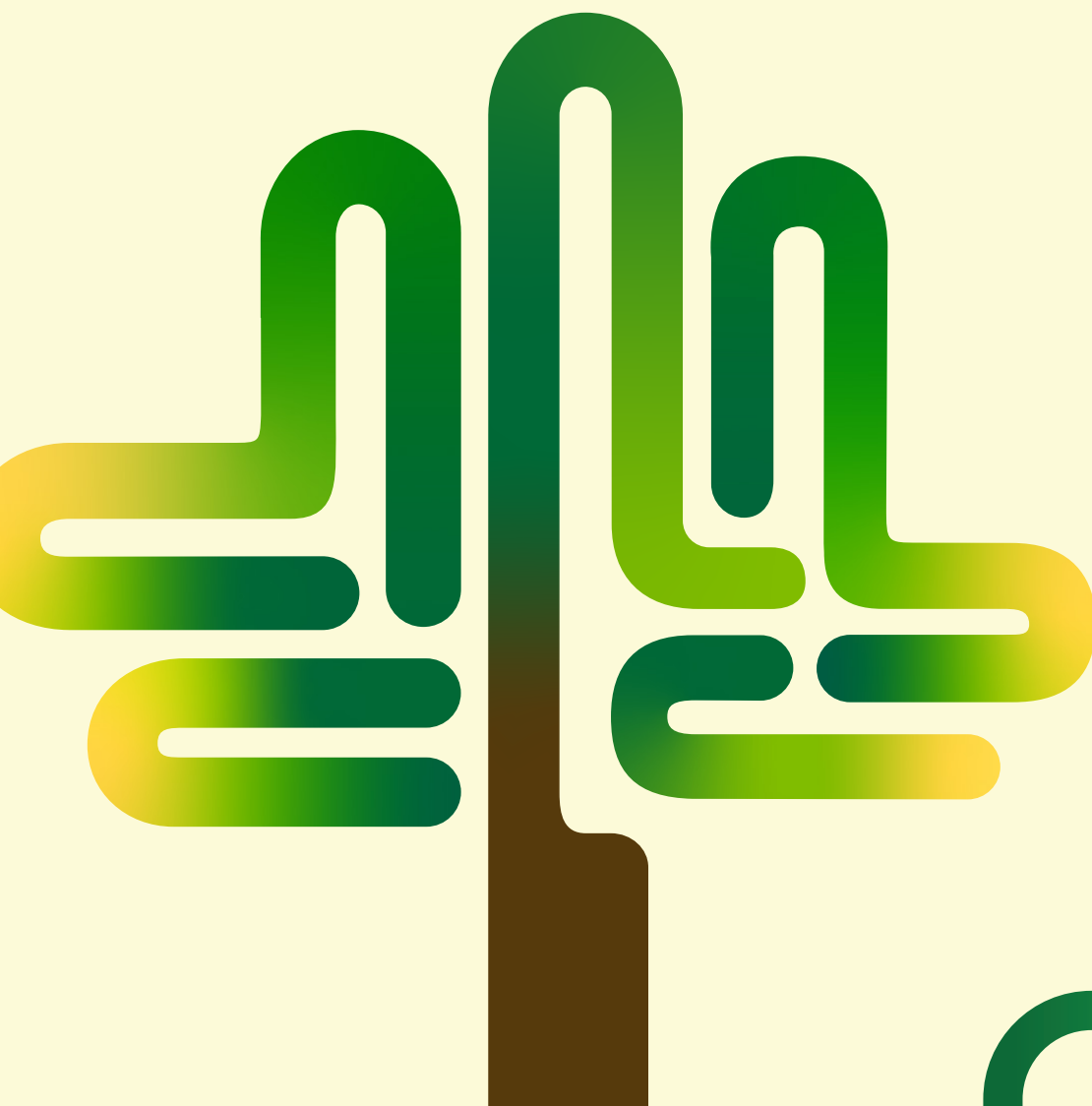


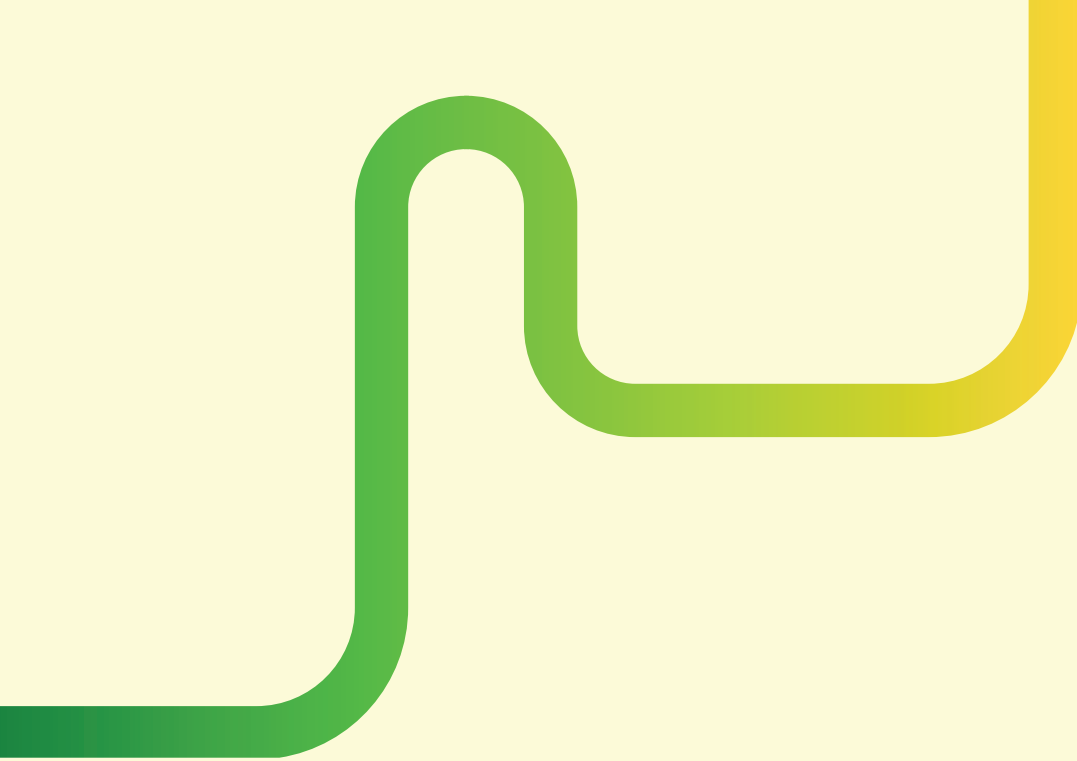
2024

# ARBORICULTURE

YOUTH + ADOLESCENT  
PROGRAMS REVIEW

FINAL REPORT





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## PROJECT BACKGROUND

The International Society of Arboriculture (ISA), an international membership society representing approximately 26,000 arborists, urban foresters, and people who care for and about trees, is the credentialing body for the arboricultural profession with 70 chapters, associate organizations, and professional affiliates.

Partnering with the USDA Forest Service and Bartlett Tree Experts, ISA hosted the 2018 Workforce Summit in Charlotte, North Carolina to discuss issues and opportunities in workforce development. Several key workforce topics were identified and discussed during the meeting, including how to ensure parents and young people know that arboriculture is a viable career option.

Despite several early youth, high school graduate, and college graduate tree and plant-related programs, ISA identified a large gap in programs for adolescents (10-19 years), an age group that is forming future career interests based in part on their educational and programmatic exposures.

In 2022, ISA requested proposals for a contractor to review and examine U.S. organizations that deliver programs that directly or indirectly introduce youth and adolescents to arboriculture. The University of Georgia (UGA) Warnell School of Forestry and Natural Resources was awarded funding in 2023 to conduct the scoping work and seek input on the results from subject matter experts and industry partners. Results of the scoping work would be used to develop a database of U.S. youth programs housed on the ISA website. Results would support ISA in promoting and advancing the development of new programs, partnerships, and/or other initiatives to introduce youth and adolescents to arboriculture career pathways. This report summarizes and analyzes data collected during the 2023 scoping process and input gathered from discussions with subject matter experts in a December 2023 meeting. This report complements the database of youth programs that were collected during this project, available as a separate publication.

## PROJECT METHODS

**SCOPING WORK: PROGRAM REVIEW** ISA sought to better understand what U.S. youth and adolescent natural resources programs were available and their arboriculture-related outcomes. As part of the scoping process, UGA Warnell investigated programs that introduce 10-19 year olds to trees, forests, plants (in general), arboriculture, horticulture, forestry, and the green industry, all subjects related to arboriculture. Several program structures were also investigated in the scoping process, including educational programs, internships/work programs, dual-enrollment programs, and more. UGA Warnell identified approximately 100 U.S. programs that met the above criteria. These programs were offered by various local, state, or national organizations or agencies. All programs were contacted via email or phone during May and June of 2023 for invitation to participate in a survey. Of the programs contacted, 58 agreed to participate in the

survey. A 22-question Qualtrics survey (IRB-exempt since human subjects not part of research) was developed to gather programmatic and outcome information for each program (see Appendix A for list of survey questions). The survey opened on July 5, 2023, and closed on July 26, 2023, with a total of 39 responses (67% response rate) (see Appendix B for list of surveyed programs). The responses were collated and then summarized and analyzed within this report.

**SUBJECT MATTER EXPERT MEETING** A two-hour virtual meeting was held with ISA Canopy Partners, industry and non-profit representatives, and university subject matter experts on December 4, 2023 to review survey results, discuss gaps in programming, and explore potential approaches for filling identified gaps.

# SURVEY RESULTS

## YOUTH PROGRAM SUBJECTS

Survey participants were asked to select from a list of subjects offered in their program that may support youth interest in arboricultural careers. Figure 1 lists the survey subjects and summarizes the number of programs that introduced these subjects to youth. The most common subject offered was plant identification (n=23 or 59% of programs surveyed). Other common subjects included plant or ecological health benefits, careers, plant care equipment, and planting. The least common subjects were tree climbing and forest management. Organizations were then asked, of the subjects listed, which were most popular with youth in the program (Fig. 1, green bars). The most popular subjects included plant identification, plant-related careers, and plant care. It should be noted that subjects offered less frequently (e.g., tree climbing) appear to be less popular compared to subjects (e.g., plant identification) offered more frequently, but this is not always the case. For the seven programs that offer tree climbing, 71% reported this activity was one of the most popular with youth participants.

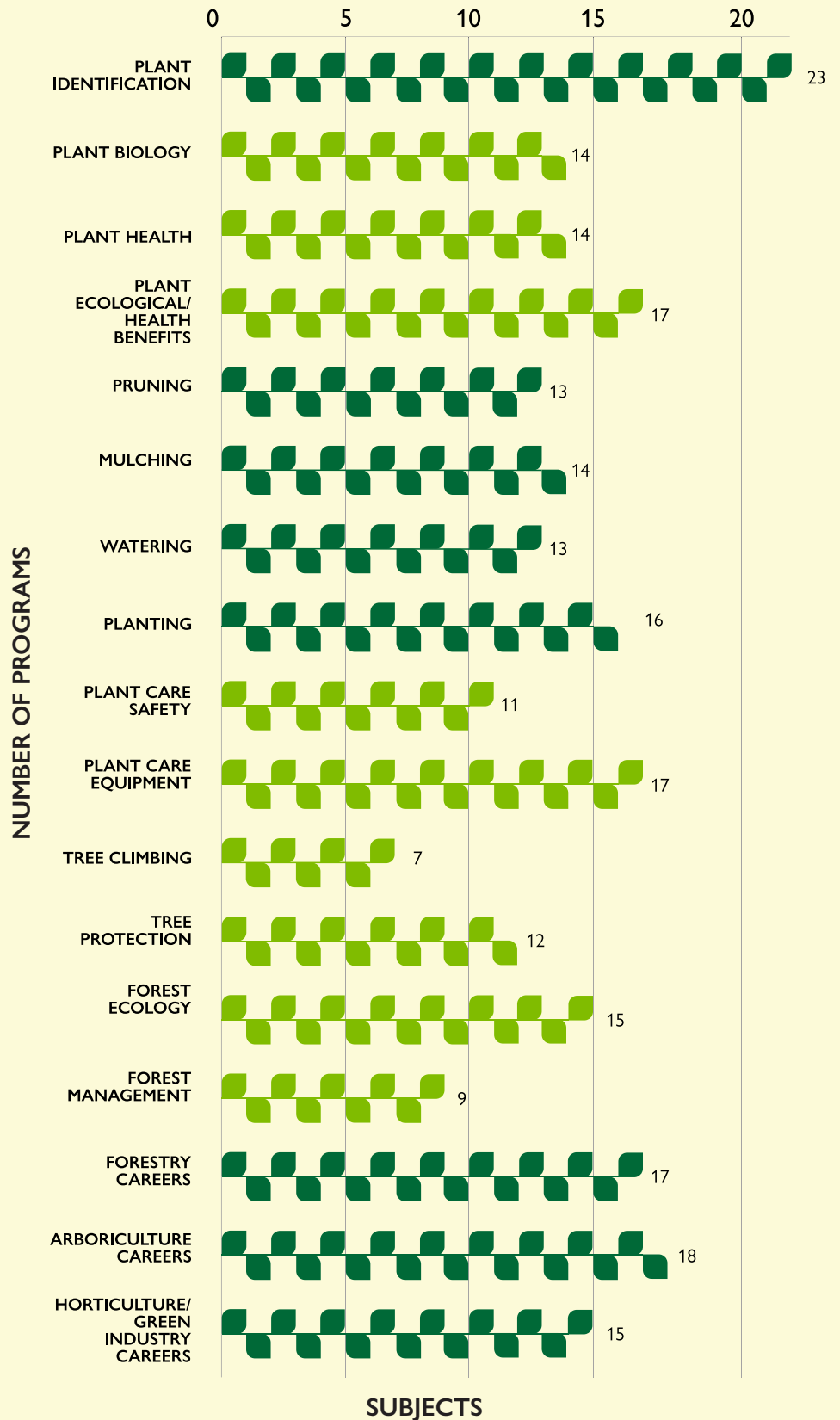


Figure 1: Number of programs offering subjects that can help introduce youth to careers in arboriculture. Numbers above the bars indicate the specific number of programs that offered this subject. Subjects with dark green bars were indicated to be the most popular subjects with youth.



## PROGRAM STRUCTURE

Organizations were asked to categorize their program structure. Structure options in the survey included programs that were solely educational; a paid work program or internship (education combined with a work program that included monetary compensation); an un-paid work program or internship; a dual-enrollment program (enrolled in high school while taking post-secondary school classes); or other structure (e.g., online program). From the responses, 85% of surveyed programs were classified as having an educational structure and 44% provided a paid work/internship structure (Fig. 3). Since organizations could select more than one structure type, several programs reported combined structures. 49% of surveyed programs were solely educational, whereas 33% combined an educational structure with a paid work program/internship. Three surveyed programs (Forest Project, Wisconsin Youth Apprenticeship, and Youth Forest Council) reported being educational, while also providing a paid work/internship opportunity and dual enrollment. Examples of “other” program structures included the online program, Plant Heroes, and the competition-based program, Ohio HS Landscape Olympics.

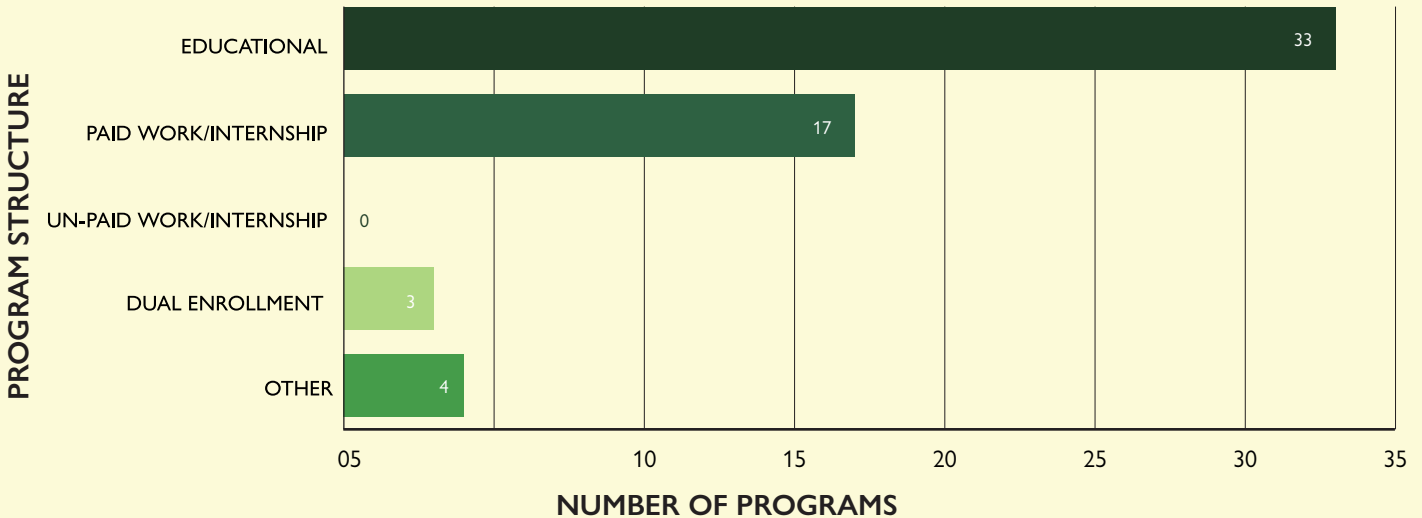


Figure 3: Frequency of program structures across surveyed programs. The number to the right of bars indicate the specific number of programs reporting a certain structure.

## PROGRAM FREQUENCY AND DURATION

To better understand program reach, organizations were asked how often their program was offered on an annual basis (frequency) (Fig. 4). Fewer programs were offered two to five times a year or infrequently. Organizations were then asked to report the number of days, weeks, or months that their program occurred each time it was offered (duration). Program duration was more difficult to assess since there were some reporting errors (answer choices for the question were not clear and, as a result, some respondents did not answer the question correctly). Accounting for these errors and combining program frequency and duration, the annual reach of programs surveyed offer approximately 2,520 day-long programs each year.

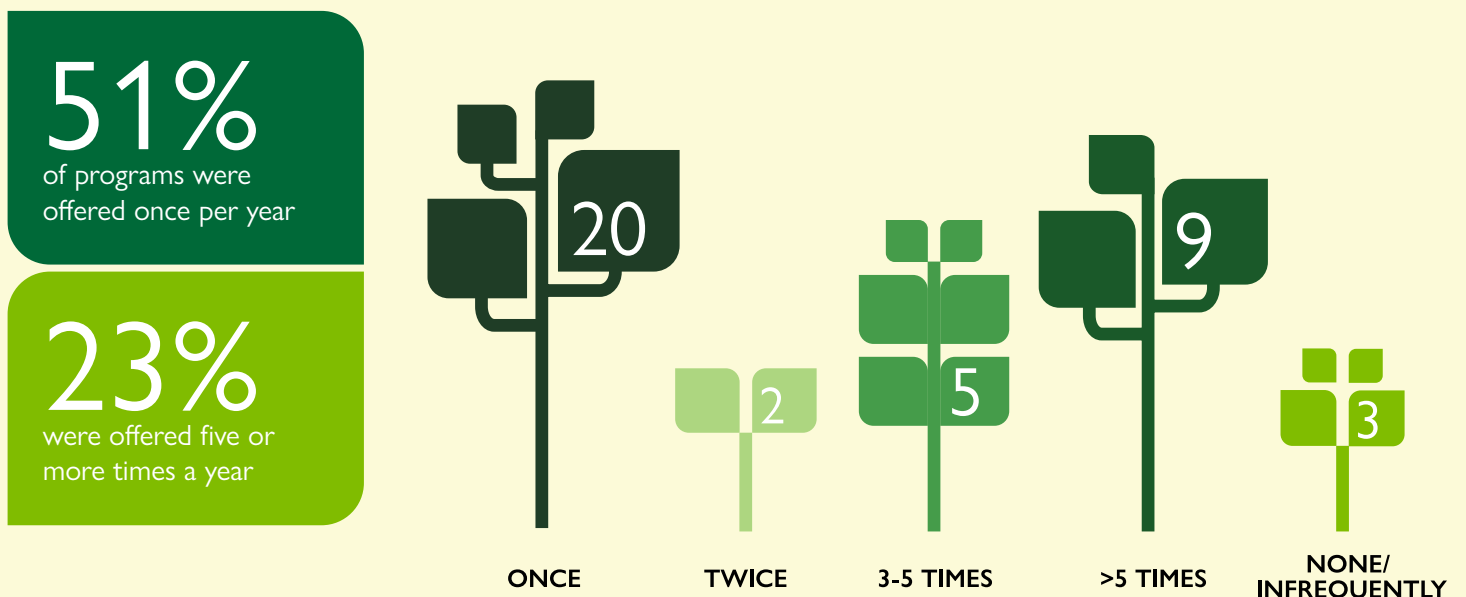


Figure 4: Annual program frequency, or how often programs were offered each year. The numbers indicate the specific number of programs reporting a certain program frequency.

## PROGRAM YOUTH AGE RANGE

Surveyed organizations were asked what youth age their program targeted, from 10-19 years old (Fig. 5). Most programs were focused on high school aged youth, with up to 87% of surveyed programs targeting 14 to 19 year olds. Less than 38% of programs targeted 10 to 13 year olds. Several programs, however, spanned multiple age ranges. For example, programs from some national organizations (e.g., Boy Scouts of America, Girl Scouts USA, Project Learning Tree, Arbor Day Foundation, and National Future Farmers of America) reached 10 to 15 years old. Approximately half of the surveyed programs reaching high school age youth are structured as a paid work/internship program. Of the 17 paid work/internship programs, 100% were available to 16 to 17 year olds and 76% targeted 18 to 19 year olds, with fewer (59%) available to 14 to 15 year olds. Seven of these programs (Green Corps, Growing Futures, Summer Youth Employment Program, Young Conservation Stewards, and the three Youth Tree Team programs) were available to youth spanning 14 to 19 year olds. Programs targeting 10 to 13 year olds had an educational or online program structure.

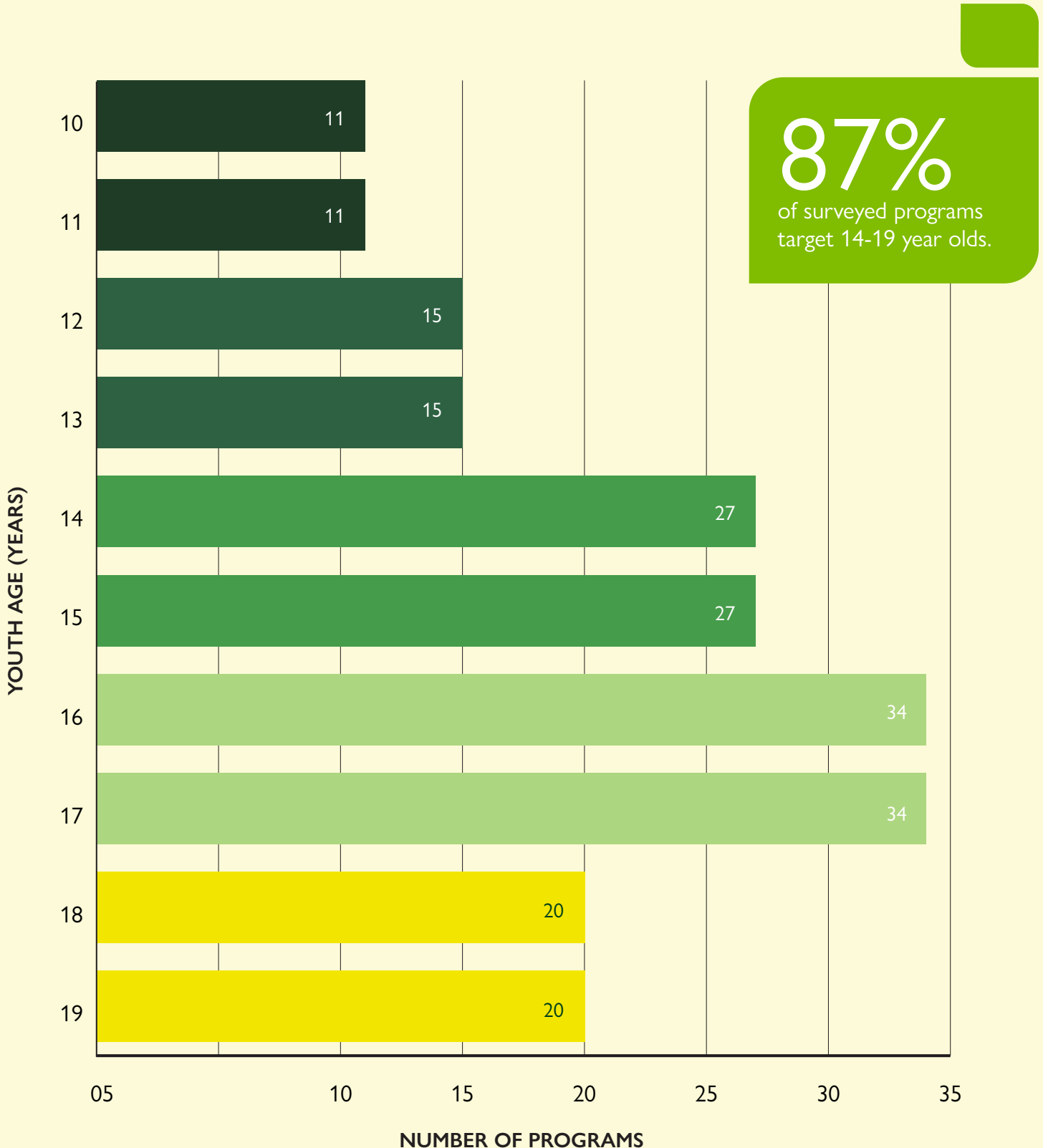
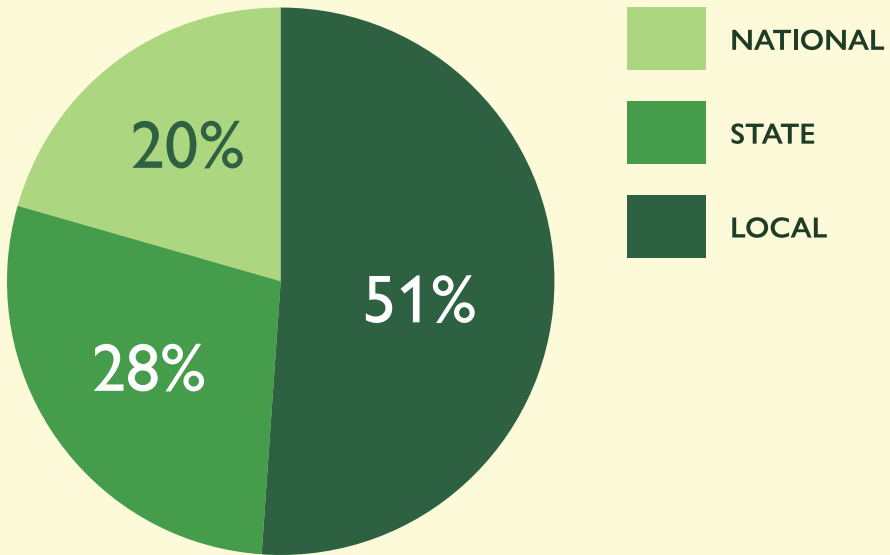


Figure 5: Number of programs and the youth age ranges they reach. The number to the right of the bars indicates the exact number of programs that reach a specific age.

## SCALE AND LOCATION

To better understand geographical program reach, organizations were asked whether their program was local (available to youth in a city, county, or other local area), statewide, regional (multi-state), or national (Fig. 6). 51% of surveyed programs were available to youth in certain localities, 28% had statewide availability, and 21% of programs were nationally available. No programs reported being regional.

Programs were distributed across 18 states, in addition to eight nationwide programs (Fig. 7). 67% of local or statewide surveyed programs occurred in the eastern U.S. More programs were identified in Georgia due to the authors' familiarity with the state.



**67%**  
of local or statewide surveyed programs occurred in the eastern U.S.

**+8**  
NATIONWIDE PROGRAMS

Figure 6: Number of programs and their geographic scale.

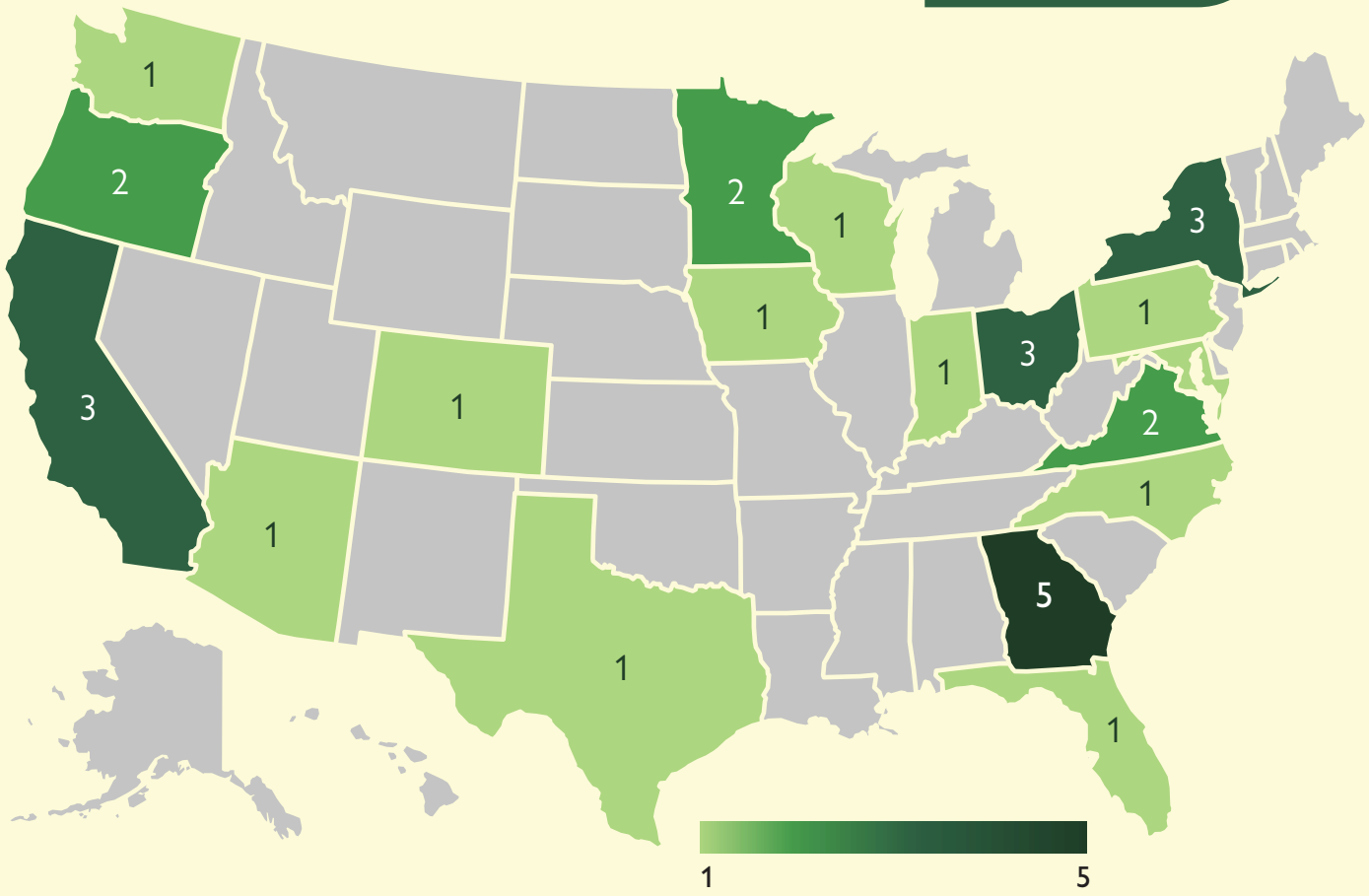


Figure 7: State locations of surveyed youth programs and the number of local or statewide programs in each state. Eight national programs also responded to the survey.

## NUMBER OF PARTICIPANTS

To gather more information on program reach, surveyed organizations were asked how many youth participants attend their program each year (Fig. 8). 23% of programs had over 500 youth participants a year. Not surprisingly, most of these organizations and their programs are national in scale (e.g., Boy Scouts of America, National Future Farmers of America, Project Learning Tree, etc.), but a few were also statewide (Wisconsin Department of Workforce Development) and local (Wilderness Awareness School). 13% of surveyed programs had 101 to 500 youth participants a year and 64% of surveyed programs have under 100 youth participants a year, where most of these programs reached local and statewide youth. By adding the minimum number of annual participants, surveyed programs reach at least 5,670 youth every year.

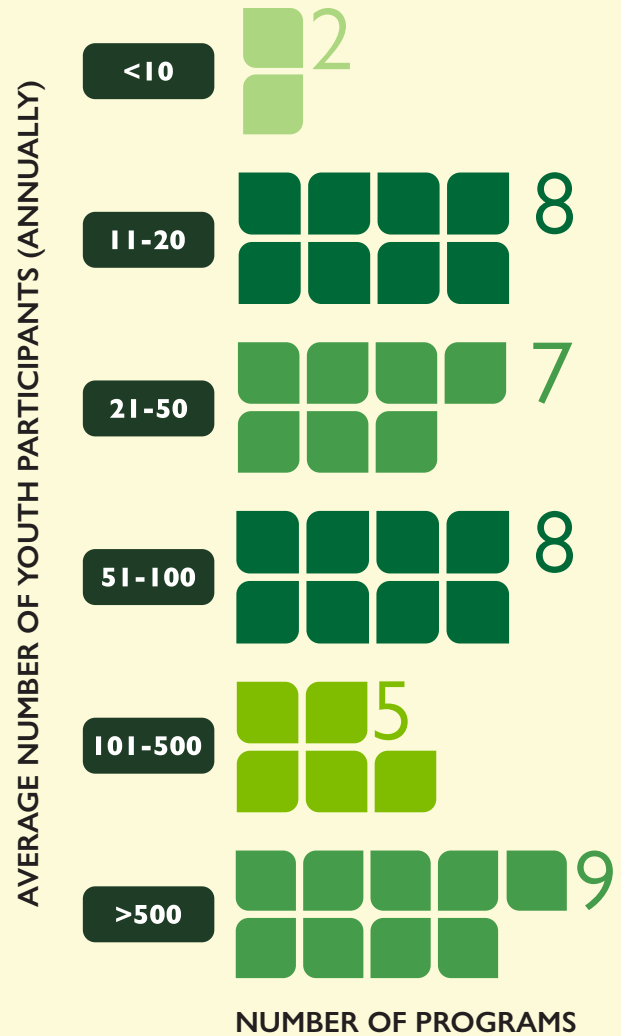
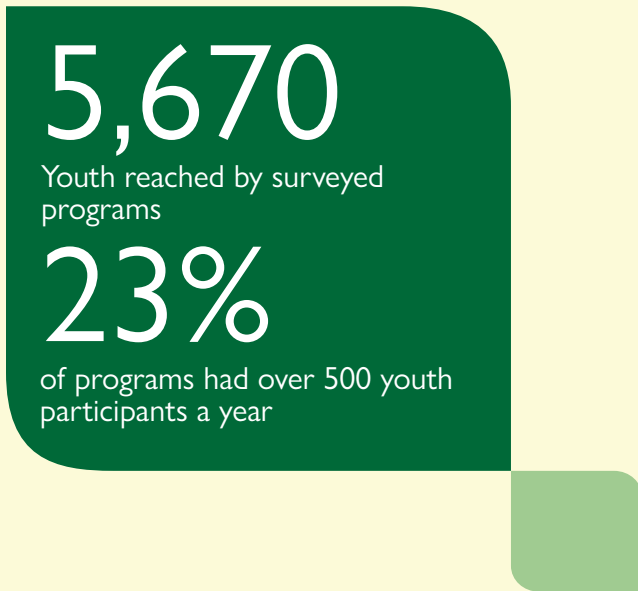


Figure 8: The average number of youth participants programs reach on an annual basis. The exact number of programs in each participant number range are indicated right of the icons.

## EDUCATIONAL CREDITS

A program that offers standardized and/or continuing education credits may have advantages. When an organization's youth program offers educational or other credits, parents, youth, and/or partner organizations (e.g., public schools) may be more interested in participating in or partnering to host a program. Although most surveyed programs (62%) did not offer educational credits in their programs, 23% of programs offered STEM, 8% offered STEAM, and 13% offered college or university credits (Fig. 9). Additionally, a few programs offered several credits simultaneously.

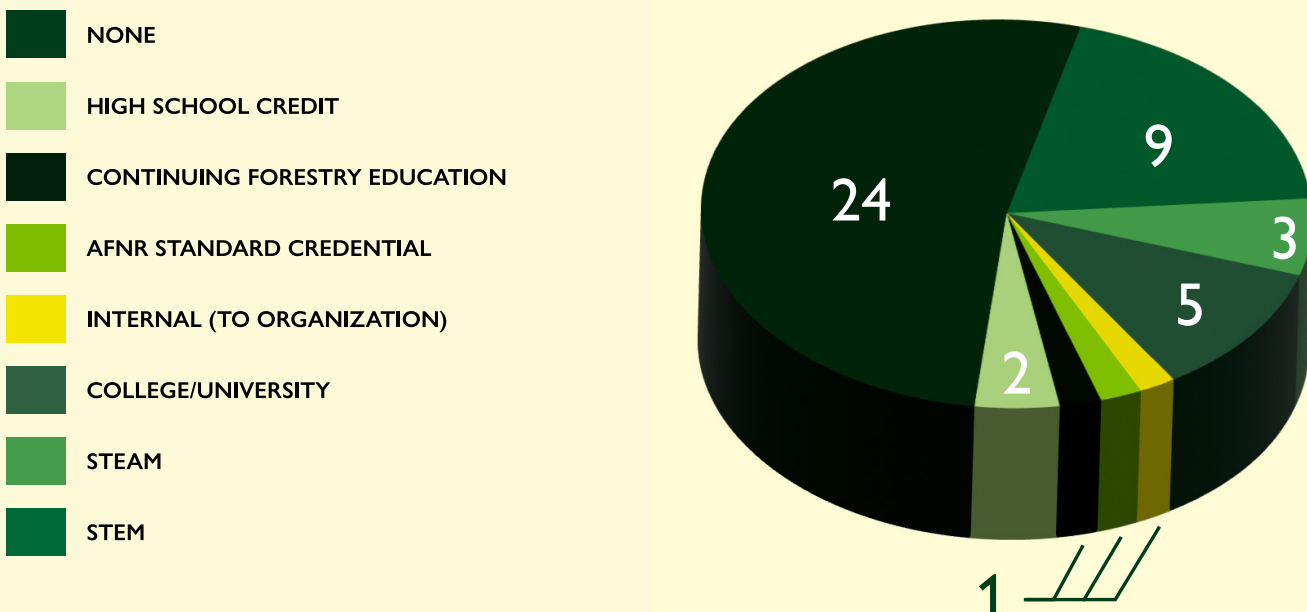


Figure 9: Number of surveyed programs that offered educational credits.

## PROGRAM TUITION AND WAGES

Surveyed programs were asked to share their registration or tuition cost (Fig. 10). Most programs (74%) were reported as free to attend, while 26% of programs' tuition ranged from \$1 to \$1000. 23% of programs did not answer the question (listed as Unknown). Several paid work/internship programs also shared youth wage information.

Several programs reported paying youth through work programs and internships, averaging \$12/hour or up to \$2000 or more over the course of the program. One program (Tribal Youth Ecological Stewardship Training and Workforce Program) pays youth a \$35,000 scholarship!

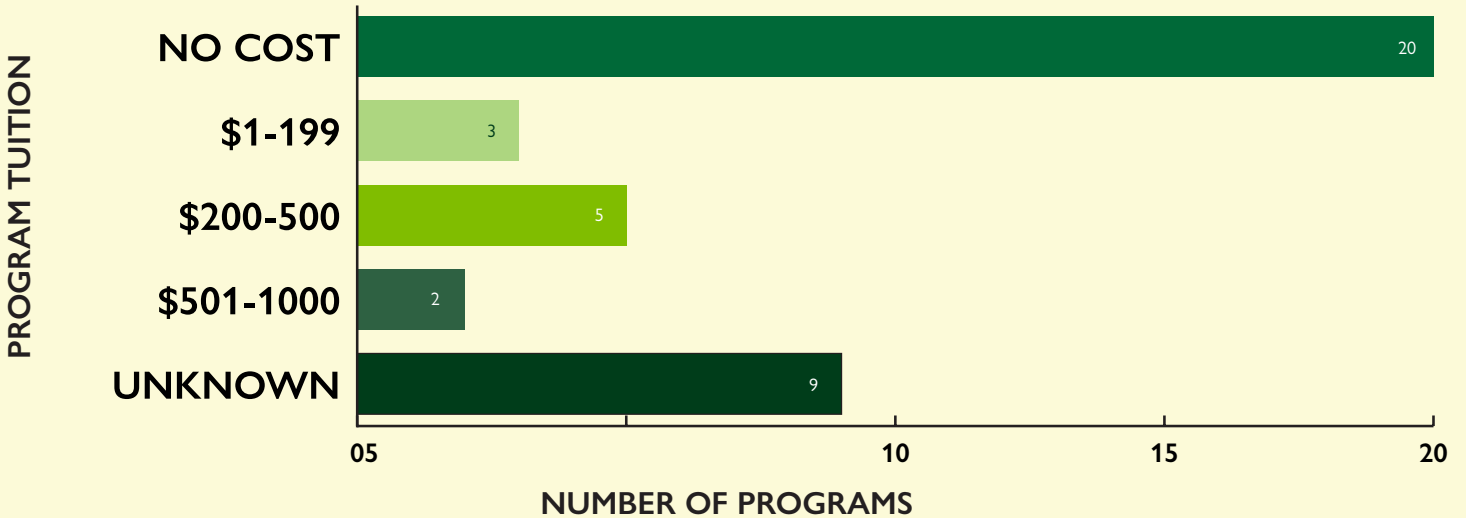


Figure 10: Tuition of surveyed programs. Numbers within bar graph indicate the specific number of programs within a tuition range.

## PROGRAM LONGEVITY

The longevity (years offered) of a program can indicate the success of the program; however, the number of younger programs may also provide important information on increasing or decreasing interest in natural resource focused youth programs. It was surprising to see that a third of surveyed programs have been in operation over 20 years (Fig. 11)! 18% of programs have been offered for 11 to 20 years, 23% offered 6 to 10 years, and 26% less than five years. Programs in operation over 20 years included a mix of national, state, and local programs.

**1/3**  
of surveyed programs  
have been operating for  
more than 20 years!

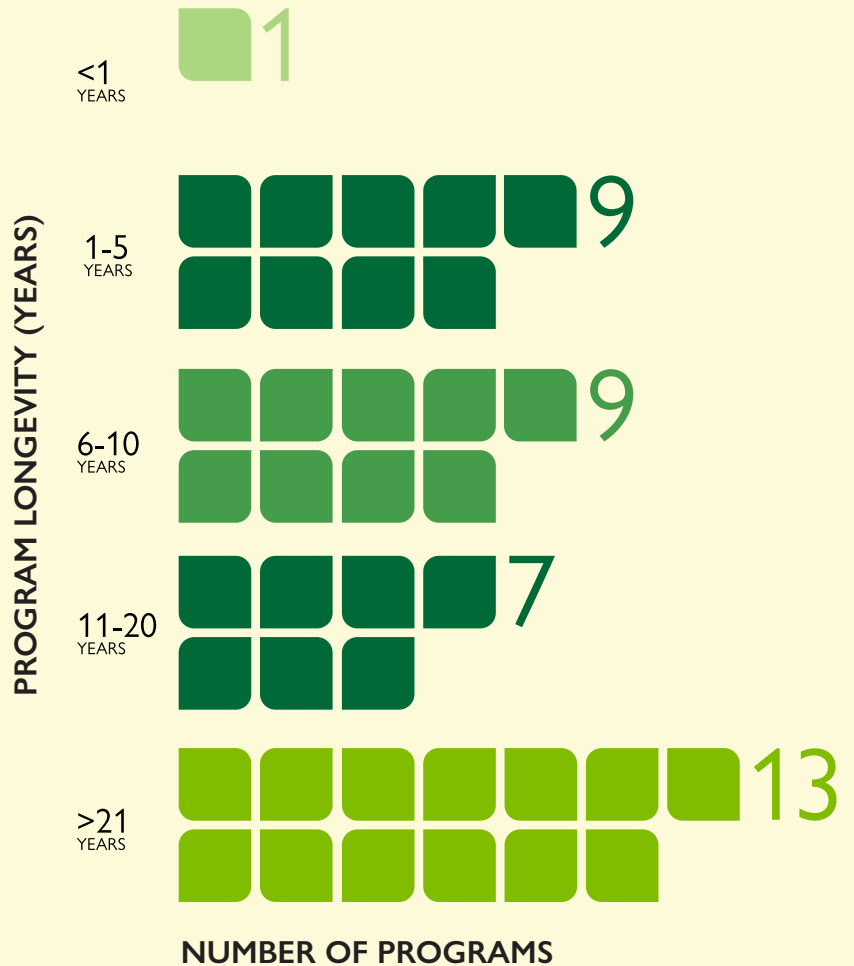


Figure 11: Program longevity, or the number of years the program has been offered. The exact number of programs in range is indicated to the right of each bar.

## POTENTIAL PROGRAM OUTCOMES

A list of specific employment and educational pathways related to arboriculture and green industry careers was developed to assess program outcomes related to arboriculture. Surveyed programs were asked to report if any of their participants ended up in one or more of these pathways following participation in the program. Although surveyed organizations did not claim that youth participation in their program resulted in specific outcomes, it is possible that the program influenced a youth's chosen pathway. Figure 12 details the percentage and number of surveyed programs who reported potential outcomes following participation in their program.

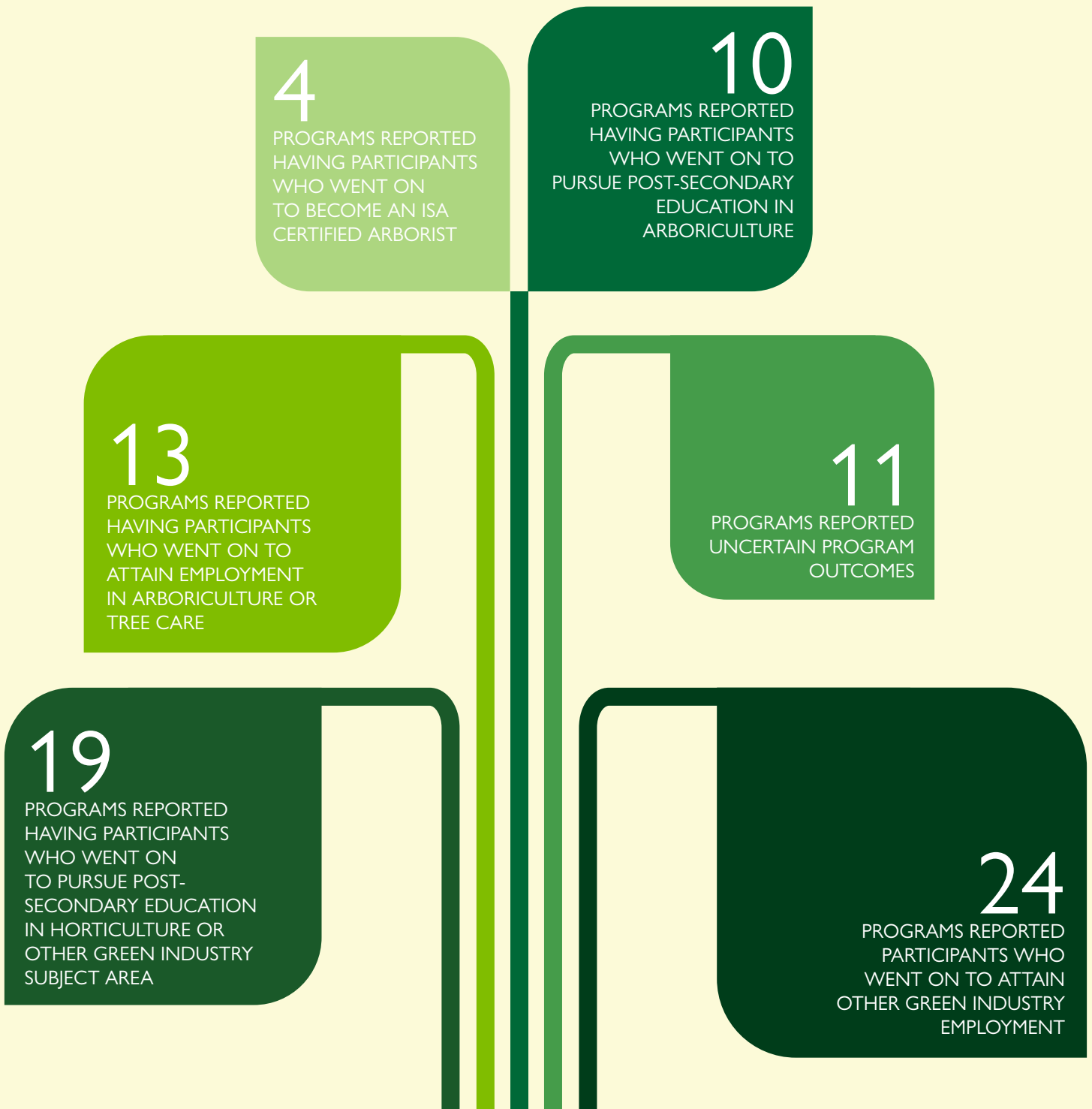


Figure 12: Reported potential outcomes of surveyed programs. The graphic represents the number of surveyed programs who reported their youth participants ended up in one or more of these employment or educational pathways following participation in the program.

# ADDITIONAL PROGRAM IMPACTS

EXCERPTS ON SURVEYED PROGRAMS

They receive a holistic view of both aquatic and terrestrial work including the Indigenous Traditional Ecological Knowledge. They meet with elected officials, learn teamwork and cultural agility, they are empowered to speak and learn the 40 ASSETS/Traditional Values and Safety in the Woods. They are prepared to apply for and succeed in entry-level positions in a natural resource career pathway.

*- Belinda Brown, Tribal Youth Ecological Stewardship Training and Workforce Program, Lomakatsi Restoration Project*

[Youth] enjoy the hands-on activities like tree boring, and also exploring the forest with all their senses.

*- Marin Oschmann, Forest Health program, Friends of the Dillon Ranger District*

The teens have direct hands-on experience working in the field and caring for trees. They also have the opportunity to go on 'environmental excursions' to learn more about green jobs and other areas of environmentalism.

*- Josh Weiner, Youth Tree Team program, Community Greeningprogram, Wave Hill*

Of our nearly 500 students surveyed after each event last year, 53% said they were more interested in an education in forestry, logging or natural resources, with a further 12% saying they are already planning on a related career/education.

*-Diane Dealey Neill, Forestry Challenge program, Forestry Challenge*

A handful of participants return to the program year after year, and many express their interest in pursuing a career or a college degree in the natural resources/environmental field as a result of their participation in the program. Many students have also pursued similar programs once they have aged out, seeking further training such as internships or other trainings commonly offered by local colleges.

*- Melissa Paduani, Georgia Urban Ecologists program, Georgia Audubon Society*

Environmental Educators at Trees New York act as the guides/instructors for the program so the students learn in an intimate setting where they are able to ask questions in a familiar atmosphere. Through field trips, education sessions and lectures, and hands-on life experiences it guides these high school students to truly understand the field and maybe find contacts and connections for the next steps among their peers, educators or other opportunities.

*- Christina McLaughlin, Young Urban Foresters Internship program, Trees New York*

A participating school may involve a student on their Tree Campus team (or at the high school level, a student may lead the team) -- so there are leadership opportunities. The Education Plan may involve learning about trees inside or outside the classroom, or experiencing a lesson led by a community member that provides career exposure. The Hands-On Experience with trees might involve planting trees or using campus trees as a learning tool. Finally, the Celebrate Arbor Day goal allows students to use the holiday as a platform to educate their peers on the importance of trees.

*- Logan Donahoo, Tree Campus K-12 program, Arbor Day Foundation*

Youth who participate in this program have expressed greater interest in pursuing studies or careers related to environmental management, forestry, green industry field, etc.

*- Tim Wheeler, Forest Project program, Wave Hill*

The Growing Futures program helps teens explore green careers, get exposure to environmental issues, and develop leadership skills in a safe environment. Crews are led by AmeriCorps members and supported by full-time staff. Teen employees work alongside volunteers from local corporations and general community members, and often lead planting demonstrations

*- Megan Schneider, Growing Futures program, Trees Forever*

[Youth are enriched in this program] by providing different learning opportunities and representation in the program. Including diverse guest speakers, providing educational field trips, hands-on training, outdoor activities and finally, wellness and appreciation days.

*- Juanita Ibarra, Teen Urban Forester program, Canopy*

Youth are exposed to different opportunities in natural resources and have many “first experiences” going on a hike or seeing a cow for example. Many go on to pursue a job or career path in conservation and become engaged in other programs such as Envirothon or other conservation leadership programs.

*- Maura Christian, Youth Conservation Camp program, Virginia Soil and Water Conservation Department*

Youth are enriched by working together to lead groups and plant trees...and teach others how to plant trees. They meet others working in the industry and get educational days.

*- Christine Smith, Neighborhood Trees Crew Leader program, Friends of Trees*

The Girl Scout Promise and Law encourage Girl Scouts to “use resources wisely” and “to make the world a better place.” Girl Scouts have been, and continue to be, active in addressing the most important challenges facing our communities by speaking out and taking action—in ways both big and small. Participating in the Tree Promise empowers youth to combat climate change and protect their futures in a very concrete way. In addition to the global implication of planting and protecting trees, youth can experience the tangible benefits of trees in their own communities—like cleaner, cooler air—and develop their leadership and organizational skills.

*- Kaleigh McKenna, Girl Scout Tree Promise program, Girl Scouts USA*

Through our paid Green Teens program, our youth gain leadership opportunities, training, and skills that better their scholarship, social & emotional maturity, and communities. For many San Francisco youth, growing up in an urban environment means that our outdoor field trips and workshops are the first opportunity they have to camp, hike, and enjoy nature.

*- Bunny McFadden, Green Teens program, Friends of the Urban Forest*

# CASE STUDIES

## PROJECT LEARNING TREE



Born out of the original Earth Day as a national program to work with the environment, Project Learning Tree (PLT) consists of workshops, online work, materials, and curriculum for all ages of youth, from pre-kindergarten all the way through their senior year of high school. Since PLT's inception in 1976, they have trained over 775,000 educators, reaching over 140 million students representing diverse backgrounds across the country. Project Learning Tree resources cover topics ranging from forests, wildlife, water, community planning, waste management, energy, and more. Available for learners of all ages, with career-specific programs like the Green Jobs Guide, which looks at different career pathways and orients high schoolers to possible futures in the green industry, there even is an accompanying quiz for learners to see how their personalities line up to different green jobs. Many activities available through PLT also include instructions on how learners can complete action projects, which encourage youth to work on specific service learning or community improvement projects, like removing invasive buckthorn plants that are competing with native trees, or removing trees infected with spruce budworms and then replanting new trees to restore the area.



PLT MATERIALS ARE PROVEN TO ACHIEVE STATISTICALLY SIGNIFICANT GAINS IN STUDENT CONTENT KNOWLEDGE AND ATTITUDINAL GROWTH ABOUT THE ENVIRONMENT

- JACLYN STALLARD, CURRICULUM ADVISOR AND NETWORK LEAD FOR PARTNERS, SUSTAINABLE FORESTRY INITIATIVE

## TREETRUST, SUMMER YOUTH EMPLOYMENT AND YOUTHBUILD PROGRAMS



With its slogan being "Transform Lives and Landscapes," Tree Trust does just that. Besides providing professional landscape services, Tree Trust also has multiple programs for youth to gain valuable experience and help build skills for meaningful careers in the green industry. The Summer Youth Employment Program, one of Tree Trust's career pathway programs, offers a "learn and earn" process where in the summer of 2023 alone, over 175 high school juniors and seniors were able to gain experience working in the green industry and high school credit. Another program, YouthBuild, allows students to receive hands-on training while earning a paycheck. YouthBuild offers a pre-apprentice tree care track where students can receive on-the-job training and gain experience with chainsaws, tree identification, invasive species removal, woodchipper usage, and much more. Once learners reach 18, there's another option to continue their training in the Branches program, where they will receive employment readiness training, all the way from tying knots to getting budgeting help from a financial advisor, as well as ground worker and TCIA certifications, and even the opportunity to cut down trees in virtual reality.



TREE TRUST IS ALL ABOUT CREATING 'POSITIVE OUTDOOR EXPERIENCES' FOR YOUTH, AND 'MAKING THE OUTDOORS ACCESSIBLE' FOR EVERYONE, REGARDLESS OF WHERE THEY COME FROM.

- KAREN ZUMACH, DIRECTOR OF COMMUNITY FORESTRY

# TOLLES CAREER AND TECHNICAL CENTER, URBAN FORESTRY PROGRAM



The Outdoor Careers program at Tolles Career & Technical Center started strictly as a turf and landscape program but has since evolved into an outdoor careers program with horticulture, landscape, arboriculture, agriculture, mining, and more. The Urban Forestry pathway follows the ISA-certified arborist manual, teaching juniors and seniors in high school valuable skills for a possible future in arboriculture. Students in the program are able to meet professionals in the field, compete in ISA competitions, gain exposure to the workforce, and gain ecological knowledge of the outdoors. The program focuses on sharing how there are many ways for young adults to be involved in the field of arboriculture, and that there are lots of opportunities that aren't strictly working outdoors and hands-on on the physical climbing and removal of trees.



THE OUTDOOR CAREERS PROGRAM IS INTENDED 'TO GET KIDS THINKING ABOUT WHY WE (ARBORISTS) DO WHAT WE DO AND WHY THINGS (ECOLOGICAL PROCESSES) WORK THE WAY THEY DO'.

- MIKE LISTON, ISA CERTIFIED ARBORIST, AND TOLLES EDUCATOR

# AMERICAN PUBLIC GARDEN ASSOCIATION, PLANT HEROES PROGRAM



Created by the American Public Garden Association, Plant Heroes is an online resource hub where educators and parents can access nature-based educational resources, like comics, lesson plans, field guides, journals, activities, and more. Completely free for anyone to use, Plant Heroes has online materials available to teach youth about forests, pests and pathogens, basic ecology, sensory tasks, understanding plants, and the importance of nature. Created in 2010, the Plant Heroes curriculum is targeted towards elementary and middle school students, focusing on four cartoon "Plant Heroes" each with their own definition of what it means to be a plant hero. The program hopes to show children that they can be plant heroes in their own way, whether that translates to a career in natural resource management, or simply a newfound appreciation for the forest behind their house.



THE PROGRAM'S MAIN INTENTION IS 'TO GET YOUTH OUTSIDE, TO GET THEM TO SEE THINGS, TO NOTICE THE OUTSIDE WORLD AND TO GET THEM EXCITED. THAT'S REALLY WHAT THIS PROGRAM IS. IT'S A TOUCH POINT.'

- JEANETTE HENDERSON, PLANT PROTECTION PROGRAM COORDINATOR

# SUBJECT MATTER EXPERT MEETING

On Monday, December 4, 2023, ISA and UGA Warnell hosted a subject matter expert virtual meeting with ISA Canopy Partners and private industry, non-profit, and university partners. The following information summarizes highlights of the meeting, most notably the discussion section of the meeting. Meeting participants included ISA; UGA Warnell; ArborMetrics; Husqvarna Group; Tree Tech Specialists; Bartlett Tree Experts; Arborjet; Vertical Supply Group; Asplundh Tree Experts; SavATree; New Urban Forestry; Project Learning Tree; and University of Tennessee.

At the start of the meeting, ISA reviewed highlights from the 2018 ISA Industry Workforce Summit, which was held at the Bartlett Tree Expert lab in Charlotte, North Carolina during May 2018. Participants from the summit identified several workforce challenges, including youth and parents being aware of and viewing arboriculture as a viable career pathway. Recommended solutions to this challenge included better understanding what programs are currently available and maximizing and leveraging partnerships with programs that already exist (nationally-available programs like Project Learning Tree). With funding from the USDA Forest Service, ISA first sought to investigate current U.S. youth and adolescent programs that directly or indirectly introduce youth to careers in arboriculture, leading to the 2023 scoping project conducted by UGA Warnell.

UGA Warnell provided a summary of the scoping project and Qualtrics survey. She then facilitated a one hour and 20-minute discussion with call participants to explore gaps in programming based on the survey results and outline potential approaches for filling the identified gaps. The following includes highlights of the discussion.

## THE OBJECTIVES OF THE MEETING WERE TO:

- Share highlights of arboriculture workforce discussions from previous meetings
- Discuss results of the scoping project and Qualtrics survey
- Explore gaps in current youth and adolescent programs
- Outline potential approaches for ISA and partners to fill the identified gap

## GAPS IN YOUTH AND ADOLESCENT PROGRAMMING DISCUSSION

Call participants were asked to reflect on the survey results and their own experience and expertise to explore gaps in youth programming that could better encourage/support career pathways in arboriculture. The following provides a summary of gaps discussed.

- **TECHNICAL AND COMMUNITY COLLEGE ARBORICULTURE PROGRAMS:** There is a national trend of decreasing university enrollment and increasing trade school enrollment as adolescents explore career options that do not require a college or university of degree. Arboriculture may fit well as an associates degree or certificate program within technical and community colleges and trade schools. These programs can be set up as a dual-enrollment program where high school students receive credit from their high school and the post-secondary institution.
- **INDUSTRY INSTRUCTORS FOR YOUTH PROGRAMS:** Programs that have the potential to introduce arboriculture career pathways to youth would greatly benefit from experienced and ISA Certified Arborists instructors being part of the program. Developing a national network, or consortium, of arborist professionals willing to provide occasional guest lectures or demonstrations could greatly enhance youth and adolescent interest in the field.
- **ARBORICULTURE INDUSTRY AS SOLUTION TO CLIMATE CHANGE AND ENVIRONMENTAL JUSTICE:** Many youth and adolescents today are concerned about climate change and environmental justice. The arboriculture industry promoting its commitment to these concerns through marketing, tree management practices (i.e., a greater focus on tree health and retention for ecological services vs. removal), and advocacy may help youth view an arboriculture career as a solution to these issues.
- **INDUSTRY FUNDING FOR PROGRAMS:** Arboriculture equipment for youth programs can be expensive, which can limit a programs experiential learning opportunities and, as a result, limit youth interest in arboriculture. For example, a program may wish to introduce youth to tree climbing but they lack the funding for the equipment and liability insurance. Rather than youth having direct experience with climbing the program instead provides a climbing demonstration by an arborist. Industry funding could enhance the interest and impact of youth programs by providing equipment and funding, potentially increasing youth interest in arboriculture careers.
- **ARBORICULTURE AS A TECHNOLOGY CAREER:** Youth and adolescents today are attracted to technology (i.e., phones, gaming, robotics, etc.) in their leisure time and as a future career. Arboriculture, however, may not be viewed as a tech-based career. The future of industry will require more technology for tree health and retention (vs. removal) and this could be a selling point for a future career opportunities in arboriculture.
- **PARENTS VIEWING ARBORICULTURE AS A PROFESSIONAL CAREER:** Increasing parental or guardian interest in arboriculture may increase the likeliness that youth participate in programs that introduce them to arboriculture and consider it as a viable career option.
- **NATIONAL YOUTH PROGRAMS AND ARBORICULTURE:** Several national programs (i.e., FFA, 4-H, Boy Scouts of America, etc.) that reach numerous youth every year lack an arboriculture area of emphasis (and instructors to teach youth about arboriculture). Supporting arboriculture programs (with instructors and resources) within these established national organizations could increase youth interest in arboriculture careers.

- **YOUTH GROUPS ALREADY INVOLVED IN OUTDOOR ACTIVITIES:** Youth and adolescents who have already developed a love for the outdoors through one or more activities (i.e., rock climbing, gardening, hiking, etc.) related to arboriculture may be interested to expand their hobby into a career. It was recommended to find ways to reach these youth and adolescents.
- **YOUTH NOT INTRODUCED TO THE OUTDOORS:** Introducing youth to the beauty and wonder of the outdoors can have a large impact on their knowledge of and interest in outdoor careers. This introduction can be anything from learning to identify one tree or climbing a tree and feeling it move in the wind (this builds a bond with the natural world) to a comprehensive program on nature subject. Diminishing fear and increasing awe of the outdoors can be a first step in youth interest in outdoor careers. Foster nature introduction was especially encouraged for youth and children (vs. high school age).

## POTENTIAL APPROACHES FOR ISA AND PARTNERS FILLING GAPS DISCUSSION

Meeting participants were then asked, based on the survey results, previous discussion on gaps in programming, and their own experience and subject matter expertise, what they think are potential approaches for ISA and partners to fill these gaps. The following provides a summary of approaches discussed.

### REACHING YOUTH TARGET AUDIENCE

- **Poll ISA Certified Arborists About How They Entered the Industry and Utilize Poll Results to Reach Youth about Arboriculture:** Better understanding the pathway(s) current arborists entered the workforce provides insight into the activities, education, and experiences that inspire arboriculture careers. Results from polling ISA Certified Arborists about their pathway into the field can be used to attract youth and adolescents to arboriculture careers. For example, if a large percentage of professionals learned about the field through rock climbing, then developing outreach and educational programs with youth rock climbing groups may increase youth interest in arboriculture careers.
- **Educate Parents about Arboriculture Careers:** Outreach to parents about arboriculture as a professional career may facilitate greater youth interest and participation in youth and adolescent programs that provide arboriculture education and experience (as well as encouraging youth to pursue a career in the field). Meeting participants recommended this outreach occur through summer camps, especially with existing organizations that have name recognition (i.e., YMCA and YWCA).
- **Communicate Arboriculture Career Pathways and Salaries Associated with Each Stage:** Youth and parents may lack clear information about career pathways in arboriculture, including salary, necessary skills, required education, and advancements. Communicating this information helps youth and parents better plan a youth's future career and view arboriculture as a professional career.

### PROVIDING PROGRAM SUPPORT AND RESOURCES

- **Develop a Directory of ISA Certified Arborist Ambassadors:** ISA Certified Arborists and partner organizations advocating for and educating about arboriculture to a wide variety of audiences can help increase knowledge of and interest in the industry. Meeting participants recommended recruiting and training "arboriculture ambassador" volunteers who can speak to diverse audiences, and providing incentives for these volunteer ambassadors to participate. Meeting participants recommended that TCIA and ISA collaborate on developing a national directory of arborist ambassadors who can serve as both educators for youth programs and outreach specialists to promote the industry (i.e., presentations to high schools or guidance counsellors).
- **Partner with Existing Youth Programs:** ISA and partners collaborating with existing programs (vs. creating a new program) may lead to better success in reaching a larger audience.

# CONCLUSIONS

Results of the scoping project provide greater insight into current U.S. youth and adolescent programs that have led or could potentially lead to arboriculture career pathways. These programs teach a variety of subjects, several of which provide an educational or experiential foundation in arboriculture. Surveyed programs also offer paid internships that provide hands on tree care experience and dual enrollment where students receive high school credit while gaining education and experience in arboriculture and the green industry. Surveyed programs are offered at varying frequencies and durations throughout the year, and each reach a wide range of participants and target specific youth ages, from 10-19 years

old. Surveyed programs occur nationwide. It should be noted that the higher program occurrence observed in the eastern U.S. is likely due to the authors' greater familiarity with this region. Most of the surveyed programs have been available for over a year, with many programs being in operation over 20 years. 38% (n=15) of surveyed programs reported arboriculture-related outcomes of their youth participants. When focusing on the survey results of the 15 programs who reported arboriculture program outcomes (arboriculture job or education, ISA Certified Arborist credential), a few trends were observed in our survey data that can be useful in filling gaps in youth and adolescent arboriculture programming:

**87%** of programs include plant identification

**53%** include career information

**47%** include plant health and plant care knowledge or experience in their curriculum

**53%**

of these programs include a paid work/internship structure, with the remaining percentage providing educational only or dual enrollment programs

**100%** of programs are targeted towards 16 to 17 year olds

**53%** for 14, 15, 18, and 19 year olds

**27%** for 12 and 13 year olds

**67%** of programs are located in the eastern U.S.

**27%** in the western U.S., and one program has nationwide availability

**80%**

of programs are greater than six years old

**66%**

of programs reach 11 to 50 youth participants a year, indicating most of the programs have a smaller number of participants

**53%**

of programs did not offer educational credits. For programs who did offer credits, these included STEM, STEAM, internal credits, and college credit.

**88%**

of the paid work/internship programs (n=8) reported both arboriculture jobs and post-secondary education outcomes

**29%**

of other educational and dual enrollment programs (not paid work programs/internships) (n=7) reported both outcomes

**87%** of programs indicated participants are working in arboriculture

**67%** are studying arboriculture at a post-secondary educational institution

**27%** include plant health and plant care knowledge or experience in their curriculum

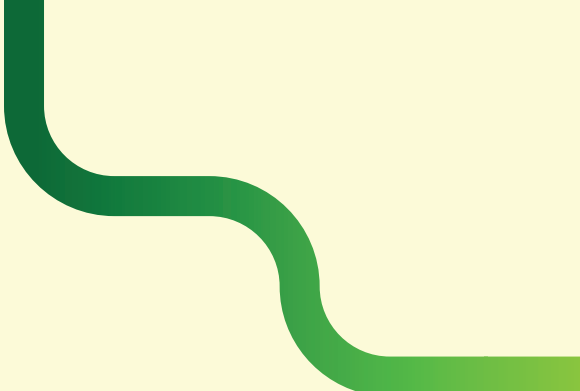
**67%** of programs did not have a program cost or registration fee and

**27%** reported providing a wage or scholarship to their youth participants

Of the programs (n=4) that reported their youth participants became ISA Certified Arborists

**2** programs were educational or dual-enrollment

**2** were paid internships/work programs



Results received from the survey provide a sample of the U.S. youth and adolescent natural resource and green industry programs that are available and their potential outcomes related to arboriculture. Although we hoped more organizations would participate in the survey to have a greater sample size, the results provided important insights. Contacting organizations via email and phone (and their subsequent completion of the survey) proved challenging, with most of the 100 programs we originally contacted never returning correspondence. We included, however, all 100 programs in the final ISA youth program searchable database because we could gather program details from program websites.

The results of the survey can be used in combination with discussion suggestions from the December 2023 subject matter expert meeting, helping identify existing programs to partner with, subjects for arborist ambassadors and educators to present, and programs and subjects that industry resources can support. The survey results also provide a database of national programs where parents and youth can explore outdoor careers, including a professional career pathway in arboriculture.

# APPENDIX A

## SURVEY QUESTIONS

1. What is the name of the program?
2. Please provide a very brief description or main objectives/goals of the program.
3. Does the program include any of the following subjects? (Possible answers: plant identification, plant biology, plant health, plant ecological or human health benefits, pruning, mulching, watering, planting, plant care safety, plant care equipment (e.g., tools), tree climbing, tree protection, forest ecology, forest management, forestry careers, arboriculture careers, horticulture or other green industry careers, none of these)
4. Expanding on the last questions, which of the following are popular topics in the program? (Possible answers: plant identification, plant biology, plant health, plant care (e.g. watering, mulching, pruning, etc.), tree climbing, tree protection, tree care equipment and safety, forest ecology and management, careers, none of these)
5. What are other popular topics in the program (if not listed above)?
6. The program can be described as: (Possible answers: educational (indoor or outdoor structured activities with one or more instructors), a paid work program/internship, an un-paid work program/internship, a dual-enrollment program (high school students taking college or university classes), other)
7. If you selected “other” to the above questions, please describe.
8. How often is the program offered each year (frequency)? (Possible answers: once, twice, 3-5 times, >5 times, none of these or offered infrequently)
9. What is the duration of the program each time it is offered? (Possible answers: days, weeks, months, none of these or not regularly occurring)
10. What is the youth age range of the program (select all that apply)? (Possible answers: 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, none of these)
11. Where is the program available (scale)? (Possible answers: local (available to youth in a city, county, or local area), state, regional (multi-state), national (or international), online, none of these)
12. How long has the program been active at your organization/agency? (Possible answers: <1 year, 1-5 years, 6-10 years, 11-20 years, >21 years, none of these)
13. Does the program meet/provide the following educational credits? (Possible answers: STEM, STEAM, college/university credit, other, none of these)
14. If you selected “other” to the above questions, please describe.
15. Approximately how many youth participate in the program each year? (Possible answers: <10, 11-20, 21-50, 51-100, 101-500, >500, unknown)
16. What is the approximate cost of the program per student for tuition, program expenses, etc.? (Participants entered dollar amount)
17. How many of the following impacts occurred with program participants following participation in the program? (Possible answers: employment in arboriculture or tree care, employment in other green industry (e.g., forestry, landscaping, agriculture, horticulture, etc.), post-secondary education in arboriculture, post-secondary education in horticulture or other green industry subject area, became an ISA Certified Arborist, continued in the program for a second year/season in a leadership position, other, none of the above, I don't know)
18. If you selected “other” to the above questions, please describe.
19. Based on observations of program delivery and/or program evaluation results, how are youth engaged and enriched in this program? (Participants provided input through an open-ended text box)
20. How do youth register or enroll for this program? Add a weblink or explain below. (Participants provided input through an open-ended text box)
21. Is there another program at your agency or organization that also related to the focus of this project? If yes, please list the program name and whether we can contact you or someone else via a phone interview to learn more about it. (Participants provided input through an open-ended text box)
22. Is there anything else you would like to share and/or is there another program (outside of your organizations) that you recommend we include in this project? (Participants provided input through an open-ended text box)

# APPENDIX B

## SURVEYED PROGRAMS

ORGANIZATION	PROGRAM TITLE
4-H Forestry	4-H Forestry
American Public Garden Association	Plant Heroes
Arbor Day Foundation	Tree Campus K-12
Athens Land Trust	Native Tree Project
Athens Land Trust	Young Conservation Stewards
Austin Texas Government	Youth Forest Council
Baltimore Ecosystem Study	Branches
Billy Lancaster Forestry Youth Camp	Billy Lancaster SAF Forestry Youth Camp
Boy Scouts of America	Ecology Conservation/BSsummer camps
Canopy	Teen Urban Forester Program "TUF"
Cary Institute	Cary Institute Summer Camps
Cloquet Forestry Center	Forestry Adventure Days
Community Greening	Youth Tree Team
Desert Botanical Garden	Teens in the Garden
Forestry Challenge	Forestry Challenge
Friends of the Dillon Ranger District	Forest Health
Friends of the Urban Forest	Green Teens
Friends of Tree	Neighborhood Trees Crew Leader
Georgia Audubon Society	Georgia Urban Ecologists
Girl Scouts USA	Girl Scout Tree Promise
Holden Forests and Gardens	Green Corps
Keep Indianapolis Beautiful (KIB)	Youth Tree Team
Lomakatsi Restoration Project	Tribal Youth Ecological Stewardship Training and Workforce Program
National Future Farmers of America Organization	Future Farmers of America - Forestry CDE
North Carolina State University	HSSI: Horticultural Science Summer Institute
Ohio Green Industry Association	Ohio High School Landscape Olympics
Penn State Extension	Future Forest Steward Program
Project Learning Tree	Project Learning Tree
Seed Your Future	Seed Your Future
Tolles Career & Technical Center	Outdoor Careers
Tree Trust	Summer Youth Employment Program
Trees Atlanta	Youth Tree Team
Trees Forever	Growing Futures
Trees New York	Young Urban Foresters Internship Program
Virginia Department of Forestry	Camp Woods & Wildlife
Virginia Soil and Water Conservation Department	Youth Conservation Camp
Wave Hill	Forest Project
Wilderness Awareness School	Wilderness Awareness School Programs
Wisconsin Department of Workforce Development	Wisconsin Youth Apprenticeship



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To file a program discrimination complaint, a Complainant should complete a Form AD-3027, USDA Program Discrimination Complaint Form which can be obtained online at: <https://www.usda.gov/sites/default/files/documents/ad-3027.pdf>, from any USDA office, by calling (866) 632-9992, or by writing a letter addressed to USDA. The letter must contain the complainant's name, address, telephone number, and a written description of the alleged discriminatory action in sufficient detail to inform the Assistant Secretary for Civil Rights (ASCR) about the nature and date of an alleged civil rights violation. The completed AD-3027 form or letter must be submitted to USDA by:

MAIL: U.S. Department of Agriculture  
Office of the Assistant Secretary for Civil Rights  
1400 Independence Avenue, SW  
Washington, D.C. 20250-9410; or  
FAX: (833) 256-1665 or (202) 690-7442; or  
EMAIL: [Program.Intake@usda.gov](mailto:Program.Intake@usda.gov)

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