, they also service clients in areas that would likely require an employee to have access to private transportation.

EMPLOYER OUTLOOK ON JOBS

The few employers engaged were generally optimistic about the availability of entry-level jobs for individuals hoping to start a career in urban forestry. One focus group respondent noted that private companies do not have the same seasonal constraints that public sector hires do, as they have many contracts with both public and private clients that continue throughout the year.

It is important to note that the employers' more optimistic view contrasts to the perspective of training program representatives, who expressed concern about job opportunities. One explanation is that employers may be referring to the availability of seasonal entry-level work while program representatives are interested in ensuring participants find stable full-time opportunities. These differing views suggest more research is required into the scope and type of jobs available.



Materials ready for planting and tree bed maintenance.

SKILLS AND TRAINING FOR ENTRY-LEVEL POSITIONS

One goal of this research was to ascertain if programs are training participants for the skills needed for entry-level jobs and what opportunities may exist to adjust training offerings to match the requirements of available jobs. While willing to hire individuals for entry-level positions without prior experience or formal training in urban forestry skills, employers also see a great value for applicants to complete a formal skills training program and are enthusiastic about the expanding training offerings.

The few employers interviewed did not highlight particular prerequisite technical skills necessary for entry-level positions, stating that these can often be learned on the job. Instead, they tend to look for certain personal qualities or attitudes they believe will make for a successful worker. These might include enthusiasm and interest, punctuality, and the willingness to work physically laborious jobs outdoors in all kinds of weather. In addition, the ability to communicate is deemed important as many entry-level roles have a public-facing component.

While 10 of 13 employers surveyed stated that they were willing to hire untrained individuals for entry-level jobs, employers were nearly unanimous in expressing support for more workforce skills training. They noted that a foundation in urban forestry skills and knowledge is invaluable for giving trainees an advantage in obtaining an initial job and for career advancement, as well as saving the employer time and money when making a new hire. One employer noted the particular value of training participants through a New York City-specific program, attuned to the particular needs of the city's communities. Employers named the following skills as the

10 of 13 employers surveyed indicated a willingness to hire people for entry-level positions without prior experience or training in urban forestry skills.

most valuable for a worker to know: tree identification, tree planting and maintenance, basic tool skills, an introduction to machinery, climbing skills, exposure to working with a bucket lift, math and mapping skills, and public speaking skills. This strong support from employers is important to ensure the success of urban forestry programs.

URBAN FORESTRY ROLES AND JOB TITLES

When considering job titles under the general rubric of urban forestry, several respondents noted the importance of understanding the difference between the arborist, forester and horticulturist positions. Each has a particular area of expertise involving specific skills and different career paths. The three titles and their responsibilities, as described by respondents, are outlined below:

Arborists work directly with trees, completing such tasks as planting, pruning small branches, cutting large limbs, as well as tree removal. These positions require abilities in tree climbing, chainsaw operation, and the use of machinery such as bucket lifts. These positions generally do not require advanced education in forestry. Respondents stated that arborist jobs are more plentiful than forester positions in both the public and private sectors, making them an attractive way to enter the urban forestry sector.

Foresters may work in the field performing tree inspections and tree inventories, conducting research, as well as performing managerial, planning, and community engagement duties. These positions usually require a degree, are less typical in an urban setting than arborist jobs, and may not involve actually climbing or cutting trees. As no forestry higher education degree programs exist within New York City, the forester positions in the city must be filled by individuals educated elsewhere. The forester positions tend to be with public agencies.

I think it's important for people entering this field to understand some of tree biology and physiology and why we are doing what we're doing. If you make a really bad cut on a tree today, it could be 10, 20 years before that tree ultimately fails...trees are on a different timeline than we are.
—Employer

Horticulturists focus on plants and shrubs, or garden cultivation, and not the care of trees. The horticultural position of “gardener” was the job title listed most frequently on survey responses among urban forestry employers.. For example, NYC Parks hires gardeners manage natural areas, with a particular focus on removing invasive plant species.

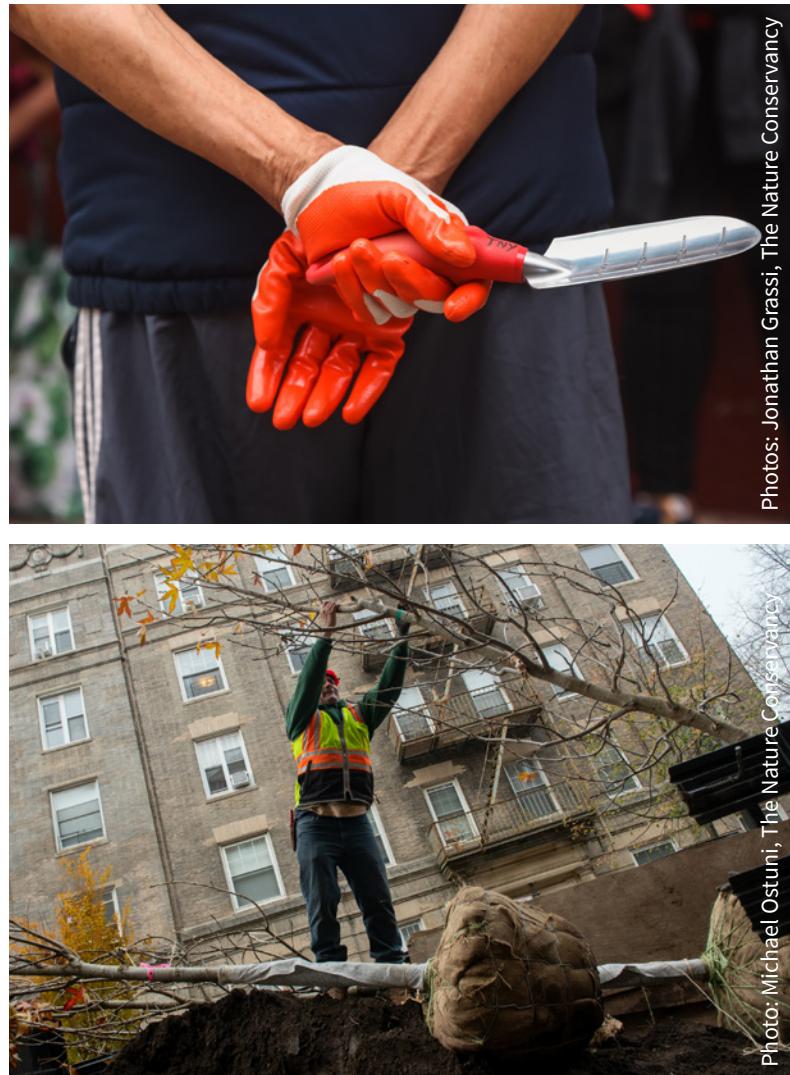
This framing of the different roles may help to explain the wide variety of titles employers listed on the survey and in the accompanying table. Titles for entry-level positions include groundskeeper and botanical aide to arborist and gardener. Administrative jobs include public programs coordinator or outreach supervisor to jobs that may require advanced training or experience such as forester, GIS technician, and horticulture manager. Jobs with similar skill requirements or responsibilities may have different names at different organizations. For example, “arborist” and “tree worker,” “groundskeeper” and “field crew,” as well as “gardener” and “horticulture technician” are pairs of titles for the same type of work. While many roles exist, the data did not reveal if these roles are being filled by participants of training programs. More research is needed to determine who the applicants are for these jobs and what, if any, training they have had.

A lot of the people come with forestry degrees from more rural settings, like maybe upstate somewhere and they're thrown into this urban canopy and a lot of them didn't like it...they don't understand the culture. So I think an urban program for people that actually like living in cities would be important.

-Employer

Job titles include:

- Public program coordinator
- Groundskeeper
- Field crew
- Park crew lead
- Tree worker / climber
- Forest restoration specialist
- Horticulturist
- Plant health care assistant



Workers prepare to plant new trees in Jackson Heights.

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CHALLENGES AND OPPORTUNITIES



Photo: Michael Ostuni, The Nature Conservancy

Respondents offered insights into the challenges and opportunities for urban forestry skills training programs. These themes were explored in greater depth with focus group participants and during one-on-one interviews. The opportunities below are directed at addressing the challenges named by organizations that offer training programs. A callout box on the next page offers opportunities identified specifically for employers to create easier entry points into careers. The opportunities for both programs and employers do not address larger structural issues regarding the quality and scope of available jobs—a labor market analysis would be needed to provide more insight.

Jobs

CHALLENGES

Availability of full-time jobs

The biggest challenge named by training program representatives is the low number of full-time, year-round jobs with salaries offering at least a living-wage. This concern regarding the seasonal nature and insufficient pay of jobs in the field was echoed by representatives across the spectrum of training organizations. Several representatives from the core workforce programs noted that the perceived lack of full-time jobs creates a challenge to recruit and retain individuals who often are enticed to pursue what they view to be more secure and lucrative career options. Of note, as indicated in Part 3 on Employer Outlook on Jobs, the few employers engaged had a very different perspective, citing an abundance of job openings.

11 of 36 programs indicated that a lack of full-time job opportunities is the challenge that needs to be addressed prior to an expansion of training.

The seasonality of jobs is something that we see across the environmental sector in general. Something we hear from a lot of our students is the challenge of finding a position that's maybe only six months to one year, and that they just get into that vicious cycle.

—Program representative

Another concern is the quality and longevity of job opportunities. Specifically, representatives of core workforce programs stated that graduates who are placed into sector jobs often do not remain in the field, choosing to pursue employment in other sectors with stable jobs and better pay. The uncertainty of career paths concerned respondents—they worried that entry-level hires do not have sufficient opportunities for professional growth.

Education requirements

Meeting minimum education requirements for jobs can be a challenge as respondents noted that urban forestry job listings may require a college degree, eliminating applicants who may have the skills but not the requisite formal education.

Driver's licenses and access to transportation

Respondents stated that urban forestry jobs often require a driver's license but few programs are able to offer driving training to participants. A related challenge is accessing job opportunities outside the city, where numerous private tree care and landscape companies are based. Even if an applicant has the license, they may not have the vehicle to get to the job opportunity.

OPPORTUNITIES

Tailoring training to entry-level job openings

Training programs could offer specific technical skills that are needed for certain available entry-level roles, particularly for positions in arboriculture. Training in climbing and rigging skills, as well as exposure to the cherry picker and bucket lift, would allow individuals to apply for arborist positions. As noted, none of the formal programs with an emphasis on workforce training currently focus on skills and knowledge specific to arboriculture, although NYC Parks is planning on offering a new training for climber/pruner arborist positions within the agency (see the callout box on page 24).

Fostering networks and mentorships

Respondents named the opportunity to strengthen the network of urban forestry organizations to improve job placements for participants. Relatedly, NAC offers a model, having created a network among program graduates who are able to share experiences and job openings with each other. One respondent specifically named the opportunity to develop a network of mentors to support individuals looking to start careers in the sector.

OPPORTUNITIES FOR EMPLOYERS TO IMPROVE URBAN FORESTRY CAREER PATHWAYS

While training programs can make some changes to improve job opportunities, interviewees and focus group respondents also considered opportunities for employers in the sector to improve access to jobs and career pathways. These include the opportunities to:

- Reframe job requirements away from minimum formal education prerequisites and emphasize the non-technical skills or qualities that may be better indicators of success such as interest in the field of urban forestry, a desire to learn, comfort with working outdoors, or the ability to interact with the public. Several focus group participants agreed that a larger opportunity exists to have the NYC Department of Citywide Administrative Services, which sets job titles and requirements, reconsider minimum qualifications for certain NYC Parks positions to make them more accessible.
- Standardize job titles across employers by creating a common vocabulary and descriptions for positions of similar responsibilities and skills. Prospective applicants may feel less intimidated to apply.
- Change recruiting practices among non-profit organizations that manage green spaces. This may include more broadly publicizing job openings, as well as reconsidering the actual skills needed for jobs. One interviewee believed these changes might help create greater racial and socio-economic diversity among urban forestry and horticulture hires.
- Create more internship opportunities for trainees within urban forestry-related organizations, giving individuals exposure to the field as well as the chance to build skills.
- Think expansively about job opportunities. One respondent noted that individuals trained in urban forestry might find seasonal placements around the country through the US Forest Service. While obviously not a solution to the seasonality of many local forestry-related jobs, this is a sector that allows individuals with skills to travel for work.
- Strengthen the connection between NYC Parks, the single largest employer in the urban forestry sector in NYC, and the city's training programs to create a pipeline of opportunity for program participants.

Program Capacity

CHALLENGES

Funding and staffing

Twenty organizations named the challenge of securing additional and reliable funding as the impediment to expanding existing skills training offerings. Several survey respondents specified that additional staff dedicated to training would be needed to expand offerings. More research is needed to better understand staffing challenges.

Training resources

Access to sufficient resources—classroom space, equipment, and appropriate curricula to be able to offer or expand training—was named as a challenge. Access to plants and trees to cut or manipulate as part of a training program is an issue for organizations, making skills such as the use of chainsaws a challenge to teach to participants.

Recruitment, retention, and tracking

Respondents representing core workforce programs named several programmatic challenges. For an unpaid training, the program's length can create recruitment and attrition challenges, as sacrificing an income for weeks or months can be a severe burden for unemployed or low-income individuals. The timing of a program can also affect program success. Graduates of training cycles that end in the late fall or winter may have more difficulty obtaining employment in a sector which tends to offer opportunities in the early spring. Tracking graduates, particularly following the first year of program completion, is a challenge as individuals lose touch with program staff. Finally, several interview subjects and focus group respondents noted that limiting the language of instruction to English is a potential barrier, as it excludes a large number of potential program participants who are non-English speakers.

OPPORTUNITIES

Government funding opportunities

In response to the funding challenges, several focus group respondents stated that additional funding for green job training, particularly at the federal and state level, is increasing and more is anticipated over the next few years. However, the longer term reliability of these funding streams is unclear. Policymakers can play an important localized



22 of the 36 programs indicated interest in expanding existing training offerings to add urban forestry skills if provided with additional resources.

The number of programs that listed the following capacity needs:

- 20 Additional funding
- 15 Additional staff
- 16 Additional curricular resources to support training program
- 12 Additional facilities or equipment

role in allocating additional and more consistent funding for workforce development projects to help eliminate the uncertainty in the sector.

Expanding program partnerships

Deepening and expanding the trend of partnerships between organizations in the sector might help to overcome individual program capacity issues. A third of all programs currently engage in a partnership with another organization. Numerous respondents were keen to form new collaborations to share organizational strengths and resources with one another. An example of a promising collaboration is the one developed by Tri-Lox, a company that works with salvaged wood. It has collaborated with NYC Parks to obtain and store city trees that needed to be removed. Tri-Lox has trained participants from the Brooklyn Woods woodworking program in skills working specifically with the wood from these trees at the end of their life cycle.

Accessing trees through NYC Parks

One respondent noted that NYC Parks currently has thousands of outstanding tree work orders, potentially offering opportunities for people in training to practice cutting and pruning skills. Recognizing that NYC Parks usually contracts with private companies for tree removal, perhaps an opportunity exists to expand or build more partnerships with training programs to facilitate trainees getting an opportunity to practice on existing tree work orders.

Skills Training Standards

CHALLENGE

The vast majority of urban forestry skills training programs do not adhere to an industry-recognized standard nor to a shared method of assessing skills among program participants. This makes evaluation of a trainee's skills and knowledge a challenge. While similar skills are being taught by programs in all categories, the rigor or depth of instruction most likely varies greatly between programs. Further research into the quality of skills training is required.

OPPORTUNITY

Several respondents noted that programs could utilize existing protocols such as the International Society of Arboriculture certification and American National Standards Institute (ANSI) standards in arboriculture. With many programs teaching a similar set of skills, an opportunity exists to develop shared curricula or common standards to be followed by various training programs to measure participants' knowledge and abilities. Adopting skills standards may increase employment opportunities by simplifying an employer's evaluation of a job applicant.

A lot of the 18 to 24 year olds have no idea of the urban forestry jobs out there... a lot of my students when they first start have never even held a rake or worked a shovel or wheelbarrow. So I feel that it is very important that these training programs not only teach the students how to use the tools, but that you have to really counsel them and show them where the jobs are.

—Program representative



Green City Force employs alumni of its Americorps program to work on the NYCHA Tree Inventory Project.

Awareness Of Urban Forestry

CHALLENGE

Numerous respondents noted the public's lack of awareness of urban forestry as a possible career path, particularly among younger individuals from traditionally marginalized communities who may not have been exposed to the sector and its skills before.

A representative from a core workforce program stated that a lack of awareness of the field can make program recruitment a challenge—teens and young adults may not consider urban forestry as a career option and might select training and employment in more familiar sectors, such as construction or retail. While the low acceptance rates among college and high school programs indicates strong interest in the field in general, perhaps individuals with less education attainment or from marginalized communities do not have the early exposure to urban forestry as a job opportunity and career path.

11 programs stated that increased interest among prospective participants is needed prior to program expansion.

OPPORTUNITIES

Exposing young people to urban forestry

Respondents focused on several opportunities to increase awareness of urban forestry, particularly among communities not historically exposed to ecologically-oriented job opportunities. A focus group respondent encouraged earlier exposure to urban forestry among K-12 students and to communicate the personal benefits of working in the sector. Green City Force offers a model that might be replicated: it hosts information sessions for its Americorps program at its so-called Eco-Hubs. These are educational spaces on seven NYCHA properties that expose potential applicants to the types of tools and activities that comprise the green skills-focused Americorps program. A program representative shared that the on-site exposure generates excitement and interest among potential applicants who may not have previously known about this line of work.

While 10 of the 36 programs already engage with NYC Department of Youth and Community Development's Summer Youth Employment Program (SYEP) to offer paid opportunities for high school summer internships, an opportunity may exist to further engage the NYC Department of Education and particularly its Career and Technical Education (CTE) program to expand educational opportunities in urban forestry skills in high school.

Large pool of diverse NYC-based trainees

The existence of a substantial pool of local applicants for skills training is seen as an opportunity for the city's urban forestry sector to train individuals intimately familiar with the particularities of city life and the needs of local communities. In addition, respondents noted particular under-represented populations who could benefit from training, including involving more women as well as non-English speakers, recent immigrants, and refugees.



A tree ready for planting in Jackson Heights.

Photo: Michael Ostuni, The Nature Conservancy

Representative leadership

Several focus group respondents saw the opportunity to diversify the leadership of organizations involved with urban forestry, including job training programs. Better representation in prominent positions might encourage greater awareness and interest among young people from historically underrepresented communities.

We need more exposure to urban forestry and other related fields of work (horticulture, urban planning, etc) at earlier ages, as well as urban forestry training options that may be alternatives to or complementary to college education. To attract a strong group of applicants, these programs should be well paid.

—Program representative



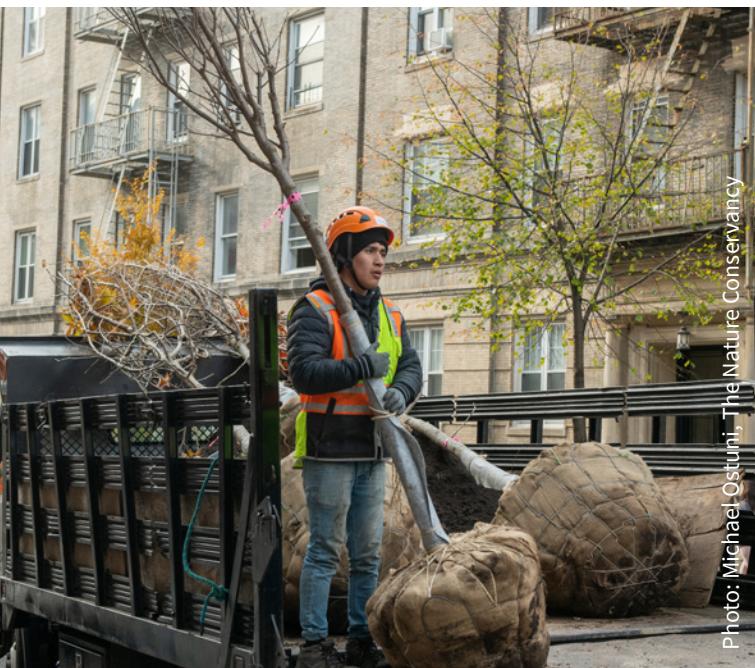
Photo: Jonathan Grassi, The Nature Conservancy

Through the interviews and the focus groups, respondents presented their visions for the future of urban forestry skills training programs. Taken as a whole, they demonstrate a strong collective desire to ensure that urban forestry skills are accessible to all New Yorkers.

VISION FOR URBAN FORESTRY TRAINING

A common theme in respondents' visions is a strong interest in ensuring youth from marginalized communities have more opportunities to receive comprehensive skills training. Several respondents centered the importance of racial equity in the urban forestry sector, particularly in preparing individuals for higher level positions.

An urban forestry training program should be broad in scope, incorporating both basic horticultural and arboricultural skills. The training should offer compensation, engage participants for several months, and incorporate both extensive field work and classroom study. Upon completion, participants should receive a meaningful certificate or be able to work toward the widely recognized International Society of Arboriculture certificate.



A worker prepares to plant new trees in Jackson Heights.

Respondents also shared that a training program should be expansive, exposing participants to advanced topics such as research and computer skills, giving participants the option to pursue higher education in forestry, opening a wider range of career opportunities.

Beyond skills training, respondents see a deeper value of an urban forestry training program as one that provides participants with a sense of purpose in their work, connecting them to their local environment and building community.

Expanding partnerships is a key component of many respondents' vision. One suggestion is to create a consortium of programs, working together to offer different aspects of a comprehensive formal training that utilized the spaces, staff, and strengths of different organizations toward a common certificate in urban forestry.

I think there's a huge opportunity to provide more resources for people that might be doing the physical work to partake in more of the research, to give them that skill set that allows them to advance even further out of that role.

—Program representative

Is there a way to start thinking more holistically about looking at the available opportunities and understanding how we should be engaging our students along that pathway? So they're not only thinking about one specific tree-related career path, but that there might be adjacent paths available.

—Program representative

MOVING FORWARD

Building on the collective energy among organizations and employers, Forest for All NYC coalition members are well positioned to take some actions to strengthen the sector. The suggestions below are organized generally from more accessible or manageable steps to ones that may require additional time and resources. Members of the coalition might:

- Continue to build connections between partner organizations to create new training collaborations, shared curricula or skills standards, and a possible consortium of organizations to offer a more comprehensive training opportunity.
- Host conversations among sector employers to create better alignment between training and available jobs and to discuss reframing job requirements and job titles to improve job placement opportunities for participants.
- Create and publicize a comprehensive directory of training programs to raise public awareness, particularly in marginalized communities, of opportunities to gain skills in the urban forestry sector.
- Collect more information from training programs regarding the rigor of skills training to identify strengths and gaps in offerings.
- Initiate further research into the city's urban forestry labor market to understand employment trends and future opportunities.
- Secure additional funding and expansion of urban forestry job training, given the level of interest among both training organizations and employers for additional formal training opportunities in urban forestry.

So much of what makes us successful is celebrating community, and prioritizing the identity of the community to fight injustice...We divorce people from the environment so much in this city and so much is around class. I think that's where there's a real sweet spot and it's exciting.

—Program representative



An instructor from Trees New York guides participants in the proper care of a tree bed.



Research Methodology

TYTHEdesign developed a data collection plan that prioritized an inclusive, equitable, and accessible approach in order to reach as many stakeholders as possible to garner insights. To meet this goal, TYTHEdesign's approach:

- ensured stakeholders feel integrated into the data collection process, and built trust with them to collect information.
- was flexible to ensure that we could identify, engage, and gather information from additional stakeholders as the research progressed.

As described on page 8, a Forest for All NYC advisory committee developed definitions for an urban forestry job and a workforce training program. Starting with the assumption that programs varied widely—from formal job training programs to volunteer programs—workforce development programs were broken into two categories, with terms co-created with the Forest for All NYC advisory committee solely for the purposes of guiding the data collection:

1. A “traditional” program is offered regularly, often by a dedicated workforce development organization to participants often from low-income and marginalized communities and provides training in technical and job readiness skills, certifications, job placement assistance, and tracks graduates.
2. A “non-traditional” program may be offered by entities not solely focused on workforce development. These opportunities should offer formal recurring training at scale. However, they may not provide services such as job readiness, job placement and graduate tracking. These training programs might take the form of an internship, a volunteer opportunity, a paid program, or a formal training component of an existing job.

These definitions helped define the boundaries of the research, supporting the identification of potential programs TYTHEdesign would include as part of its mapping of stakeholders.

DATA COLLECTION METHODOLOGY

Upon establishing the research goals, boundaries, and research questions with The Nature Conservancy and the Forest for All NYC advisory committee, TYTHEdesign developed a data collection plan to collect insights regarding the current landscape of programs. The research focused on organizations located in the five boroughs and all data collection engagements were conducted virtually. Methodologies and confidentiality protocols were reviewed and approved via The Nature Conservancy's Human Subjects Research Standard Operating Procedure before data collection began. To ensure an inclusive and expansive engagement, TYTHE utilized the following methods:

Stakeholder Mapping

Beginning with the list of Forest for All NYC coalition members, TYTHEdesign performed desk research to add to this list of organizations that may offer urban forestry skills training. One important resource for this research was the US Forest Service's Stewardship Mapping and Assessment Project (STEW-MAP), which provides extensive information on organizations involved in environmental stewardship, including urban forestry.¹⁵ The research built out both the stakeholder map of both traditional and non-traditional training programs.

Digital surveys

Two surveys were developed, with one survey distributed to traditional workforce training programs and a second survey to non-traditional training offerings. An assumption guiding the decision to create two surveys with different sets of questions was that traditional workforce programs might be able to answer standardized questions regarding recruitment, training and job placement while non-traditional programs may not have the ability to provide the same information as many of these programs are not necessarily intended as formal job training opportunities.

Interviews

One-on-one interviews were conducted with a selection of survey respondents. The primary purpose of the interviews was to gather more detailed qualitative information, insights, and opinions directly from individuals administering skills training programs or in the position to hire individuals in the field of urban forestry.

Focus groups

Based on the early findings of the survey results, key stakeholders were invited to participate in two identical focus groups designed by TYTHEdesign. Focus group participants were provided with an overview of the research project and general insights from the survey analysis before engaging in a facilitated conversation on themes related to urban forestry training and employment. The purpose of the focus groups was to identify challenges and opportunities to improve urban forestry job training and careers.

Data for the project were collected between February and April 2023. TYTHEdesign collected both quantitative data through surveys and qualitative information through all three forms of engagement—surveys, interviews, and focus groups. Once data were collected, a segment analysis was performed on survey responses to group programs into distinct types based on certain shared traits. We analyzed the quantitative data using descriptive statistics to determine the frequency distribution of certain program characteristics. The qualitative data collected in the surveys, interviews, and focus groups underwent a thematic analysis—written survey responses and transcriptions of interviews and focus group conversations were coded and grouped to identify patterns and determine themes, particularly when considering opportunities and challenges. To supplement the quantitative data, qualitative information in the form of quotes was utilized to provide a more complete and nuanced understanding of urban forestry skills training and employment landscape. Data collected were anonymized, so the quotes utilized in the report are not attributed to specific individuals. For any questions regarding survey questions or the archiving of answers, you may contact The Nature Conservancy Ethics and Compliance Hotline at (833) 426-1404 or online at: nature.org/tnchelpline.

LIMITATIONS OF THE RESEARCH

This project had certain limitations which affected data collected and analysis, outlined below:

- While extensive desk research was conducted, some organizations that offer programs may not have been identified during the desk research phase.
- Data collection relied on participants to choose to complete the surveys and to decide what information they were willing to provide. Respondents either did not consistently answer all questions or, in some instances, provided minimal information. The data analysis was limited by the variability in the level of detail and depth of information provided by respondents. Additionally, due to time and budget limitations, the project team conducted limited follow-up with organizations that did not respond to the survey or other emails about the research.
- Some organizations did not respond while others stated they did not offer training in urban forestry, based on the definition of urban forestry provided in the survey. Although the definition was broad, some organizations may have erroneously chosen not to participate, assuming that their programs do not fit the provided definition.
- As this project was not intended to engage many employers, insights regarding employment and jobs are based on limited survey responses and interviews.

Acronyms

Abreviation	Meaning
BBG	Brooklyn Botanic Garden
BIPOC	Black and Indigenous People of Color
CBO	Community-Based Organization
CTE	Career and Technical Education
CUNY	The City University of New York
DYCD	New York City Department of Youth and Community Development
GCF	Green City Force
GED	General Education Development
HRA	New York City Human Resources Administration
NAC	Natural Areas Conservancy
NYBG	New York Botanical Garden
NYC	New York City
NYCHA	New York City Housing Authority
NYC Parks	New York City Department of Parks & Recreation
OSHA	Occupational Safety and Health Administration
POP	Parks Opportunity Program (run by New York City Department of Parks & Recreation)
SST	Site Safety Training
SYEP	Summer Youth Employment Program (run by New York City Department of Youth and Community Development)
WCS	Wildlife Conservation Society

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- Brooklyn Botanic Garden
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- Brooklyn Greenway Initiative
- Brooklyn Workforce Innovations
- Central Park Conservancy
- City Parks Foundation
- Coney Island Beautification Project, Inc.
- Curb Allure
- Davey Tree
- Farm School NYC
- Friends of Governors Island
- Goddard Riverside Community Center
- Gowanus Canal Conservancy
- Green City Force
- Greenbelt Conservancy
- HorticultureNYC (New Roots)
- Hudson River Park Trust
- John Bowne High School
- Lower East Side Ecology Center
- National Wildlife Federation
- Natural Areas Conservancy
- New York Botanical Garden
- NYS Department of Environmental Conservation
- New York Restoration Project
- New Yorkers for Parks
- NYC Environmental Justice Alliance
- NYC H2O
- New York City Department of Parks & Recreation
- New York City Housing Authority
- New York League of Conservation Voters
- Partnerships for Parks
- Prospect Park Alliance
- Queens County Farm Museum
- Randall's Island Park Alliance
- Refoundry
- St. Nicks Alliance
- The Door - A Center of Alternatives Inc.
- The Green-Wood Cemetery
- The HOPE Program
- The Horticultural Society of NY
- The Morton Arboretum
- The Nature Conservancy
- The Trust for Governors Island
- Treadwell Farm Historic District Association
- Trees New York
- Tri-Lox
- Urban Arborists
- Van Cortlandt Park Alliance
- Wave Hill
- Wildlife Conservation Society
- Woodlawn Conservancy, Inc.
- Youth Action / YouthBuild East Harlem

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Endnotes

1. Forest for All NYC. (2021). NYC Urban Forest Agenda. Retrieved from forestforall.nyc/wp-content/uploads/2021/06/NYC-Urban-Forest-Agenda-.pdf
2. Defined as: “deriv[ing] from the concept of nature-based solutions, which refers to the sustainable management and use of nature for tackling challenges such as climate change, stormwater runoff, air quality, water and food security, biodiversity protection, urban heat island effect, human health, coastal and flooding risks, and disaster risk management. Nature-based jobs include occupations promoting nature-based solutions and occupations centering activities supporting and caring for nature for nature’s own sake.” Just Nature NYC. (2021). Opportunities for Growth: Nature-Based Jobs in New York City. Retrieved from nyc-eja.org/wp-content/uploads/2021/12/Nature-Based-Jobs-Report-2021.pdf
3. “Marginalized communities are those excluded from mainstream social, economic, educational, and/or cultural life. Examples of marginalized populations include, but are not limited to, groups excluded due to race, gender identity, sexual orientation, age, physical ability, language, and/or immigration status. Marginalization occurs due to unequal power relationships between social groups.” Sevelius, J.M., Gutierrez-Mock, L., Zamudio-Haas, S. et al. Research with Marginalized Communities: Challenges to Continuity During the COVID-19 Pandemic. AIDS Behav 24, 2009–2012 (2020). doi.org/10.1007/s10461-020-02920-3
4. Treglia, M.L., Acosta-Morel, M., Crabtree, D., Galbo, K., Lin-Moges, T., Van Slooten, A., and Maxwell, E.N. (2021). The State of the Urban Forest in New York City. The Nature Conservancy. doi: 10.5281/zenodo.5532876
5. The Forest For All NYC advisory committee includes representatives from USDA Forest Service NYC Urban Field Station, Trees New York, The Nature Conservancy, Natural Areas Conservancy, and The HOPE Program.
6. Organizations offering training programs did not share a standardized metric for “low-income.” The City of New York defines the term as earning 80% or less of area median income. Retrieved from nyc.gov/site/hpd/services-and-information/area-median-income.page
7. Defined in the International Society of Arboriculture Online Dictionary. Retrieved from isa-arbor.com/education/onlineresources/dictionary
8. Defined in the International Society of Arboriculture Online Dictionary. Retrieved from isa-arbor.com/education/onlineresources/dictionary
9. U.S. Environmental Protection Agency defines greenscaping as landscaping practices for lawns, gardens, etc. that protect the environment. Retrieved from epa.gov/sites/default/files/2014-04/documents/greenscaping_-_the_easy_way_to_a_greener_healthier_yard.pdf
10. Defined as: “Equal distribution of environmental risks, hazards, investments, and benefits, without direct or indirect discrimination, at all jurisdictional levels. Environmental justice also implies equal access to environmental investments, benefits, and natural resources; access to information and justice in environmental matters; and participation in decision-making.” Just Nature NYC. (2021). Opportunities for Growth: Nature-Based Jobs in New York City.
11. “The United Nations Environment Programme defines a green economy as ‘low carbon, resource efficient, and socially inclusive, where growth in employment and income are driven by public and private investment into such economic activities, infrastructure, and assets that allow reduced carbon emissions and pollution, enhanced energy and resource efficiency, and prevention of the loss of biodiversity and ecosystem services.’” Just Nature NYC. (2021) Opportunities for Growth: Nature-Based Jobs in New York City.
12. New York City Housing Authority Capital Projects Division (2021). New York City Housing Authority’s Urban Forest: A Vital Resource for New York City. Retrieved from nyc.gov/assets/nycha/downloads/pdf/NYCHA_Urban_Forest.pdf
13. The Citizen Pruner Tree Care Course trains volunteers in tree care, biology, identification and pruning. After the completion of the \$100 course, Citizen Pruners volunteer their time and skills to care for trees, which is why this program is included for this report under volunteer programs.
14. City of New York Mayor’s Office (2023) PlaNYC: Getting Sustainability Done. Retrieved from climate.cityofnewyork.us/wp-content/uploads/2023/04/PlaNYC-2023-Full-Report-low.pdf
15. U.S. Department of Agriculture U.S. Forest Service (2017). The Stewardship Mapping and Assessment Project. Retrieved from: fs.usda.gov/research/products/dataandtools/interactivemaps/stewardship-mapping-project-2017-new-york-city-dashboard



Forest for All NYC is a broad and diverse coalition of public, nonprofit, and private sector groups dedicated to conserving and expanding the urban forest in New York City. Our vision is to create a healthy, biodiverse, robust, accessible, well-understood, and resilient urban forest that justly and equitably delivers its multiple benefits to all residents of New York City and helps the city adapt to and mitigate climate change. Coalition members work together to implement the *NYC Urban Forest Agenda*, a roadmap to protect, maintain, expand, and promote the New York City urban forest to benefit all New Yorkers in a way that is just and equitable.

forestforall.nyc



The Nature Conservancy is a global conservation organization dedicated to conserving the lands and waters on which all life depends. Guided by science, we create innovative on-the-ground solutions to our world's toughest challenges so that nature and people can thrive together. In New York City, The Nature Conservancy advances strategies to equitably improve the well-being of all New Yorkers and create a healthy, resilient, and sustainable urban environment. The Nature Conservancy convenes and is a leading member of Forest for All NYC, a broad and diverse coalition of cross-sector organizations. To learn more, visit nature.org.

TYTHE design

TYTHEdesign is a capacity-building firm that uses the lens of design and strategy to support organizations doing good in their communities. By taking a human-centered approach, we help organizations connect with their stakeholders, drive innovation internally, enhance new and existing services, and share their story. Ultimately, our mission is to deepen existing skills and strengthen the impact of the social sector.

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