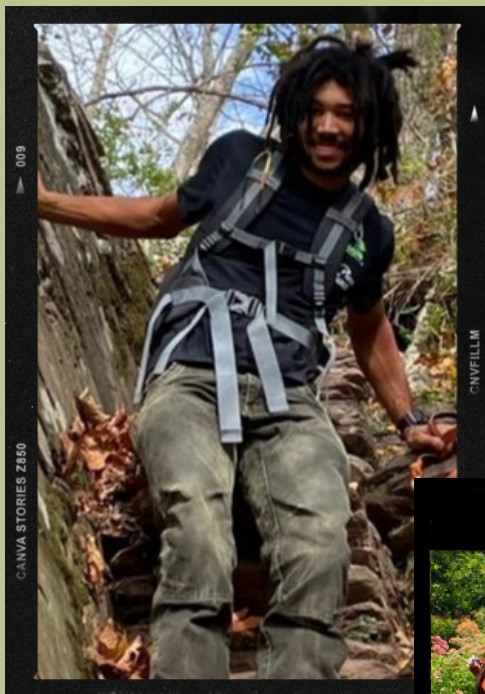


# Conservationist of Color Playbook

An Engagement and Exposure Strategy



**JOHN S. WATSON, JR**  
CO-EXECUTIVE DIRECTOR, NJ CONSERVATION FOUNDATION

*"You don't have to hug a tree to embrace its value."  
-John S. Watson, Jr.*



**New Jersey Conservation**  
FOUNDATION

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# Table of Contents

<b>03</b>	Acknowledgements	<b>30</b>	Core Module 2: Birding
<b>04</b>	Introduction	<b>35</b>	Core Module 3: Stormwater Management and Green Infrastructure
<b>06</b>	Our Shared Reality	<b>40</b>	Core Module 4: Air Pollution
<b>08</b>	Informing Policy	<b>47</b>	Core Module 5: Pollinators and Meadows
<b>09</b>	Environmental Justice	<b>51</b>	Core Module 6: Water
<b>12</b>	Identifying Needs	<b>60</b>	Core Module 7: Climate Change
<b>14</b>	Outreach and Engagement	<b>64</b>	Core Module 8: Urban Agriculture
<b>16</b>	Next Generation of Stewards	<b>68</b>	Core Module 9: Parks, Open Space, and Habitat
<b>19</b>	Core Module 1: Urban Forestry and Street Trees	<b>74</b>	Appendix A: Speakers Bureau



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This playbook has been on my mind and in my heart for years now. I want to take the time to provide special acknowledgement and appreciation to the individuals that contributed to the idea and development of the playbook and made it a reality. After 40 years in the environmental protection and natural resource protection movement, both in government and the nonprofit sector, I have tried to find the right formula to diversify the makeup of those employed as environmental/conservation professionals, those who benefit from a clean green environment, and those who will enjoy visiting our incredible parks and open spaces. These organizations and individuals have all contributed to this document in some way, to my knowledge and to my spirit, whether they know it or not. I'd like to express special appreciation to New Jersey Conservation Foundation and the Mary Owen Borden Foundation for believing in this project and providing me with the support, resources, and enthusiasm needed to make it a reality.

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Chapter I

# Introduction

This playbook provides a strategy to engage people of color more in outdoor, environmental, and natural resource protection issues. Collectively, we need to create unique experiences to get people outdoors to learn — in a fun and captivating way — about environmental issues that affect their physical and mental health, quality of life, and community. The goal is to engage and expose people of color to places to enjoy, as well as provide them with access to professionals, learning opportunities, and job paths in the environmental and natural resource protection fields.

A report issued by the Center for American Progress in 2020, *The Nature Gap*, analyzed census tract demographics, the natural environment, as well as resources in those census tracts.<sup>1</sup> Their findings showed that communities of color are almost three times more likely to live in “nature deprived” areas than white communities. They defined those areas as having less or no access to traditional and non-traditional green spaces. The report outlined policy recommendations to increase equity in the distribution of and access to nature in the United States.

The *Nature Gap* report laid bare what communities of color have known anecdotally for decades, if not centuries, and is now being confirmed with data. Policy change is critical to increased access to nature by people of color, but engagement and education perhaps more so. In the following pages, you will find strategies and tools for implementing nature access and education programming in communities of color. It is important to understand that it is an aim of this playbook that communities of color embrace nature through increased access and education, with the hope that it will ignite the next generation of environmental stewards, leaders, and heroes.

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1. Jenny Rowland-Shea et al., “The Nature Gap,” Center for American Progress, July 21, 2020, <https://www.americanprogress.org/article/the-nature-gap/>.

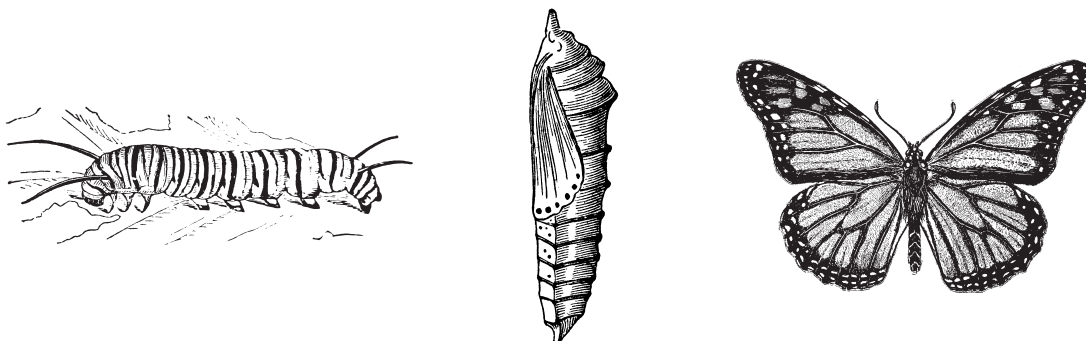
There is a heightened, new awareness of the critical need to reconnect diverse communities with the land and establish green healthy spaces as a priority in their lives. There are so many opportunities in the sector to increase representation and make strides in conservation, environmental justice, and equitable access to nature. We must take full advantage of the awareness, focus, and resources that will help us change this historic paradigm.

Success in the implementation of this playbook in any community or neighborhood will be measured by:

- the number of people engaged with;
- the increase in people enjoying the outdoors and open space;
- more community members advocating for the greening of their neighborhoods;
- the number of people seeking higher education and learning in the fields;
- measured improved health data in communities;
- and ultimately, the number of people hired as environmental, natural resource, and science professionals.

We believe that an appreciation of nature and a good clean environment is embedded in our human DNA. We hope these modules will serve to ignite the flame of environmentalism contained within us all. Once ignited, we will rely on self-discovery to fan these 'flames' into raging environmental action in all communities. Then, we can have satisfaction in knowing that we leave our collective environmental work in the hands of a generation that cares.

This playbook will be successful when more people of color accept that "you don't have to hug a tree to embrace its value."





Chapter II

# Our Shared Reality

The conservation community is replete with well intentioned, dedicated, high-powered professionals that prioritize the environmental and natural resource values that we protect and espouse. We are eager to share what we know is important to protect our landscape and create a higher quality and healthier life for people, plants, and wildlife. Our hearts are in the right place for this, but we need to make sure that we let new constituents understand who we are and what we have to offer. We must seek to understand what these specific communities and neighborhoods will value most as well as what we can provide. Then, we must provide it.

Let's begin with the known. We know that there are a myriad of environmental factors and issues in neighborhoods that are predominantly home to communities of color; things like water contamination, heightened lead poisoning rates, polluting industries, contaminated sites, and inequitable access to public open spaces and natural areas. There are also disproportionate impacts of climate change: in urban neighborhoods, residents are dealing with the heat island effect that causes higher ambient temperatures than their suburban and rural counterparts are experiencing.

There are a myriad of environmental factors and issues in neighborhoods that are predominantly home to communities of color; things like water contamination, heightened lead poisoning rates, polluting industries, contaminated sites, and inequitable access to public open spaces and natural areas. It is important that we share the knowledge and understanding that communities of color have the power to implement change, and that focusing on nature access can lead to better outcomes with regard to health challenges, like asthma. According to the National Institutes of Health, over 750,000 people in New Jersey have asthma, with only about 24% of them being white, non-Hispanic individuals.<sup>2</sup>

2. "New Jersey State Health Assessment Data New Jersey's Public Health Data Resource," NJSHAD - Query Result - New Jersey Behavioral Risk Factor Survey Data - Current Asthma - Crude Rate, accessed September 26, 2022, [https://www.doh.state.nj.us/doh-shad/query/result/njbrfs/DXAsthmaNow/DXAsthmaNowCrude11\\_.html](https://www.doh.state.nj.us/doh-shad/query/result/njbrfs/DXAsthmaNow/DXAsthmaNowCrude11_.html).

The National Park Service has a workforce of over 20,000 permanent and seasonal employees spanning 12 regions that include all the United States and its territories. Of these employees, 79% are white, showing a true lack of racial diversity. According to the latest ten-year survey conducted by the National Park Service, only 23% of their park visitors were people of color.<sup>3</sup> But let us not forget that the first marked trail at Yosemite was built by U.S. Army Buffalo Soldiers, the African American army regiments.<sup>4</sup>

As this work is moved forward and the playbook is implemented, it is critical that we illuminate the contributions of people of color in building this nation and in the conservation of public spaces. We must also cultivate a love for the history of those that came before us on this land. The indigenous peoples of the lands we now occupy deserve reverence and recognition for their stewardship of this land for thousands of years.

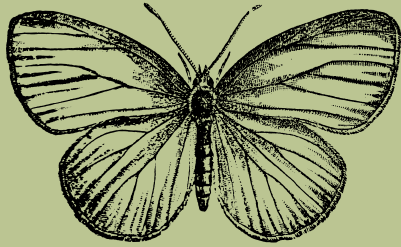
We need to determine as a conservation community, what will excite youth to engage in environmentalism as well as protect and green their communities, thereby taking care of the very future of our planet. People of color will account for most of the world's population within our lifetimes. We need to create leadership pathways for youth of color to lead this work. We must converge interests around land use (preservation, urban agriculture, city forestry, etc.) so that we can diversify the voices in the movement and the work.

Every community is unique with different needs and challenges. We must go in and talk with communities to discover what resonates and what is needed, and then provide whatever it is we can as the conservation community. We must bring people in as participants and convert them into stewards. We must bring nature to the people.

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3. "By the Numbers," National Parks Service (U.S. Department of the Interior), accessed September 26, 2022, <https://www.nps.gov/articles/000/by-the-numbers.htm>.

4. "Buffalo Soldiers," National Parks Service (U.S. Department of the Interior), accessed September 26, 2022, <https://www.nps.gov/yose/learn/historyculture/buffalo-soldiers.htm>.



### Chapter III

# Informing Policy

All good policies are informed by data. In New Jersey, we have the benefit of having the NJ Conservation Blueprint at our disposal. The publicly available dataset provides users with the ability to identify the conservation value of critical open space, farmland, and community green spaces. The data serves to create ease in the development of new partnerships, plans, and ideas for land conservation in New Jersey. From the Blueprint stemmed a city-specific dataset for Camden, NJ that moves beyond the mapping of green spaces to include health indicators associated with open space and land use in the city.

The NJ Conservation Blueprint was created for powerful decision-making and has been a tool for informing policy in the state. U.S. Senator Cory Booker has introduced a bill, Justice for Black Farmers' Act, seeking reparations based on historical land ownership. U.S. Representative Bonnie Watson Coleman introduced the Shade Act to mitigate the ill effects of Redlining practices in America and neighborhood degradation in communities of color that were subject to historic racism.

Policies are also being informed by equitable access and the cultivation of new partnerships. In Mercer County, NJ, a new alliance was recently formed, the Outdoor Equity Alliance, to create experiences that inform and inspire people of all ages, ethnicities, abilities, and income levels to enjoy nature and the outdoors. The alliance pays special attention to removing barriers to participation. This unique coalition pulls together the Mercer County Park Commission, local land trusts, service organizations, and school officials to collaborate and advocate countywide.

The Mercer County Park Commission has also done a great deal of work to diversify their programming and ensure that it is accessible for all county residents. They have tailored their offerings around interest areas, race/ethnicity, and skill level. Some of their programs include equestrian, rowing, concerts, nature tours, Black cowboys' events, and more. They also offer scholarships and internships to help nurture the conservationists of tomorrow.

As we dive into ways to engage with communities of color and bring them into this work, we must center the impacts that policy has on the sector. Policy can completely change the course of the work, the funding available to it, and the career opportunities that exist for the next generation of stewards.



## Chapter IV

# Environmental Justice

To effectively understand environmental justice, it is important to acknowledge the ways our society has been and continues to be unjust regarding the environments in which we live, work, and play. Historically, people of color, immigrants, and individuals with low income in the United States have been intentionally exposed to disproportionate environmental threats that impact physical and mental health, access to natural spaces, ownership of land, and overall safety. The displacement of Indigenous peoples from their ancestral land and discriminatory policies such as Redlining laid the foundation for generations of environmental racism and the environmental inequality that we see today. Systemic discrimination in housing, agriculture, and politics has and continues to perpetuate social inequality and poor environmental quality, and man-made climate change is exacerbating these problems more each year.

Communities of color, immigrants, and low-income families experience environmental burdens in abounding ways. The mental and physical wellbeing of these individuals is particularly at risk, with impacts being directly linked to housing discrimination. As a result of Redlining — a government-sanctioned policy that blocked people of color from obtaining loans to buy homes in quality neighborhoods — Black, Asian, and Latinx/Hispanic families were forced to live in areas neglected by local government and exposed to environmental toxins. The neighborhoods they were segregated into were often near hazardous waste facilities and Superfund sites (land contaminated by multiple hazardous wastes). With major systemic barriers preventing upward financial growth, many of these families remained in these hazardous areas for generations.

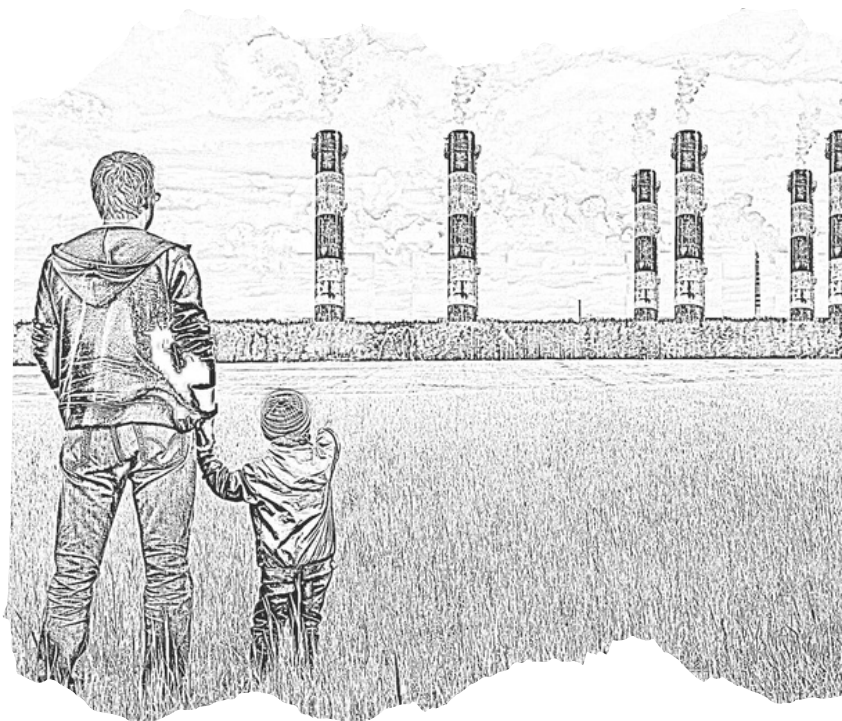
Today, families continue to live, work, and play in areas that are not only devoid of nature but also have an overabundance of air pollution, toxic waste, and contamination. This leads to higher blood lead levels, increased risk of asthma, and neurological conditions, among other problems.<sup>5</sup> These dangers further harm individuals by increasing stress levels, creating financial burden through healthcare costs, and limiting the ability to work. Diminished access to safe, open spaces, such as parks, can also be harmful to mental health, and with barriers to mental health services, many go untreated.

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5. Jessie Laurore et al., "To Protect Children of Color, Leaders Must Understand and Address Environmental Racism," Child Trends, February 9, 2021, <https://www.childtrends.org/blog/to-protect-children-of-color-leaders-must-understand-and-address-environmental-racism>.

Additionally, with a higher population density, older infrastructure, and fewer trees, urban heat islands (urban areas with temperatures that reach 1.8 to 5.4 degrees Fahrenheit higher than their surrounding rural areas) are often home to low-income individuals and families.<sup>6</sup> Extreme heat can worsen pre-existing health conditions, cause health issues for infants, and put people at risk of death. More extreme and frequent weather events — such as heatwaves, wildfires, and floods — are causing homelessness, poverty, mental and physical health problems, and death. These events most impact communities with fewer resources and social protections like healthcare, transportation, and communications in their native language.

Fortunately, advocates and conservationists work diligently to fight for environmental justice (EJ), defined by the U.S. Environmental Protection Agency as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.”<sup>7</sup> Individuals began working towards environmental equality in the U.S. as far back as the Civil Rights movement of the 1960s with a rise of sanitation strikes and a call for better pay and working conditions. The movement was primarily piloted by people of color, like Cesar Chavez, the Mexican American labor leader and activist who led Latinx/Hispanic agriculture workers in the fight for workplace rights, including protection against pesticides in the fields. Then, in the late 1960s, African Americans in Houston and New York City fought against hazardous wastes in their communities.<sup>8</sup>



6. Kim Rutledge et al., “Urban Heat Island,” National Geographic Society, May 20, 2022, <https://education.nationalgeographic.org/resource/urban-heat-island>.

7. “Environmental Justice” (Environmental Protection Agency), accessed August 8, 2022, <https://www.epa.gov/environmentaljustice>.

8. Brian Palmer, “The History of Environmental Justice in Five Minutes,” NRDC, May 18, 2016, <https://www.nrdc.org/stories/history-environmental-justice-five-minutes>.

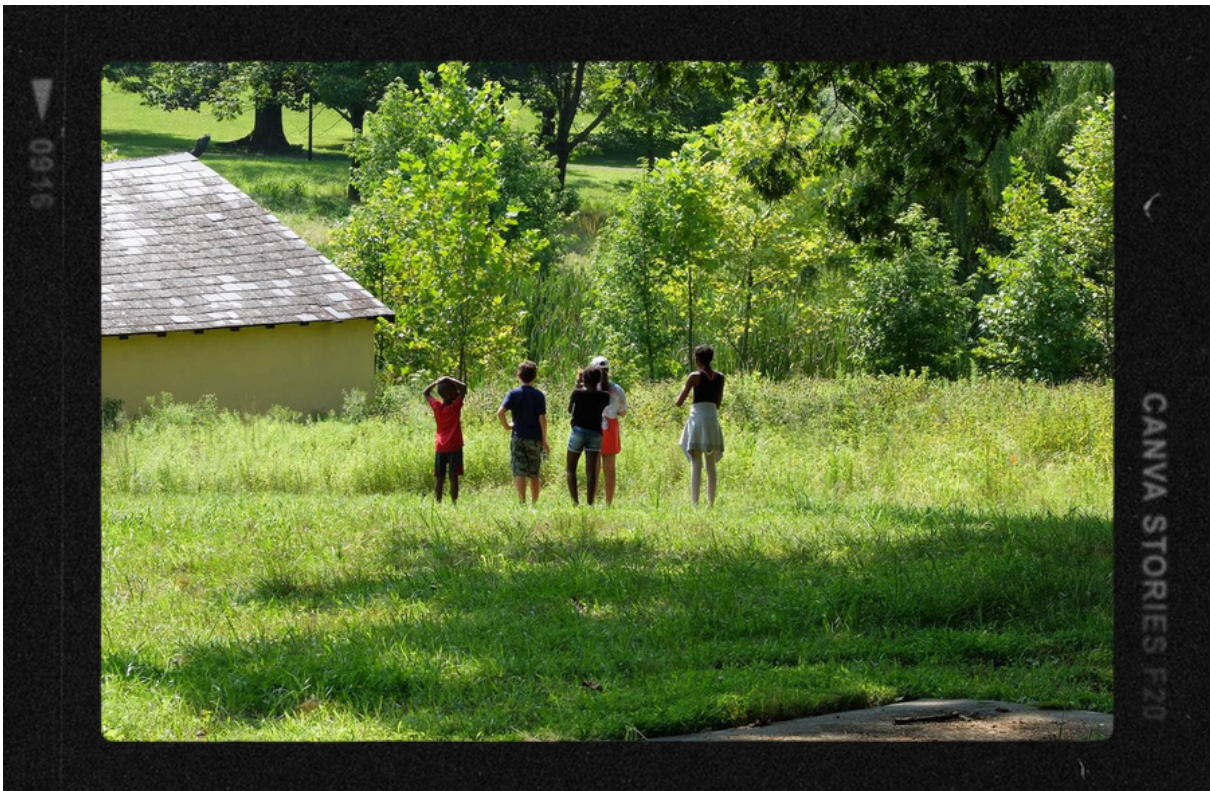


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The environmental justice movement today across the United States is often spearheaded by impacted communities. They lead the fight for their justice as advocates to themselves and on behalf of those who are also experiencing the effects of harmful practices impacting the environment around them. Advocacy for environmental justice policy can be at the local, state, or federal level depending on the jurisdiction associated with the issue that is being addressed.

The movement for environmental justice is growing, and along with it, we have seen an increase not only in the people advancing the movements as volunteers but also in job creation in the sector. Grassroots organizing — action at the local level by local people — can be effective at addressing issues and developing movements and campaigns to advocate for environmental justice. This type of action has led to the creation of jobs at local organizations for community organizers, policy advocates, and more. The movement for land conservation has grown significantly, which has created jobs for land stewards, natural resource educators, and land use attorneys.

People of color have galvanized the environmental justice movement for decades, and the recognition of the intersectionality of these efforts has increased over time.<sup>9</sup> With more discussion of the impact of environmental burden on the LGBTQ+ community, the disability community, the incarcerated, and the aging, the movement is unmasking the intricacies of social inequality and environmental quality with profound action.



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9. The Chisholm Legacy Project, accessed September 26, 2022, <https://thechisholmlegacyproject.org/>.



## Chapter V

# Identifying Needs

To have meaningful impact, we must make today's environmental issues relevant to future generations. Key to this effort is understanding the natural assets of each community or neighborhood, as well as what changes residents would like to see. The easiest way to begin this work is with an assessment of the built environment. Some items to consider include:

- Parks
- Playgrounds
- Street trees
- Community gardens
- Access to local, nutritious food sources
- Trails
- Brownfields
- Hazardous Waste and illegal dump sites

The next step is directly asking community members:

- How would you describe your current environment?
- What do you think is important in your community?
- What kinds of activities and programs would attract you to the outdoors?
- How do you prioritize environmental issues?
- Do you use your parks and open spaces?
  - What do you love about them?
  - What don't you like?
- Do you value your shade trees on your street?
- Do you experience recurring flooding?
- Do you fear spending time in the outdoors (hiking, camping, birdwatching, etc.)?
  - If so, why?
- Do you know about careers in the environmental sector?

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Then, the real engagement work begins. As a conservationist ambassador, let communities and neighborhoods know what you can offer, influence, and advocate for; things like street trees and urban forestry, land to grow food, flood mitigation (i.e., rain gardens), and educational programming (i.e., birding, stewardship, environmental justice issues, exposure to the outdoors, etc.). Also, the economic perspective that green initiatives often enhance neighborhood and real estate values must be promoted. But most importantly, listen and gather information, follow up to be certain that you heard correctly and understood, and then deliver the things within your capability. Identify their priorities and work within them, rather than bring the same agenda to every community and neighborhood.

Additionally, remove obstacles and make people understand that they are not visiting these places; they own these places. Create opportunities for people to work and advocate together. Instead of simply demonstrating the jobs and careers available or the quality of life and benefits, share all the joy Mother Earth has to offer. Develop teams of credible messengers to talk about the environment in every community; people who can carry the message to others and are from the community, speak like the community, and look like the community.







## Chapter VI

# Outreach and Engagement

There are three critical parts to conducting outreach and engagement as outlined in this playbook. First, we must examine myths and fears that exist within communities of color regarding nature and the outdoors. Second, we should be recruiting participants from within existing community spaces first and including incentivization strategies. Third, influencers and ambassadors of this work within communities of color will be critical to successful implementation.

So, you've identified the environmental resources and hazards in the neighborhood, and you have your baseline regarding community needs and desires for their environment. Now stop. Before you gather a group of people of color to hit the outdoors, you should have open dialogue about the myths, fears, and misperceptions that exist regarding nature. A study conducted by the University of Michigan "found that race had significant effects on thinking about disconnectedness, predators, getting lost, loathsome and hateful places, fearfulness, and danger in the context of reflecting on nature."<sup>10</sup> Be prepared to discuss safety tips, explain some of the wonders of nature (i.e.: insects, poisonous plants, etc.), and explore ways to scale individual outdoor experiences over time.

Wait! How do you recruit participants? Who is your target audience and who is your target market? You want to make sure that you have built out your program and are marketing in spaces where people are already connecting naturally. Also, we know that the younger a person is when they begin cultivating an interest in nature, the more likely they will nurture that love throughout their lifetime.<sup>11</sup> There are some locations that will make for great starting points, like schools, colleges, mentorship programs, cultural clubs, and partner organizations.

Things to think about for incentivization might be offering stipends for ongoing participation or developing pathways for paid internships and jobs. Ensure that you are providing exposure to careers and information about how to access those career paths. Connect talent when appropriate. Most importantly, develop positive and unforgettable outdoor experiences. This means creating a "cool" atmosphere that celebrates culture through food, music, and art and that generates a love for the outdoors.

10. Dorceta E. Taylor, "College Students and Nature: Differing Thoughts of Fear, Danger, Disconnection, and Loathing" (Environmental Management, May 10, 2019), <https://doi.org/10.1007/s00267-019-01172-9>.

11. Ruth A. Wilson, "Starting Early: Environmental Education During the Early Childhood Years," ERIC Digests, 1996, <https://files.eric.ed.gov/fulltext/ED402147.pdf>.

Let's not forget the role that the media can play in supporting and advancing our goals. As we hope to meet people where they are, we also must keep in mind what they are already exposed to. Where are they consuming their information? What influences their decision making? How can we get important issues in front of large audiences through current influencers of color? Can we imagine topics routinely discussed in media that people of color are already connecting with? Here are some outlets that might reach new and young audiences of color:

The Griot	American Forests	Chef Zu
The Root	The Breakfast Club Podcast	Charlamagne tha God
Black Enterprise	Blavity	Michele & Barack Obama
HuffPost Black Voices	Latina.com	Senator Cory Booker
HuffPost Latino Voices	Conference of National Black Churches	Alexis Nicole Nelson
Unlikely Hikers	Panhellenic councils (Kappa League...)	The Joy Trip Project

It is also critical that content and materials be culturally competent and relevant. In a diverse nation, we must ensure that we are respecting cultural values and traditions with land and its use. We must also provide information in various languages. Part of equitable access includes an equitable understanding, which oftentimes means we need to translate materials and have interpreters on site for activities and programming. Not only does this provide access, but it gives comfort to all community members in knowing that we aim to make meaningful connections that are rooted in their equitable understanding.

Let's go back to the idea of the trusted messenger. We should also utilize leaders of color that are already in the sector to move this work forward in our communities. They are well connected, deeply knowledgeable, and oftentimes pioneers in their sector/space. We have put together a non-exhaustive list of leaders of color in the environmental sector who are well respected and known for their catalyzing work in New Jersey and more broadly (Appendix A). We consider them as a speaker's bureau; a group of people that we can tap into to speak with youth and their families about careers, stewardship, and conservation. We urge those who want to implement this playbook to identify relevant leaders of color in their area to support this work and provide expertise and resources to advancing the cultivation of additional stewards of color in your region.

An underlying goal here is to cultivate the next generation of conservationists, stewards, and lovers of the outdoors. Central to that is the question: how are we going to increase exposure to large audiences and lift visibility of these issues in media that people of color frequently access? The answer is to employ advocates and messengers who come from within the communities of color that we are trying to reach. Using credible messengers, the work is not only conveyed, but also modeled. That reflection in racial diversity is critical to the development of the next generation of people of color that will engage in the environmental sector.



Chapter VII

# Next Generation of Stewards

You've done your initial engagement, and now you have some youth of color that are exploring the possibilities of entering the workforce in the environmental sector. Now what? Well, you need to create opportunities for exposure. Not only exposure to career field possibilities, but also to specific areas within the environmental sector so you can see where they enjoy themselves the most. Also, don't forget to integrate culture (music, art, food, etc.) when developing exposure opportunities.

Here are some examples:

### Experiential Learning and Exposure

- Birding
- Urban Farming
- Hiking (can include walks and running)
- Greening (tree planting and beautification)
- Plants (pollinators, meadows, marshlands, etc.)
- Biking
- Camping
- Fishing
- Alternative Energy (wind, solar, etc.)



Let's move beyond learning. How do you get the next generation of stewards to move towards career opportunities in the environmental sector? Identify the external groups that can be pulled into the room to support career exploration and advancement. Some of these partners are obvious, such as the government, higher education institutions, and preservation organizations. When thinking of the government as a partner, remember that they are resourced and have interest in diversifying their workforce. Leverage their resources, expertise, and existing programming to support efforts to increase the number of Black, Indigenous, and people of color (BIPOC) who see the environmental sector as a viable career path. Also, it is critical that we stop trying to reinvent the wheel. There are great programs that have been doing the work and seeing success; let's focus on their replication. For example, in Camden and Trenton, NJ there are programs, like ClimateCorps and PowerCorps, that are creating educational and career opportunities for young adults through activities that revitalize public land in the city.

Here are some career opportunities in the environmental sector for youth to consider:

- Arborists / Tree climbers
- Water systems engineers
- Regenerative / Sustainable / Urban farmers
- Wildlife biologists
- Botanists
- Renewable energy specialists
- Weatherization professionals
- Landscape architects
- Planners
- Land stewards
- Outdoor programmers
- Docents and interpreters
- Appraisers
- Title searchers

As we think about the next generation of stewards, we should also keep in mind ways to show meaningful outcomes as part of the projects we engage youth in. There are immediate urban climate mitigation and adaptation strategies that could be implemented with the support of youth. Some may feel easier to implement, like tree planting, for example. Increasing the urban tree canopy with street trees and micro forests allows for direct exposure, but it also bolsters long-term skill development, like tree care.

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Another hands-on project could be the development of accessible cooling stations in neighborhoods. Recycled water spray pads can be woven into the streetscape or community parks to give people a place to cool off as temperatures rise. Additional projects could look at integrating technology with temperature activation and timers for water and power conservation. Flood mitigation projects, like rain gardens, are another alternative that would combine both water and planting.

We must not forget to cover history when engaging youth in these projects. For example, in New Jersey, we have Dr. James Still who is known as the "Black Doctor of the Pines."<sup>12</sup> He was a botanist before his time who developed homeopathic remedies from what he found on the land. Dr. Still only had three months of formal education and noted in his autobiography that he felt a calling to medicine from a young age. He utilized his medicinal remedies to support his community, and he eventually became one of the richest men in Burlington County. We might also, while outdoors, cultivate a passion for archeology by taking students to places like the Abbott Marshlands and Abbott Historic Landmark site, located in Hamilton Township, Mercer County, NJ, where 13,000 years of Indigenous People's history has been verified and documented in the soils.

Youth need projects that are hands-on, equip them with skills, and incorporate history. A fishing excursion can turn into an educational conversation about clean water access or daily consumption of water. Or, while taking a hike, we can speak about the physical and psychological benefits of being with nature.

Before we go looking for resources and support, it is critical that organizations, programs, and projects align their internal values with those of the work ahead. This could mean evaluating policies and procedures for equitable access, checking our relevance, and delivering content that ties conversation topics into everyday life.

It is my sincerest hope that this Playbook strategy and the "primer" Modules that follow, might set us on a new path of igniting the interests and passions of the next generations who will reflect the beautiful diversity of our planet; who will assume the awesome responsibility of being good stewards of its natural resources and biodiversity.

### Resources

- [NJ State Parks](#)
- [NJ Trails](#)
- [NJ Outdoors](#)

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12. Dr. James Still Historic Office and Education Center, accessed September 26, 2022, <http://www.drjamesstillcenter.org/>.

# Core Module #1: Urban Forestry and Street Trees





# Core Module #1:

## Urban Forestry and Street Trees

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*Author: John S. Watson, Jr.*

### Themes

1. Identification of urban trees.
2. Benefits of trees to people and society.
3. Community engagement and employment opportunities for urban forestry and street trees.
4. Environmental justice and climate change impacts on carbon dioxide emissions, fossil fuels, and air quality.
5. Racial justice and access to the resources needed to plant and care for trees.
6. Right tree, right place.

### Background

Saving Land, a publication by the Land Trust Alliance, reported on a 2021 study that examined tree canopy cover in the 100 largest urban areas in America.<sup>13</sup> The study demonstrated that low-income blocks had 15.2% less tree cover on average and were hotter by an average 3 degrees Fahrenheit. The Northeast data showed the greatest disparity with low-income blocks in some urban areas having 30% less tree cover while being 7 degrees Fahrenheit hotter. Blocks with the greatest proportion of people of color had less tree cover and hotter summer temperatures generally.

Trees are part of the vital and critical Green Infrastructure in every community. Tree-lined streets in our cities, small patches of forested lands, and parks add value to the aesthetic and have implications on community health and quality of life in communities of color. Unfortunately, these values are often overlooked and undervalued and do not receive the attention deserved to sustain, nurture, and grow this important infrastructure. This module will serve as a primer to demonstrate the value of trees in our community and serve as a training document on the very basics we should all know and embrace to position us to advocate and care for our local environments.

This module will engage teams of young people, who are relatable to members of their community, to educate and inform fellow residents about urban forestry and demonstrate its benefits for all.

### Values

Trees offer many benefits in communities. First is the aesthetic value. Walk in any city, and if you are paying attention, you can see the glaringly obvious aesthetic difference in tree cover and the quality of trees. A recent article in The New York Times held a sub headline, “if you want to map inequality in New York, you can just count trees.”<sup>14</sup> That is to say that generally, the more trees on your block, the better off your quality of life, existence, and property value.

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13. Robert I. McDonald, “The Tree Cover and Temperature Disparity in US Urbanized Areas: Quantifying the Association with Income across 5,723 Communities,” PLOS ONE (Public Library of Science, April 28, 2021), <https://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0249715>.

14. John Leland, “Why an East Harlem Street Is 31 Degrees Hotter than Central Park West,” The New York Times (The New York Times, August 20, 2021), <https://www.nytimes.com/2021/08/20/nyregion/climate-inequality-nyc.html>.

Even more impressive though is the “natural capital” value trees provide communities by:

- serving as filters and absorbing harmful pollution and particulate matter from the air we breathe;
- cooling down our streets on hot summer days by casting shade and releasing moisture in the form of fine mist onto our blocks;
- saving energy costs by blocking the heat of the sun onto homes and structures, reducing the need for excessive air conditioning and energy waste;
- capturing stormwater, mitigating flooding on streets and preventing wasteful runoff into the storm drain systems and rivers; and
- making us feel better about where we live and work, calming our nerves in these complicated times, and reducing violent crime.

### **Challenges**

Older street trees have been known to heave sidewalks, causing liability to homeowners and costly repairs to their sidewalks. This occurrence is largely negated now by a better selection of tree species available and more thoughtful planting design and implementation.

The challenge is to make sure that we give proper attention to maintaining our existing tree canopy as we strive to plant more trees. Proper maintenance and care of our tree infrastructure will foster an appreciation of their value to our shared quality of life.

### **Solutions**

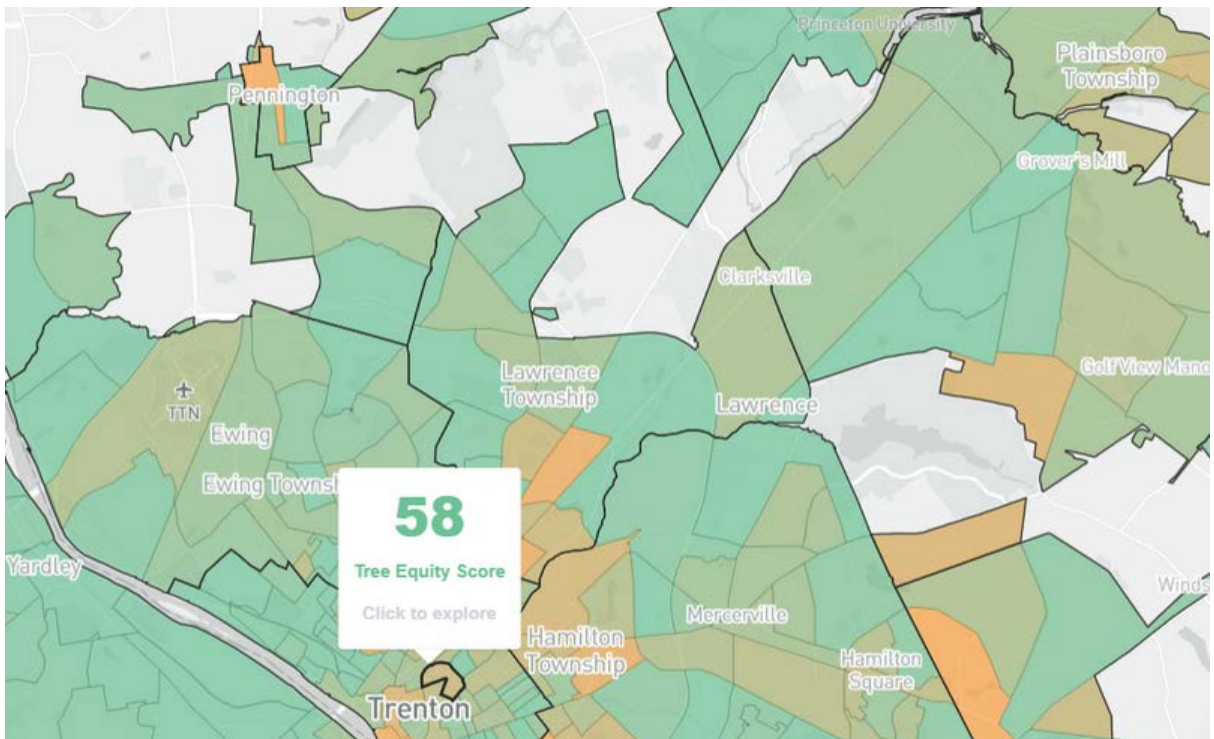
Community engagement, credible messengers, resident receptivity, proper tree selection, and very importantly, care will result in a realization of value and appreciation for this natural wonder that can make our lives more enjoyable and neighborhoods more livable. We must also recognize that many negative views of trees held by residents are directly related to lack of maintenance and care over many years. Better stewardship of our street trees can change this negative perception into an understanding of their value as a community asset.

## Implementation

We will use the Tree Equity Score Maps,<sup>15</sup> NJ Conservation Blueprint,<sup>16</sup> and other tree canopy data sets to identify neighborhoods and specific streets to consider for planting projects. Teams will identify specific streets in census tracts to select those areas ripe for reforestation by assessing the “carrying capacity” of the streetscape, overhead and underground utilities, sidewalk conditions, homeowner occupied housing, and receptive residents.

Teams will be trained and deployed to contact residents to provide information on the benefits and assess receptivity, cooperation, and willingness to be good stewards of the investment. When communities are identified and “street work” has been done, a design of the planting plan will be created to select appropriate tree species based on conditions. Understanding ground preparation requirements including sidewalk cutouts and soil conditioning, as well as overhead and underground utilities constraints, will also be necessary to the plan’s design and success.

Once plans are established, a second round of community engagement will be deployed to share plans, share visuals, and confirm resident support and commitment to stewardship.



Source: treeequityscore.org

15. “Tree Equity Score Maps,” Tree Equity Score, accessed November 8, 2021, <https://treeequityscore.org/>.

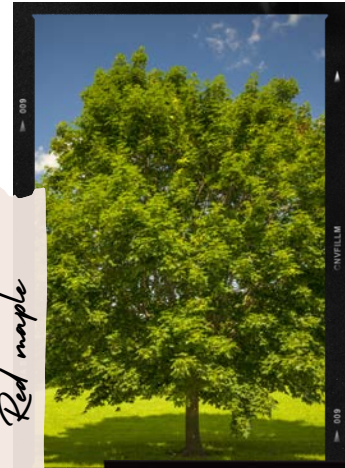
16. “Protecting New Jersey’s Land and Legacy,” New Jersey Conservation Blueprint, accessed November 8, 2021, <https://www.njmap2.com/blueprint/>.



## The Best Selection of Tree Species for Urban Thriving

### Large deciduous shade trees<sup>17</sup>

1. *Acer rubra* - Red maple
  - a. This tree is one of the most widely planted trees in America. Reaching 40 feet in height in cities, it is an excellent street tree and wonderful in park settings.
  - b. More salt tolerant than Sugar Maple.
  
2. *Acer saccharum* - Sugar maple
  - a. A beautiful maple with stunning fall colors transforming streets in autumn. Commonly referred to as the red maple, this 40 to 50-foot tree offers attractive red flowers in the spring and a bright red foliage in the fall.
  - b. Lacks salt tolerance
  
3. *Ginkgo biloba* - Maidenhair tree
  - a. A stately upright tree with unique leaves and interesting character. Vibrant yellow, fall color and fine for the urban streetscape. Can reach 50 to 80 feet high and tops with a pyramidal crown. Male cultivars should be selected to prevent the unpleasant smelling fruits of female trees.
  
4. *Gleditsia triacanthos* - Honey Locust - 'Shademaster' variety
  - a. The Honey Locust tree is another hardy and desirable selection suitable for street tree plantings, parks, and urban plazas.
  - b. Its fine-textured foliage provides wonderful, filtered shade, and the small leaves make for easy fall clean up.



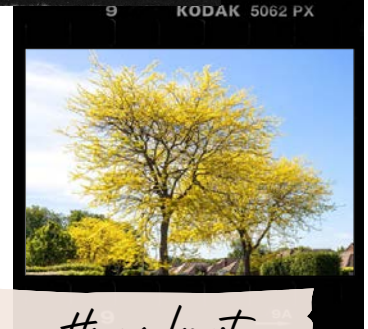
*Red maple*



*Sugar maple (fall)*



*Maidenhair tree*



*Honey locust*

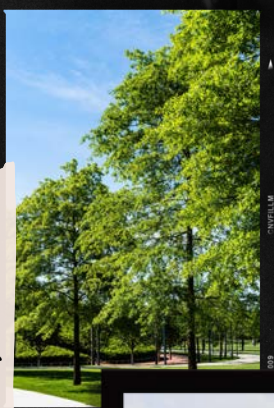
17. "Tree Identification," Tree Identification, accessed November 8, 2021, <https://www.arboday.org/trees/index-identification.cfm>  
utm\_source=Arboday.org&utm\_medium=Top\_Menu&utm\_campaign=Dropdown\_Menu&utm\_term=Trees&utm\_content=Tree\_Identification.

*London planetree*5. *Platanus acerifolia* - London planetree

- a. Vigorous growing, shade tree with mottling and peeling bark patterns for added visual interest. Very tolerant in urban conditions and forms grand allées on many urban and suburban streets. Can reach heights of 75 to 100 feet.
- b. Thrives as street tree planting but needs room to grow. Best used in situations / streets with large planting areas.

*Swamp white oak*6. *Quercus bicolor* - Swamp White Oak

- a. A moderate fast-growing tree that can grow up to 24 inches in a year. The tree can reach a height of 50 to 60 feet at maturity. An excellent choice for street tree plantings and parks.
- b. Very easy to transplant

*Willow oak*7. *Quercus phellos* - Willow oak

- a. Beautiful fine leafy oak that is very hardy along city streets and in parks and can adapt to various water and soil conditions.
- b. Quick growing, totaling between 40 to 75 feet in height, and easy to transplant, making this a great urban tree.

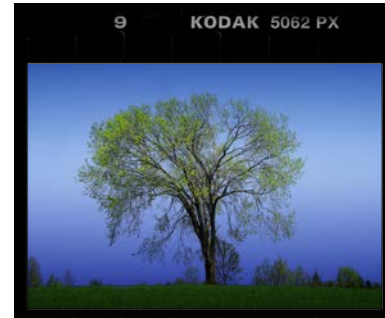
*Little leaf linden*8. *Tilia cordata* - Little leaf linden

- a. A summer bloom with yellow fragrant flowers on these trees reaching 50 to 60 feet. Offers a dense canopy that is excellent for shade. The soft wood provides an optimal nesting site for some bird species.
- b. Excellent, tolerant street tree.



### 9. *Ulmus americana* - American elm

- a. Reaching heights of 80 feet, the American elm was widely planted as ornamental in urban settings because it was stress-tolerant, fast growing, and beautiful. As it grows, the trunk divides near the base into several large limbs causing a cathedral-like effect on the street below.



*American elm*

### 10. *Ulmus Parvifolia* - Lacebark elm

- a. Another hardy, beautiful elm tree. While not native to the U.S., it is a very desirable and tolerant tree for the urban setting.
- b. May be preferred over the American Elm for its tighter growth characteristics.



*Lacebark elm*

## Smaller Street Trees for Underneath Overhead Utility Lines

### 1. *Acer griseum* - Paperbark maple

- a. Slow growing tree to 30 feet tall. Is excellent along streets and parks where space is limited.
- b. Exceptional ornamental peeling bark and comes in many cultivars with stunning fall colors. At maturity, it will not exceed 20 feet. Often called the "flame" tree, it offers a greenish-yellow flower in the spring that is followed by red-winged samaras. The leaves turn red in autumn for a distinct visual in the landscape.



*Paperbark maple*

### 2. *Amelanchier Canadensis* - Shadblow serviceberry

- a. Typically grows between 15 to 30 feet tall and offers an early bloom. White flower clusters emerge before the leaves each spring. Provides an edible berry that begins as a greenish color that turns red and later, a dark purplish black by late summer when they are ripe.



*Shadblow serviceberry*

### 3. *Cercis canadensis* - Eastern Redbud

- A beautiful spring flowering tree with dark bark.
- Grows to 30 feet in height and is generally wide, so should be left to parks and larger spaces.

### 4. *Crataegus viridis* - "Winter king" green hawthorn

- A late spring bloom with white flower clusters that offer a sweet fragrance that is perfect for attracting birds and butterflies. Can also have small thorns no longer than 1.5 inches. Averages a height of 30 feet.
- Beautiful red berries add to the winter interest of this species.
- This species tends to be wide spreading, so it is best used in parks and wider streetscapes.

### 5. *Koelreuteria paniculata* - Golden Rain Tree

- A beautiful summer flowering tree that grows to 30 feet.
- Yellow flowers are very dramatic in summer and have ornamental seed pods going into fall.
- Use 'fastigiata' cultivar for street trees as this cultivar is more upright than spreading.

### 6. *Nyssa sylvatica* - Black gum

- A beautiful native tree growing to 45 feet.
- Sensitive to transplant but once established, is very tough and tolerant.
- Exceptional fall color
- Cultivar "Gum drop" is an excellent upright form

### 7. *Syringa reticulata* - Japanese tree lilac

- Can reach heights of 30 feet tall, and at times can appear as a shrub rather than a tree due to its dense leaf structure that can hide the trunk. Blooming between late spring and early summer, it offers a creamy white flower that attracts hummingbirds and butterflies.



*Eastern redbud*



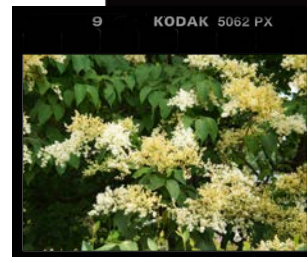
*"Winter king" green hawthorn*



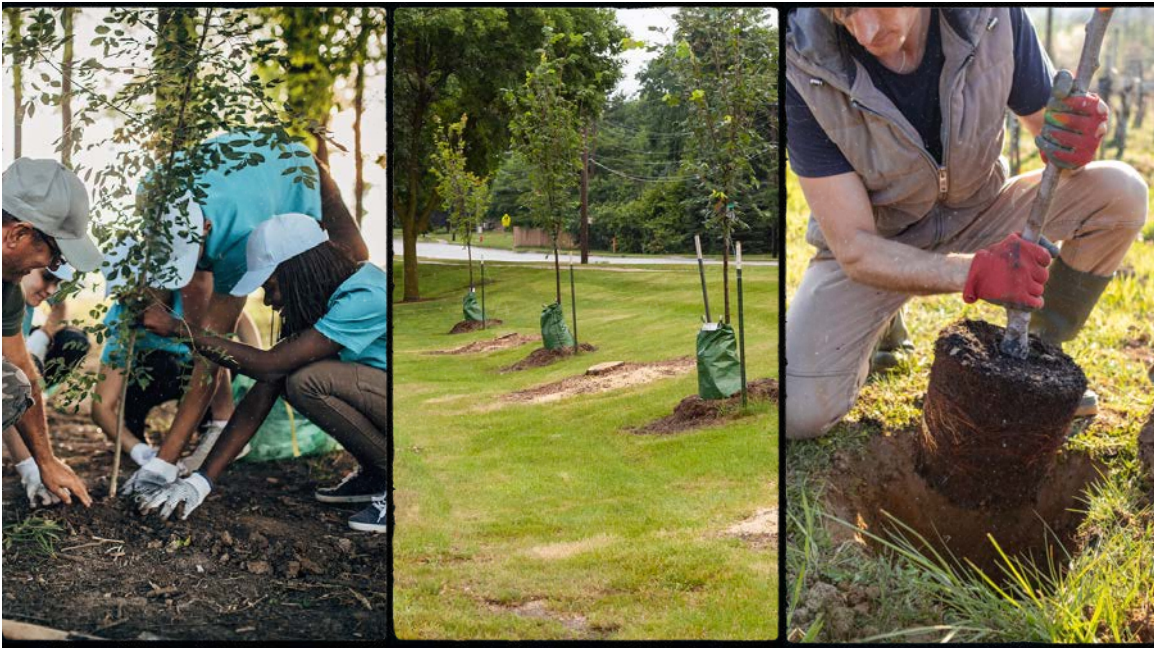
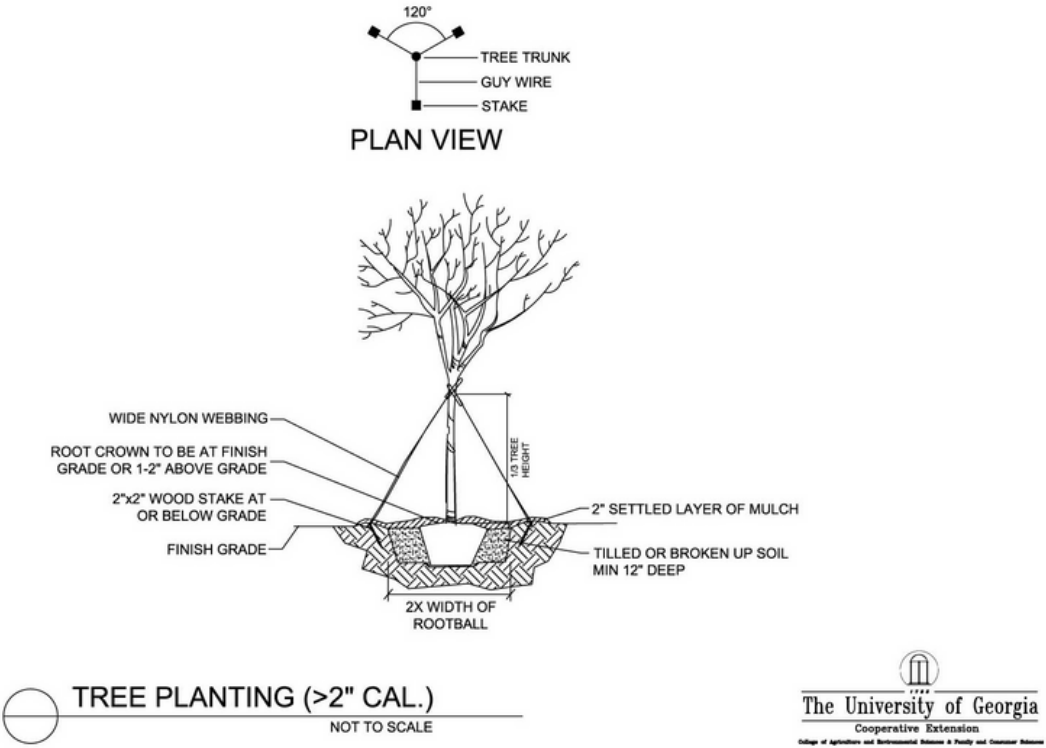
*Golden rain tree*



*Black gum (fall)*



*Japanese tree lilac*





These are some seasonal ornamental characteristics for selections to consider:

*London plane tree bark*



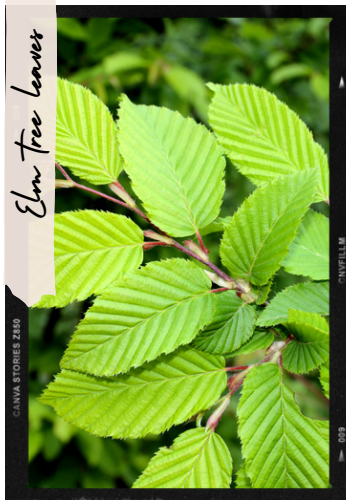
*Maple samaras*



*Golden rain tree fruit*



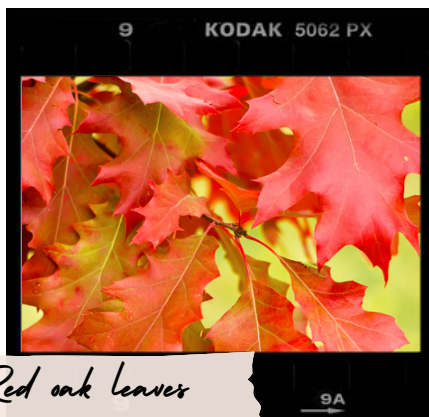
*Elm tree leaves*



*Shadblow serviceberry*



*Red oak leaves*



*Willow oak leaves*



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### Care In — and With — Community

Plan design, tree selection, and planting trees mark the beginning of the path to greener streets. The community engagement will not only share the inherent values of urban tree cover but will firmly establish and acclimate the new trees to ensure survival for many years through routine community visits and proper training on care. Trees will require water while establishing a strong root system and foundation, as well as proper pruning throughout their lives. Proper care and stewardship will protect this green infrastructure investment, which in turn will provide care for community health, both physical and mental.

### Job Creation

This is a real “green job” opportunity that will result in an enhanced cleaner, greener community. We must find ways to fund:

- tree advocates/ambassadors
- arborists
- foresters
- tree maintenance
- tree planting
- concrete saw cutters for tree pits

### Facilitation Questions:

1. What is your general feeling for the trees in your neighborhood?
2. Do you see them as a burden or asset to your neighborhood and quality of life?
3. How do you think that a well-maintained, tree-lined street could make people feel?
4. What do you think or hear are "negative perceptions" of urban street trees?
5. What do you think could be done to mitigate any negative perceptions about urban street trees?

### Additional Resources:

- Book: The Tree Book – Michael A. Dirr & Keith S. Warren
- Documentary: City of Trees
- Documentary: Trees in Trouble
- Calculator: National Tree Benefit Calculator
- Access: Tree Equity Score
- Short Video: How Systemic Racism Linked to Fewer Trees in Your City | One Small Step

# Core Module #2: Birding





## Core Module #2: Birding

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*Authors: Bill Lynch, M.S. and John S. Watson, Jr.*

### Themes

1. Introduction to the pleasure of birding by sight and sound.
2. Identification of common "backyard" bird species seen in your neighborhood followed by movement to nearby diverse habitats to add other birds to your list.
3. Getting people outdoors in new ways to enjoy nature and understand the value of natural systems and habitats.
4. Whet the appetite of the community for the sport/activity and create a lifelong love of birding.

### Background

"Birding" or bird watching is one of the fastest growing outdoor activities in the world. An estimated 45 million people in America alone consider birding a hobby, according to a 2016 U.S. Fish and Wildlife Service study. It is such a pleasant way to enjoy nature and gain incredible insights into our ecosystems, wildlife, and habitat values. From your own street or backyard, along your favorite stream or field, or in large tracts of intact forest, an incredible array of species can be observed. It is remarkable to think that if one travels just a few miles outside of their neighborhood or city, they might see an entirely different suite of birds that they wouldn't see at home.

For instance, in a city or city park, you might see plenty of American robins, Northern cardinals, blue jays, red-bellied woodpeckers, and other "backyard species", but traveling to an open meadow just outside of town, you might observe Eastern meadowlarks, bobolinks, Eastern bluebirds, and other species that require wide open grassland habitats. Or you might enter a large, forested area where forest interior species' breed, feed, and dwell. These interior species prefer large stands of undivided intact woods without edges such as roads, mowed lawns, pipeline "rights of way," and other areas that create breaks in the intact forest canopy. There, you might see or hear barred owls, scarlet tanagers, pileated woodpeckers, and many colorful varieties of neotropical songbirds moving through the area as they head north and south on their annual migrations.

The reliance on special habitat types by individual species clearly demonstrates the importance of protecting a mosaic of habitats to maintain our planet's biodiversity.

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### Values

Birding brings joy to millions of people around the world every day. Whether viewing them at your backyard feeder or participating in the Audubon Annual Christmas Count, it is a fun, safe way to spend time outdoors year-round. Birding is a great way to demonstrate the value of different types of habitats and why it is important to protect our landscapes around the globe. This is true not only for the wintering and breeding grounds, but also for the "flyways" that provide respite for weary migrating species on their long-distance travels. Birding offers a direct glimpse into the depths of biodiversity of species and the land types they rely on for their very survival. For instance, an interior forest species would not survive long in only grassland habitats.

### Challenges

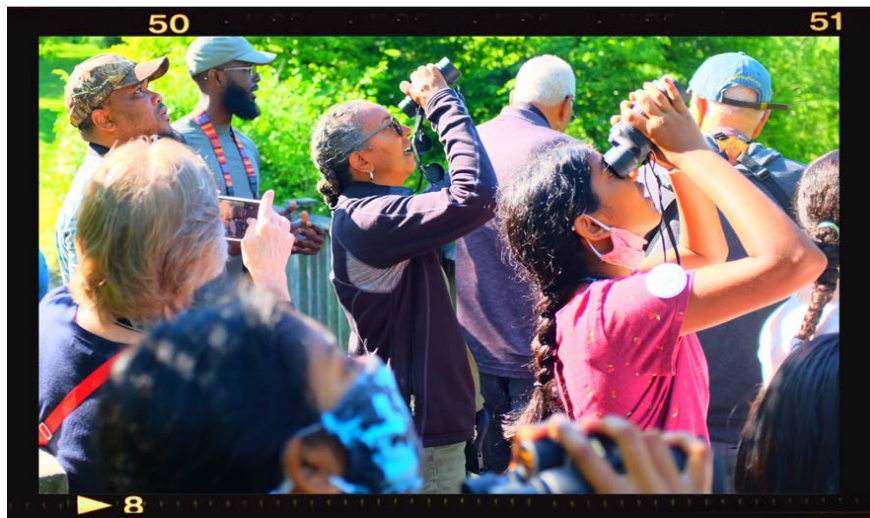
Our challenge for this module is to recruit more young people to the world of birding for both enjoyment and enlightenment on natural systems, diverse habitat values, and outdoor recreation.

### Solutions

We recommend getting people engaged in safe spaces to ignite and nurture their passion for this lifelong activity. We can demonstrate the process of starting a "life list" of birds and expose them to proper use of binoculars, backyard feeders, and identification by sight and by ear.

### Training

- Instruct basic "backyard" bird identification by sight and sound and basics of binocular use.
- Conduct routine bird walks in convenient places to engage the community.
- Create a backyard feeder program and a species list.



## Bird Identification

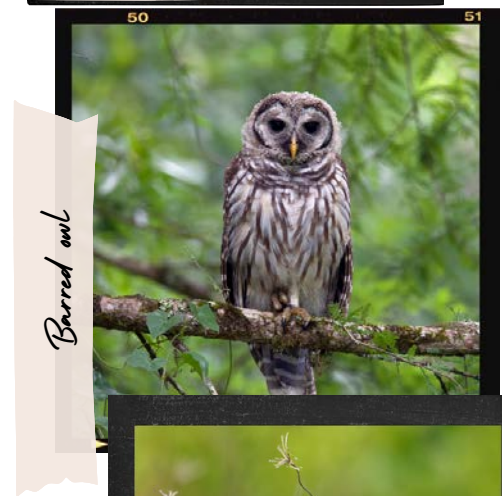
### Level 1: Common "Backyard Birds"

- American robin
- Northern cardinal
- Blue Jay
- Downy woodpecker
- Carolina wren
- House wren
- Sparrows (multiple species)
- American goldfinch (New Jersey's State bird!)



### Level 2: Interior Forest Species

- Barred owl
- Northern parula
- American redstart
- Eastern wood pewee
- Rose-breasted grosbeak
- Scarlet tanager
- Black-and-white warbler
- Hooded warbler
- Pileated woodpecker
- Ovenbird



### Level 3: Grassland Species

- Eastern meadowlark
- Bobolink
- American kestrel
- Eastern bluebird

### Level 4: Birds You Might See Near Rivers, Lakes, and Streams

- Great blue heron
- Bald eagle
- Osprey
- Belted kingfisher
- Double-crested cormorant

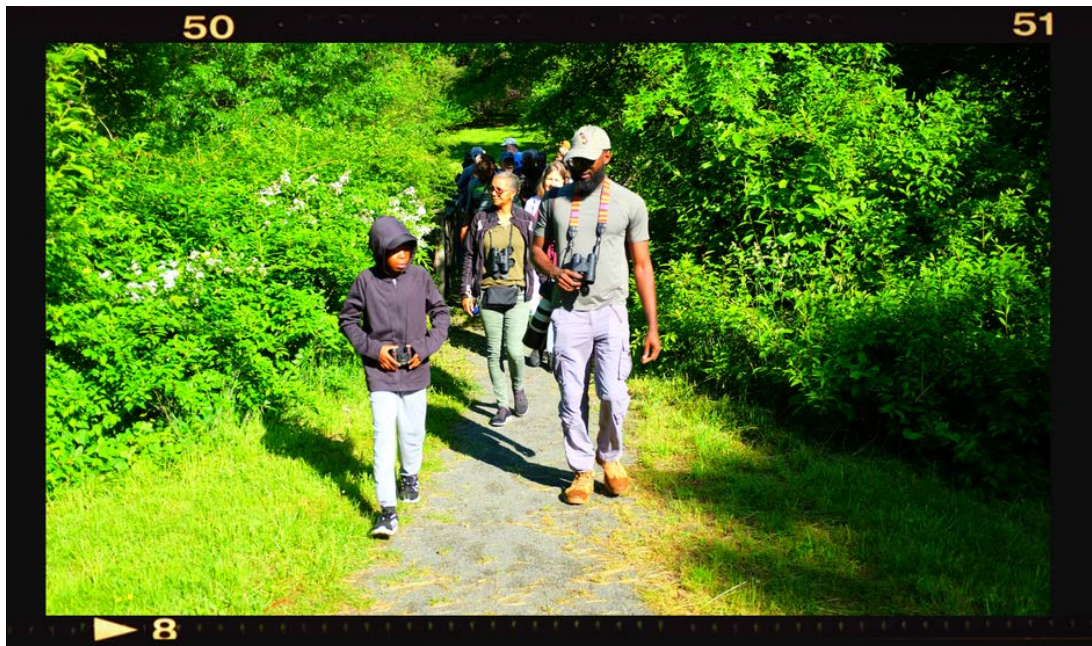


**Facilitation Questions:**

1. What are some common birds you might see in your neighborhood?
2. Describe proper setup and "sighting objects" with binoculars.
3. Match these six birds with their calls / song / sounds / behaviors.
4. What is the difference between a "resident" species and "migratory" species?
5. What times of year do migrations occur?
6. Where does a certain migratory species come from and where are they going?
7. What is a "flyway"?
8. Why is habitat protection of lands along the flyway important?
9. How might nonnative invasive plant species impact migrating bird species?
10. Which bird can hover and fly backwards?

**Additional Resources:**

- Book: [The Sibley Field Guide to Birds](#), by: David Allen Sibley
- Video: [Black Birders Week 2020](#)
- Video: [Birders Central Effect](#)
- App: [Merlin All About Birds](#)





# Core Module #3: Stormwater Management and Green Infrastructure



Photo Credit: Allison Palmer Jensen





# Core Module #3: Stormwater Management & Green Infrastructure

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*Author: Sophie Glovier*

## Themes

1. Understanding storms, stormwater, and flood events.
2. Knowing where stormwater goes and its impacts to our environment and resources.
3. Exploring ideas to mitigate the harmful effects of stormwater runoff to the environment and communities.
4. Exploring Green Infrastructure Solutions, like “sponge cities.”

## Background

Communities across the country are experiencing damaging flooding. As a result of increases in storm intensity due to climate change, the problem is expected to get worse. Studies show that neighborhoods containing residents with lower incomes, racial and ethnic minorities, the elderly, and individuals with disabilities are disproportionately affected by flooding.<sup>18</sup> At the same time, we face water quality issues. Our streams and lakes have elevated levels of bacteria and other nutrients that cause issues like harmful algal blooms.

Polluted stormwater runoff is a major cause of both problems. This is the water that falls on hard surfaces like roofs, roads, and sidewalks and subsequently “runs off.”<sup>19</sup> In doing so, it picks up unnoticed and oftentimes unintended “people pollution,” such as vehicle waste (antifreeze), lawn treatment chemicals, road salt spread in the winter, and more.

That water all ends up in our streams and rivers, and, after cleaning, is ultimately our source of drinking water. The more polluted it is, the more difficult and expensive it becomes to treat it for our use. In addition, when it rains hard, that water has nowhere to go and floods our streets, homes, and businesses.

When water falls on undeveloped areas like fields and forests, much more of it is absorbed so there is less “runoff.” In addition, water falling on natural surfaces gets cleansed as it soaks in, moves through soil, and is taken up by native plants and trees. “Green infrastructure” mimics this natural process by directing stormwater runoff from our hard surfaces to where it can be cleansed by soil and plants. This can be done in our urban areas by using “best management practices” like rain gardens and green roofs.

This module will provide information on how green infrastructure can be integrated into our communities as well as a description of pathways to employment for young people relating to this important work.

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18. John Fialka, “When Storms Hit Cities, Poor Areas Suffer Most,” *Scientific American* (Scientific American, April 1, 2019), <https://www.scientificamerican.com/article/when-storms-hit-cities-poor-areas-suffer-most/>.

19. Alvaro Sanchez Sanchez, Jeremy Hays, and Andrea Quinn, “Staying Green and Growing Jobs,” *American Rivers*, April 2013, <https://www.americanrivers.org/wp-content/uploads/2016/05/staying-green-and-growing-jobs.pdf>.

**Values**

Bringing green infrastructure into our communities offers benefits beyond reducing flooding and improving water quality.<sup>20</sup> Well maintained green spaces have been shown to offer many positives, including:

- Reducing the heat on city streets
- Reducing crime rates
- Improving mental health
- Increasing property values
- Providing habitat for birds, bees, butterflies, and other species

Since low-income communities and communities of color are more likely than other demographic groups to live in paved and developed areas and to experience more flooding, adding green infrastructure can make a significant positive impact.

**Challenges**

Community members may be more accustomed to the green space being maintained as a lawn and view rain gardens and other green infrastructure as “messy.”

Since plants are an important element of green infrastructure, proper maintenance is vital. Weeds need to be removed and drainage grates cleared, for example. This is an opportunity as well as a challenge. Demand for workers who know how to maintain green infrastructure installations will grow along with its adoption.

**Solutions**

Community engagement and proper design and maintenance of the green infrastructure installations will build awareness and appreciation of the important role that plants and soil can play in managing flooding and protecting water quality. Educational signage where appropriate can also increase community acceptance.

**Implementation**

In New Jersey, new development that perturbs more than an acre of land or adds ¼ acre of impervious surface is required to manage stormwater runoff with green infrastructure. Redevelopment of a property is also a good time to add green infrastructure, particularly in neighborhoods where flooding occurs.

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20. Emily Gordon et al., “Water Works,” Pacific Institute (Green for All, April 17, 2020), <https://pacinst.org/>.

Green infrastructure projects can be extremely large scale; an example would be a park that can double as a basin to capture and hold water during flooding. A project like this would probably be undertaken by the County or the City. However, small-scale residential solutions can also help to address flooding and water issues, such as basement flooding. These projects can be undertaken by municipal government, schools, and community groups working with one of the many organizations with expertise in this area like Isles, the Water Resources Program at Rutgers, or The Watershed Institute.<sup>21</sup>

### Job Creation

Job opportunities related to green infrastructure installation include landscaping, plumbing, horticulture, construction, engineering, and paving.<sup>22</sup> Jobs relating to maintenance of green infrastructure include caring for plantings and ensuring proper function of GI technology.<sup>23</sup> The work can involve vacuuming pervious pavement and periodic replacement of paver blocks for pervious pavement. Additional work includes annual cleaning of cisterns, erosion repair, raking of rain gardens, and cleaning of inlets.

### Training

A variety of programs exist to provide training and job skills for the green infrastructure field. These include:

- [Rutgers Green Infrastructure Champions Program](#)
- Trenton Climate Corps Program (Contact <https://isles.org/> for information)
- [Camden PowerCorps](#) (for residents of Camden, NJ)
- Other training opportunities can be explored [here](#).



21. "Wells of Opportunity: Training Residents and Prioritizing Local Hiring ...," Jersey Water Works, November 2020, <https://cms.jerseywaterworks.org/w-content/uploads/2020/11/Newark-Local-Hire-Report-November-2020.pdf>.

22. "Green Jobs in Your Community," EPA (Environmental Protection Agency, July 14, 2022), <https://www.epa.gov/G3/green-jobs-your-community>.

23. Kevin Doyle, "Growing Jobs through Green Stormwater Infrastructure: The Philadelphia Experience," Jobs for the Future (JFF), June 23, 2016, <https://www.jff.org/points-of-view/growing-jobs-through-green-stormwater-infrastructure-philadelphia-experience/>.

**Facilitation Questions:**

1. Do you think green infrastructure would add value to your neighborhood?
2. How do you think your neighbors would react to having a rain garden or naturalized basin nearby?
3. Do you understand how green infrastructure can reduce flooding?
4. Do you understand how green infrastructure improves water quality?
5. What do you think some issues might be with adding green infrastructure to your neighborhood?
6. How could those issues be addressed?

**Additional Resources:**

- Watershed Institute: [Exploring Green Infrastructure](#)
- Water Risk & Equity Map: [New Jersey Water Risk & Equity Map](#)
- Documentary: [Water Blues Green Solutions](#)
- Short Video: [Green Infrastructure](#)
- Rutgers University: [Green Infrastructure Guidance for Home, Work, and School](#)



# Core Module #4: Air Pollution





## Core Module #4: Air Pollution

Authors: Riche Outlaw and John S. Watson, Jr.

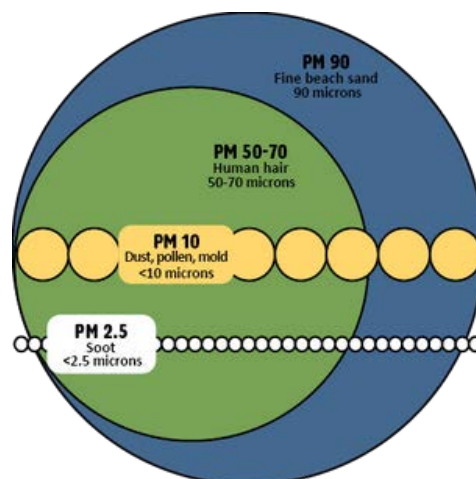
### Themes

1. Understanding sources of air pollution.
2. Understanding implications of air pollution on public health.
3. Understanding disproportionate impacts on communities of color.
4. Understanding how the community can get engaged around mitigation and advocacy.
5. Introduction to jobs in the field and providing pathways to learning and employment.

### Background/Definition/Introduction

Air pollution refers to the release of pollutants into the air, which are detrimental to our health and planet. Annually, air pollution is responsible for nearly seven million deaths globally. People of color living in low- and middle-income areas suffer the most. In general, most air pollution comes from energy use and production, and much of it is related to transportation – trucks, buses, cars, trains, and boats. Burning fossil fuels releases gasses and chemicals into the air.

Smog and soot are the most prevalent types of air pollution. Smog is air pollution that reduces visibility; a fog or haze that combines with smoke and other atmospheric pollutants. It occurs when emissions from combusting fossil fuels react with sunlight. Soot (aka “particulate matter”) is made up of tiny particles of chemicals, soil, smoke, dust, and other allergens carried in the air. Fine particulate matter, also called PM 2.5, is particulate matter that is 2.5 micrometers in diameter or smaller, which is smaller than dust and mold particles. These fine particles penetrate deep into the lungs and are linked to premature death, heart attacks, strokes, and aggravated asthma.<sup>24</sup>

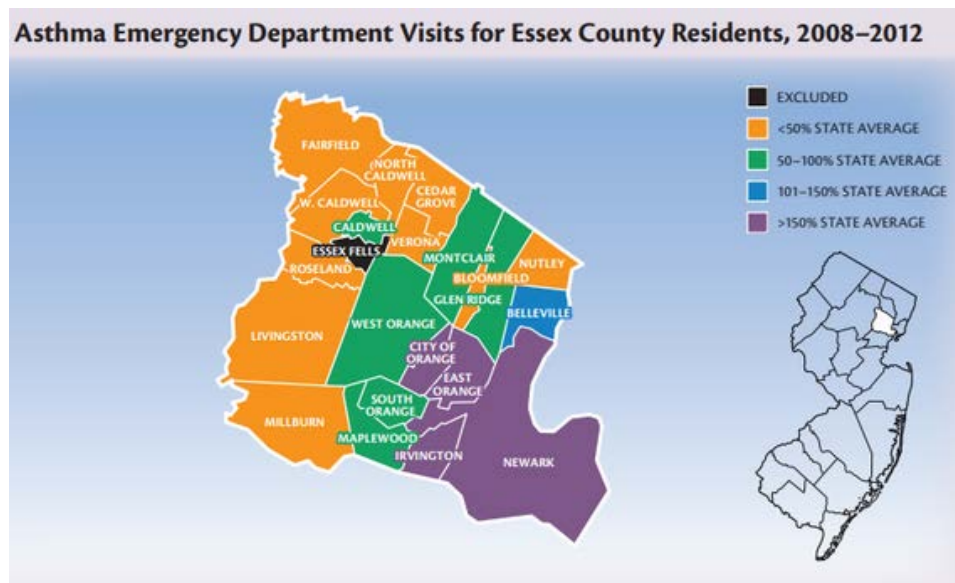


Source: Washington State Department of Ecology

24. Brian Palmer, “Particulate Matters,” NRDC, June 15, 2018, <https://www.nrdc.org/onearth/particulate-matters#:~:text=They%20found%20that%20an%20increase,heart%20disease%20by%2010%20percent.Add a little bit of body text>

Both smog and soot come from cars, trucks, buses, trains, factories, power plants, incinerators, and anything that burns coal, gas, or natural gas. In New Jersey, the transportation sector is the largest source of air pollution and accounts for 79% of nitrogen oxides from manmade sources, 23% of fine particulate pollution, and 41% of net greenhouse gasses. These pollutants impact our most sensitive residents, which include the elderly, children, and those with heart and lung conditions, such as asthma.

Research shows that air pollution can worsen asthma symptoms.<sup>25</sup> The graphic below illustrates how residents of Essex County, NJ visit the emergency room (ER) for asthma more often than residents in the rest of the state. Newark, East Orange, Irvington, and the City of Orange had the highest rates, together accounting for 86% of Essex County's ER visits for asthma. In Newark, about 25% of the children have asthma — a rate three times higher than the national average. This data suggests the pollution from Newark International Airport and nearby highways, truck routes, and industrial businesses is having a profound effect on the health of local residents.



Source: New Jersey Department of Health

In addition to health concerns, air pollution contributes to climate change. While the ozone in the atmosphere is warming the climate, the particulate matter can have either warming or cooling effects on the climate depending on its different components.<sup>26</sup> This translates to at-risk communities seeing an increase in flooding, heat waves, droughts, and wildfires due to climate change. The US Environmental Protection Agency released a report that examines how climate change may impact environmental justice communities.<sup>27</sup>

25. "Air Pollution," Asthma and Allergy Foundation of America, October 2015, [https://www.aafa.org/air-pollution-smog-asthma/?fbclid=IwAR0Eo2ailgG5OVzn0PjCJWExUM8xu8hT0hmPihZkWYCLX\\_6wAGuYubREE](https://www.aafa.org/air-pollution-smog-asthma/?fbclid=IwAR0Eo2ailgG5OVzn0PjCJWExUM8xu8hT0hmPihZkWYCLX_6wAGuYubREE).

26. "Air Quality and Climate Change Research," EPA (Environmental Protection Agency, March 30, 2022), <https://www.epa.gov/air-research/air-quality-and-climate-change-research#:~:text=Ozone%20in%20the%20atmosphere%20warms,sulfates%20cool%20the%20earth's%20atmosphere.>

27. "Social Vulnerability Report," EPA (Environmental Protection Agency, July 21, 2022), <https://www.epa.gov/cira/social-vulnerability-report>.

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**Key findings from the report:**

- Black and African American individuals are projected to face higher impacts of climate change for all six impacts analyzed in this report compared to all other demographic groups. For example, with 2°C (3.6°F) of global warming, Black and African American individuals are:
  - 34% more likely to currently live in areas with the highest projected increases in childhood asthma diagnoses. This rises to 41% under 4°C (7.2°F) of global warming.
  - 40% more likely to currently live in areas with the highest projected increases in extreme temperature related deaths. This rises to 59% under 4°C of global warming.
- Hispanic and Latinx individuals have high participation in weather-exposed industries, such as construction and agriculture, which are especially vulnerable to the effects of extreme temperatures. With 2°C (3.6°F) of global warming, Hispanic and Latino individuals are 43% more likely to currently live in areas with the highest projected reductions in labor hours due to extreme temperatures. With regards to transportation, Hispanic and Latino individuals are about 50% more likely to currently live in areas with the highest estimated increases in traffic delays due to increases in coastal flooding.

**Values/Benefits**

Knowing about sources of air pollution and impacts on human health can help one better understand and limit the exposure of these harmful pollutants. To help with this, the NJ Department of Environmental Protection (NJDEP) has developed several resources and tools:

- NJDEP | Environmental Justice | [Where Are NJ Environmental Justice Communities?](#)
- NJDEP | Environmental Justice | [What are Overburdened Communities \(OBC\)?](#)
- [What's In My Community? \(arcgis.com\)](#): A mapping tool that will find every facility with an air permit registered with the Division of Air Quality.
- [Site Remediation Waste Management Program's \(SRWMP\) Community Corner](#): A mapping tool that keeps New Jersey residents informed on SRWMP activities in their community.

**Challenges/Liabilities**

The air we breathe affects human health and global climate conditions. Unfortunately, communities of color are disproportionately impacted by polluting facilities, industry, and transportation. Soot levels are highest in urban areas, disproportionately exposing urban residents to potential health problems from soot. Children, residents of urban areas, and the elderly are particularly vulnerable to the effects of soot. Children have immune and respiratory systems that are still developing, and they breathe up to 50% more air per pound of body weight than adults do. Breathing in soot from diesel exhaust can cause both acute and chronic respiratory problems, such as asthma. Asthma is the leading chronic illness among children and is one of the leading causes of school absenteeism<sup>28</sup>. The risk of premature death is 26% greater in areas with high soot levels than in areas with less fine-particle pollution.

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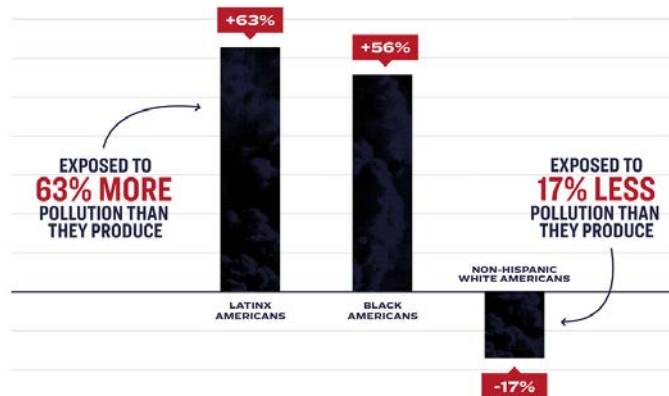
28. "Asthma Trends Brief," American Lung Association, accessed September 6, 2022, <https://www.lung.org/lung-health-diseases>.



There are six criteria air pollutants: ozone, particulate matter, carbon monoxide, lead, sulfur dioxide, and nitrogen dioxide. Criteria air pollutants are air contaminants that, at certain levels, can cause harm to human health and the environment. The NJDEP monitors for all six criteria air pollutants, however, the two pollutants of most interest are ozone (O<sub>3</sub>) and fine particulate matter (PM<sub>2.5</sub>). At unhealthy levels, they can cause harm to everyone, especially our vulnerable populations, including people with asthma, heart or lung problems, children, teens, and the elderly. By reducing soot by 2%, nearly 400 premature deaths could be avoided each year in New Jersey.

The graphic below depicts racial inequities of how much air pollution Black, Hispanic/Latinx, and White communities emit versus inhale. A 2019 study published in the Proceedings of the National Academy of Sciences<sup>29</sup> found a racial gap between who causes air pollution and who breathes it. White people enjoy a “pollution advantage” when it comes to air pollution. They inhale 17% less air pollution than they generate. Black and Hispanic/Latinx people, on the other hand, experience a “pollution burden.” They face 56% and 63% more pollution exposure, respectively, than they cause. As indicated by the study, Black and Hispanic/Latinx communities in the United States are much more likely than White communities to have negative health impacts from their exposure to air pollution.

#### POLLUTION EXPOSURE BY POPULATION (2003–2015)



Source: Christopher W. Tessum et al., “Inequity in consumption of goods and services adds to racial-ethnic disparities in air pollution exposure,” *Proceedings of the National Academy of Sciences* (March 2019).

#### Solutions/Mitigation

In understanding the sources of air pollution and health implications, we can develop community activists to support environmental justice issues. The activists’ role could include opposing the siting of new pollution-emitting facilities in already overburdened areas, or advocating for mitigation projects like smokestack “scrubbers” as well as other upgrades and retrofits to existing polluting facilities. We can also gain support for green infrastructure projects, like shade tree plantings, that help clean and cool our communities.

29. Susan Hanson, ed., “Inequity in Consumption of Goods and Services Adds to Racial ... - PNAS,” *Proceedings of the National Academy of Sciences of the United States of America* (PNAS, March 11, 2019), <https://www.pnas.org/doi/pdf/10.1073/pnas.1818859116>.

You can get air quality alerts sent directly to your phone or computer. Like the weather, air quality can change from day to day, or even hour to hour. Up-to-date information allows you to make decisions based on current air quality forecasts. Sign up now: [EnviroFlash – Home](#). The Air Quality Index (AQI) daily forecasts are based on a color-coded system for reporting outdoor air quality conditions. The AQI was established as an easy way for the public to gauge air pollution levels compared to the health-based national air quality standards. It is a yardstick that runs from 0-500. On the left are the AQI values, and on the right are the level of health concerns associated with the corresponding AQI values. The higher the AQI value, the greater the level of air pollution and the greater the health concern.

AIR QUALITY INDEX	
0-50	<b>GOOD</b> Air pollution poses little or no risk.
51-100	<b>MODERATE</b> Health concern for people who are unusually sensitive to air pollution.
101-150	<b>UNHEALTHY FOR SENSITIVE GROUPS</b> Sensitive groups, young children and the elderly, may experience health effects.
151-200	<b>UNHEALTHY</b> Everyone may experience health effects; sensitive groups may experience more serious health effects.
201-300	<b>VERY UNHEALTHY</b> Health alert: everyone may experience more serious health effects.
301-500	<b>HAZARDOUS</b> Health warnings of emergency conditions. The entire population is more likely to be affected.

Source: Greater Mercer TMA

New Jersey's groundbreaking Environmental Justice Law, N.J.S.A. 13:1D-157, requires the NJDEP to evaluate the contributions of certain facilities to existing environmental and public health stressors (including but not limited to air pollution) in overburdened communities when reviewing certain permit applications. Check out this link to learn more on how to get involved and be a part of solutions: [NJDEP | Environmental Justice | Take Action](#)

### Teaching/Training

Things we can do to help reduce air pollution:

- Work remotely.
- Consider ways to green your transportation, whether by taking public transit, biking, ridesharing/carpooling, or driving electric. There are many incentives available to make the transition to driving green easier.
- Do not idle your cars for more than 3 minutes. It is the law.
- Use cleaner wood-burning practices.
- Consider high energy efficient models when it is time to update your HVAC system or water heaters.
- Consider solar energy.
- Learn what you can do to help reduce air toxics in New Jersey.
- Sign up for the NJ Air Quality Flag Program. Eligible organizations will receive a set of flags and an educational toolkit at no cost. NJDEP staff will contact you to assist you in implementing the program.
- Participate in the public engagement sessions, hearings, and meetings hosted by state and local/county governments.

**Facilitation Questions**

1. What is PM 2.5?
2. Why is it harmful?
3. How can it affect your health?
4. Where does it come from?
5. What are some things you might do to reduce air pollution in your community?
6. How can air pollution contribute to climate change?

**Additional Resources**

## Videos:

- [What is Environmental Justice](#)
- [Learn more about Air Quality and Climate change affecting NJ](#)
- [Environmental Justice from the perspective of the Ironbound Maria López-Nuñez](#)
- [South Ward Newark, Truck Count Event, April 2022](#)
- [South Ward Environmental Alliance in Newark, NJ](#)
- [NJ Matters: Larry Mendte sits with Doug O'Malley, State Director of NJDEP to discuss how clean is the air we are breathing](#)

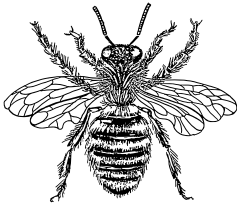
## Links:

- [Environmental Justice | US EPA](#)
- [NJDEP | Environmental Justice | Environmental Justice Resources](#)
- [Furthering the Promise: A Guidance Document for Advancing Environmental Justice Across State Government](#)
- [New Jersey's Environmental Justice Law](#)
- [Environmental Justice Rulemaking Briefing Presentation](#)
- [Environmental Justice Rule Proposal](#)

# Core Module #5: Pollinators and Meadows







## Core Module #5: Pollinators and Meadows

*Authors: Alex Rivera and John S. Watson, Jr.*

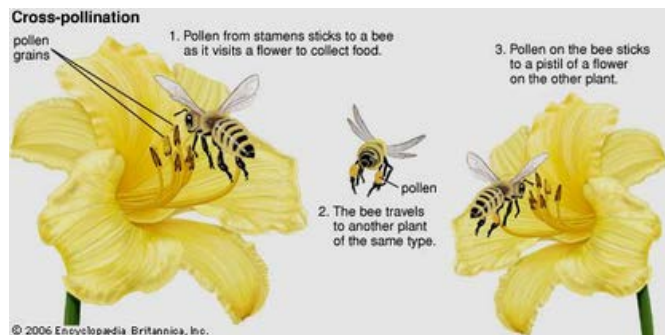
### Themes

1. Appreciate the constantly evolving sights and sounds of meadows and the pollinators they serve.
2. Understand what meadows do for nature and people.
3. Use strategies that visually communicate meadows' diversity and environmental impact and encourage direct engagement with plants and pollinators.

### Background/Definition/Introduction

Pollination is the act of transferring pollen grains from the male anther of a flower to the female stigma. The goal of every living organism, including plants, is to create offspring for the next generation. One way that plants can produce offspring is by making seeds. Flowers are the tools that plants use to make their seeds. Seeds can only be produced when pollen is transferred between flowers of the same species.

Our very life depends on pollination; the food we eat depends on this process. Without it, we would have no fruit, vegetables, or even meat to eat, as the animals that humans consume all rely on plants to survive. Seventy-five percent of leading food crops depend on pollinators to some extent. No pollination, no food!



Pollinators are the insects, birds, and bats that carry pollen from flower to flower, which fertilizes flowers of the same species. Native bees, butterflies, moths, and birds all transfer pollen to plants.

Meadows are diverse communities of grasses and flowers, buzzing with life and changing appearance from one week to the next. With more plant diversity, pollinators can find food, a place to rest, and a safe place for their young when the time is right for them.

### Values/Benefits

Meadows are beautiful landscape features providing year-round sensory experiences. Aside from their beauty, meadows are part of the local solution to significant challenges, such as climate change and the loss of plant and wildlife diversity. The benefits of meadows include providing food, rest, and shelter for pollinators, as well as reducing carbon in the atmosphere through plants, which take in carbon dioxide and store it in their roots and soil.

**Challenges/Liabilities**

One challenge facing meadows and pollinators is expectations for where natural spaces belong, what they look like, and who they are designed for. A common and impactful strategy for community conservation is converting lawns to meadows. However, lawns are appreciated for their neat appearance and all-purpose design, which can cause conflict when conservationists support installing meadows where lawns are.

Another challenge facing pollinators and meadows is invasive plant species, which reduce the number of native plants in a meadow. Invasive trees and shrubs are particularly challenging because woody plants change the relationship between plants and pollinators in a meadow. In addition, invasive plants provide fewer food benefits to pollinators, reducing wildlife diversity.

Pollinators are in decline around the globe. Climate change and the use of harmful chemicals like herbicides and pesticides are killing pollinator species in large numbers. Additionally, biological pests like mites are affecting our pollinators in large numbers, leading to declining populations.

**Solutions/Mitigation**

Conservationists using this playbook are doing their part to change cultural expectations about what natural areas should look like, who they should serve, and where they should be. People helping others nurture a relationship with nature is the best way to change the culture. Educating others about the benefits of meadows to humans and wildlife is critical to building pathways for people to take actions that support healthy meadows. These actions might include reducing the amount of lawn in a community, not planting invasive species at home, and volunteering to monitor and remove invasive species in meadows.

Elimination and or reduction of herbicides and pesticides in our systems will go a long way in protecting our pollinators. Wherever possible, organic methods should be used to control pests and weeds, including biological insect control and mechanical removal of unwanted plant species.

**Teaching/Training**

The app, iNaturalist, provides tools that visually communicate the diversity of plants and pollinators that meadows support. For example, BioBlitz events organize people to photograph and identify plants and wildlife in a specific area. People at all levels of environmental knowledge can use iNaturalist in a BioBlitz.

Observing native flowers blooming in a meadow for only a few minutes will typically communicate the diversity of pollinators using meadows. For comparison, observe something blooming on a lawn for a few minutes, and discuss the difference in pollinator activity.

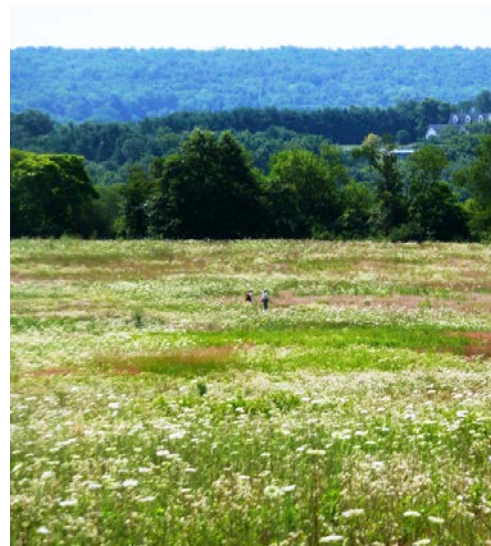
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### Facilitation Questions

1. When you hear the word meadow, what sights, sounds, and sensations come to mind?
2. Why do meadows support more pollinator species than lawns?
3. What is pollination?
4. What are some pollinators?
5. What opportunities do you see in your community to convert lawns to meadows?
6. Who can you ask for help organizing a BioBlitz to educate your community about the benefits of meadows?
7. Why are invasive plants a threat to meadows and pollinators?
8. What choices can we make to avoid the application of harmful chemicals in our natural system?

### Additional Resources

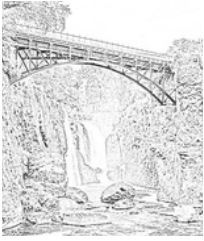
- [iNaturalist](#)
- [Choose Natives!](#) Promoting Native Plants in the Mid-Atlantic
- [Pollinator Conservation Resource Center](#) | Xerces Society



# Core Module #6: Water







# Core Module #6:

## Water

*Author: Dr. Dan Van Abs*

### Themes

1. Water is life: all of society requires and uses water for many different purposes, the most fundamental of which is hydration of our bodies.
2. Nearly all the world's water is not available for human use. What we see as usable fresh waters (lakes, rivers, groundwater) is a tiny fraction of all water, and even a small fraction of all freshwaters.
3. Water moves in cycles, making life possible when it falls as rainfall, moistens the soil, fills surface waters and groundwater systems, and eventually moves to the ocean. Portions of the water move back to the atmosphere to become precipitation once again.
4. Human use of water changes natural systems. This is inevitable, and so the key question is, what level of change are we willing to tolerate?
5. Drinking water treatment and delivery systems, as well as wastewater collection and treatment systems, are critical to the support of densely populated areas, such as cities. This water infrastructure is very expensive to build, maintain, and restore as it ages. It also uses a lot of energy, which in turn can harm both the environment and people.

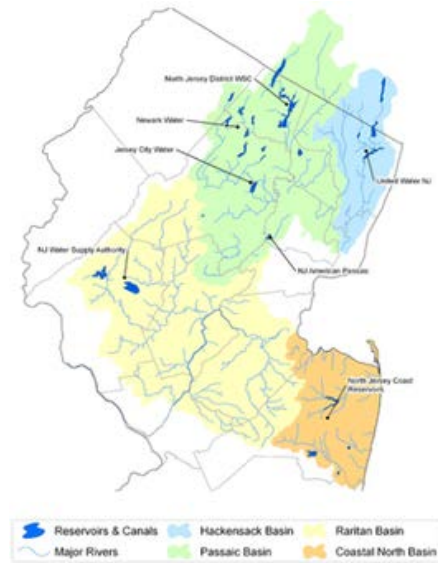
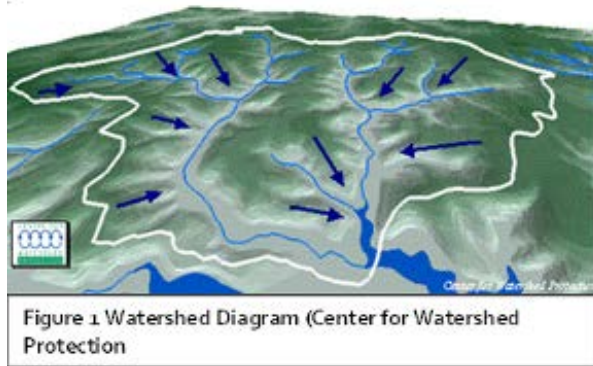
### Background

Water speaks to our bodies (which are mostly water) and minds. Who hasn't found it relaxing to sit by and watch water, to bathe/shower, or to use water for recreation? Water is in our music, poetry, and other writing, our physical and performance art.

Historically, access to water has been important to everything, from desert camel trains to empires. No major society has been built that did not place water as a high priority, for everything from agriculture and manufacturing to public use.

In New Jersey, as elsewhere, we get our water from multiple sources. Easiest are the surface waters, such as streams, rivers, and lakes. These waters are located and interconnected within watersheds, the land area from which all surface waters exit through a single stream (see Figure 1). However, available water varies from season to season, year to year, and so we often build reservoirs to hold water from wet periods for use during drier periods. The ability to provide water during drought is called, "the safe yield". New Jersey's reservoir systems support a total of 781 million gallons per day (mgd); these reservoirs are all located in Central and North Jersey (see Figure 2). Each reservoir is required to ensure releases to downstream waters to support aquatic ecosystems and downstream supplies.





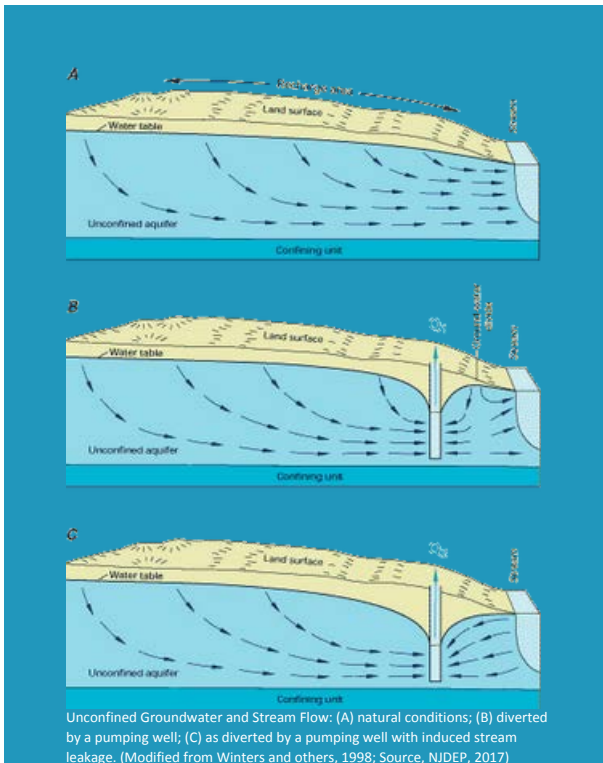
The second major water source is groundwater. Groundwater is a result of rain that slowly infiltrates downward to a point where all the pore spaces are filled with water (the water table) (see Figure 3). Some aquifers known as “unconfined aquifers” are easy to recharge but also easy to pollute. New Jersey started drilling wells into these aquifers in the 1800s, as soon as drilling and pumping technology was allowed. Some have been depleted by past demands and so are regulated to limit harmful impacts, and some have been lost to contamination. “Confined aquifers” in southern New Jersey are deep units that are less easy to pollute.

### Water Demands and Issues in New Jersey

The NJDEP closely tracks freshwater demands for all purposes that require more than 100,000 gallons per day, as required by the Water Supply Management Act.

Centralized potable water [DJVA1] systems serve 90% of the state’s population; the remainder rely on domestic wells. Both residential water and agricultural/irrigation demands tend to be lowest in the winter and peak in summer months when outdoor uses are more common. This is also the time when water supplies are most stressed, resulting in an increased potential for droughts.

New Jersey periodically suffers from shortfalls in precipitation. The most severe droughts occurred in the mid-1960s, 1981-82, 1995, and 2002.



### Water and Energy

Two resources are fundamental to a developed society, as they make so much else possible. One is energy, and the other is water. They support manufacturing, our ability to build housing, the growing of food, and much more. In the last 150 years, most energy resources have required the use of water (e.g., thermal electricity generating stations, hydroelectric power), and even renewable energy requires water for manufacturing wind turbines and solar energy cells. The use of water, on the other hand, requires the use of energy. These two resources are intertwined in nearly every aspect of society.

One of the most important uses of water, of course, is for drinking water that we use for household and office uses of all sorts. Even those who don't drink tap water, do drink water, whether as bottled water or as part of our coffee, tea, soft drinks, or alcohol. And when we use water, we create wastewater that must be collected and treated before it is discharged back into the environment. In New Jersey, the largest use of freshwater by far is for drinking water through public water systems.

What people don't often realize is that our nation's agricultural system is the dominant user of water, roughly 75 to 80% of all water demands, but nearly all that use occurs outside of New Jersey.

Our increasing populations and industrialization of food and manufacturing have placed immense pressure on natural water resources. There is no formula for making water – we have what we get. We can use it efficiently and effectively, we can reuse it, but we cannot invent more. In addition, climate change is altering where and when precipitation occurs, often making dry periods drier and wet periods wetter.

**Human Values of Water Supply**

Fresh waters are by State law a public resource, managed on behalf of the public by the NJ Department of Environmental Protection. The 1981 Water Supply Management Act provides guidance for how these waters are allocated among potential users to protect other users and the environment. Unlike western states, water resources cannot be privatized, but the right to use waters for beneficial purposes can be approved. The nature of water, however, raises some complicated issues of value.

Water is often managed and sold as a commodity; you get what you pay for, and people can have approved rights to water, which others cannot take from them. Water is also a service, supporting developed land uses, such as homes, commercial businesses, offices, and industry. The service concept is important, as it recognizes that water supplies to individual users also benefits society in general.

Finally, water is a right – nobody has the right to prevent people from accessing water that is fundamental to their very lives. These three views of water – commodity, service, and right – are often in conflict. For example, if everyone has a right to sufficient water to live, but they can't pay for that service, who will pay instead? If water is a service, then how should the price of water be managed to ensure that its function as a commodity doesn't damage its societal value or prevent people from exercising their right to water?

Think of roads as an example. We support the creation and maintenance of roads using gasoline taxes, as a service supporting society. Vehicle fuels such as gasoline, diesel, and electricity are commodities, available only to those who can afford them. However, most roads are available for anyone to walk or bicycle on them, as a right. In many ways, water works the same way – a mix of commodity, service and right, none of which are always absolute.

Having sufficient water in the natural environment, such as streams and groundwater, is similarly a right where everyone has reason to expect that our water demands won't destroy the water resource, a service that provides benefits to society because of its natural functions, and a commodity that can be tapped for water demands ranging from agriculture to manufacturing to urban uses.

**Challenges**

Water is naturally limited, and those limitations change with the season and the year, as precipitation increases or decreases and plants in the environment use more water in the summer than the winter. Human uses tend to increase in the summer (for lawns, pools, and other outdoor activities) and decrease in the winter. For this reason, we build storage reservoirs to capture water in wet times for use in dry times. Summer demands for agricultural irrigation and outdoor residential uses have been increasing even as indoor demands decline, and these summer demands occur when water supplies and aquatic ecosystems are most stressed.

Increasing water demands over the last 150 years are linked to population growth, industrial uses, and irrigation for food production. The result is that many areas have reached or exceeded the available supplies of water, even where reservoirs have been built.

A major challenge we face is that some areas have degraded water resources because of historic development and industrial practices, the age and construction of water infrastructure, and new findings regarding public health effects of contaminated drinking water and natural waters. Urban streams are almost uniformly polluted and damaged by excessive development along the streams (the riparian area) and stormwater discharges into the streams, causing stream erosion.

Urban water infrastructure is often old and requires major expenditures for rehabilitation and upgrades, and the issue of lead service lines harming children (and adults) is a major concern. Associated with this issue is the need for improved treatment as new contaminants are discovered, such as the recent concerns with the PFAS family of so-called “forever chemicals.”

Climate change will force new attention on water supply, as New Jersey has been receiving increased rainfall (useful for water supply but not for flooding), but through stronger storms. We also anticipate that more frequent droughts will stress our water supply systems as increased temperatures drive greater demands for agricultural irrigation and lawn watering.

Finally, all these issues will drive costs higher, which raises an issue of increasing concern: affordability. Water and sewer utility costs have been rising faster than the general consumer price index (i.e., inflation) since the 1980s when federal laws greatly increased expectations for clean drinking water and improved wastewater effluent. A recent study for Jersey Water Works indicates that perhaps one-fifth of all New Jersey households could be affected by these affordability issues.

**Solutions**

- **Reduction of Summer Water Demands:** Summer demands can be reduced in all areas from urban to rural, and all sectors from agricultural to energy. Some ideas are:
    - **Adapt Lawns:** Most grass lawns use cool-season grasses that don't do well in hot summer weather but will come back when temperatures decline. Residents can allow lawns to brown in summer, transition lawns to mulch areas or plantings that don't require regular watering (e.g., trees and shrubs), or shift to grasses that better tolerate high temperatures and require minimal watering.
    - **Retrofit Lawn Irrigation Systems:** How many times have we seen irrigation systems running in the middle of a rainstorm? Irrigation systems that rely on timers should be modified to rely on soil moisture or other measures that reduce irrigation use.
    - **Agricultural Efficiency:** Many farmers in New Jersey have shifted to high-efficiency irrigation techniques, but others have not. Increased temperature stresses and drought frequency are likely to push more farmers toward irrigation, and so ensuring maximum efficiency will be critical.
    - **Urban Demands:** Urban areas tend to have fewer outdoor water uses, but gardening and other uses can be significant. Both urban and suburban areas can use rain barrels and (more effectively) cisterns to capture rainfall for later use in gardens. In addition, water for street sweeping can use treated wastewater instead of drinking water.
  - **Reduction of Indoor Water Demands:** Even more water-efficient appliances (clothes washers, dishwashers) and plumbing fixtures are available that are branded through the USEPA WaterSense Programs that help low-income households and renters/landlords to reduce water demands.
  - **Protection of Water Resources:** Both existing and new land uses can introduce contaminated stormwater, lawn runoff, and other pollutants to drinking water supplies from both surface water and aquifers. Excessive stormwater runoff can also cause stream erosion that damages downstream reservoirs.
    - **New Land Uses:** New land uses are supposed to meet all State and municipal regulations for stormwater management, protection of streams, etc. Local environmental commissions, municipal Green Teams, neighborhood associations, and local watershed organizations can all play a part in making sure that local officials are knowledgeable and that applicants are fully compliant with the law.
    - **Existing Land Uses:** The more difficult issue is existing land development, as there are no rules requiring action to reduce water resource threats. In this case, cooperative efforts can work best, combining landowner interests and public interests.
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- **Aging Urban Water Infrastructure:** New Jersey will spend billions of dollars over the next 20 years to restore and replace aging drinking water infrastructure because of both system needs and the requirements of the Water Quality Assurance Act of 2017. These expenditures will provide multiple benefits. We can't afford to ignore the problem of aging infrastructure. Constant attention to drinking water treatment is also needed to ensure public health is protected. Perfection is not possible, but high-quality drinking water is certainly achievable.
  - **Lead Service Lines:** The public health damages of lead in drinking water are undeniable. One result is a 2021 State law requiring their replacement within ten years. Local conservationists and public health activists can help keep this program in the public eye and promote action.
  - **Climate Change Impacts:** Much can be said about mitigating climate change, but the emphasis here is on mitigating the impacts of climate change on water resources. Several actions are needed:
    - **Reservoir Water Quality:** With a warming climate and watersheds that contribute too many nutrients to reservoirs, we face a future with more episodes of "harmful algal blooms" (HABs) that can create toxic conditions. Two actions are needed here. First, better protection of reservoir water quality and secondly, better drinking water treatment to avoid health effects when HAB episodes do occur.
    - **Aging Water Infrastructure:** Climate change increases the potential for damages to aging infrastructure, as heat waves stress drinking water pipelines, treatment systems, and pumping stations.
    - **Storm Damages:** Whether from erosion at the Jersey Shore and along rivers, or flooding of water supply treatment plants, increased storms from climate change can cause catastrophic damage to water infrastructure. New Jersey needs to anticipate where damages may occur, plan for protection or removal of those assets, and then be prepared to act quickly when storm damages occur.
  - **Affordability:** All the actions above have one thing in common – they require money. In some cases, acting will reduce costs long-term, but the initial expenditures must be funded somehow. No matter how much money is provided by the federal and state governments, it is inevitable that drinking water utilities will need to fund most of the costs for most of these efforts. That means that consumers will pay more, which will exacerbate affordability problems for lower-income households. There are three major approaches available:
    - General support for individual households, such as Section 8 housing vouchers from the federal government.
    - Utility-based affordability programs that allow a reduced cost to households that can't afford to pay normal rates for reasonable but efficient use of drinking water.
    - Statewide programs to subsidize households with affordability problems, like the federal/state Low Income Household Energy Assistance Program (LIHEAP). While a federal Low Income Household Water Assistance Program exists, it is a temporary grant that provides forgiveness of overdue water and sewer balances, not a permanent solution.
-

**Training**

Several training programs exist that can be helpful for people who want to be more aware of these issues:

- US Environmental Protection Agency: Online Training in Watershed Management
- US Environmental Protection Agency: Watershed Academy
- US Environmental Protection Agency: Drinking Water Training

**Working With Water Issues**

Water can be a complex set of issues, but people new to the field can readily become familiar with the specific issues of interest to their household, community, neighborhood, municipality, or region. The key is to start simple, learn from others already in the field, and gradually build knowledge. Many people in the field are typically very open to those who want to learn.

**Facilitation Questions**

1. Where does the water in your home come from?
2. Can we make more water?
3. What are surface waters?
4. What are reservoirs?
5. What is groundwater?
6. What is a watershed?
7. What is potable water?
8. What industry is the largest water user?
9. What is wrong with many urban service lines?
10. How is a changing climate impacting water supply?

**Additional Resources**

- American Planning Association - [Planners and Water](#)
- [US Environmental Protection Agency WaterSense](#)
- [US Geological Survey](#) - A hydrologic primer for New Jersey watershed management

# Core Module #7: Climate Change





# Core Module #7: Climate Change

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*Author: Amy Hansen*

## Themes

1. Humans play a large role in climate change, historically and now.
2. Climate change is a collective problem that requires collective solutions.
3. The negative impacts of climate change disproportionately impact communities of color.
4. Advocacy and policy change are critical to reducing climate change impacts.

## Background

Climate change poses a threat to the environment in New Jersey, from sea level rise to more and more extreme flooding, heat waves, and storm events. The earth's average temperature has been on the rise with an increase of 1.5°F over the past century. It's projected, with variations due to the human response to climate change, that temperatures will rise another 0.5 to 8.6°F over the next hundred years.<sup>32</sup>

Our ability to grow food and live in the places we've inhabited for thousands of years is rapidly changing. Glaciers have shrunk, ice on rivers and lakes is breaking up earlier, and we are witnessing mass species extinction at a rate our planet has not witnessed in its 4.5 billion-year history. There is growing acceptance of what science has told us for more than a half century: humans are causing the climate crisis, and we are at a tipping point. We absolutely must reduce the use of fossil fuels and the greenhouse gas (GHG) emissions causing climate change so that we can continue to inhabit the Earth and sustain its water, climate, and biological systems.

Climate change not only impacts the "natural" environment but has direct impact on social justice and human rights. It is a critical and urgent threat.<sup>33</sup> We have a moral responsibility to those already dealing with the impacts of the climate crisis and future generations to address this threat immediately.

## The Good News

We humans have both created and solved phenomenally difficult environmental challenges before. We no longer have rivers and lakes that glow orange or spontaneously combust, as we once did. While the ozone layer may be thin in some places on the globe at certain times of the year, the ozone hole no longer poses an existential threat. Perhaps, the climate crisis being our greatest shared challenge may help us solve it collectively. We can work together to address the climate crisis!

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32. "Climate Basics," NJDEP | Climate Change, accessed September 26, 2022, <https://www.nj.gov/dep/climatechange/basics.html>.

33. "Climate Justice," WE ACT for Environmental Justice, October 5, 2017, <https://www.weact.org/whatwedo/areasofwork/climate/>.

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## Impacts

The climate crisis disproportionately impacts urban communities and communities of color who are already experiencing higher cases of asthma and other health problems caused by pollution from diesel traffic, power plants, and other industrial operations in their midst. Sea level rise has already forced some to move to higher ground. More recent disastrous storms have resulted in people dying as well as more damage to homes, businesses, and wildlife.

## Benefits from Local Action

Local action on the climate crisis can be powerful in creating positive change. In New Jersey, the Association of New Jersey Environmental Commissions (ANJEC) has consulted with environmental commissions and climate scientists to develop a shortlist of the most pressing climate actions municipalities can take right now to address the two most urgent climate issues:

1. Reducing GHG emissions to stop the impacts from growing exponentially worse. Switching to electric vehicles and electrifying homes and businesses can help make a difference right away.
2. Improving resiliency to prepare our communities for the unavoidable impacts.

All NJ municipalities must now conduct climate mitigation hazard assessments for inclusion in their land use plans in accordance with new requirements signed into law by Governor Murphy in 2021. ANJEC worked to develop resources to help towns perform this assessment with the [NJ Office of State Planning](#). Environmental commissions (ECs) should ask their local elected officials and land use board members about when and how the municipality will proceed and ask to have a representative participate in the assessment.

Environmental commissions and citizens can review local zoning and land use ordinances to ensure enhanced flood hazard area protection. [NJFloodmapper.org](#) and the recently announced Protecting Against Climate Threat rules from the NJ Department of Environmental Protection (NJDEP) provide data that accounts for sea level rise and increased flooding. State and local zoning needs to prohibit inappropriate development in flood areas to stop putting people in harm's way.

## More Good News!

New Jersey's move to clean energy will benefit the economy and create thousands of new jobs, according to research from the Applied Economics Clinic, which provides analysis on energy and the environment. The organization found that New Jersey could add up to 11,000 new jobs annually and about \$1.3 billion in economic activity with its dedicated efforts to transition to clean energy by 2050, which is a goal of Governor Mark Murphy's administration.<sup>34</sup> Advocates want to make sure job creation is inclusive, saying clean energy creates a big opportunity for low-income and minority communities.

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34. "New Jersey's Clean Energy Transition Could Generate \$34.1 Billion in Statewide Economic Activity, Nearly 300,000 Job-Years by 2050," Insider NJ, June 8, 2022, <https://www.insidernj.com/press-release/new-jerseys-clean-energy-transition-could-generate-34-1-billion-in-statewide-economic-activity-nearly-300000-job-years-by-2050/>.



### Advocacy

We must speak loudly and often to our elected officials about the need to work together to replace "dirty energy" with clean sources, like wind and solar, while also decreasing our overall energy use. Citizens can call and email their local, state, and congressional officials to urge them to work as hard as they can to stop the climate crisis. You can join a group to do action calls together, which can make it fun. Voting for elected officials who care about climate change is powerful.

### Facilitation Questions:

1. When you hear the words climate change, what comes to mind?
2. If climate change is such a big problem, what can an individual person do about it?
3. What opportunities do you see in your community to address climate change?
4. Who can you ask for help with educating your community about the threats from climate change?
5. Why aren't more people taking action to stop climate change?

### Additional Resources:

- The NJ Department of Environmental Protection has many resources available about climate change.
- [The 2020 New Jersey Global Warming Response Act 80x50 Report](#) was written in response to the mandate in the Global Warming Response Act, to reduce New Jersey's GHG emissions by 80% from 2006 levels by 2050. This report evaluates our state's emissions from both energy and non-energy systems, providing guidance, policies, and regulatory and legislative recommendations to meet the State's GHG emission reduction goals.
- [We Act for Environmental Justice](#) - WE ACT's mission is to build healthy communities by ensuring that people of color and/or low-income residents participate meaningfully in the creation of sound and fair environmental health and protection policies and practices. WE ACT envisions a community that has informed and engaged residents who participate fully in decision-making on key issues that impact their health and community; strong and equal environmental protections; and increased environmental health through community-based participatory research and evidence-based campaigns.
- [A Look at Why Environmentalism is so Homogeneous and How Organizations Might Cultivate Genuine Diversity](#)
- [The Association of New Jersey Environmental Commission's Spring Report](#) – They have speakers available and many other resources about climate, clean energy, and creating a healthy environment.
- [The League of New Jersey Conservation Voters](#) grades elected officials and candidates running for office on their environmental record.
- [Green energy will boost jobs, nonprofit group says](#)

# Core Module #8: Urban Agriculture





## Core Module #8: Urban Agriculture

*Authors: Meredith Taylor and John S. Watson, Jr.*

### Themes

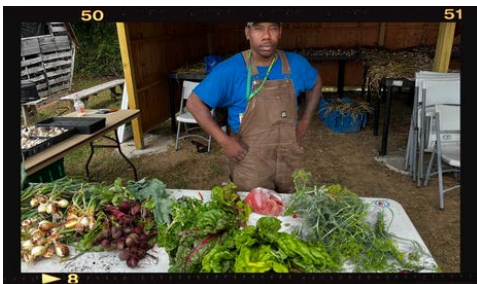
1. The challenges of urban agriculture.
2. Community involvement in urban agriculture.
3. Advancements and innovations in land reuse and urban agriculture.
4. Training and education that supports successful urban agriculture.

### Background

Lack of access to fresh nutritious foods in urban communities directly affects the health and quality of life for many communities of color. Lack of fresh markets, high prices, and low-quality food sources result in health concerns, including high obesity rates, diabetes, and heart disease. Growing fresh produce in cities is an emerging land use that improves access to good nutritious foods and connects people with the source of their meals, all while enhancing neighborhood aesthetics and providing a gathering space for communities outdoors. Cities across New Jersey and the nation are utilizing undeveloped lands and vacant lots for food production. Neighbors are getting involved in the growing, nurturing, harvesting, and consumption of these hyper locally grown products. “Vertical Farms” are cropping up in former industrial buildings using cutting edge indoor controlled atmosphere hydroponic and aeroponic growing techniques and strategies.

### Values/Benefits

Growing nutritious food sources in neighborhoods will provide easy access to healthy choices of food products. Proper diet can measurably improve the health and wellbeing of a community. Easy-to-access neighborhood spaces also provide opportunities for new food entrepreneurs to develop value-added products, such as local honey, hot sauces, herbal botanicals, tomato sauce, and other ‘up market’ products. Also important are the social benefits generated by urban green spaces. These farms provide places for communities to gather around important topics of discussion, music, poetry, art, and other programs that get people outdoors connecting with the environment, soils, food production, and nature.



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## Challenges

One challenge is that just about every urban lot presents remediation obstacles to overcome to ensure that the food we consume is grown in places that are not contaminated. Urban vacant lots often have had some prior use that may have contaminated the land in some way through demolition of structures and backfill in basements, underground leaking fuel storage tanks, lead paint residue, and illegal dumping, to name a few.

If we are growing food to bring good nutrition to the community, we must make sure the soils are suitable for safe growing so contaminants are not absorbed into edible parts of the plant and the workers and visitors at the site are not exposed while working.

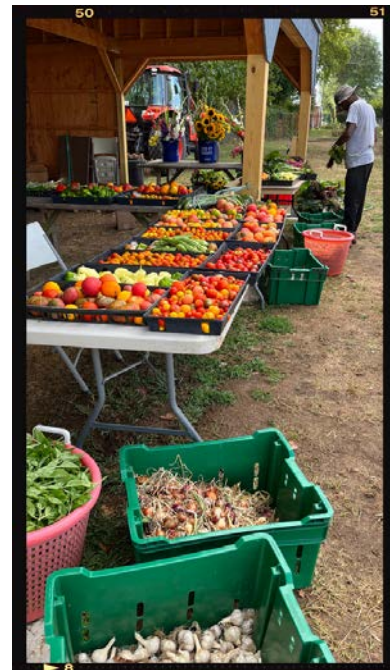
Other challenges include developing a consistent, skilled land management structure by the community to operate and innovate in the space.

## Solutions/Mitigation

We should use public funding sources, foundation grants, and “angel investors” to permanently dedicate these properties to open space/natural habitat (pollinator meadows and micro forests) and agriculture. These lands can be held by local nonprofit land conservancies, or the local community, and the lands should be protected by a conservation/agricultural easement, which will restrict the lands for these purposes in perpetuity. If the community no longer has the will to farm the lands, they can easily be converted into pollinator meadow habitats, or micro forests to help cool our streets and clean our air, aiding our climate resiliency objectives.

All resources, including state/federal agencies, licensed site remediation professionals, institutions, and universities, should lend their expertise and resources to assist in soil sampling, developing remedial action work plans, and remediating these lands to make sure the growing medium and workspace is safe for the community and consumers.

Most often, urban gardeners will either test the soil or generally assume that their sites are contaminated in some way. The way these sites are generally ‘unofficially mitigated’ is by bringing in soil and compost and planting in raised beds in the new soils so that none of the food source plant roots will penetrate the existing soils on site.



**Teaching/Training**

We must tap into the local institutions to provide curriculum and ‘hands-on’ experiences in agricultural, environmental, and related industries. Working with vocational technical schools, private universities, and governmental agencies, we can train communities to use proper techniques and share information on professional fields of employment. Additionally, local garden clubs, extension services, and others are all looking for opportunities to engage their communities around similar issues.

Training should include topics like soil science, basic horticulture, agricultural techniques, greenhouse management, food and health connections, marketing, and sales. Nonprofit organizations and municipal/county officials can support the community on strategies to identify, preserve, and dedicate lands and lots for these purposes.

Basic training on conducting environmental assessments, land remediation requirements, and feasibility and actions needed to make land safe for food production can be provided by the local health offices, environmental agencies, and others.

**Facilitation Questions**

1. What is “urban agriculture”?
2. What are some of the benefits of urban agriculture?
3. What are some challenges in urban agriculture?
4. What are some new, innovative ways to produce food in our cities?
5. Why are these new methods important and beneficial in urban spaces?
6. What are some of the products that can be marketed to the community?
7. What other ‘community values’ can be derived from farm spaces in cities?

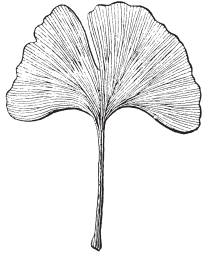
**Additional Resources**

- [A guerilla gardener in South Central LA / Ron Finley – TED talk](#)
- [USDA Urban Agriculture](#)
- [Rutgers Urban Agriculture Lab](#)
- Book - *Farming While Black: Soul Fire Farm’s Practical Guide to Liberation on the Land* by Leah Penniman and Karen Washington



# Core Module #9: Parks, Open Space, and Habitat





# Core Module #9: Parks, Open Space, and Habitat

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*Authors: Dr. Emile DeVito and John S. Watson, Jr.*

## Themes

1. The numerous types of plant and animal habitats on Earth.
2. The importance of parks and open spaces for plants, wildlife, and humans.
3. Challenges in preserving and protecting native species.

## Background

Parks and open spaces provide us with public places to enjoy for recreation, relaxation, entertainment, and civic engagement, all while providing space for our wide array of plant and animal species to thrive. They provide critical green infrastructure, thus aiding in stormwater control, air pollution abatement, and cooling our communities in a changing climate. They are lands owned by the people and managed for the people. Whether you are an avid active sports enthusiast, hiker, birdwatcher, or someone who just wants to be in a beautiful space enjoying nature, our park systems provide that opportunity. And while we enjoy all these diverse and unique lands, we must also become good stewards to maximize the values derived for every person and every living thing everywhere.

## Values

We know that having close access to parks and open space makes our quality of life better. Whether it is a large expanse of natural lands and forests or a linear trail along a waterfront, there is something for everyone.

Our parks:

- improve physical and mental health;
- increase property values;
- provide places for community to come together in nature; and
- provide places to grow healthy, nutritious produce.

**Habitats**

Parks and Open spaces provide habitat for birds, bees, butterflies, and other species reliant upon these natural spaces. Our flora and fauna rely on very specific habitat types. Our landscape is a mosaic of forests, fields, meadows, aquatic, and others. To maintain our diversity of species, we must also maintain the diversity of our habitats. Diversity is everything — in people, plants, and wildlife. For instance, there are many bird species that rely on large tracts of intact forests to breed and survive. These “interior species” need to be deep in the woods and cannot live in areas where there is “forest fragmentation.” Forest fragmentation occurs when large tracts of forested lands are disturbed by the creation of roadways, utility line “rights of way,” and other developments that create smaller blocks of intact forest and create opportunities for edge dwelling predators, like predatory birds and mammals like crows, blue jays, raccoons, and coyotes, that become extremely abundant as forests are fragmented. Sensitive interior forest birds need to be away from those dangerous forest edges, so there must be enough unbroken forest for them to persist. Fragmentation reduces the quality of habitat for this suite of species. Some examples of interior bird species are the barred owl, scarlet tanager, worm-eating warbler, and the wood thrush. The wood thrush is now listed as a “species of concern” and is being considered for listing as an “endangered species” in New Jersey due to steady population decline.

Some forests are suffering and need help to conduct ecological restoration activities. Many forests are in good condition, especially if their soils have never been disturbed by past agricultural uses. Forests on these undisturbed soils should be left alone to mature and sequester massive amounts of carbon for many decades while also holding on to their habitat values.

On the other hand, there are species that require open grasslands and meadows to survive. These “grassland species” need the sunlit fields that provide grasses, flowering plants, and insects for breeding, nesting, and feeding their young. Grasslands and meadows are insect “factories,” as the insects breed and thrive in these spaces providing nutrition for birds, moles, voles, field mice, and other species. Many of these grassland species are “ground nesters,” meaning they build their nests on the ground and in the grasses and meadow plants. Unfortunately, many of these habitats are active farm fields, and successful nesting is determined by the type of farming as well as the farmer’s understanding of the value of these unique habitats. We strive to strike a balance with thoughtful farmers to enable their harvest in ways that protect some of the nesting populations. Some examples of ground nesting grassland bird species are bobolink, eastern meadowlark, and Savannah sparrow.

**Aquatic Habitats**

As global scientists and astronomers search the universe for life, the first marker they seek is water. If they find water, there may be life. Clean water is a basic need in all living things. People, plants, and wildlife require water to exist. From microscopic organisms to the largest animals on earth, water provides both habitat and support in keeping things alive. From the smallest trickling headwater stream to the vast oceans, Earth's life abounds. Water contains an intricate system of organisms feeding the food chain of life.

The lands abutting our waterways impact water quality. As rain moves across our landscape, it ultimately lands in our streams, rivers, and groundwater, affecting these aquatic systems. Things that humans use every day — fuel, fertilizers, pesticides, and salts — are washed into these systems, impacting the quality of our waterways for potable use by humans, plant life, and aquatic organisms. Protecting lands adjacent to our waterways provides buffers to mitigate and filter runoff into the system.

Parks and public open spaces are for the people and all forms of life that depend upon them, and we can help to care for these public spaces as we all enjoy them and benefit from their existence.

**Challenges**

We must make sure that everyone has access to these public amenities, wherever they live. Not everyone has access to quality parks and recreation opportunities, and they are not all equal quality. Our parks and open spaces often suffer from overuse and sometimes neglect. Parks and open space agencies across the nation routinely see budget reductions in challenging fiscal years, and these results are immediately seen in the lack of maintenance of the land and reduction of programs that attract people to these spaces.

Our habitats are frail and are constantly changing these days, largely related to climate change and the introduction of non-native species (plant and animal) replacing or displacing our native species. Collectively, we must act to curtail these disruptions to our natural systems.

**Forest challenges**

Many of our native forests are challenged by climate change, invasive plant establishment, fragmentation, overpopulation of deer, and development. Our forests must have sound management plans to ensure their long-term viability and health.

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### Grassland species challenges

Grassland species have diminished over the years, largely due to loss of habitat and increased pressure by new agricultural practices.

### Aquatic habitat challenges

Our warming planet and increased runoff, like lawn and agricultural chemicals, are a real threat if unchecked. Care must be taken to understand that what is done to our land, ends up in our waterways and aquifers.

### **Solutions**

We must as a community engage our local leaders and neighbors around the value of these open spaces. The best and safest parks are those that have high visitor use and enjoyment. Community engagement, advocacy, proper design, and stewardship will ensure the protection of these important public amenities now and for many future generations.

NJ is fortunate to have a platform known as the Conservation Blueprint. It is a one-stop information platform with loads of content about open space, habitats, and forests. See the link in the additional resources for this module.

### **Job Creation**

Job opportunities related to open space include land acquisition professionals, appraisers, land surveyors, environmental consultants, landscape architects and designers, planners, arborists, construction specialists, land stewards, docents, recreation programmers, event planners, and more. Unfortunately, the BIPOC community make up a very small percentage of the workforce in most of these professions and fields.





**Facilitation Questions:**

1. Tell me about the parks in your community:
  - a. Do you take advantage of them?
  - b. Are they well maintained?
  - c. Are there programs available that invite you to your local parks?
  - d. What do you enjoy most about your local parks?
  - e. What are some of the challenges you see?
  - f. What would be your ideal park/open space experience?
2. Do you know what a Land Appraiser does and how they go about determining property values?
3. Do you know about Landscape Architecture?
4. Do you know what a Land Surveyor does?
5. Have you ever heard of a biological survey for plants, butterflies and moths, birds, or mammals?

**Additional Resources:**

- [National Park and Recreation Association](#)
- [Land Trust Alliance](#)
- [NJ Park and Recreation Association](#)
- [American Society of Landscape Architects](#)
- [Appraisal Institute](#)
- [National Society of Professional Surveyors](#)
- [NJ Conserve Wildlife Foundation](#)
- [NJDEP Natural Lands Management](#)
- [NJ Conservation Blueprint](#)



# Appendix A: Speakers Bureau

The first table below provides New Jersey-specific examples, but to find speakers in your state, try reaching out to local land preservation and environmental protection agencies, both governmental and nonprofit. The second table offers several suggested national speakers. You could also try searching for organizations near you by visiting the [Land Trust Alliance](#) online.

New Jersey Speakers	Area of Expertise	Affiliation
Anika Andrews	Wetlands and Environmental Permitting	<a href="#">New Jersey Department of Watershed Protection</a>
Philip Collins	Parks and Landscape Design	<a href="#">Green Acres Program</a>
<a href="#">Olivia Glenn</a>	Environmental Protection / Justice	U.S. Environmental Protection Agency
<a href="#">Lamar Gore</a>	Wildlife	U.S. Fish and Wildlife Services
<a href="#">Jada Jackson</a>	Forestry	U.S. Forest Service
<a href="#">Steven Olivera</a>	Land Use Permitting	New Jersey Department of Environmental Protection
Maria Richardson	Park Programming	<a href="#">Trenton Department of Recreation, Natural Resources, &amp; Culture</a>
<a href="#">Alex Rivera</a>	Environmental Careers	Kean University's Center for Economic and Workforce Development
<a href="#">Dr. Nicky Sheats</a>	Environmental Justice	John S. Watson Institute for Urban Policy and Research at Kean University
<a href="#">Meredith Taylor</a>	Urban Agriculture	Rutger's University
<a href="#">Romy Toussaint</a>	Mindfulness Outdoors	Romy Yoga
<a href="#">Dr. Rosetta Treece</a>	Environmental Curriculum	Hopewell Valley Regional School District
<a href="#">Aaron Watson</a>	Community engagement in open space	Mercer County Park Commission
<a href="#">Jay Watson</a>	Land Conservation	New Jersey Conservation Foundation

Appendix A  
Speakers Bureau

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National Speakers	Area of Expertise	Affiliation
<a href="#"><u>Christian Cooper</u></a>	Birding	Extraordinary Birder
<a href="#"><u>Ron Finley</u></a>	Guerrilla Gardening	Ron Finley Project
<a href="#"><u>Carolyn Finney</u></a>	Author, Facilitator, Environmentalism	Black Faces, White Spaces
<a href="#"><u>J. Drew Lanham</u></a>	Birding	The Home Place: Memoirs of a Colored Man’s Love Affair With Nature
<a href="#"><u>Rue Mapp</u></a>	Equitable Nature Access	Outdoor Afro
<a href="#"><u>Corina Newsome</u></a>	Birding	Hood Naturalist
<a href="#"><u>Leah Penniman</u></a>	Agriculture	Soul Fire Farm
<a href="#"><u>Michael S. Regan</u></a>	Environmental Protection	U.S. Environmental Protection Agency

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# Conservationist of Color Playbook

An Engagement and Exposure Strategy



New Jersey Conservation  
FOUNDATION