RELEASED FALL 2020

ATLANTA CITY DESIGN: Nature

A plan to protect, restore, and accentuate the urban ecology of Atlanta

Department of
CITY PLANNING

Mama Mia
404-221-9296

LETTER FROM THE COMMISSIONER

When the City Charter was amended in December 2017 to incorporate the *Atlanta City Design*, we immediately began the process of refining its design for this unique city. This was the intention from the beginning of the design process: that *Atlanta City Design* would serve as the enduring conceptual framework, that we would refine essential components of the concept in a second phase of work and, where needed and appropriate, design for construction of individual projects. Cities are dynamic and unpredictable, so our planning and design process must commensurately be so.

In 2018, among the second phase design work we began, was something we were initially calling an Urban Ecology Framework. This study was intended to delve much deeper into the *Atlanta City Design* aspects related to nature. *Atlanta City Design* conceptual design recommendations were organized by 1) Design for People, 2) Design for Nature, and 3) Design for People in Nature. This study assessed the unique natural conditions of Atlanta and devised a plan for how we best protect our ecosystems, restore their function, and accentuate their importance with urbanism.

We recognize that natural condition of Atlanta is an essential part of Atlanta's identity. However, it is much more than that. The extent and health of our forests, streams, and wetlands are much of what makes this city habitable. Atlanta's priority of adapting to a changing climate is dependent on how we care for the natural systems that were here before us. A growing city, as envisioned in *Atlanta City Design*, requires that nature flourish even as we become denser and more urban.

Our continued responsibility is to achieve all we want for Atlanta; that the city is affordable for people of all means, that there is opportunity here for people to be successful on their own terms, and that we shift to a city where mobility options abound and that we have a shared public realm that is beautiful and inclusive. All of this is possible in a city that designs for nature to flourish in the process.

This is the first ever study of ecology in Atlanta—
Atlanta City Design: Nature.

Commissioner Tim Keane
City of Atlanta Department of City Planning

ACKNOWLEDGMENTS

Keisha Lance Bottoms, Mayor, City of Atlanta

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1

Introducin
Atlanta Ci
Design: Na

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1.1 THE ATLANTA CITY DESIGN: ASPIRING TO THE BELOVED COMMUNITY

This document is intended to provide a deeper understanding of the value of Nature in Atlanta, and the challenge of protecting and expanding the ecological value of the city's forest, watersheds, and native habitats, while embracing the desired growth of the city.

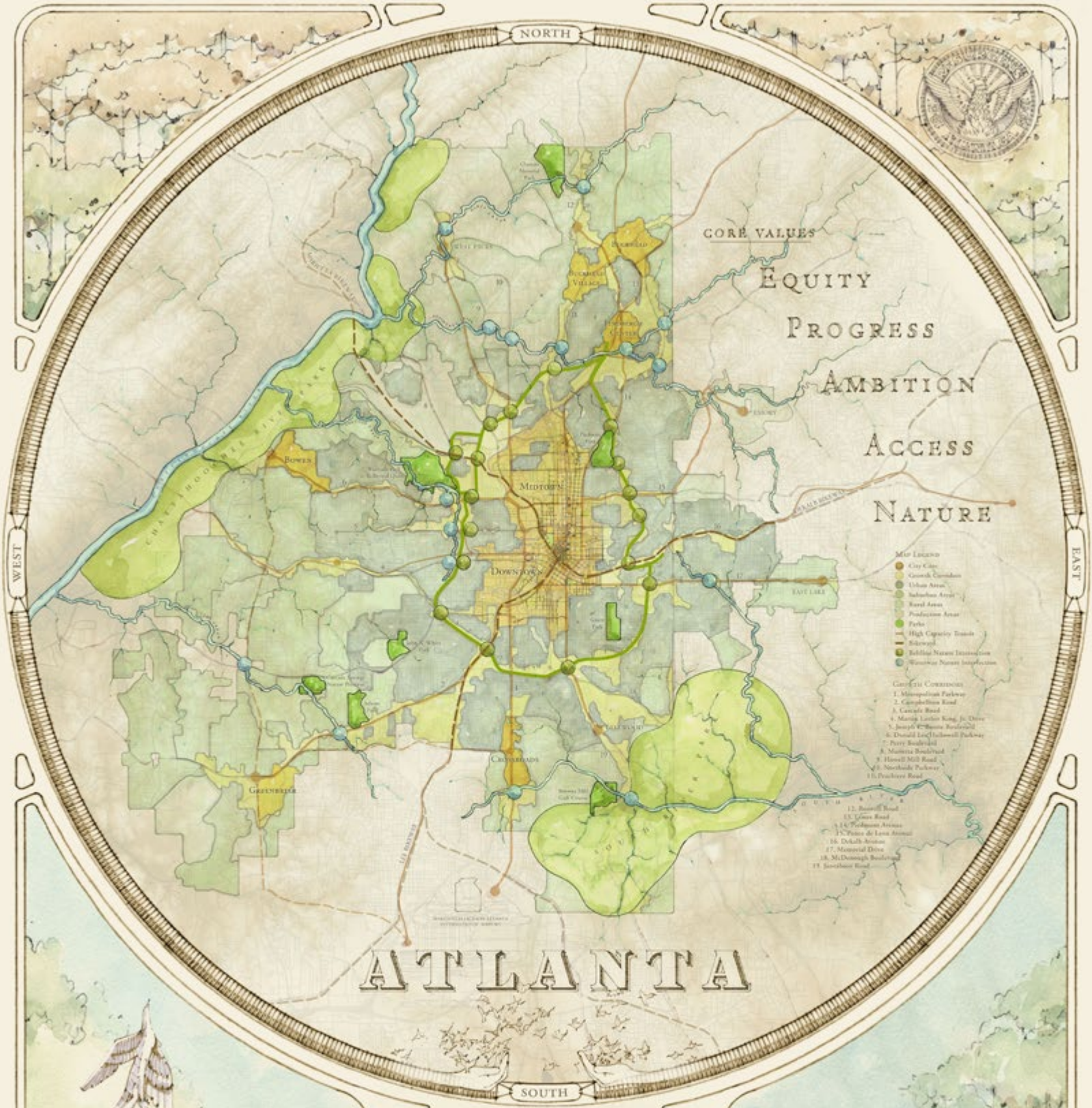
Recognizing a pivotal moment in a decades-long cycle of change, and contemplating dramatic growth forecasted for the city in coming years, in 2017 Atlanta's Department of City Planning and Atlanta City Studio led the creation of *The Atlanta City Design: Aspiring to the Beloved Community*. Atlanta City Design is a guiding document, rooted in the city's legacy as the cradle of the Civil Rights Movement and in Dr. Martin Luther King Jr.'s vision for a civic life built on human decency and nonviolence—a "Beloved Community." Its purpose is to articulate an aspiration for the city. Atlanta City Design is more than a plan, it is a strategic realignment of priorities to capture the city's imagination, mobilize it to action, and instill a sense of accountability to the future.

CORE VALUES

Atlanta City Design declares five core values that define the city when it is at its best:

- ***Equity***
- ***Progress***
- ***Ambition***
- ***Access***
- ***Nature***

PREVIOUS Piedmont Park, one of Atlanta's most cherished spaces, provides a green refuge for densifying Midtown.
OPPOSITE The integrated Atlanta City Design map synthesizes the five core values within the city's geographic context.



CITY DESIGN

CITY OF ATLANTA DEPARTMENT OF CITY PLANNING | ATLANTA CITY STUDIO

·2017·

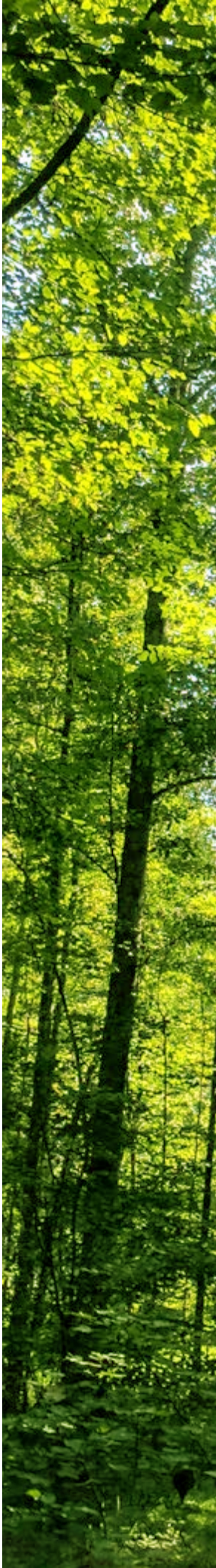
1.2 DEFINING URBAN ECOLOGY

Urban ecology is "the study of nature in cities, of humans in cities, and of the coupled relationship between humans and nature."
Urban Ecology, International Scientific Journal

To realize its full potential, Atlanta must recognize that the plants, animals, soil, and waterways of the city are a part of its Beloved Community. Locally and regionally, they sustain the processes which give life- food, shelter, clean water, clean air, and hospitable climate. Bees, butterflies, and other pollinators support the food supply and maintain the city's forests. Pines grown in the region are brought to the city to build homes. Urban forests in the city's watersheds help to provide clean drinking water, reduce flooding, cool neighborhoods, provide oxygen, and clean pollutants from the air that city residents breathe. Physical activity in Atlanta's parks and greenways reduces obesity and cardiac disease and improves overall physical fitness. Experiences in natural areas in the city lower stress levels and symptoms of anxiety and depression. Atlanta's collective civic identity as the "City in a Forest," the character of its unique neighborhoods, and the many activities of residents and visitors are also drawn from Atlanta's ecosystems and landscapes.

The greater Beloved Community supports physical and mental health and gives joy and inspiration. When Atlanta's residents and decision makers are at their best, they are respectful members and stewards of that community.

"As we begin to design our future, the intrinsic value of Nature will be realized only when we see ourselves as an integral part of it—when we envision humans as essential and active partners within our ecological systems."
Atlanta City Design



"THE CASE FOR MORE URBAN TREES"

CITYLAB, 2012

"Scientists have discovered that living near trees is good for your health"

WASHINGTON POST, 2015

"INTRODUCING 'TREECONOMICS': HOW STREET TREES CAN SAVE OUR CITIES"

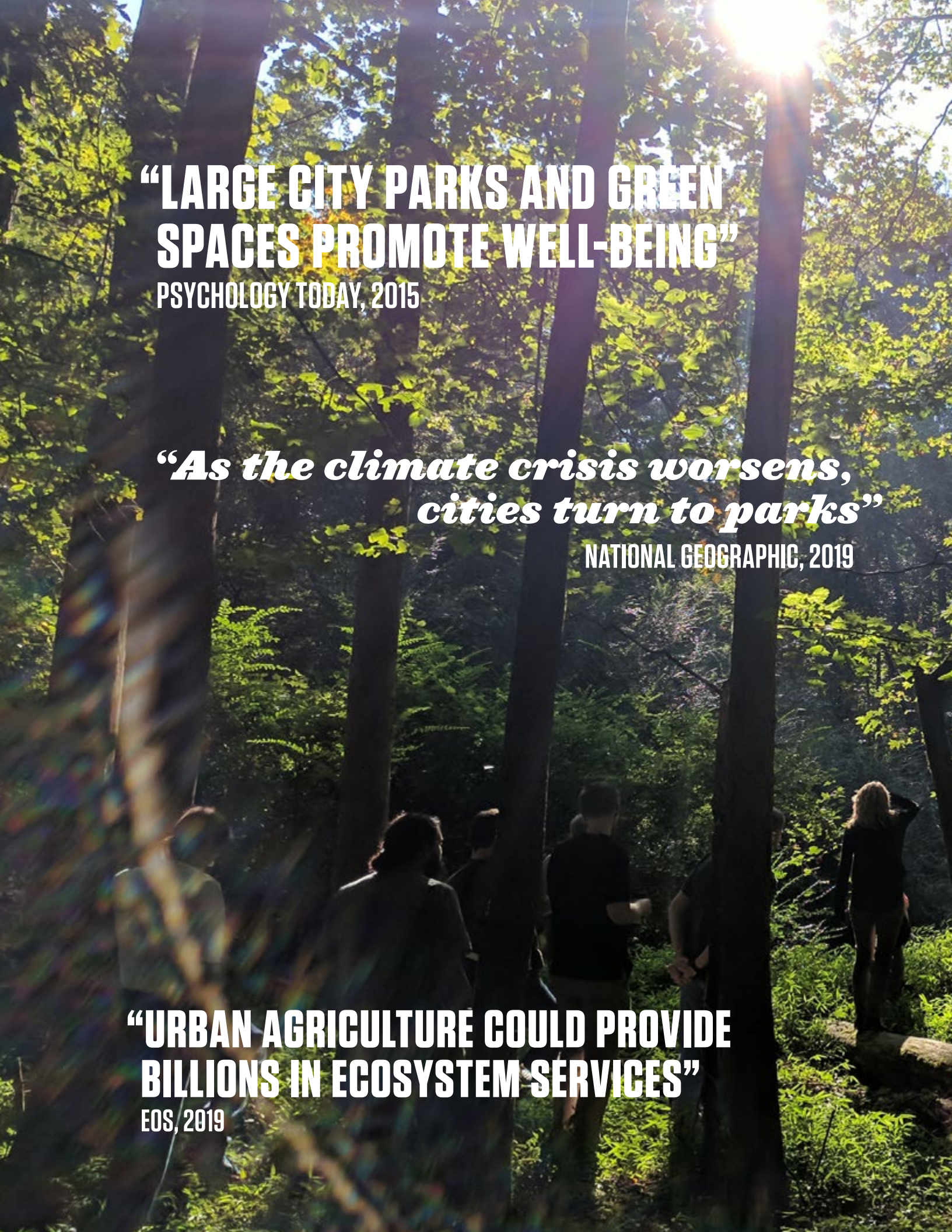
THE GUARDIAN, 2015

"Building nature into cities for better mental health"

STANFORD UNIVERSITY, 2019

"Finding connections to nature in cities is key to healthy urban living"

SCIENCEDAILY, 2016



"LARGE CITY PARKS AND GREEN SPACES PROMOTE WELL-BEING"

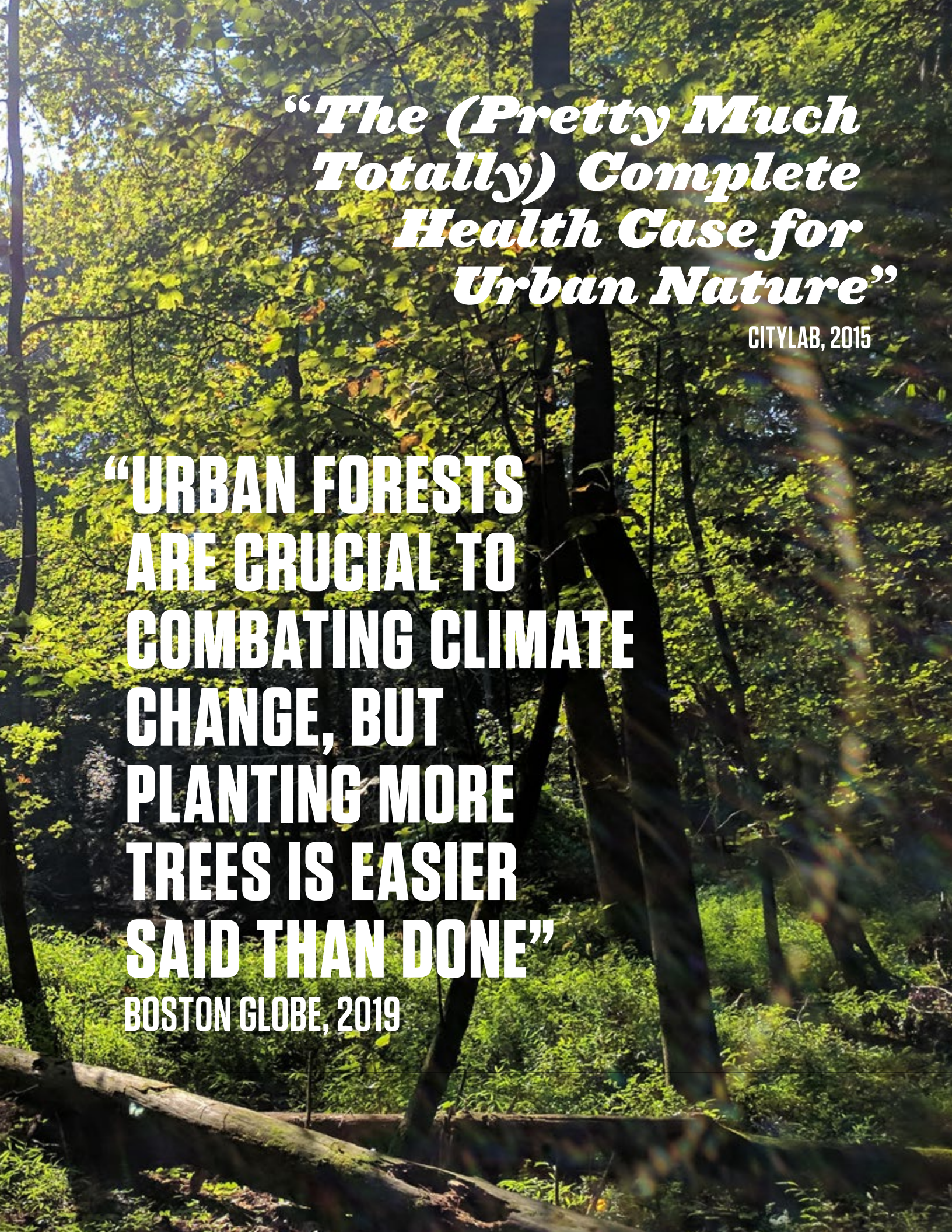
PSYCHOLOGY TODAY, 2015

"As the climate crisis worsens, cities turn to parks"

NATIONAL GEOGRAPHIC, 2019

"URBAN AGRICULTURE COULD PROVIDE BILLIONS IN ECOSYSTEM SERVICES"

EOS, 2019



"The (Pretty Much Totally) Complete Health Case for Urban Nature"

CITYLAB, 2015

"URBAN FORESTS ARE CRUCIAL TO COMBATING CLIMATE CHANGE, BUT PLANTING MORE TREES IS EASIER SAID THAN DONE"

BOSTON GLOBE, 2019

1.3 ELEVATING ECOLOGY IN ATLANTA

Atlanta City Design: Nature sets the stage for a livable future that is not just based on sustainability, but on regeneration—the process of integrating living systems with human aspirations.

Atlanta is grounded in its unique ecological character of native functional ecological systems and accessible greenspace, both verdant and vibrant. It is likewise grounded in a strong sense of community and culture bound in many ways to its natural resources.

Atlanta City Design: Nature strategically guides and equitably addresses the projected increase in Atlanta's population density and diversity such that this growth protects, restores, and accentuates the native forest resources, waterways and waterbodies, soils, wildlife, urban agriculture, and public greenspace of the city. It promotes resilience, livability, and connectivity through increased participation, sense of ownership, and stewardship.

Like Atlanta City Design, Atlanta City Design: Nature is a guiding document. It is a detailed and deepened exploration of the processes by which the core value of Nature can be fulfilled. It encompasses scientific, technical, and social research, along with the ideas and opinions of Atlanta residents. Atlanta City Design calls on the city to elevate ecology. Atlanta City Design: Nature helps to answer the question of how we can design "For People, For Nature, and For People in Nature."

Note: Atlanta City Design: Nature may be shortened to ACD: Nature within this document

OPPOSITE ABOVE The Chattahoochee River forms the city boundary in much of northwest Atlanta. Portions of the riverfront are protected as part of the Chattahoochee River National Recreation Area, where management contributes to a healthy habitat.
OPPOSITE BELOW Invasive, exotic species, like kudzu and Asian privets, are present throughout riparian land in Atlanta, crowding out native species and decreasing the health of the native ecosystem.

1.4 PROCESS

Rooted in scientific analysis and community participation, Atlanta City Design: Nature was developed in four key steps:

1. ***Data Collection and Analysis***
2. ***Visioning and Needs Assessment***
3. ***Final Data Analysis***
4. ***Recommendations***

Each step included collaboration with a Stakeholder Advisory Committee of neighborhood advocates and leaders, and a Technical Advisory Committee of local ecology experts. Citywide public meetings marked each step where progress was shared, and community ideas and feedback were collected. Data Collection and Analysis, Visioning and Needs Assessment, and Final Data Analysis were synthesized into Sec. 2: "Atlanta's Story of Place." Recommendations were integrated into Sec. 3: "Atlanta's Future Urban Ecology." The Plan of Action in Section 4 and Administrative Recommendations in Section 5 round out the study and put Atlanta on a path to becoming a more resilient, vibrant, and healthy city.

01

Data Collection and Analysis

02

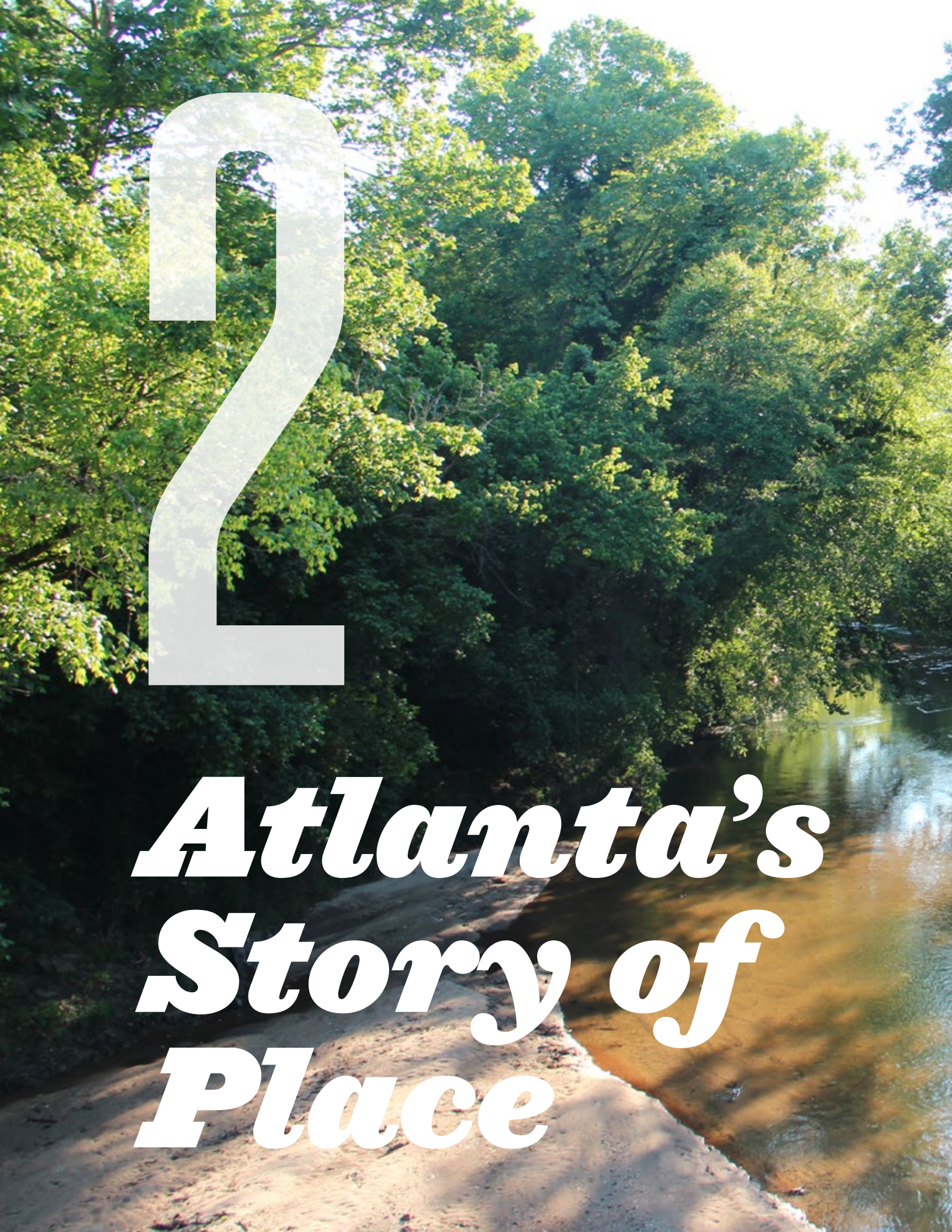
Visioning and Needs Assessment

03

Final Data and Analysis

04

Recommendations



2

Atlanta's Story of Place

2.0 THE CITY'S NATURAL CONDITIONS

AN ECOLOGICAL ANALYSIS

In order to understand the existing and future potential of nature in Atlanta, it is necessary to review the layers of natural systems and how they interact in the city. "Atlanta's Story of Place" describes the city's ecological character and the relationships between nature and people. This knowledge provides a guide to what future actions are needed to align with current aspirations.

CHATTAHOOCHEE RIVER

PROCTOR CREEK GREENWAY

PREVIOUS Peachtree Creek, viewed from the Northside Drive bridge, flows west towards the Chattahoochee River.

SUGAR CREEK

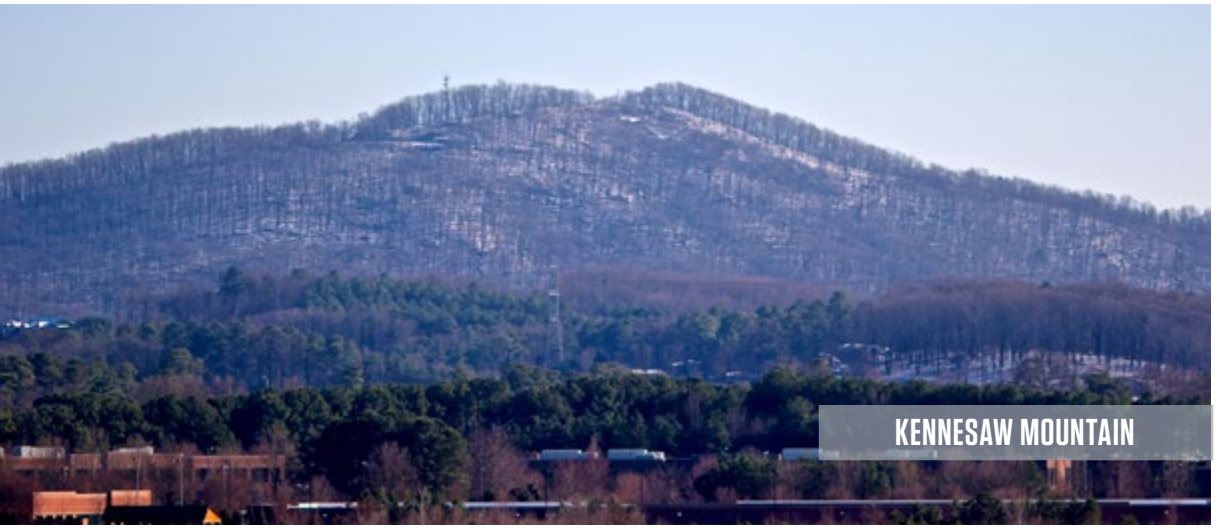
COOPER'S HAWK IN PIEDMONT PARK

GRANT PARK

2.1 REGIONAL ECOLOGY

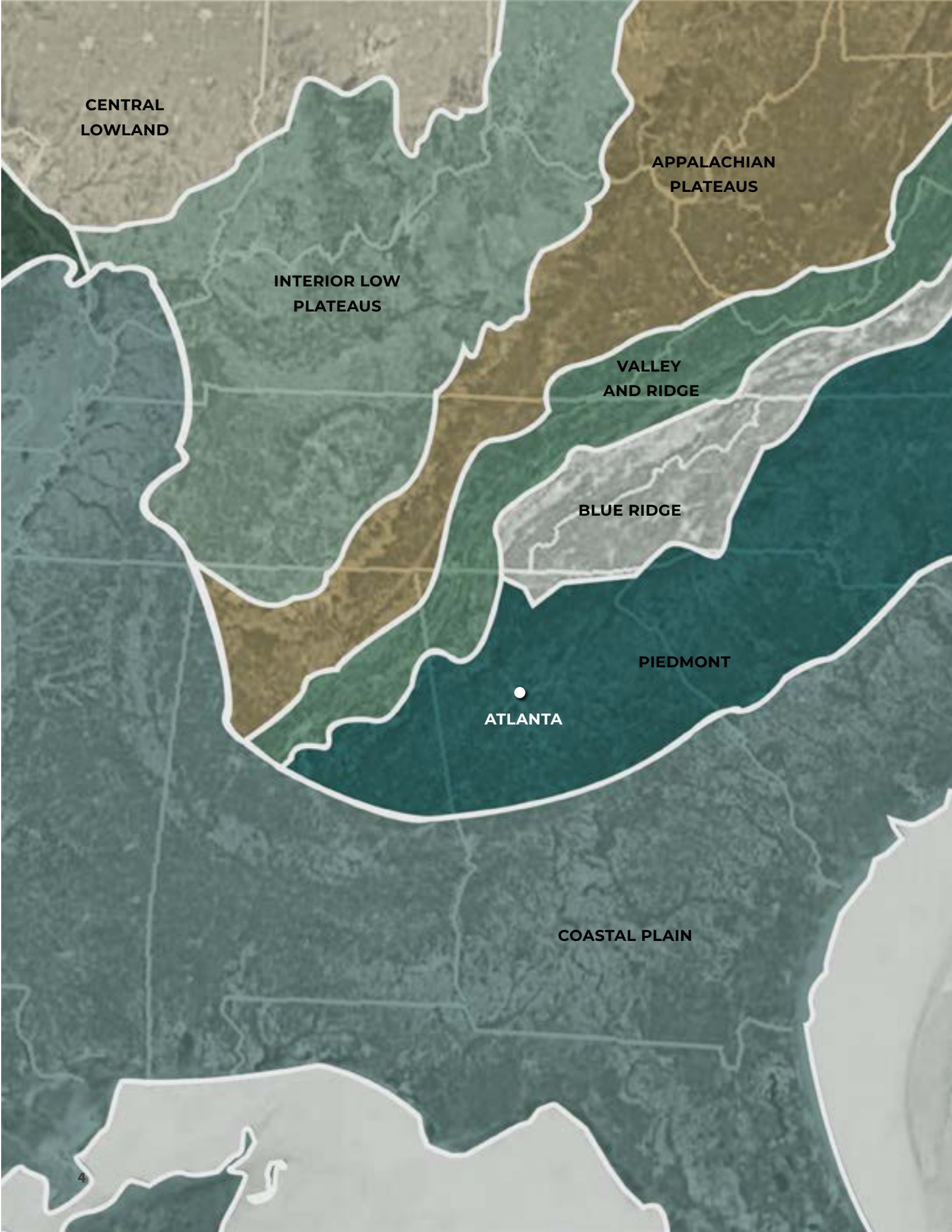
PIEDMONT

Atlanta sits within rolling foothills and forests at the southern end of the Piedmont region. The region is a geologic transition, from the steeper Blue Ridge range of the Appalachian Mountains in north Georgia, to the flat, broad Coastal Plain to the south. Native forests of oaks, hickories, and pines define hillside forests in the landscape. In streams and river valleys, deciduous sweet gum, beech, red maple, elms, and birches as well as a rich understory of shrubs and herbs make their home.



KENNESAW MOUNTAIN

UTOY CREEK


CENTRAL
LOWLAND
APPALACHIAN
PLATEAUS
INTERIOR LOW
PLATEAUS
VALLEY
AND RIDGE
BLUE RIDGE
PIEDMONT
ATLANTA
COASTAL PLAIN

MIGRATORY FLYWAYS

The forest and wetland ecosystems of Atlanta are connected to continental-scale bird migrations along the Atlantic Flyway and the Appalachian Ridges Flyway. The scarlet tanager, the black-throated blue warbler, the wood thrush, and several vireos are among the species that migrate to and through Atlanta twice a year. These birds are neotropical migrants that spend their breeding season in North America, then migrate back to Central and South America for the winter. Their journey enriches Atlanta's bird diversity every year.

WOOD THRUSH (HYLOCOCHLA MUSTELINA)

ATLANTA
Appalachian Flyway
Atlantic Flyway - Major
Atlantic Flyway - Principal Routes

HABITAT CONNECTIVITY

In urban landscapes, river and forest corridors are especially important. Development in the city fragments habitats into patches that are often smaller than wildlife need. Urban river and forest corridors connect patches of habitat to help reduce wildlife isolation and potential local extinctions. They also help animals access a greater area for food and other resources that support their reproductive success.

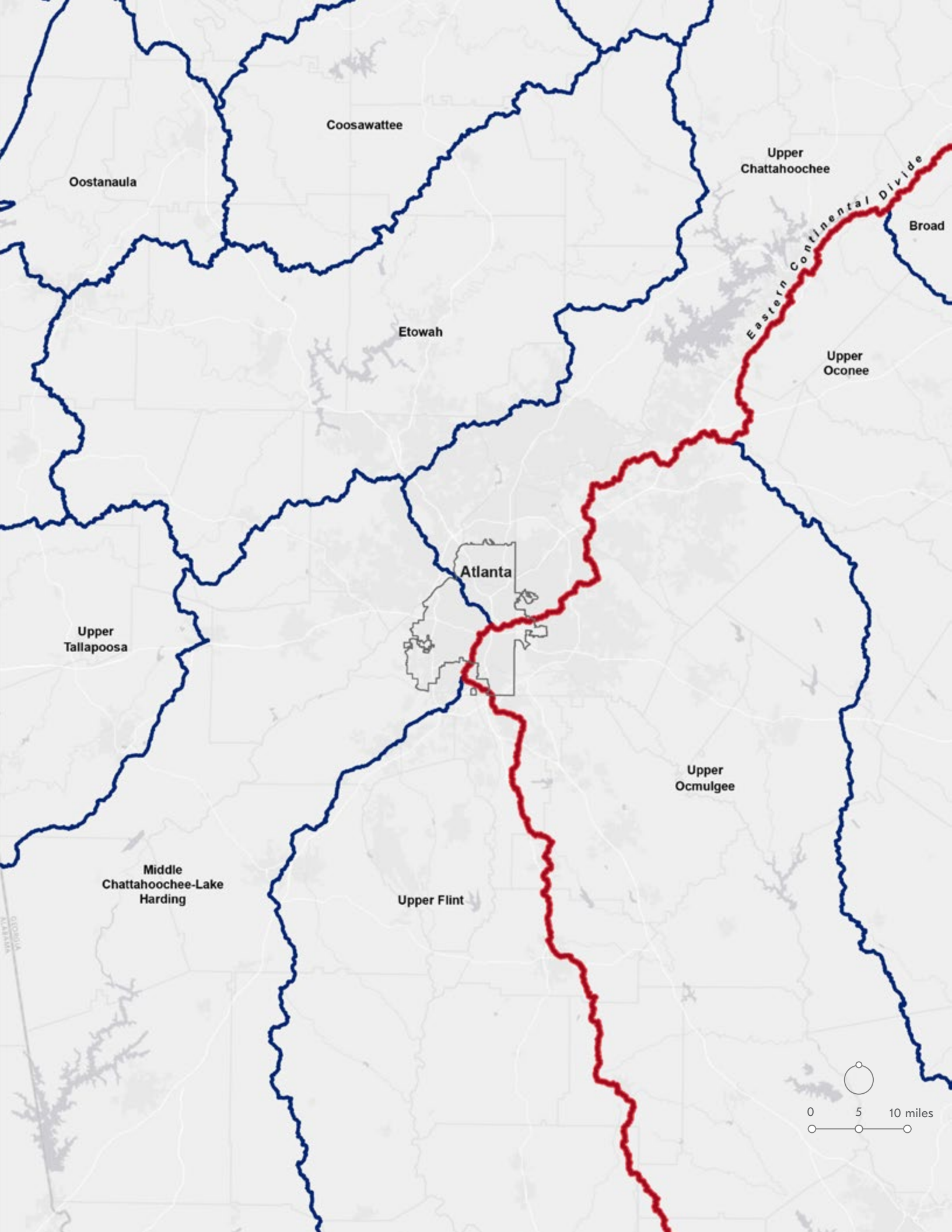
The Chattahoochee River to the west and the South River corridors to the southeast offer Atlanta significant zones of wildlife connectivity to large, intact forest habitats in the region. Improving forest linkages through the city and to these regional corridors would increase their potential to sustain and enhance urban wildlife in Atlanta.

Johns Mountain Wildlife Management Area
Lake Lanier
Etowah River Basin
Stone Mountain
Sweetwater Creek State Park
Atlanta
Arabia Mountain
South River Corridor
Chattahoochee River Corridor
Piedmont National Wildlife Refuge
Low
High
0
5
10 miles

REGIONAL WATERSHEDS

Watersheds illustrate how the land is connected to water resources. All land within a watershed directs rainfall to an associated network of streams and rivers. The Eastern Continental Divide (the Divide) bisects Atlanta, directing rainfall at a continental scale. Water that falls to the west of the Divide flows to the Chattahoochee River, and ultimately the Gulf of Mexico. Rain to the east of the Divide runs south and east through Georgia to the Atlantic Ocean. Locally, the Upper and Middle Chattahoochee Watersheds border the west side of the divide, draining most of the city. The Upper Ocmulgee watershed borders the east side of the divide. It drains southeast Atlanta via the South River and its tributaries.

Watersheds and the Divide have been critical to Atlanta's development. To the northeast, the Divide runs through the steep terrain of the Appalachian Mountains and becomes difficult to cross. Atlanta's level topography along the ridge of the Divide made it a logical crossing and led to the creation of a railroad junction in the 1800s. That settlement at the railroad junction later became the City of Atlanta.


Coosawattee
Oostanaula
Upper Chattahoochee
Eastern Continental Divide
Broad
Etowah
Upper Oconee
Atlanta
Upper Tallapoosa
Upper Ocmulgee
Middle Chattahoochee-Lake Harding
Upper Flint
0
5
10 miles

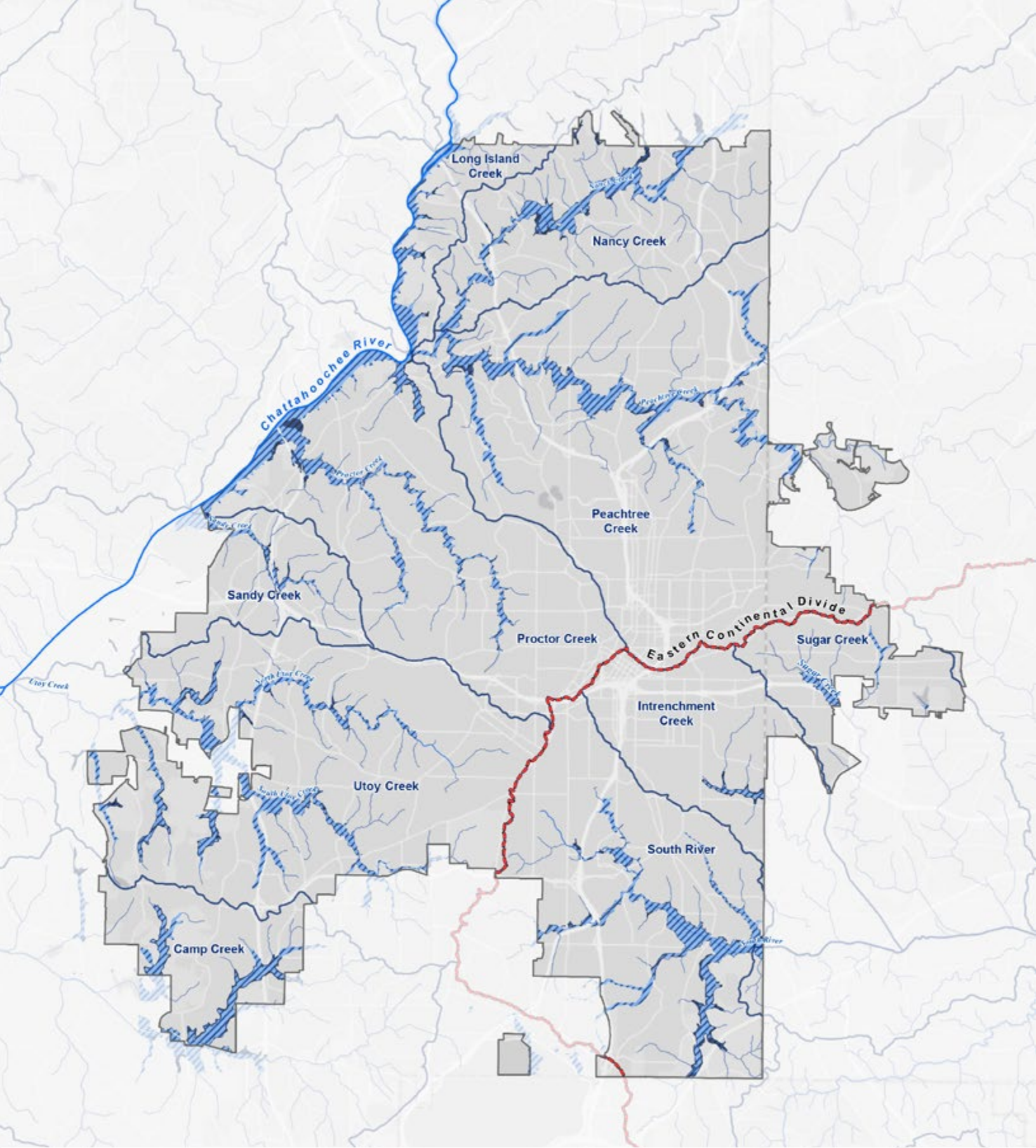
2.2 NATURE IN THE CITY

LOCAL WATERSHEDS AND HYDROLOGY

The Eastern Continental Divide organizes the pattern of waterways in Atlanta. Streams and rivers flow away from the Divide to the west or to the east and southeast. Because the city's downtown core sits on and near the Divide, many of Atlanta's streams originate in the most densely developed areas of the city. This condition impacts the water quality and health of the city's streams and rivers, and it underscores the importance of green infrastructure to manage and cleanse stormwater in the city core and beyond.

Atlanta's local watersheds:
Long Island Creek
Nancy Creek
Peachtree Creek
Proctor Creek
Sandy Creek
Utoy Creek
Camp Creek
Sugar Creek
Intrenchment Creek
South River

OPPOSITE **Atlanta's watersheds, streams, and floodplains**



Primary Tributary

Secondary Tributary

100-year Floodplain

500-year Floodplain

Watershed

0 1 2 miles

ABOVE Nancy Creek, near its confluence with Peachtree Creek, has a relatively healthy stream buffer, benefiting from the large forested lots that border much of the corridor. Erosion is visible along the banks, however, particularly where they have been disturbed beneath a supply line.
BELOW Sugar Creek's banks are specked with plastic bags and other trash, evidence of the height the stream reaches from rainfall and the waste deposited during storms.
OPPOSITE Utoy Creek, in Lionel Hampton Nature Preserve, appears to be a nearly pristine riparian environment. The stream's branches flow through densely forested areas of southwest Atlanta, suffering much less from the negative effects of urban impacts.

TOPOGRAPHY

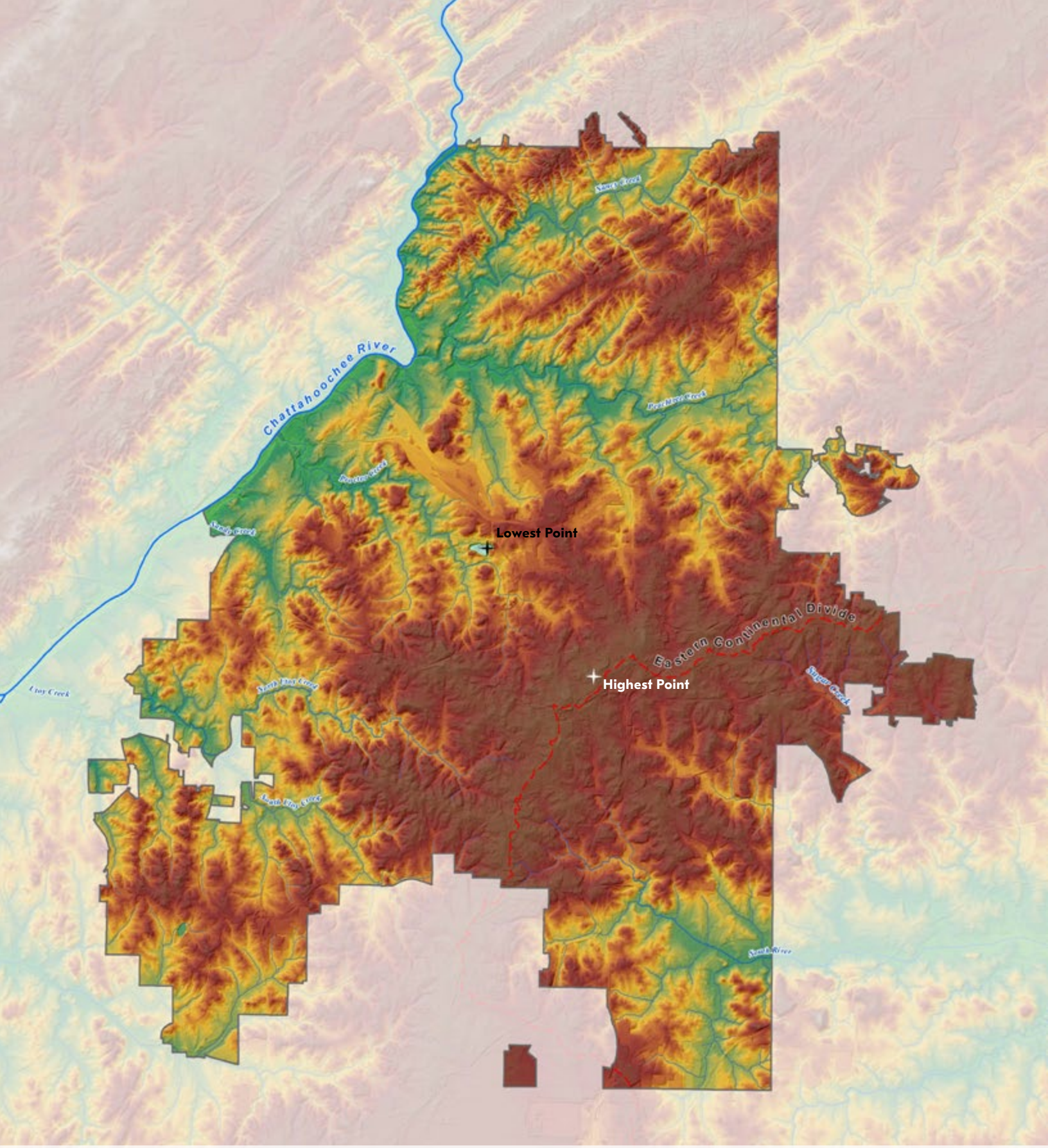
The topography of Atlanta shapes watersheds and the flow of streams, often influencing patterns of development. The rails and roads that provided the city's early structure often traced the flatter ridgelines. In contrast, where steep slopes are natural features, they have often remained largely undeveloped for more of the city's history. These steep slopes are often home to older urban forest patches.

HIGHEST POINT

Elevation: 1,086 feet
200 block Walker Street SW, between Fair Street and Stonewall Street in Castleberry Hill

LOWEST POINT

Elevation: 522 feet
Bottom of Bellwood Quarry in Grove Park



Elevation

High — Low

0 1 2 miles

PLANT COMMUNITIES

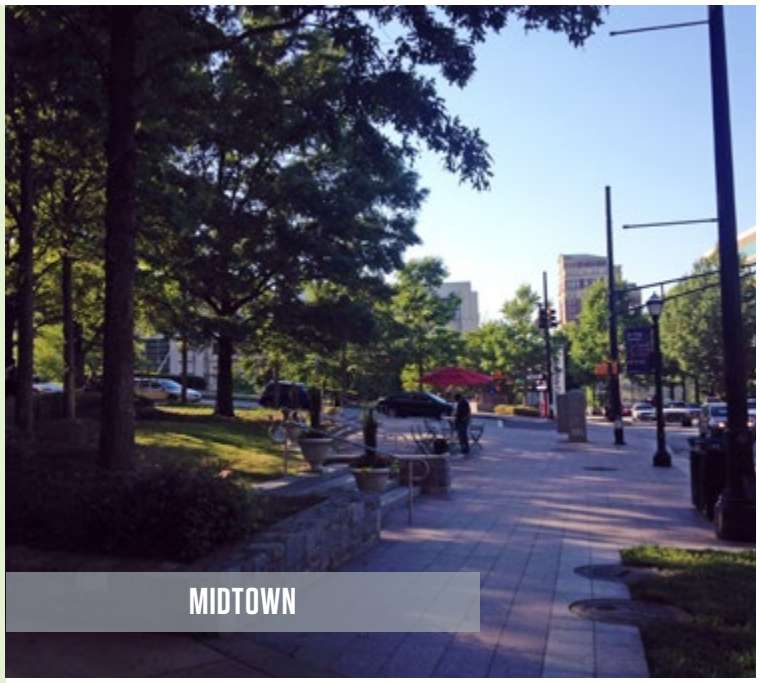
Meadows

Unforested landscapes of grasses and wildflowers in Atlanta are generally found where human management has supported them. If left unmanaged, most vegetated land in Atlanta would eventually revert to forest and shade out most meadow species. Fire, which can naturally maintain meadows by preventing forest succession, is suppressed in Atlanta, as in most populated areas. This makes meadows in Atlanta a locally unique habitat that is important for grassland-dwelling birds and insects.

PROCTOR CREEK GREEVNWAY

Urban Landscapes and Gardens

Much of the human-managed urban landscape showcase plant groupings based on aesthetics and programming, with a variety of native and non-native trees and understory species planted over the city's long history. These include street tree plantings, public and private gardens, vegetable and herb gardens, lawns, and public park and plaza landscapes. Since these plantings are not generated from natural seed dispersal and succession processes they often do not match the natural assemblages of species based on soil, topography, and moisture regimes. They also generally have a much higher percentage of non-native species.



MIDTOWN

Upland Forest

The dominant forest type in Atlanta is Oak-Pine-Hickory, the most common forest type of the Georgia Piedmont region. Rich in acorns and nuts, these forests can support a diverse assemblage of wildlife. More mature forests shift to oak-hickory dominance, with those longer-lived species replacing the fast growing, shorter-lived pines. These older forests also have more mature soils and a richer understory community including shrubs and groundcover species.

Mesic Forest

In cooler, shaded sites with wetter soils, the forest has fewer oaks and more beech and tulip trees. These communities form along the bottoms of steep slopes where water collects, and the soils are rich with organic material and nutrients.

Floodplain Forest and Wetlands

Floodplain forest communities shift to plant species that can tolerate more frequent inundation, such as sweet gum, red maple, elms, and birches. Some wetlands are saturated to a point where few trees can grow but herbaceous wetland species thrive.

THREATS TO HEALTHY PLANT COMMUNITIES

Conversion of land from forest, wetlands, and meadows to roads, residential and commercial development, and lawn has had, and may continue to have, a significant impact on urban forest and plant communities in the city. Aside from the destruction of plant communities due to grading and other construction activities, development can break contiguous plant communities into smaller fragments, which can have major impacts on ecological function and habitat value. The increase of edges along natural areas that arises from habitat fragmentation allows for more colonization of invasive species and impacts from deer.

Numerous non-native plant species have been introduced to Atlanta since its founding. Some of these, particularly kudzu *(Pueraria sp.)*, Chinese privet *(Ligustrum sinense)*, English ivy *(Hedera helix)* and Japanese stiltgrass *(Microstegium vimineum)* are invasive and can cover large areas, disrupting the natural growth of forests, and suppressing native species that are important to Atlanta's habitat and biodiversity. Additionally, non-native and invasive insects and other pests in the Atlanta metropolitan region are a threat to healthy plant communities.

KUDZU (PUERARIA SP.)

ENGLISH IVY (HEDERA HELIX)

Deer love browsing in urban forest fragments. With few natural population controls in cities, deer can become overpopulated and have significant negative impacts on plant community composition and the natural regeneration of native tree seedlings and saplings, which build the forest canopy of the future.

Climate change and associated increases in seasonal temperatures and rainfall could also have a significant impact on species compositions in Atlanta's forests and managed landscapes. These changes may also increase native and non-native pests and their impacts to city forests. Depending on the magnitude of these changes in coming decades, several species of the city's urban forest and plant communities may no longer survive in future conditions.

The effects of threats to plant communities are often cumulative, with several factors causing multiplying impacts. Plant communities and urban forests with a high degree of native biodiversity and healthy ecological function will generally be more resilient to current and future threats and disruptions.

CHINESE PRIVET (LIGUSTRUM SINENSE)

JAPANESE STILTGRASS (MICROSTEGIUM VIMINEUM)

HABITAT AND BIODIVERSITY

The plants and animals that are native to the City of Atlanta are part of the fabric of the city. They support life, both literally and symbolically. Native animals and plants that have existed here for millennia connect people to the landscape and they rely on very specific interactions with other species for their survival. Protecting their ability to survive here is the most basic form of stewardship of the land. Local biodiversity and healthy natural systems provide the residents of the city opportunities for connection and respite offered by nature. The physical and mental health of Atlanta residents are linked inextricably to the health of the city's natural systems.

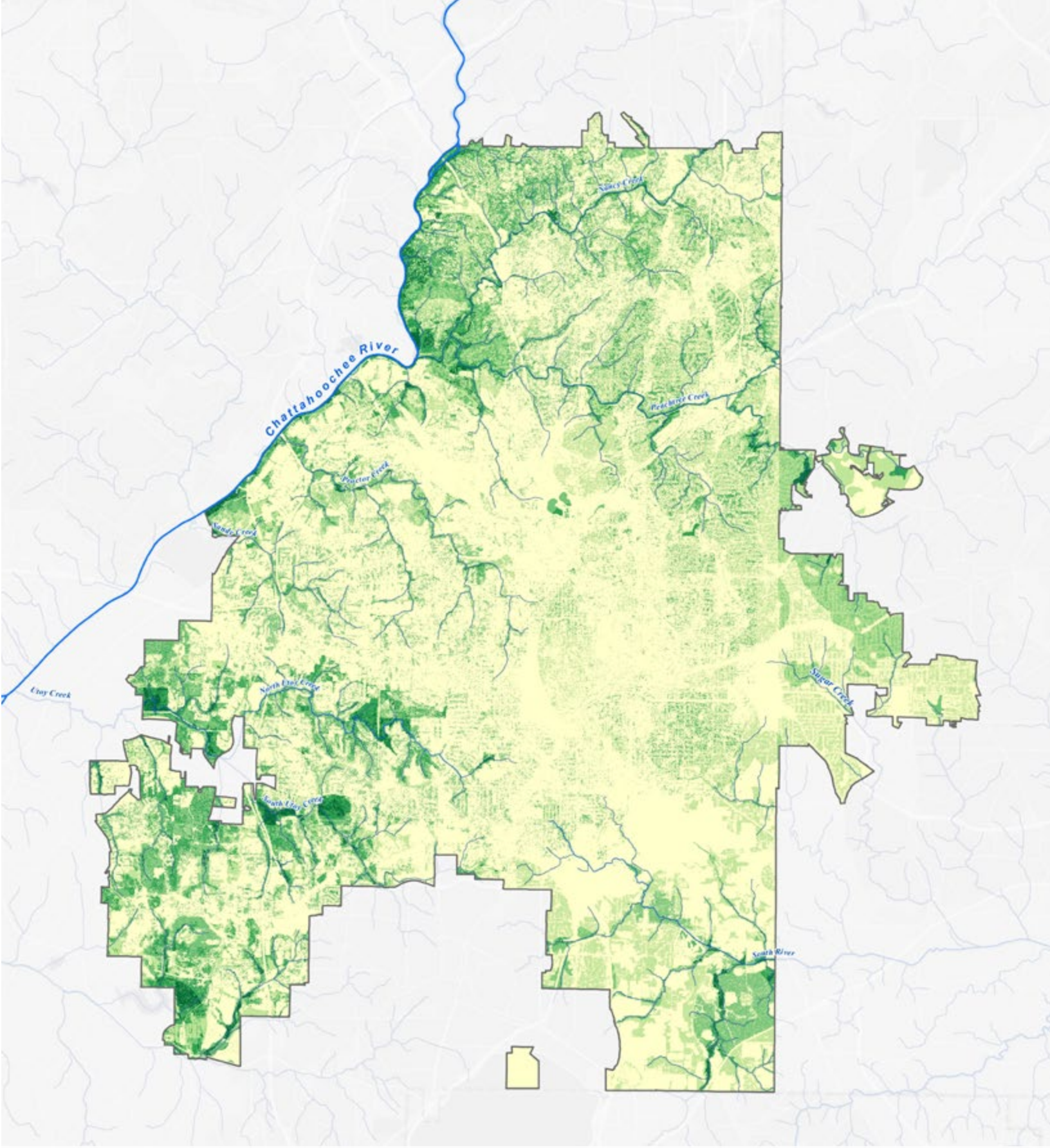
Six categories of citywide data were used to rank land based on the likelihood of higher quality habitat and greater biodiversity:

- **Rarity:** presence of Georgia High Conservation Priority Species
- **Uniqueness:** mature forest and City Champion Trees
- **Aquatic and Riparian Habitat:** wetlands, streams, lakes, ponds, floodplain forest
- **Soils:** mature forest soils
- **Forest Size:** size of forest patch
- **Forest Vertical Diversity:** vertical complexity of vegetation structure

Today, larger areas of mature forest and stream corridors often have some of the highest habitat and biodiversity values. Large mature forests support plants and animals that can't survive in smaller forest fragments or more densely developed areas of the city.

Healthy stream corridors, with their interaction of land and water and their potential to connect different habitats, create unique conditions that can also support a diversity of species. Some of the richest habitat in the landscape can be found in the southwest areas of the city in the Utoy Creek and Camp Creek watersheds, in the southeast along the South River, and in the northwest where Peachtree Creek meets the Chattahoochee River and northward. Smaller, but important gems of forests, wetlands, and streams can also be found in many other parts of the city.

OPPOSITE **Habitat and biodiversity analysis of the city.**



Habitat & Biodiversity Value

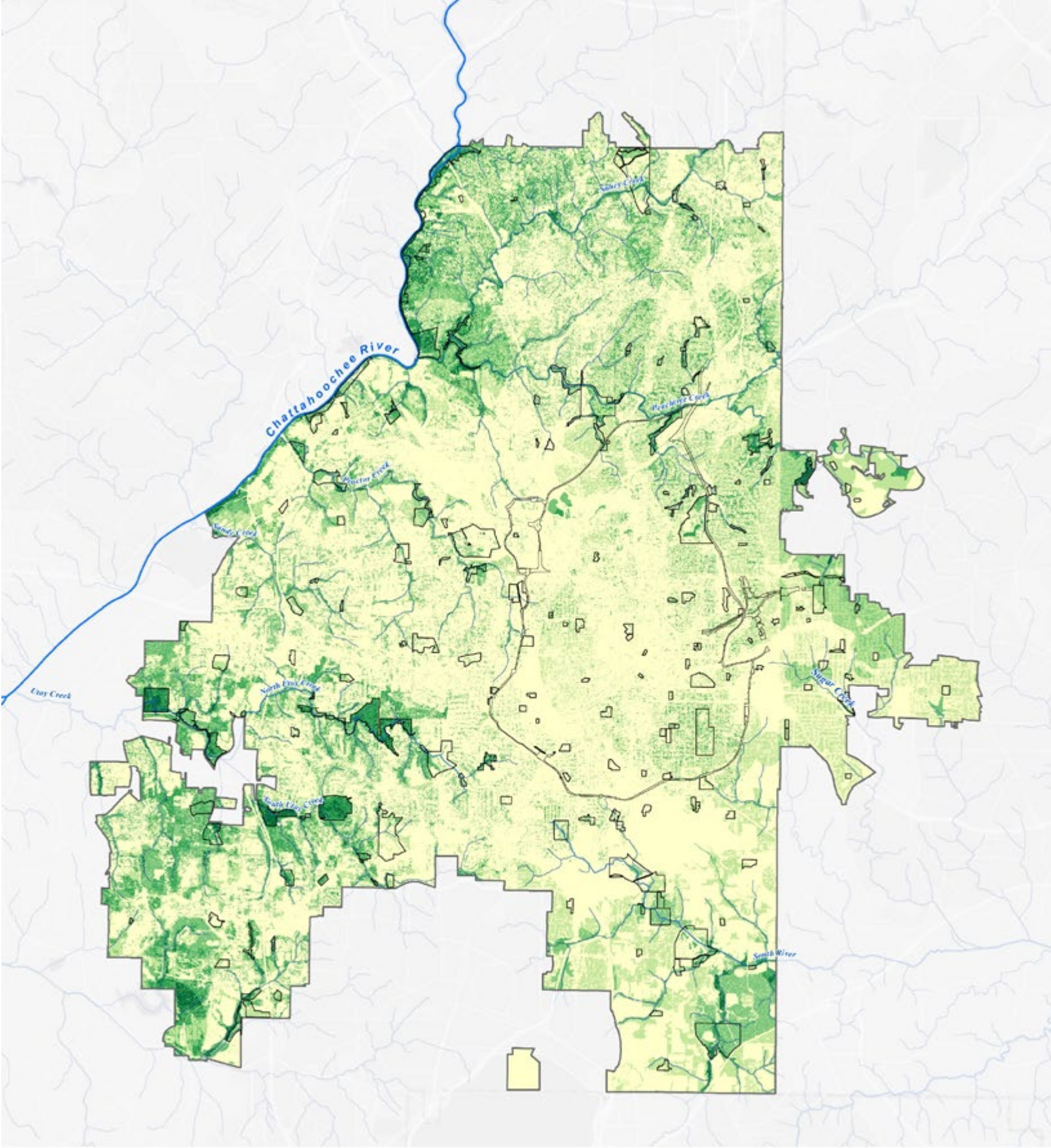
- 5 (Highest)
- 4
- 3
- 2
- 1 (Lowest)

0 1 2 miles

HABITAT AND BIODIVERSITY: PROTECTED AND UNPROTECTED AREAS

In areas that are not protected as public parks, Department of Watershed Management conservation lands, or conservation easements, significant amounts of important habitat are potentially vulnerable to development or other impacts. While habitat in public parks can technically be developed with public amenities, they are included in the category of protected land for this analysis, as high-value habitat in parks can be protected from development through park management decisions. Protected areas place only a small portion of the city's valuable habitat under public ownership. Indeed, most of the high habitat and biodiversity value areas in southwest, southeast, and northwest Atlanta are not in conservation areas or under protection. Protected areas with the highest habitat value tend to fall in the southwestern quadrant of Atlanta and offer some protection to the North and South Utoy Creek systems. Most of the city's tree canopy and highest value habitat is on private land. This makes forms of ecological protection on private land such as regulations for floodplains, stream buffers, wetlands, tree protection, and areas protected under the Chattahoochee River Corridor Metropolitan River Protection Act critical to preserving the ecology of the city. Stewardship of the city's urban habitats by private residents is also vital.

OPPOSITE Habitat and biodiversity value analysis with protected and unprotected areas.



Habitat & Biodiversity Value

- 5 (Highest)
- 4
- 3
- 2
- 1 (Lowest)
- Parks, DWM Conservation Lands, and Conservation Easements (>= 2 acres)

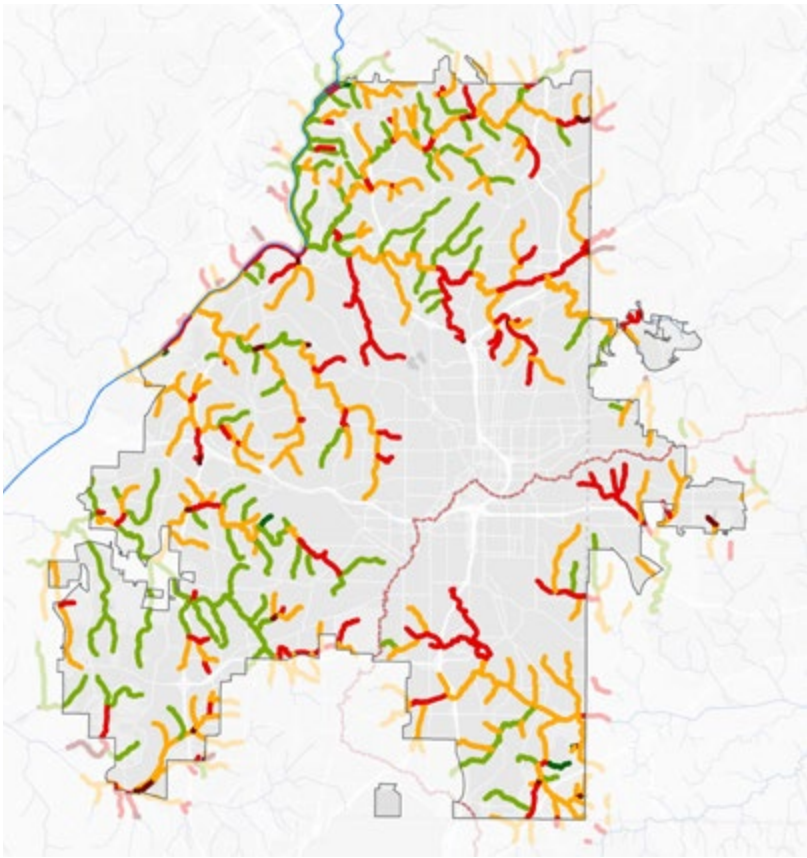
0 1 2 miles

HABITAT AND BIODIVERSITY: RIPARIAN STREAM BUFFERS

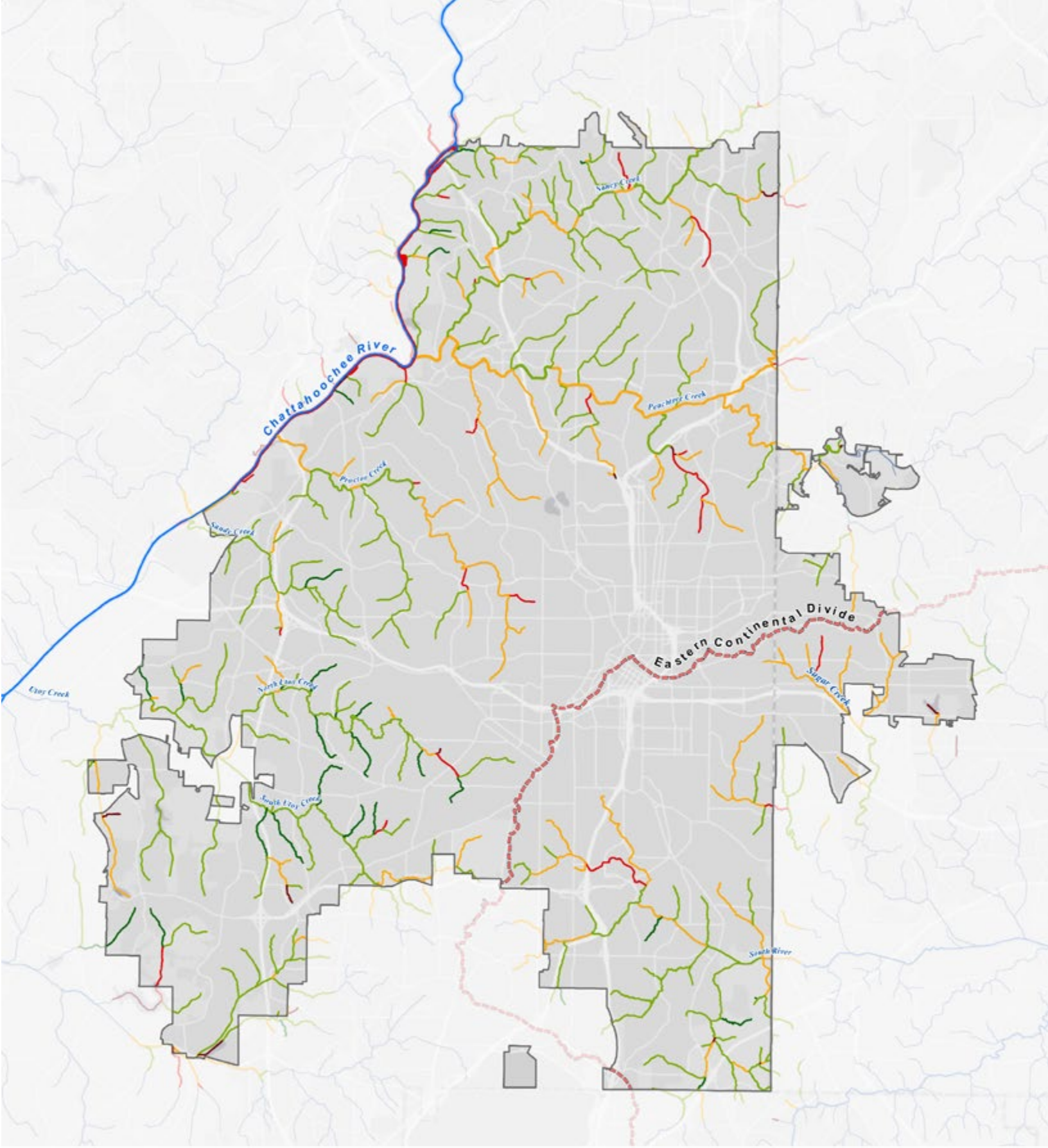
The quality of riparian habitat, or the land along rivers and streams, has a direct and significant impact on a stream's overall ecosystem health and function. If streams are shielded from nearby development by a robust buffer of land covered with shrubs and trees, their banks are stronger and undergo less erosion and the water quality is higher because stormwater-borne pollutants are filtered out before they enter the waterway. The City of Atlanta code requires "a 75-foot, natural, undisturbed, vegetative buffer" on both sides of streams. Intact forests provide the highest value of ecological function within that buffer because mature trees and a diverse understory provide more stability and protection for the streams.

North and South Utoy Creeks, Sandy Creek, and Nancy Creek and their tributaries have buffer areas with some of the most intact forest in the city. Major waterways such as Peachtree Creek, Proctor Creek, and South River receive water from both deforested tributary streams and from tributaries with more robust buffer vegetation.

Going beyond the 75-foot required buffer, research has shown that 300-foot wide forested stream buffers, on both sides of streams, are correlated with higher ratings of stream and riparian habitat than narrower buffers. In urban areas, a larger buffer also provides greater flood protection, wildlife habitat, and pollution reduction. Taking the analysis out to this wider zone exaggerates the results of the analysis of the 75-foot buffers, highlighting the more robust riparian buffers in southwest Atlanta and in smaller tributary streams of northwest Atlanta.



INSET Percentage of tree canopy cover within 300 feet of stream banks.
OPPOSITE Percentage of tree canopy cover within 75 feet of stream banks.



Percentage of Tree Canopy Cover Within Stream Buffer

- 0% - 20%
- > 20% - 40%
- > 40% - 60%
- > 60% - 80%
- > 80% - 100%

0 1 2 miles

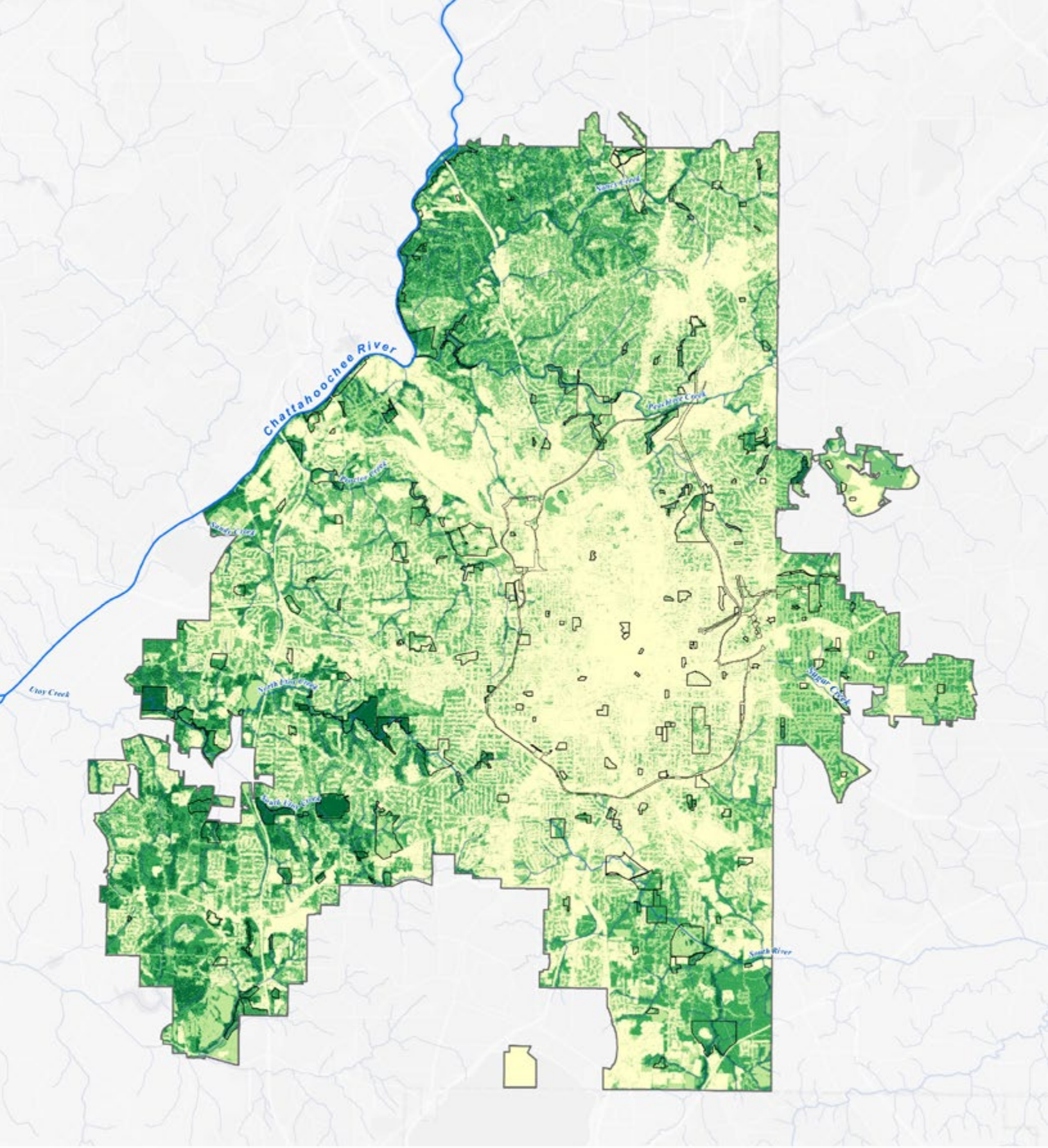
ECOSYSTEM SERVICES

Ecosystem services are the contributions that nature makes to a community's well-being— supporting survival and quality of life. Among a host of services, natural systems conserve and replenish the drinking water supply; protect, and restore fertile soils; and regulate local climate, hydrologic cycles, air quality, nutrient flows, and the impacts of natural hazards. They also provide cultural support inspiring, calming, and creating space for community interactions. For Atlanta City Design: Nature, the essential ecosystem services examined were storing carbon, reducing flood risk, and mitigating air pollution and urban heat islands.

ECOSYSTEM SERVICES: CARBON STORAGE

As the levels of carbon dioxide in the atmosphere rise, the global community is relying on the services provided by trees and vegetation to sequester and store carbon. Urban forests and their soils are the primary form of carbon storage in Atlanta.

OPPOSITE Potential carbon storage value analysis of the city.



Carbon Storage Potential Value

- 5 (Highest)
- 4
- 3
- 2
- 1 (Lowest)
- Parks, DWM Conservation Lands, and Conservation Easements (>= 2 acres)

0 1 2 miles

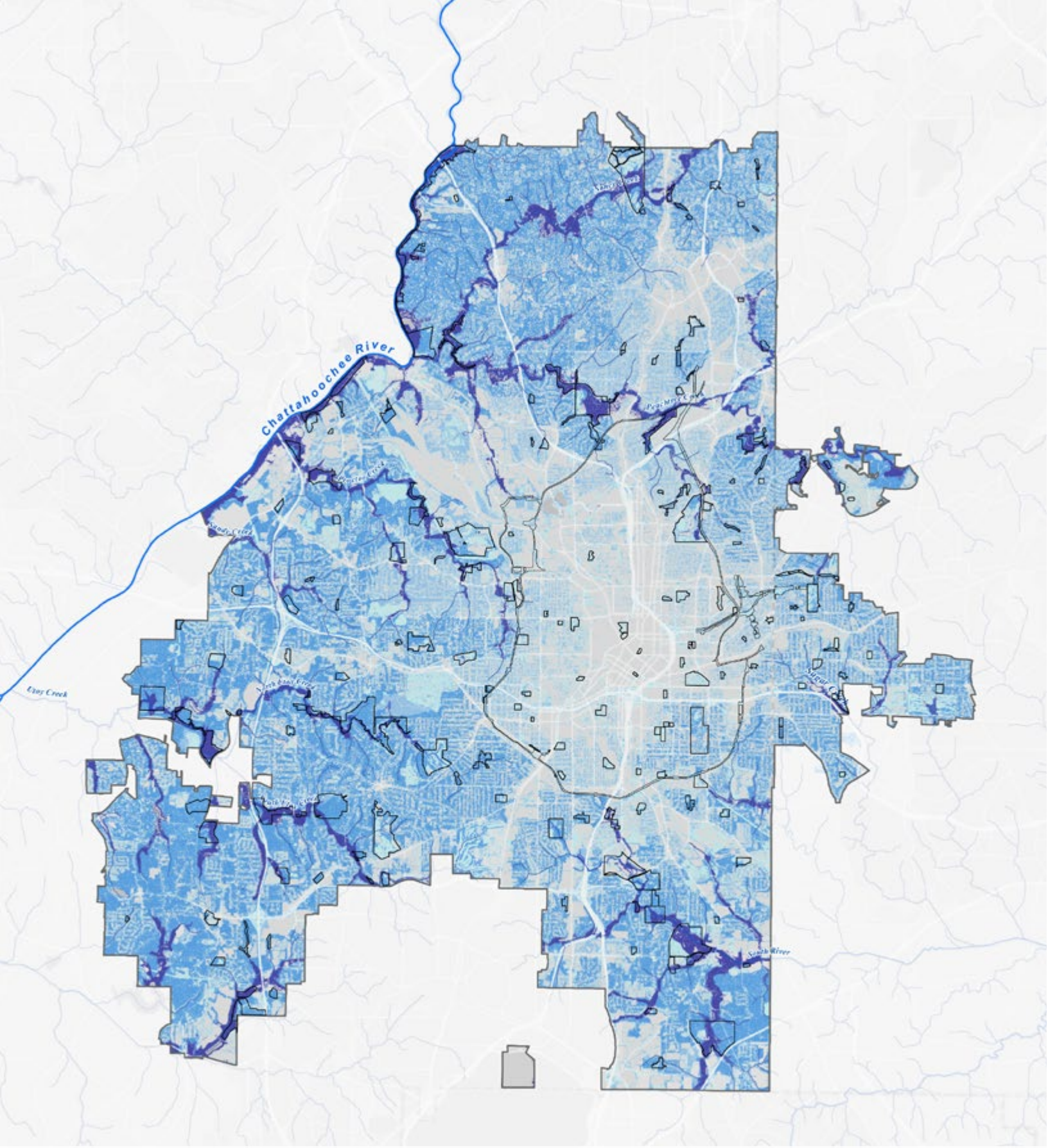
ECOSYSTEM SERVICES: FLOOD MITIGATION POTENTIAL

Riparian corridors and natural floodplains play a major role in flood mitigation. Healthy floodplains and wetlands have the capacity to temporarily store and infiltrate flood waters during high runoff events. Constructed storm systems ultimately release stormwater into city streams and are thus also dependent on natural drainage systems and floodplains. The city's natural systems can best mitigate the likelihood of flooding where the following are found:

- Vegetated floodplains, streams, and natural wetlands
- Soil with high infiltration rates
- Low Impervious surface coverage

These functions are often met in protected areas and community parks and forests. But unprotected land, especially along the stream corridors, also contributes to this ecosystem service.

OPPOSITE **Potential flood mitigation value analysis of the city.**



Flood Mitigation Potential Value

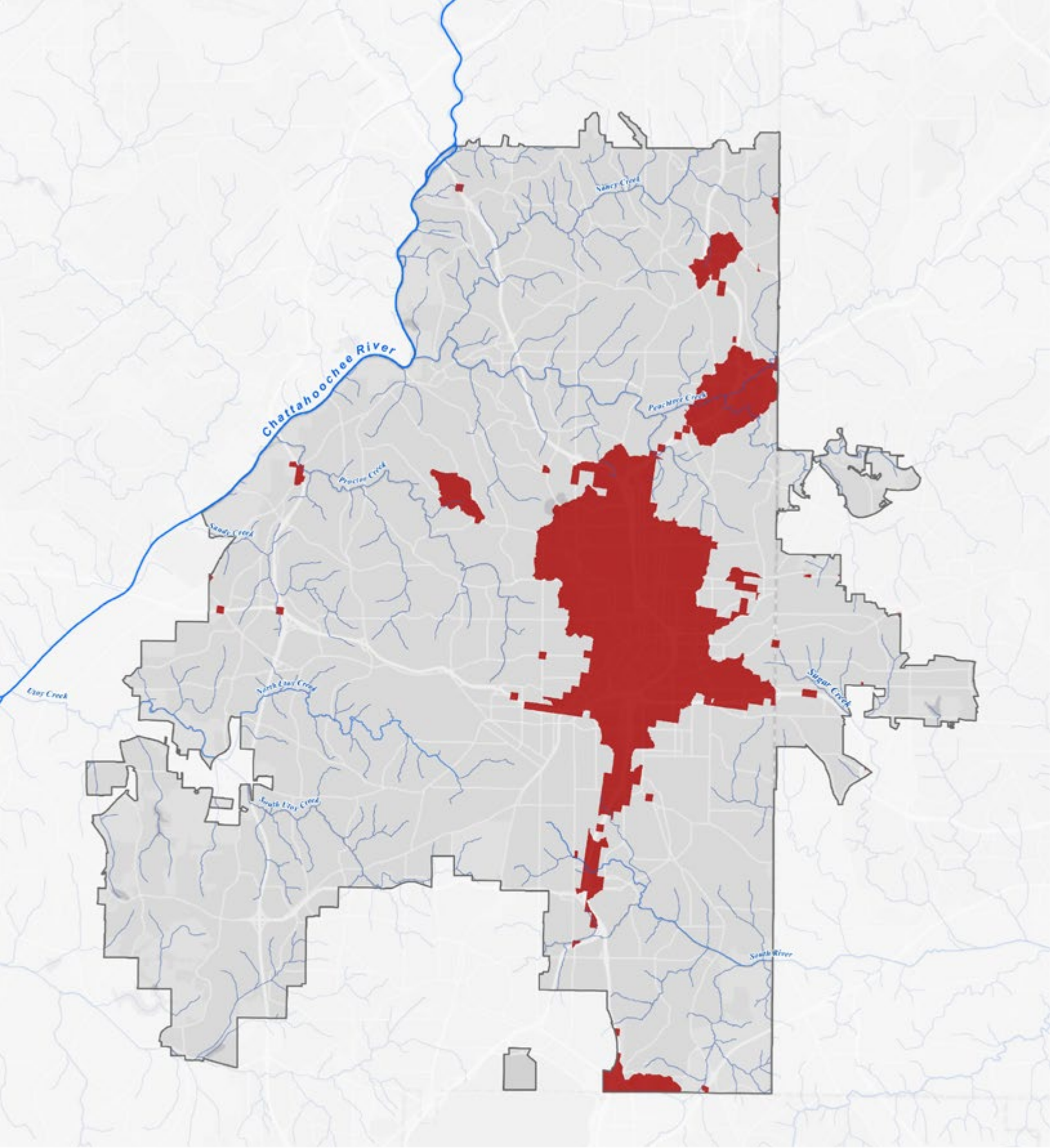
- 5 (Highest)
- 4
- 3
- 2
- 1 (Lowest)
- Parks, DWM Conservation Lands, and Conservation Easements (>= 2 acres)

0 1 2 miles

ECOSYSTEM SERVICES: AIR POLLUTION

Higher levels of exposure to particulate air pollution are associated with higher levels of cardiovascular and pulmonary disease. These effects are felt unevenly across the city. Exhaust from vehicular traffic is a driver of this pattern, with areas of high volume and density of vehicular traffic being associated with higher air pollution. Trees can reduce particulate air pollution by trapping small particles, making the urban forest key to providing this ecosystem service. Accordingly, where local tree cover is low, particulate air pollution measurements are higher than similar areas with dense tree canopy along streets and highways.

OPPOSITE **Areas of the city with high impacts from air pollution and low levels of tree canopy.**



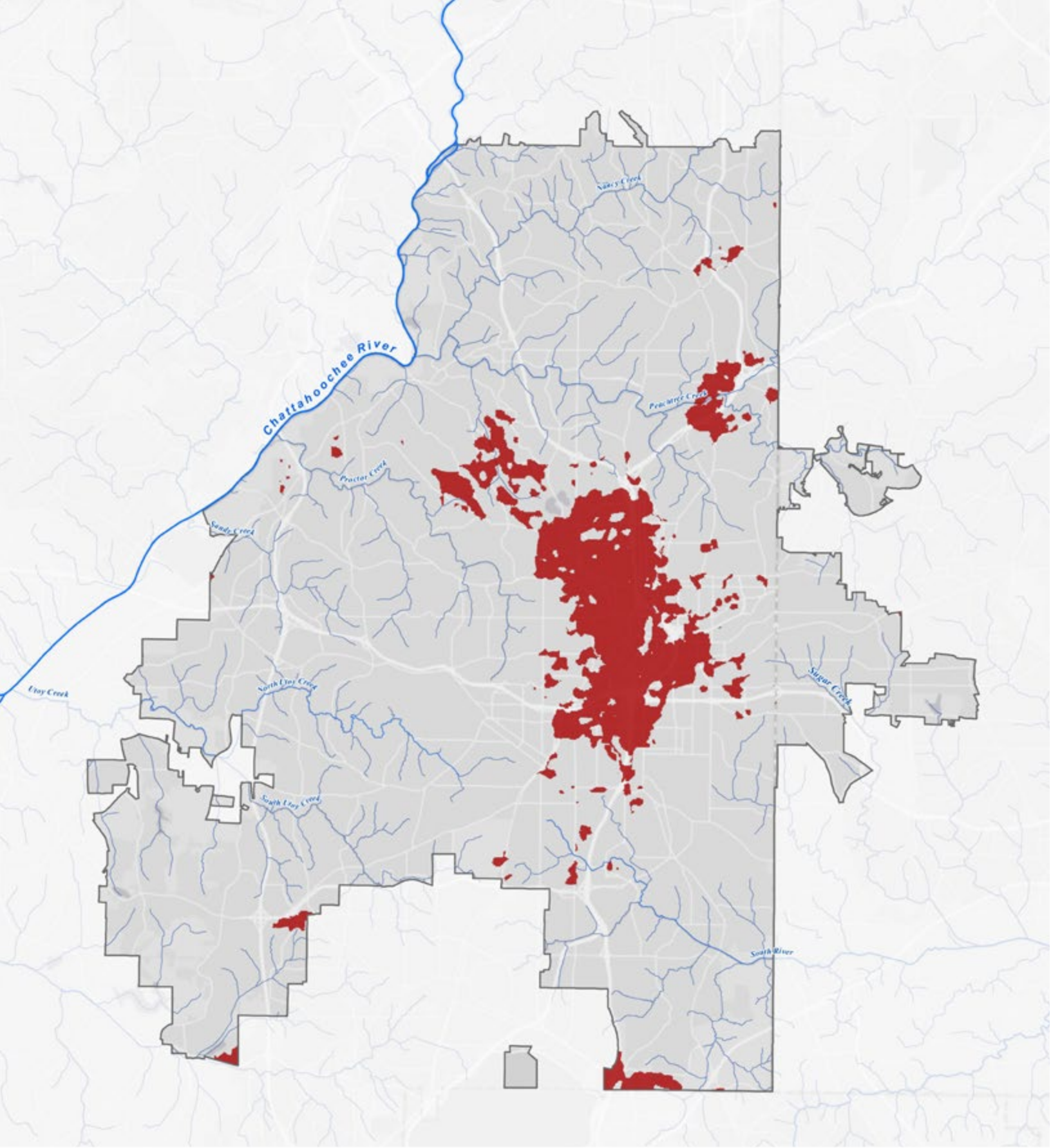
Areas of High Particulate Air Pollution and Low Canopy Coverage

0 1 2 miles

ECOSYSTEM SERVICES: HEAT ISLAND

Impervious surfaces such as roads, parking lots, and building roofs absorb and radiate more heat from the sun than vegetated surfaces. Concentrations of hot impervious surfaces cause cities to be warmer than rural areas, creating an urban heat island. This phenomenon can have the greatest impact on human health and energy use (for air conditioning) in the summer months. In Atlanta, the downtown core exhibits high concentrations of paving and low tree canopy and unsurprisingly it also records the highest temperatures in the city. These areas can be as high as 20°F hotter than in areas of the city with dense tree canopy, where trees cool temperatures by shading streets and roofs, reducing the urban heat island effect. Forests, meadows, and other natural areas, as well as trees shading roads and parking lots can reduce the urban heat island.

OPPOSITE **Areas of the city with high heat hazard risk and low levels of tree canopy.**



Areas of High Heat Hazard and Low Canopy Coverage

0 1 2 miles

ENVIRONMENTAL JUSTICE AND ECOSYSTEM SERVICES

Environmental Justice involves strategies that highlight and correct environmental policies and actions of the past and present that disproportionately impact minority, poor, or other at-risk communities. It is about addressing inequities associated with environmental harms that have impacted these communities and ensuring they have a voice in future decision-making. Research into the ways that environmental conditions impact various vulnerable communities within the city forms the core of the Environmental Justice analysis including environmental harms like lower air quality, higher heat island, and flooding impacts. There is also significant study of inequities associated with access to amenities, like parks and greenspaces. Equity is seen as an important outcome of environmental justice efforts, where justice is being served and there is a leveling of the playing field for all members of the community to enjoy the same benefits of a healthy natural environment.

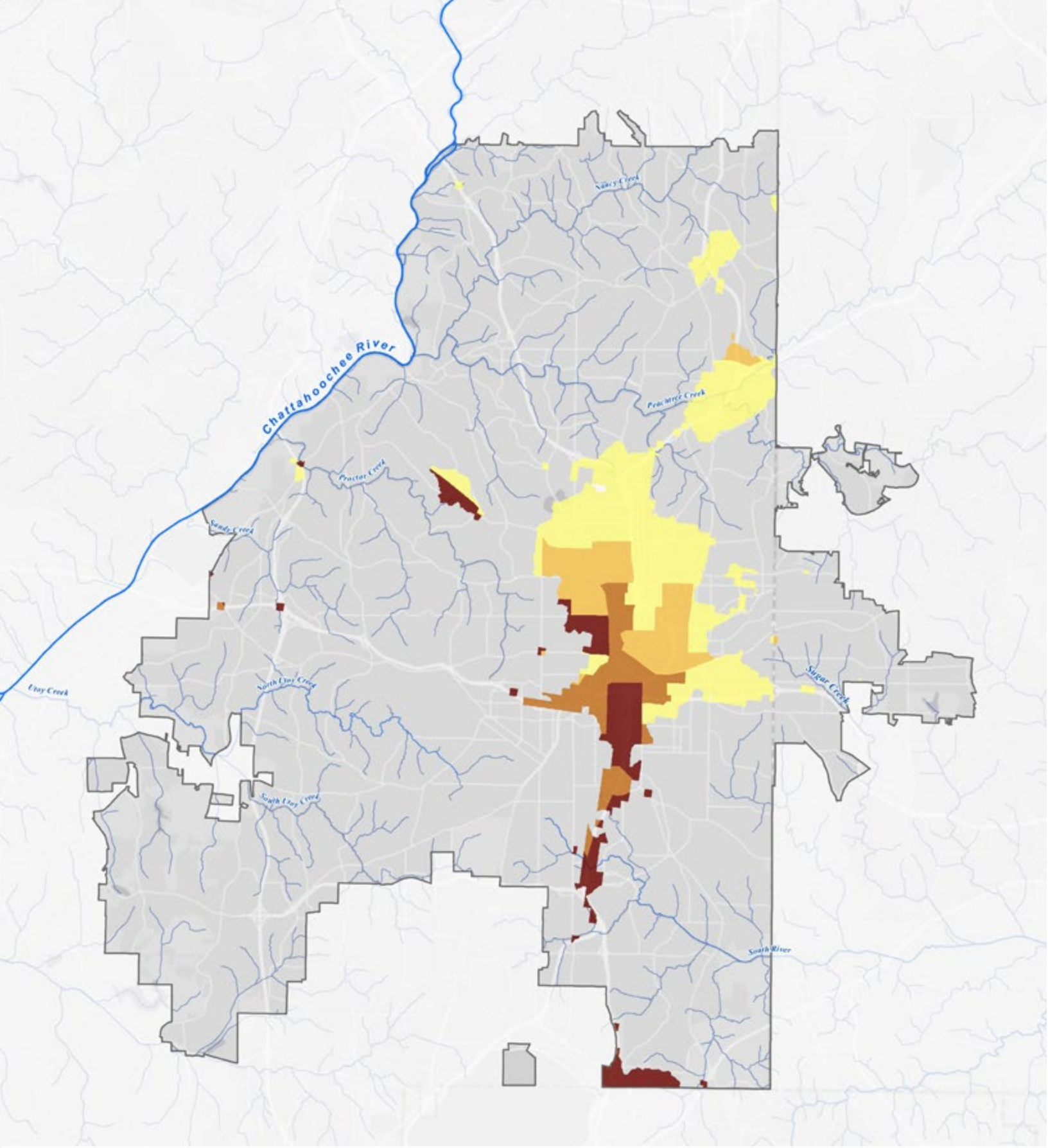
Historically throughout Atlanta, areas with lower household income and higher percentages of people of color have been disproportionately affected by negative environmental impacts. These include various forms of pollution and their sources, including heavy industry, vehicular exhaust, landfills, waste treatment facilities, and others.

Using a variety of demographic factors, including socioeconomic status, household composition and disability, minority status, and others, the Centers for Disease Control and Prevention (CDC) has developed a Social Vulnerability Index, with higher social vulnerability referring to factors that exacerbate environmental stresses on human health and wellbeing. This Social Vulnerability Index was used to identify areas of environmental justice concern.

ENVIRONMENTAL JUSTICE: AIR POLLUTION

Following on the previous analysis on air pollution, intersecting the air pollution data with the Social Vulnerability Index shows where stresses and inequities from this aspect of environmental health might be greatest. The central and southern sections of the downtown core, extending in a corridor southward along the highway, is the region where the factors intersect most dramatically in areas where social vulnerability and air pollution are both high.

OPPOSITE Social vulnerability of areas with high impacts from air pollution.



Social Vulnerability and Air Pollution

- Most Vulnerable
- Vulnerable
- Somewhat Vulnerable
- Least Vulnerable

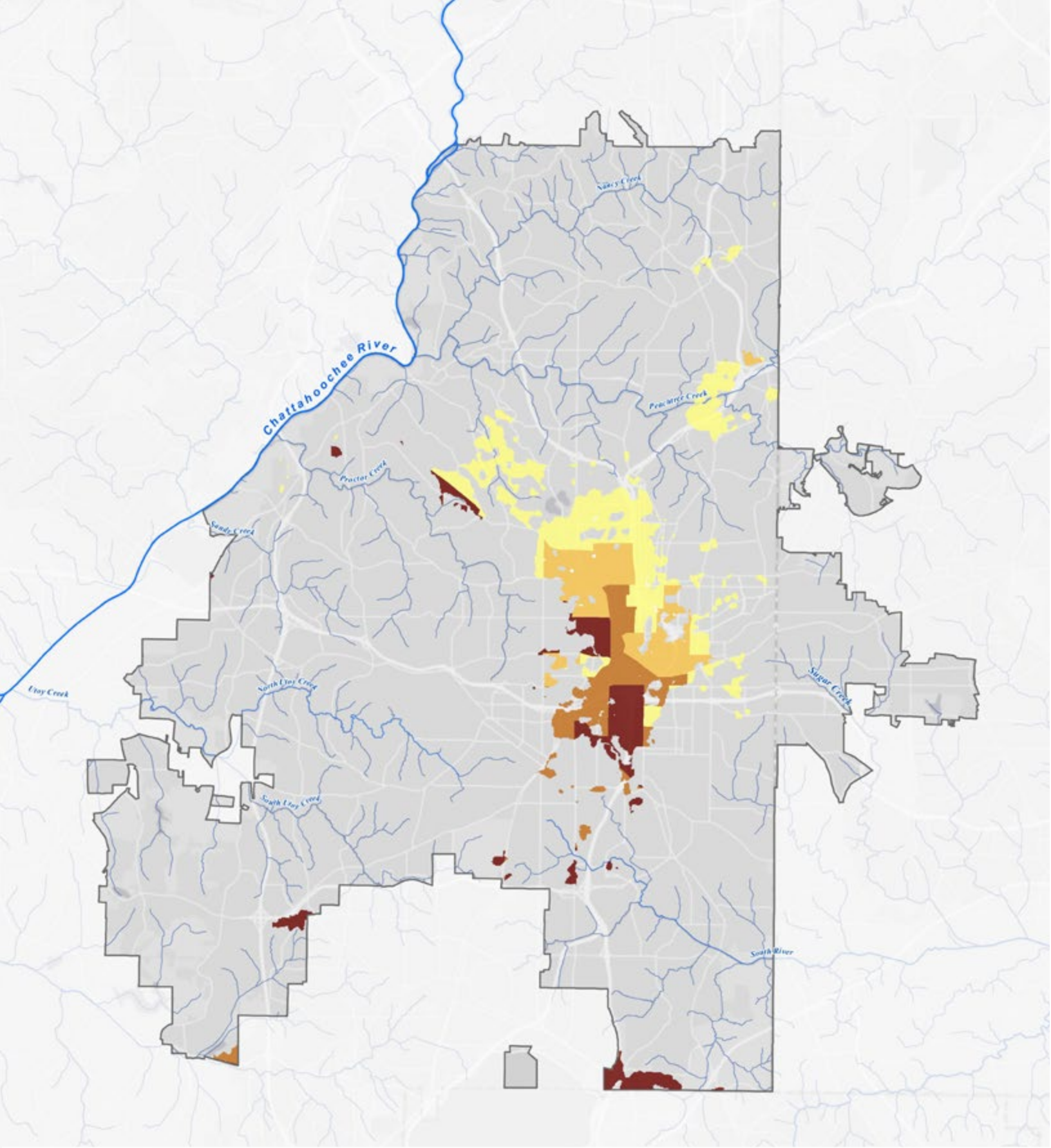
0 1 2 miles

ENVIRONMENTAL JUSTICE: HEAT ISLAND

Similarly, identifying areas at the intersection of social vulnerability and the urban heat island effect yields a focus on the central and southern sections of the downtown core, but without a concentrated extension to the south.

This analysis of environmental need is critical given the high heat index of the city and because heat effects are rising and exacerbated by climate change.

OPPOSITE Social vulnerability of areas with high impacts from the urban heat island.



Social Vulnerability and Heat Island

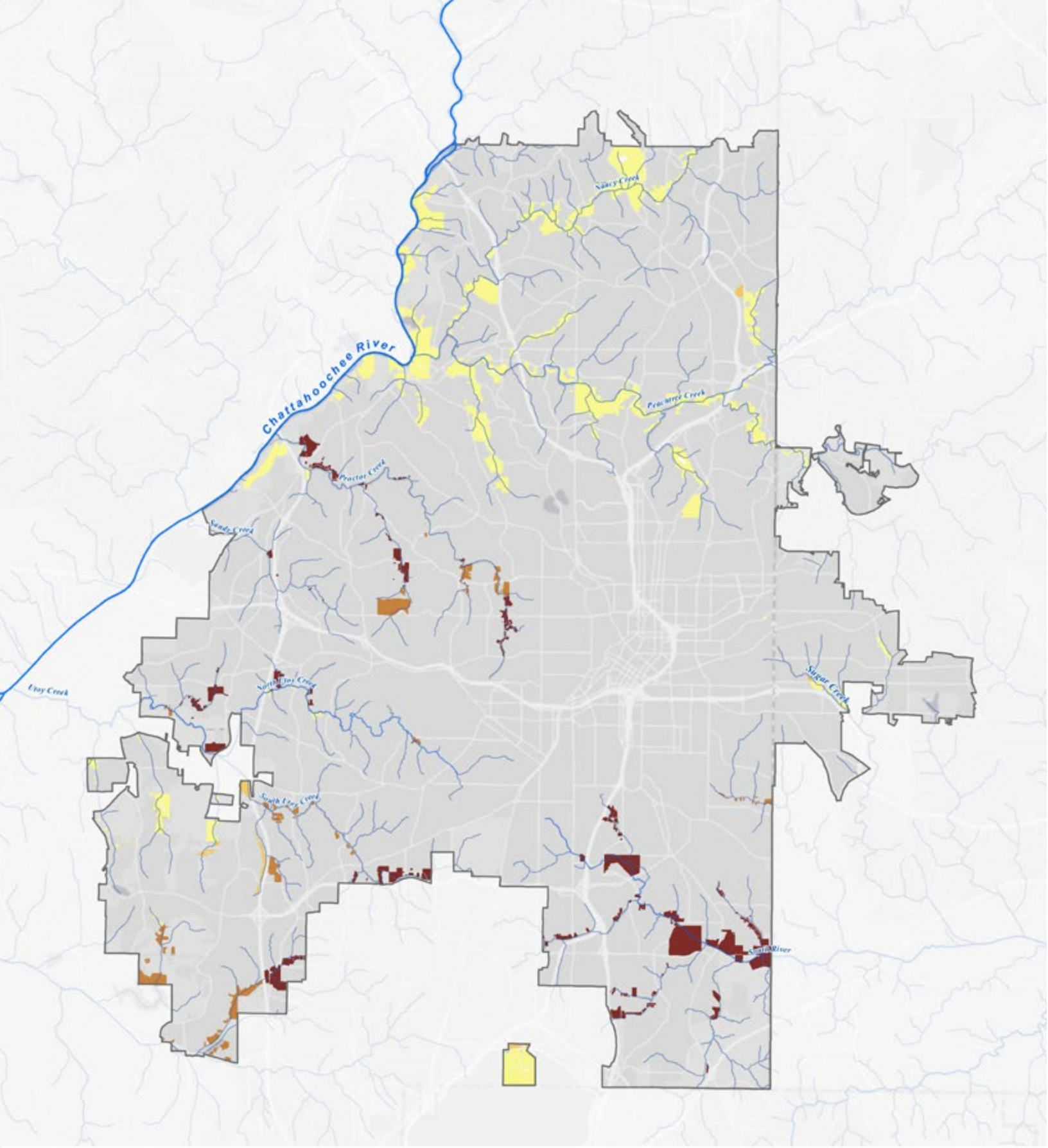
- Most Vulnerable
- Vulnerable
- Somewhat Vulnerable
- Least Vulnerable

0 1 2 miles

ENVIRONMENTAL JUSTICE: FLOODPLAINS

The ecosystem value of floodplains is often directly correlated to the risk of storm impacts and floods. Despite frequent examples of the disastrous effects that development in floodplains poses—including the 2009 Atlanta flooding—some floodplain development exists throughout Atlanta, most built before the current floodplain development restrictions were implemented in the early 1970s. Citizens and their community resources are generally at greater risk from flooding in these areas. Using the social vulnerability lens, areas can be identified where the community would be disproportionally impacted by flooding.

OPPOSITE Social vulnerability of parcels that contain buildings within the floodplain.



Social Vulnerability and Parcels Containing Buildings within the 100-yr Floodplain

- Most Vulnerable
- Vulnerable
- Somewhat Vulnerable
- Least Vulnerable

0 1 2 miles

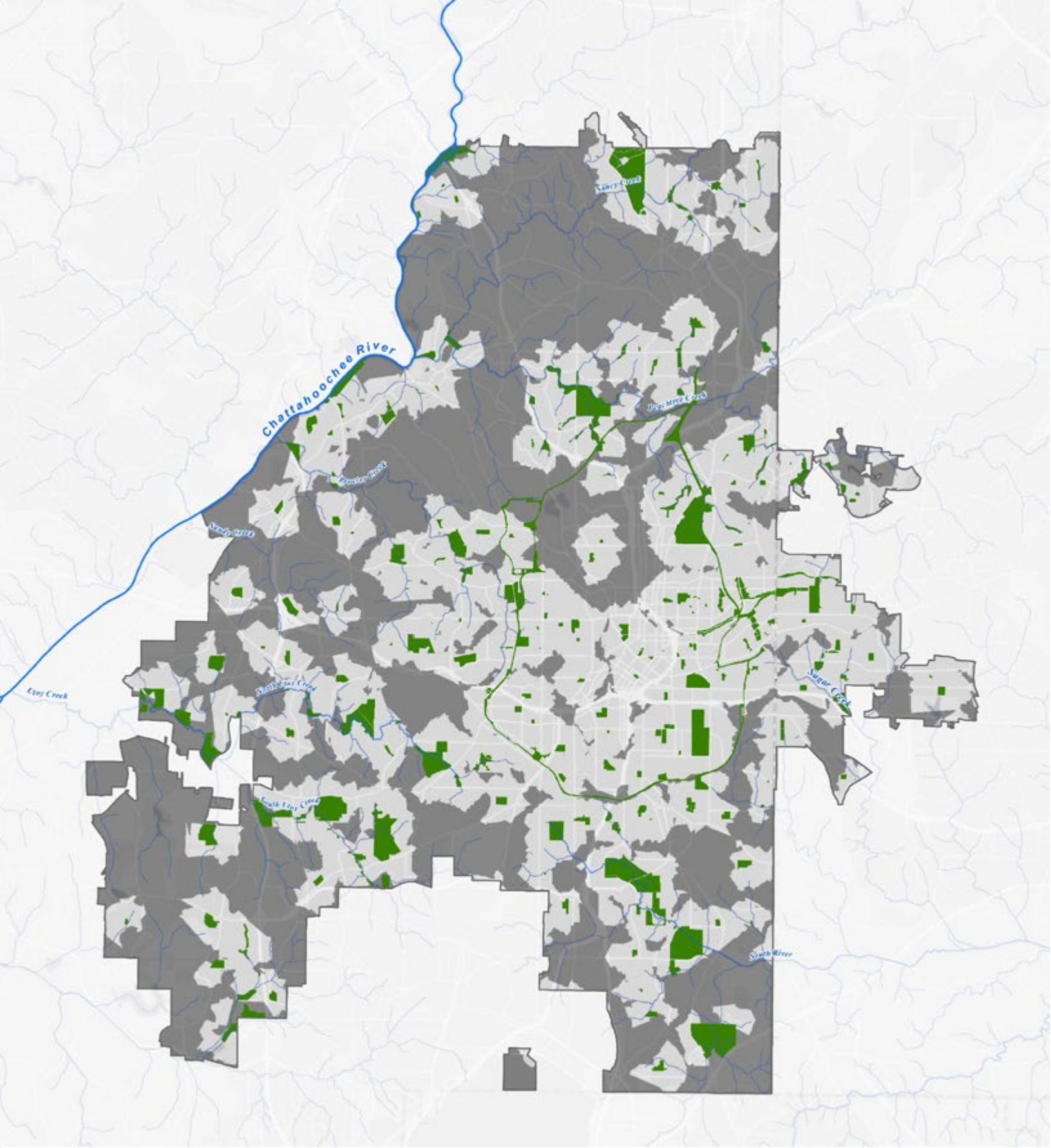
PARKS AND OPEN SPACE ACCESS

Parks form a critical juncture among all ecosystem services. They can protect important ecological resources that contribute to the city's well-being, while providing public access to the physical and mental health benefits of urban nature. Parks are important spaces of social interaction and community identity, and they can also be beneficial components of neighborhood economic development. Looking at areas of the city that lack access to public parks, locations of high ecological value in those areas, and their demographic conditions, can help inform priorities for new parks that expand the benefits of public urban nature in the city.

PARKS AND OPEN SPACE ACCESS: PARK DESERTS

Easy walking access (within 10-minutes) to a park is widely considered a desirable and reasonable standard for urban residents. Studies have connected having a park within a 10-minute walk to higher levels of moderate-to-vigorous physical activity and other health benefits. Urban areas that are underserved by public parks, and fall beyond a 10-minute walk, are termed "park deserts." Significant areas of the city are designated as park deserts based on this definition. Large sections of northwest and southwest Atlanta have forested land that provide important ecosystem services, however those resources are primarily on private land, and are not accessible to the public.

OPPOSITE Areas of the city that lack walkable accessibility to public parks.



Areas of Walkable Accessibility to Parks

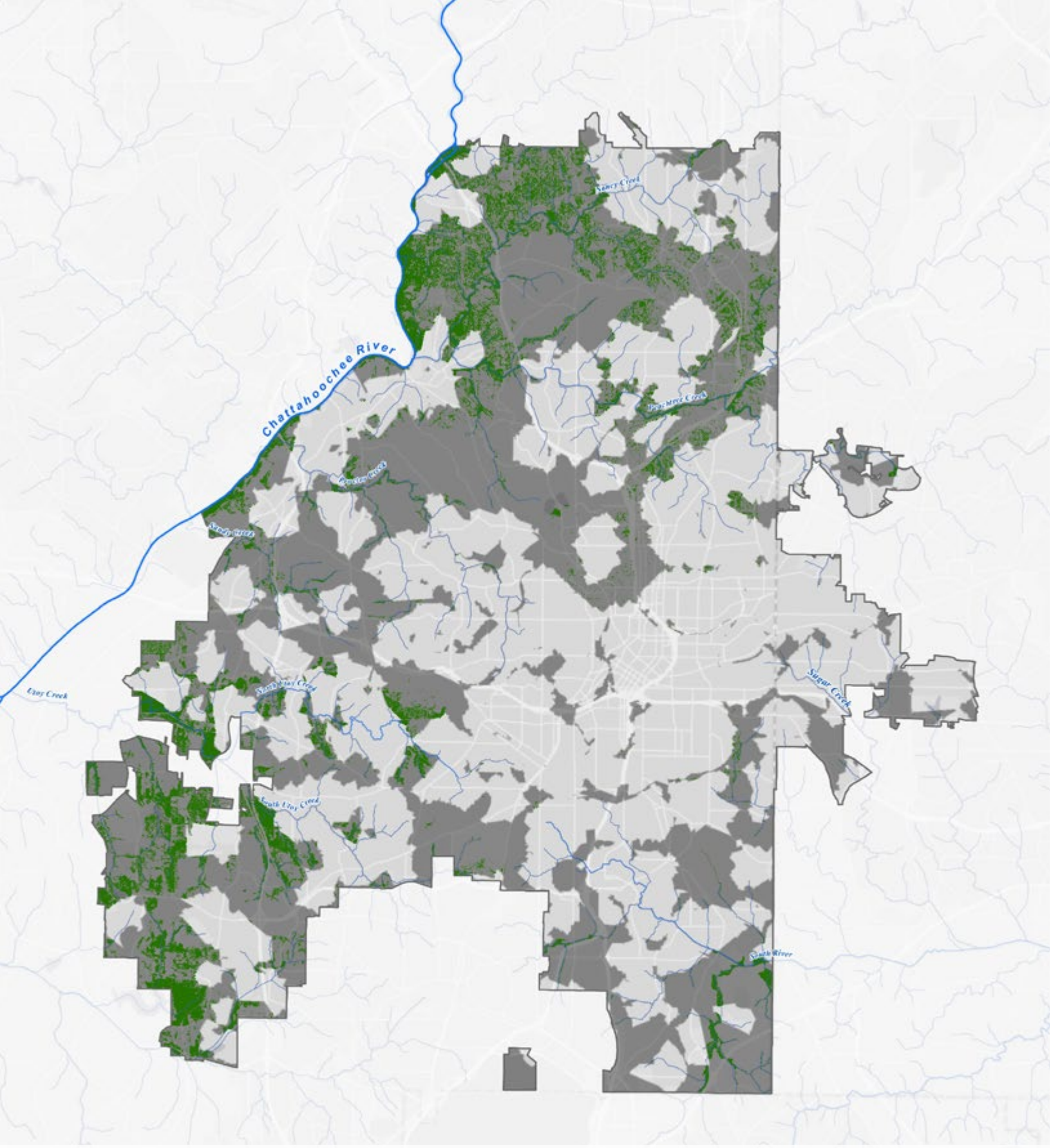
- Outside 10-minute Walking Distance to Park (Park Desert)
- Within 10-minute Walking Distance to Park
- Parks

0 1 2 miles

PARKS AND OPEN SPACE ACCESS: HIGH BIODIVERSITY IN PARK DESERTS

In order to reduce the inequities of park access, park deserts represent areas that should be considered for new parks. With limited resources for new park creation, it's worth focusing on areas with the highest existing biodiversity, to protect these high value areas from development, while providing improved access to nature and recreation. In this analysis, areas with a value of 5 and 4 from the previous Habitat & Biodiversity analysis are defined as a highest biodiversity areas.

OPPOSITE **Areas of highest biodiversity within park deserts.**



Areas of High Biodiversity in Park Deserts

- Highest Biodiversity Area
- Outside 10-minute Walking Distance to Park (Park Desert)
- Within 10-minute Walking Distance to Park

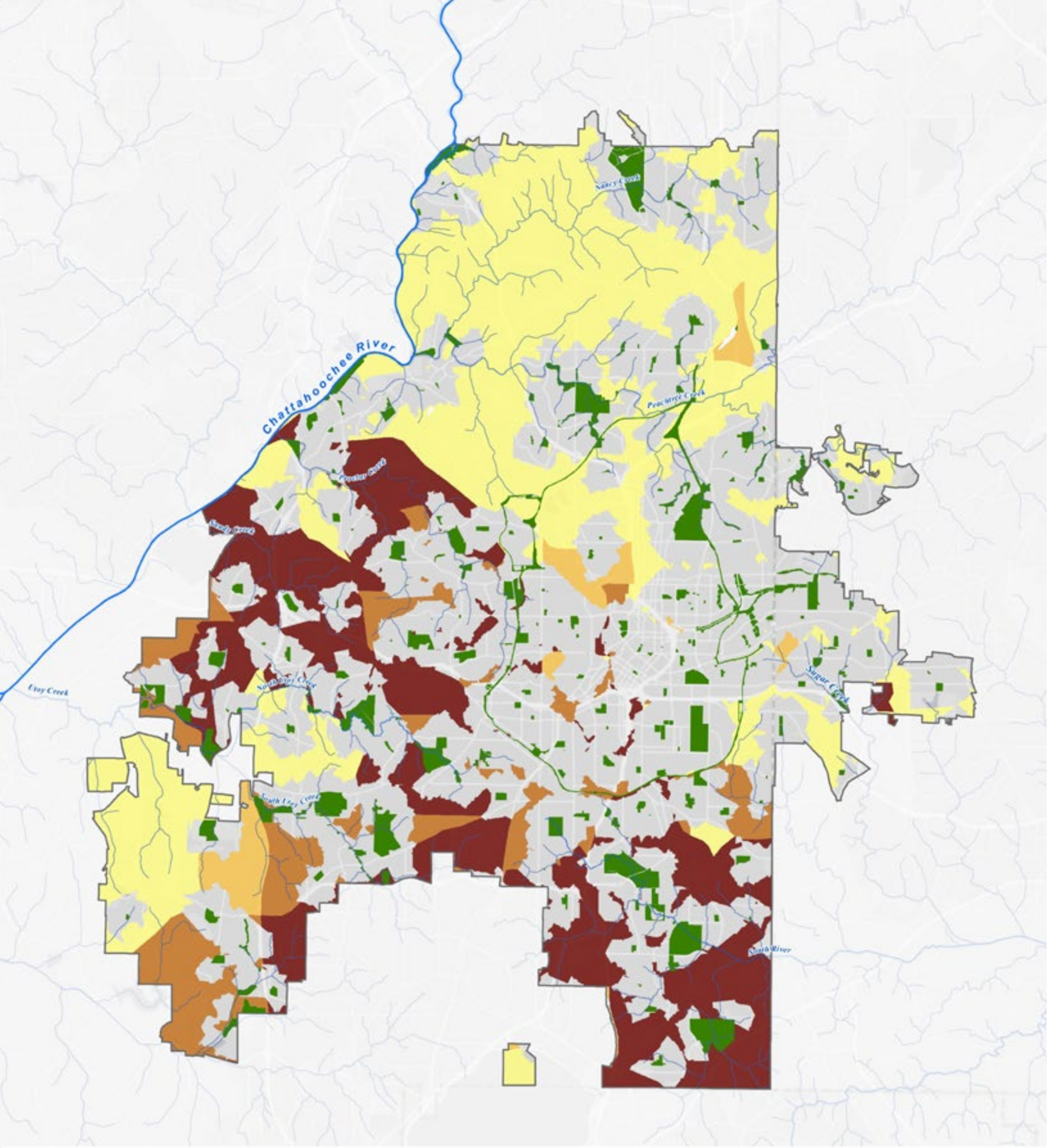
0 1 2 miles

PARKS AND OPEN SPACE ACCESS: ENVIRONMENTAL JUSTICE AND PARK DESERTS

The patterns of development and demographic conditions across Atlanta exhibit known, and often stark, inequities. While all park deserts are deserving of efforts to improve their access, further examining the range of social and environmental need is a valuable exercise.

The largest contiguous park desert area in northwest Atlanta, is also the least socially vulnerable. However, a diagonal band of irregular park desert with high social vulnerability stretches from the Chattahoochee to the southeast corner of the city. This region warrants increased consideration for new parks and improvements of park access. New parks in park desert areas where high social vulnerability and high biodiversity are both present could help address ecological protection needs and park access needs.

OPPOSITE Social vulnerability in park desert areas.



Social Vulnerability and Park Deserts

- Most Vulnerable
- Vulnerable
- Somewhat Vulnerable
- Least Vulnerable

0 1 2 miles

2.3 COMMUNITY INPUT

The voice of Atlanta's residents can be found in the Story of Place developed through the ongoing engagement process for Atlanta City Design: Nature. From the outset, public meetings were held throughout the city to both share and collect information. Interviews with a diverse group of stakeholders and technical advisors from the city also imparted significant local knowledge and recommendations.

The Needs and Opportunities that citizens and stakeholders identified early on, along with the Risks and Threats, guided the development of the Story of Place and informed ongoing analysis. The output generated by the community informed the development of Atlanta City Design: Nature and its Plan of Action in the subsequent sections.

NEEDS AND OPPORTUNITIES

Public input identified two primary means to ensure a healthy natural environment throughout the city, with certain geographic areas and sites deserving particular focus:

Preservation

Forest preservation involves protection of tree canopy, removal of invasive species, and implementation of native tree replacement program.

Protection

- Rivers, Creeks, and Streams

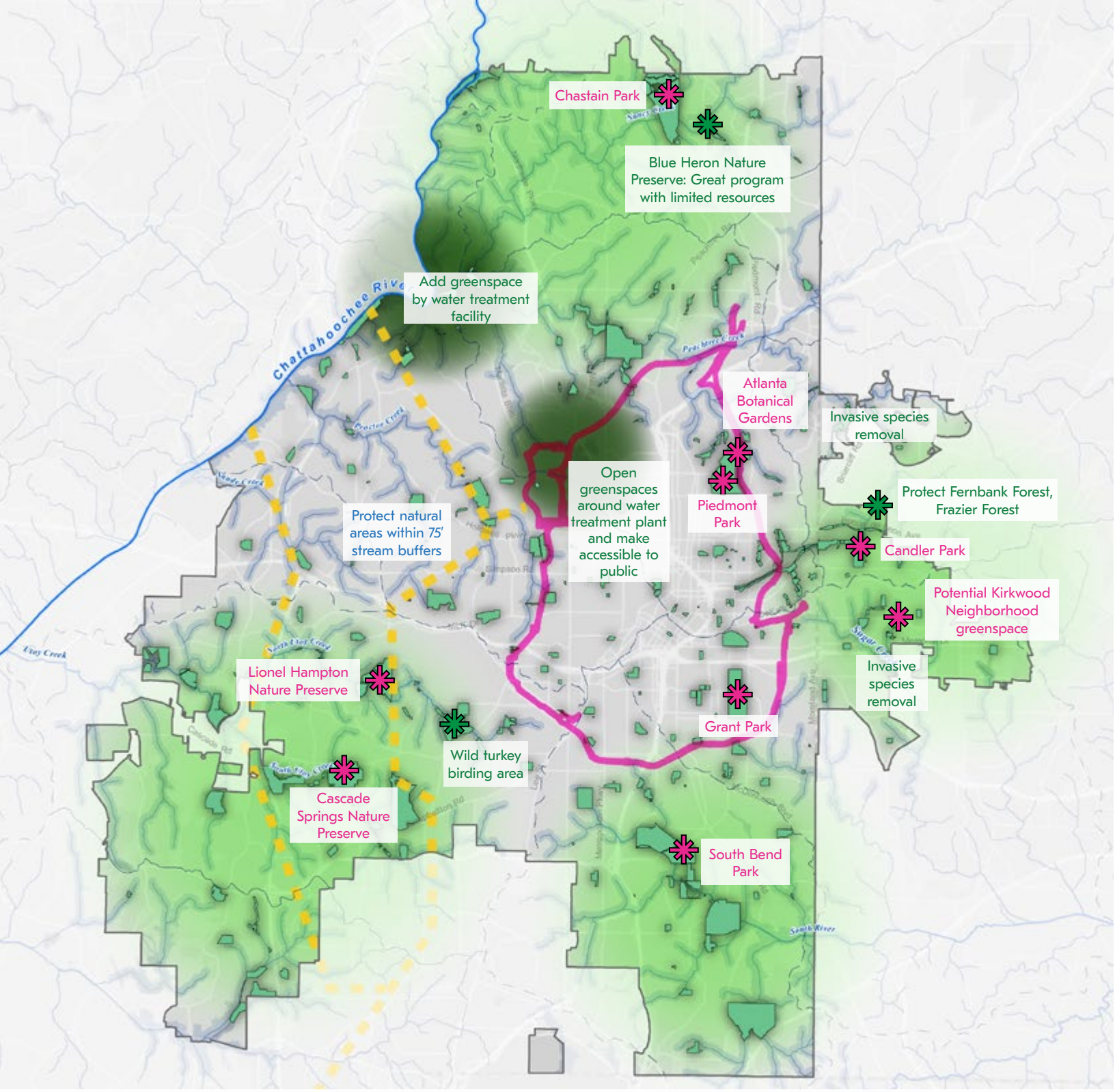
  Remove invasive vegetation; improve water access; plant, stabilize, and protect riparian edges; and improve water quality.

- Watershed Ridges and Creek/Stream Headwaters

  Protect the top of watersheds and stream headwaters to improve water quality and quantity downstream.

- Parks and Linear Greenspaces implement ecological best practices.

OPPOSITE **Needs and opportunities identified by stakeholders**



Stakeholder Interviews - Needs + Opportunities

Forest Preservation Protection of tree canopy, removal of invasive species, and implementation of native tree replacement program.

Implement ecological best practices

High concentration of quality trees in private properties

Acquire additional greenspace for access/protection

Rivers, Creeks, and Streams Remove overgrown invasive vegetation, improve water access, protect riparian edges, and improve water quality.

Rivers, creeks, and streams with adequate buffers that facilitate ecological improvements and connections.

Watershed Ridges and Creek/Stream Headwaters Protect top of watersheds and stream headwaters to improve water quality and quantity downstream.

Watershed areas

Parks and Linear Greenspaces Implement ecological best practices

Atlanta BeltLine

Signature greenspaces with opportunities to implement ecological best practices

Parks and open spaces with opportunities to implement ecological best practices

Power line easements as opportunities to create connected food producing landscapes

0 1 2 miles

RISKS AND THREATS

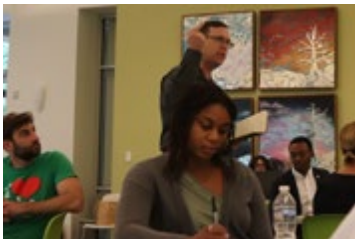
Public input identified four primary challenges to a healthy natural environment throughout the city, again with certain geographic areas needing particular focus:

Rapid Urbanization and Redevelopment
Areas with high quality tree cover are under threat due to rapid urbanization and redevelopment, causing reduction in the number of trees and natural forest areas.

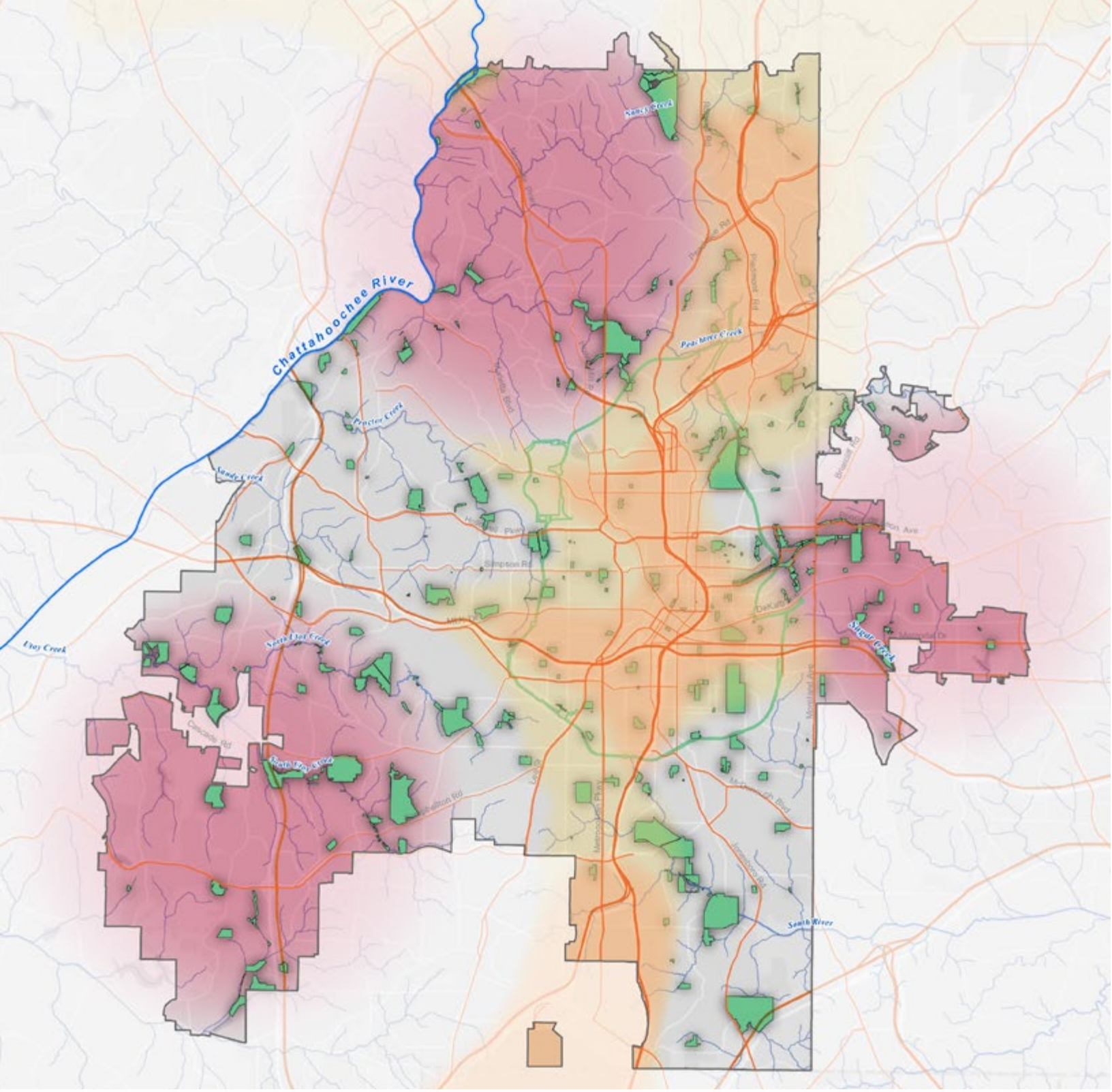
Urban Heat Island Effect
Rapid urbanization, large impervious surfaces, and extensive usage of asphalt causing 8-10 degrees rise in temperatures in urban areas.

Air Quality
Historic, car-centric Atlanta development culture has led to poor air quality conditions, which are affecting human health and contributing to heat island effect.

River, Creek, and Stream Quality
Rivers, creeks and streams are subject to flooding and erosion, which has led to severe degradation of streams and poor water quality.



OPPOSITE **Risks and threats identified by stakeholders**



Stakeholder Interviews - Risks + Threats

Rapid Urbanization and Redevelopment	Areas with high-quality tree cover are under threat due to rapid urbanization and redevelopment causing reduction in the number of trees and natural forest areas.	High-quality ecological areas under threat due to development
Urban Heat Island Effect	Rapid urbanization, large impervious surfaces, and extensive usage of asphalt causing 8-10 degrees rise in temperatures in urban areas.	Higher temperature areas due to urban heat island effect
Air Quality	Historic car-centric Atlanta development culture has led to poor air quality conditions, which are affecting human health and contributing to heat island effect.	Interstates, highways, and major transportation corridors
Rivers, Creeks, and Streams	Rivers, creeks, and streams are subject to flooding and erosion, which has led to severe degradation of streams and poor water quality	Streams, Creeks and Rivers
		Parks and open spaces with opportunities to implement ecological best practices

0 1 2 miles

COMMUNITY FEEDBACK

As shown on the previous pages, which offer just a snapshot of the engagement activities occurring throughout the Atlanta City Design: Nature planning process, community members shared their passions and insights from their lived experience in nature to help inform this work. The resonating themes of preservation, protection, restoration, access, and connection are in response to their concerns about the risks and threats of rapid urbanization and redevelopment, urban heat island, and air and water quality issues.

These insights directly informed the evolution of City Design's five design proposals (Wildness, Comfort, Retreat and Adventure, Connections, and Lifestyles) in Sec. 3 "Atlanta's Future Urban Ecology" as well as the Sec. 4 "Plan of Action" that follows. In addressing Equity, the community's interest in access and connection is front and center. Protect directly considers ways to protect not only the remaining mature forest resources in Atlanta, but the headwaters of the sensitive stream, riparian corridors, and river features throughout the city as well- mitigating and responding to the concerns of rapid urbanization and redevelopment. Restore responds to the desire to replace native trees and create green spaces in underserved parts of the community, as well restoring the form and function of the waterways that traverse the city through improved buffers. Accentuate responds to the desire for best practices for ecological design in streetscapes, parks, and linear green spaces, where people meet and interact with nature, addressing air and water quality concerns as well as increased and equitable access. Steward and Engage addresses the public's interest in further opportunities to support invasive species management and best ecological practices that can be incorporated into neighborhood and community initiatives.

OPPOSITE ABOVE Citizens share their input at an early information gathering session designed to understand community members' priorities.
OPPOSITE BELOW Technical Advisory Committee members share their ideas with Commissioner Tim Keane.

SCENARIO 3 - EQUITY & ECOLOGY
SCENARIO 4 - GREY TO G

3

The Futur
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3.1 AN INTEGRATED APPROACH

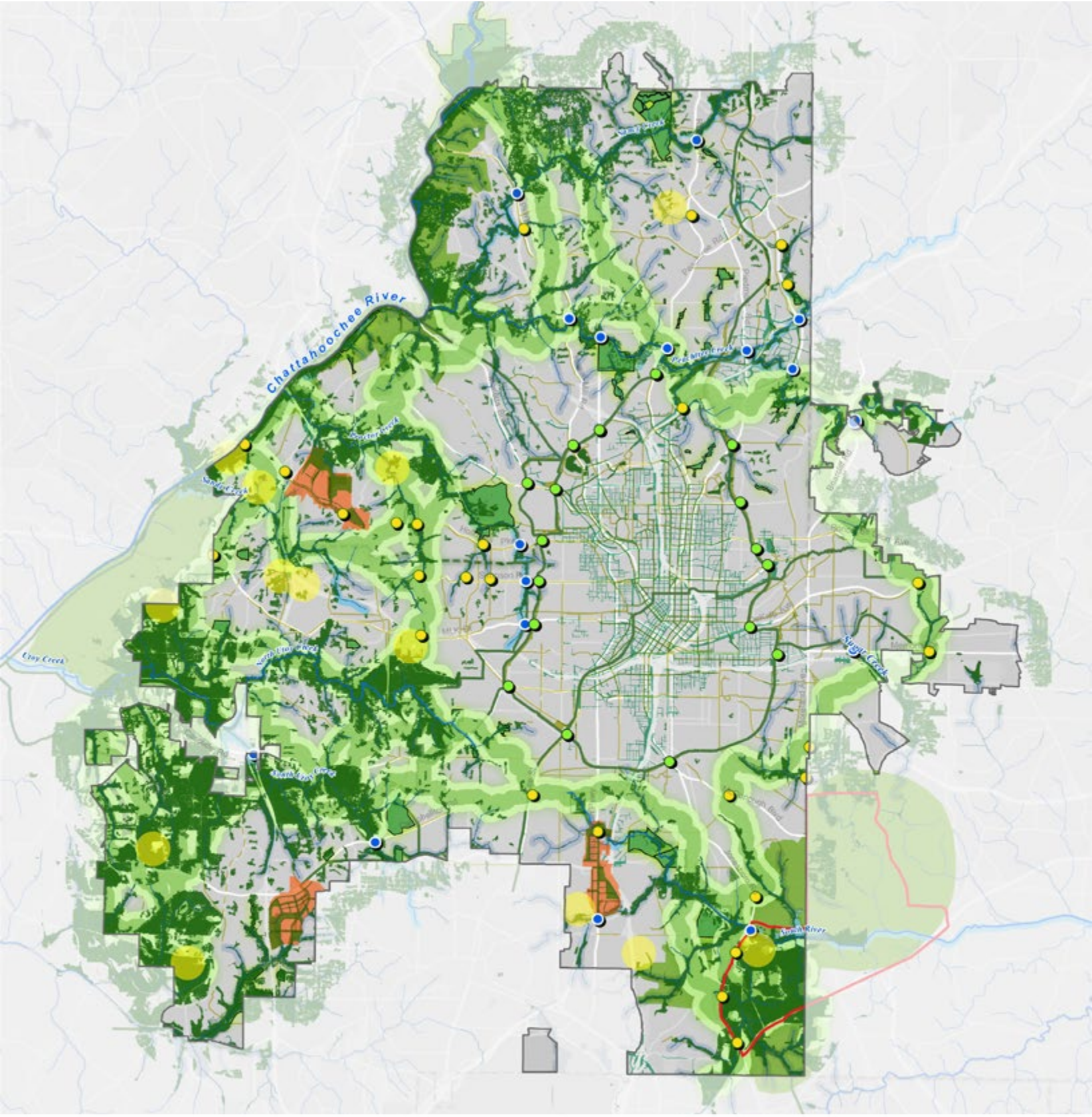
Based on an understanding of the city's current needs and opportunities for nature through "Atlanta's Story of Place," a bold vision for its future can be crafted. Five design proposals for linking nature and people, building on concepts from *Atlanta City Design*, guide this bold approach to designing for nature and people in Atlanta:

Design for Wildness
Design for Comfort
Design for Retreat and Adventure
Design for Connections
Design for Lifestyles

Each proposal works in concert with the others to protect and enhance the uniquely forested city. The synthesis of the analysis and recommendations form Atlanta City Design: Nature.

OPPOSITE The integrated components of Atlanta's future ecology

PREVIOUS Landscape design, and its proper management, plays a critical role in contributing to stormwater management and ecological health. Lake Clara Meer, in Piedmont Park, has served this role for over 120 years.



Legend

- Atlanta City Limits + Major Streets
- Streams | Creeks | Rivers + Riparian Corridors
- Blueways (water trails)
- Primary Multiuse Trails
- Secondary Multiuse Trails
- Eco-Developments
- Forest Connectivity Corridors
- High Biodiversity Areas
- Existing High Biodiversity Parks
- Street Tree Increase Area
- Proposed Major Parks + Refined Park Boundary
- BeltLine Nature Space
- Waterway Nature Space
- Additional Nature Spaces
- Proposed Park in this Vicinity

0 1 2 miles

3.2 WILDNESS

TRULY WILD HABITAT DESIGNED INTO THE LIFE OF THE CITY, THROUGH TWO MAJOR PARKS.

As the city grows, Atlanta is going to boldly protect and invest in two new major regional parks:

Chattahoochee River Park
South River Park

These park systems will provide access to open space, opportunities for recreation, and respite for all city residents. They will ensure that large, intact urban wilderness remains a part of the city for future generations.

Envisioned to be created on the riverfront, the Chattahoochee River Park will build on its wild origins while recognizing its cultural history. It will strategically connect residents to their hidden riverfront and provide environmental protection for sensitive areas. Through Chattahoochee River Park, Atlanta will invest in access, connectivity, and ecological health. It will be a welcoming urban riverfront that offers a diversified experience to the existing life of the city.

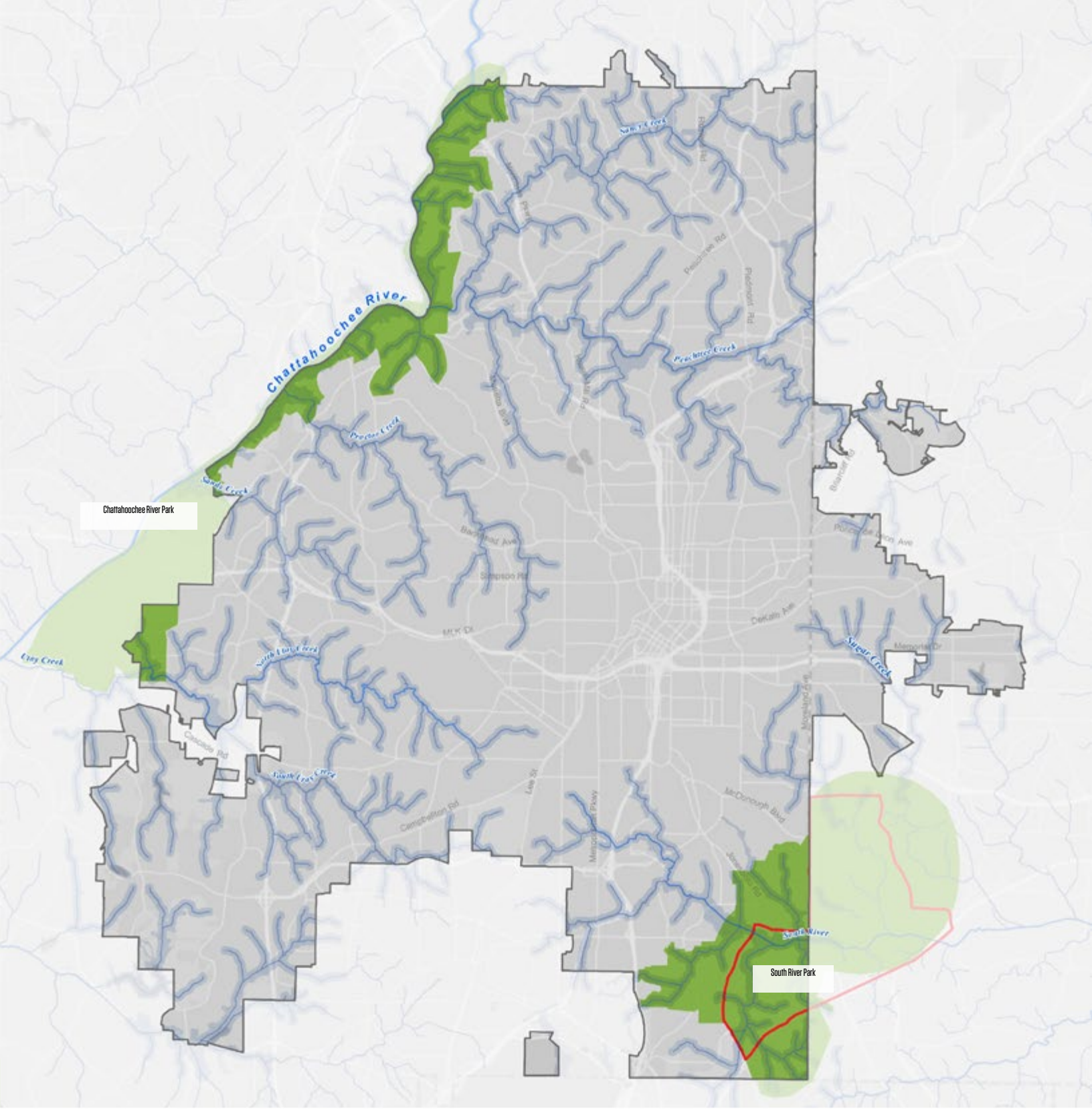
South River Park could provide 1,200+ acres of new parkland. This large urban park will provide a boost to urban ecosystem services while providing new connections to the verdant South River landscape.

The proposed boundaries for the parks encompass land with high habitat and biodiversity values as well as forest buffers along rivers and their tributaries. The area for these parks prioritizes the protection and enhancement of interior forest, mature forest, wetlands, stream corridors, and their forested floodplains.

OPPOSITE Wildness: proposed major parks

Recommendations

- **Perform** more detailed planning and design assessments of the two park zones to identify locations of particular importance for restoration, preservation, and acquisition.
- **Prioritize** acquisition of areas that expand upon existing high value resources, including a study of annexation or partnerships with neighboring jurisdictions.
- **Develop** partnerships that support stewardship efforts to ensure long-term protection and management of the habitats along these two significant river corridors.
- **Celebrate** contributing watersheds: Nancy Creek, Peachtree Creek, Sandy Creek, Utoy Creek (North and South), and South River through increased engagement and outreach efforts.



Legend

- Atlanta City Limits + Major Streets
- Streams | Creeks | Rivers + Riparian Corridors
- Proposed Major Parks
- South River Park Boundary

Descriptions

- Major streets and radial streets identified in City Design, Design for Connections
- 100yr floodplains, streams, and stream buffers measured from 300' on each side of stream centerlines
- Refined major park boundaries within City of Atlanta that consider Parcel Data | Include High Ecological Value Areas + Forest Connectivity Corridors | Exclude City Design Production Areas + Growth Areas
- The Nature Conservancy South River Park Master Plan Boundary

0 1 2 miles

3.3 COMFORT

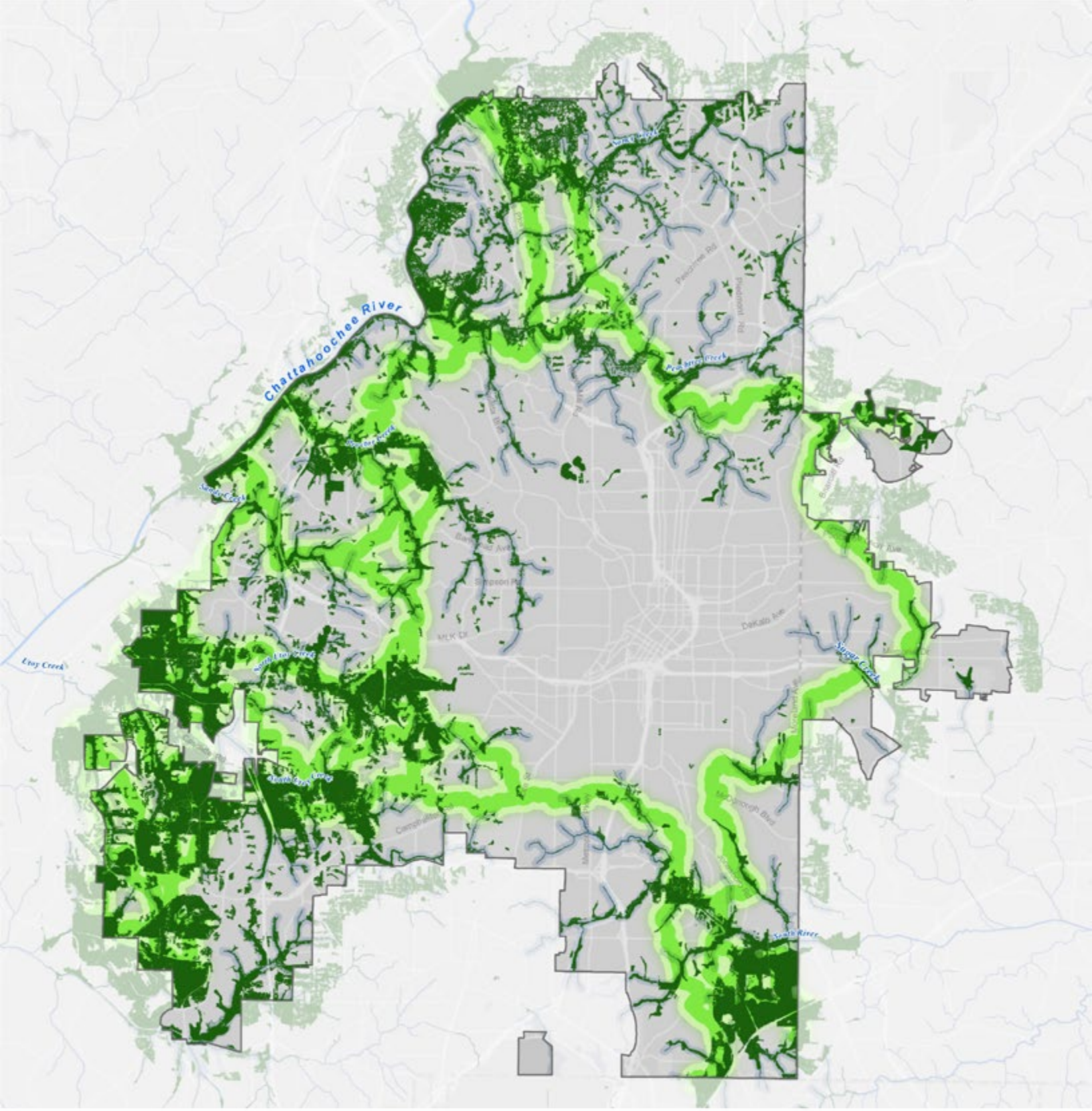
CRITICAL ECOSYSTEM SERVICES FOR THE CITY, AS AN EXPANSION OF THE FORESTED "LUNGS OF ATLANTA" THAT SURROUND THE URBAN CORE.

By protecting and enhancing Atlanta's urban forests and stream corridors, and the habitats they provide, the "green lungs" of the city will provide improved ecosystem services such as cleaner water, cleaner air, and cooler temperatures. These benefits contribute to improved physical and mental health and lower power bills. These forests make up a network of habitats that sustain the city's wildlife while also binding neighborhoods together beneath leafy canopies. Urban forests have also become a defining part of Atlanta's identity as a City in the Forest for residents and visitors alike.

OPPOSITE High ecological value habitat in Atlanta

Recommendations

- **Prioritize** high value habitat and biodiversity areas and forest habitat connectivity corridors for acquisition, continuing to strengthen natural function and ecosystem services.
- **Restore** and enhance forest habitat connectivity corridors that link major forests throughout the city.
- **Restore, enhance, and protect** streams and their forested buffers.
- **Prioritize** invasive species management in High Biodiveristy Areas to ensure future forest health.
- **Establish** increased education and stewardship efforts focused on the value and presence of ecological resources across the city.
- **Support** denser development practices outside of the areas that provide critical ecosystem services.
- **Perform** more detailed vegetation and health surveys of all habitat corridors and patches to quantify and continually monitor value of citywide resources.



Legend

- Atlanta City Limits + Major Streets
- Streams | Creeks | Rivers + Riparian Corridors
- Forest Connectivity Corridors
- High Ecological Value Areas

Descriptions

- Major streets and radial streets identified in City Design, Design for Connections
- 100yr floodplains, streams, and stream buffers measured from 300' on each side of stream centerlines
- Areas of high animal connectivity importance between Interior Forest Cores
- Areas of highest ecological value, including: interior forest cores, mature forest and soils, floodplain forest, wetlands, and areas with a value of 5 and 4 from Habitat & Biodiversity analysis.

0 1 2 miles

3.4 RETREAT AND ADVENTURE

ESCAPE ROUTES TO NATURE AND ACCESS TO OPEN SPACE

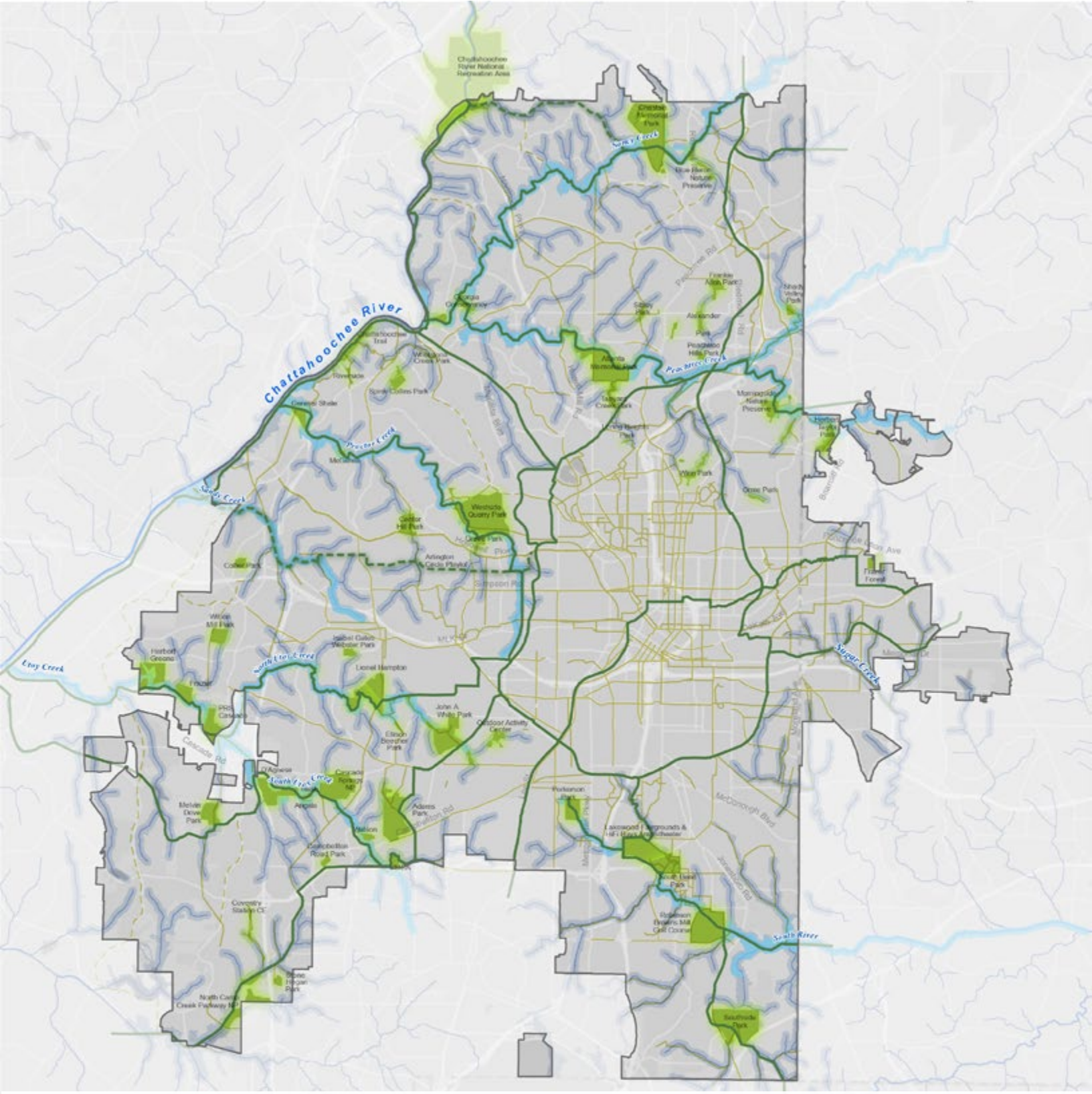
Escape routes to nature and access to open space will be provided, connecting every community to nature through strategically located and accessible nodes and corridors and by integrating nature into built infrastructure. Greenways will bridge the city's outer green lungs to the urban core by extending and linking to existing trails and connecting parks in a green network.

Retreat and Adventure allows residents to more easily move from heavily developed areas of the city into more natural ones, contributing to physical and mental health. This proposal increases access along greenway (through forested or vegetated corridors) and blueway trails (in waterways) while also protecting and restoring native plant communities and streams to simultaneously improve human well-being and habitat function. Implicit in this idea is that travel along these greenways will be done by foot, bicycle, or other means of active transportation, which will also help decrease air pollution and road congestion.

OPPOSITE **Trail and cycle connections to nature**

Recommendations

- **Protect** high biodiversity parks and preserve lands in this network by barring destruction of the high-value resources identified in Sec. 3.3.
- **Increase** biodiversity in all parks, trails, and greenways through invasive species management and native plantings using a diverse palette of species for canopy and understory trees, as well as shrub and groundcover species.
- **Implement** ecological restoration of native forests, wetlands, streams, and meadows.
- **Restore** floodplains and stream habitat buffer areas (300′ on each side of streams) to protect water quality and habitat potential along stream corridors with increased tree plantings and invasive species removal.
- **Include** green stormwater infrastructure along trails and within parks.
- **Create and expand** environmental education programs in public parks.
- **Highlight** the significance of this trail, park, and forest network through increased wayfinding and educational materials along these routes.
- **Assess** vacant lands for further opportunities to connect through new parks or open space.
- **Avoid** fragmentation of existing habitat by implementing the trails network along the edges of interior forest habitat areas rather than through interiors.



Legend

- Atlanta City Limits + Major Streets
- Streams | Creeks | Rivers + Riparian Corridors
- Primary Multiuse Trails
- Secondary Multiuse Trails and Bike Lanes
- Existing High Biodiversity Parks
- Blueways

Descriptions

- Major streets and radial streets identified in City Design, Design for Connections
- 100yr floodplains, streams, and stream buffers measured from 300' on each side of stream centerlines
- Primary trails identified in City Design (solid line) + proposed by UEF (dashed line)
- Secondary trails and bike lanes identified in City Design and other planning efforts (solid line) + proposed by UEF (dashed line)
- City of Atlanta Parks with areas of highest habitat and biodiversity
- Water trails in rivers and streams

0 1 2 miles

3.5 CONNECTIONS

CONNECTING COMMUNITY WITH NATURE BY CREATING PUBLIC SPACES AND URBAN DESIGN WHERE NATURE CAN THRIVE.

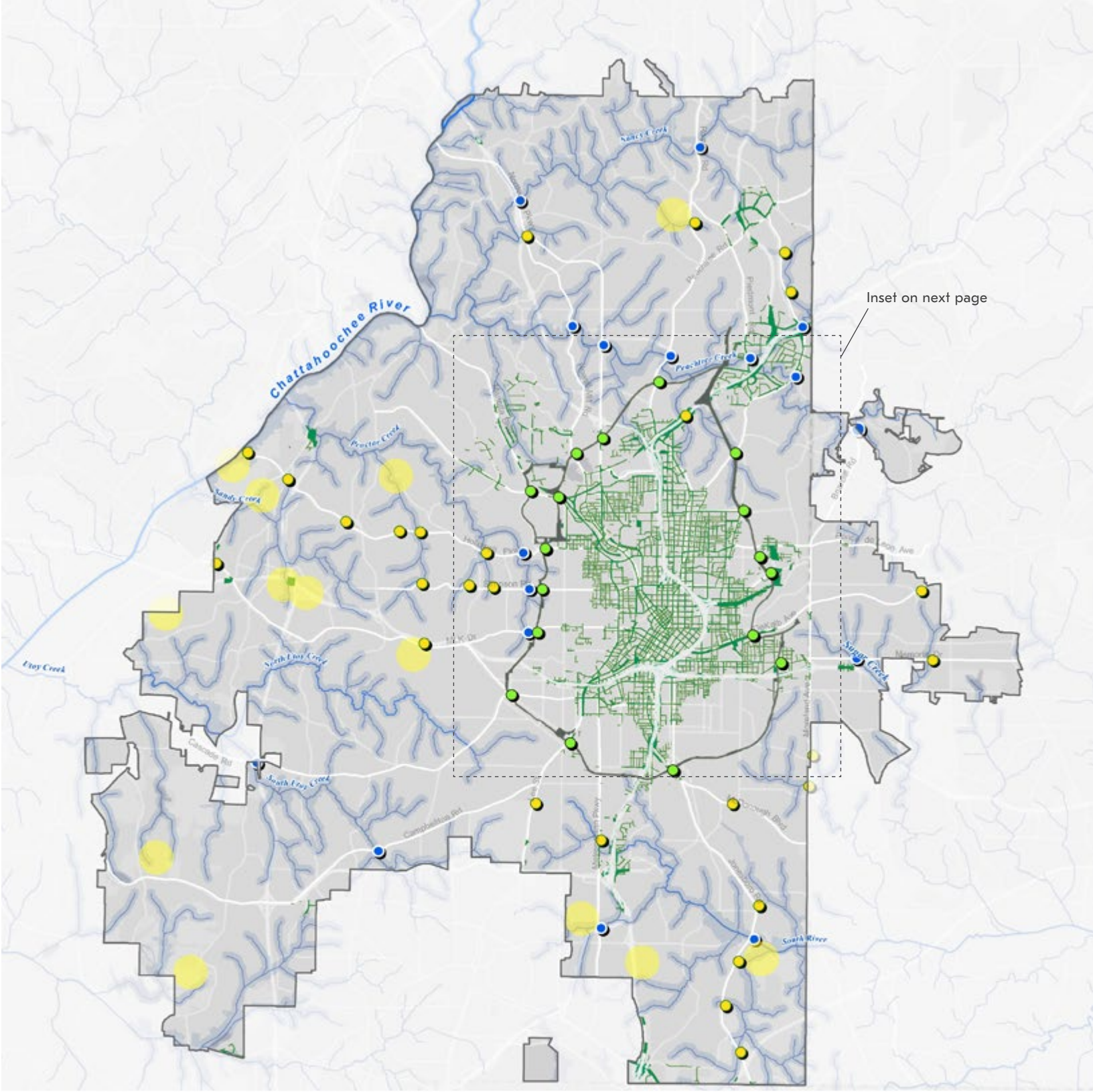
Urban nature will be made more visible and accessible with the creation of Nature Spaces—tangible and symbolic connections between people and nature. Nature Spaces will be built at the intersection of major city streets with streams, trails, and forest habitat connectivity corridors. These new Nature Spaces will be a doorway between urban Atlanta and the natural systems that underlie and support it. These will be new sites for cultural, educational, and artistic expression while demonstrating techniques and tools to preserve and enhance the City's natural resources.

Additionally, new parks are proposed in areas of high habitat and biodiversity value that are within park deserts and vulnerable community areas. Both Nature Spaces and new parks will make nature more visible and access to nature more equitable while celebrating and respecting the unique ecology of Atlanta.

OPPOSITE **Proposed Nature Spaces**

Recommendations

- **Highlight** Nature Spaces at locations around the city with new public spaces that integrate green infrastructure practices, urban forest, streambank and stream buffer enhancements, and reconnect floodplains.
- **Prioritize** Department of Watershed Management's Green Infrastructure Strategic Action Plan goals and projects.
- **Develop** consistent signage and wayfinding that highlights the City's natural resources and connects more communities with green spaces, highlighting thoughtful urban design.
- **Integrate** best practices of green infrastructure for stormwater in the public realm to clean, capture, and hold stormwater in the landscape closer to where it falls. These practices support cleaner downstream waterways:
    - Streetscape swales and bioretention with a diverse native plant palette
    - Rain gardens
    - Turf conversion to meadow, native grasses, and lo1w/no mow lawn alternative grasses
    - Steam channel restoration
    - Wetland and floodplain restoration where appropriate
    - Green roofs and living walls



Legend

- Atlanta City Limits + Major Streets
- Streams | Creeks | Rivers + Riparian Corridors
- BeltLine Nature Spaces
- Waterway Nature Spaces
- Additional Nature Spaces
- Proposed Park in this Vicinity
- Street Tree Increase Area

Descriptions

Major streets and radial streets identified in City Design, Design for Connections

100yr floodplains, streams, and stream buffers measured from 300' on each side of stream centerlines

Proposed Nature Spaces identified in City Design at Beltline/ Waterway and Radial Street/Waterway intersections

Additional proposed Nature Spaces at Radial Streets within City Design Cores, Clusters, & Corridors, where they intersect High Ecological Value Areas

Areas of high urban heat island effect and high particulate air pollution that also have low tree canopy coverage

0 1 2 miles

CONNECTIONS INSIDE THE CORE AND ALONG GROWTH CORRIDORS

Inside the Core and along Growth Corridors, nature will be made more visible in the heart and arteries of the city. Nature Spaces will celebrate nature with memorable public spaces. In addition, the streetscape public realm will be revitalized with an expanded and diverse tree canopy and green infrastructure that cleans and infiltrates stormwater while creating urban pockets of nature. This will help reduce temperatures and improve air quality in the areas of the city where analysis showed some of the greatest heat risk and air pollution. Focusing on improving this condition in the downtown with help address this spatial inequity in the city. It will also help improve water quality of rainwater runoff high in the watersheds, before it reaches streams and floodplains.

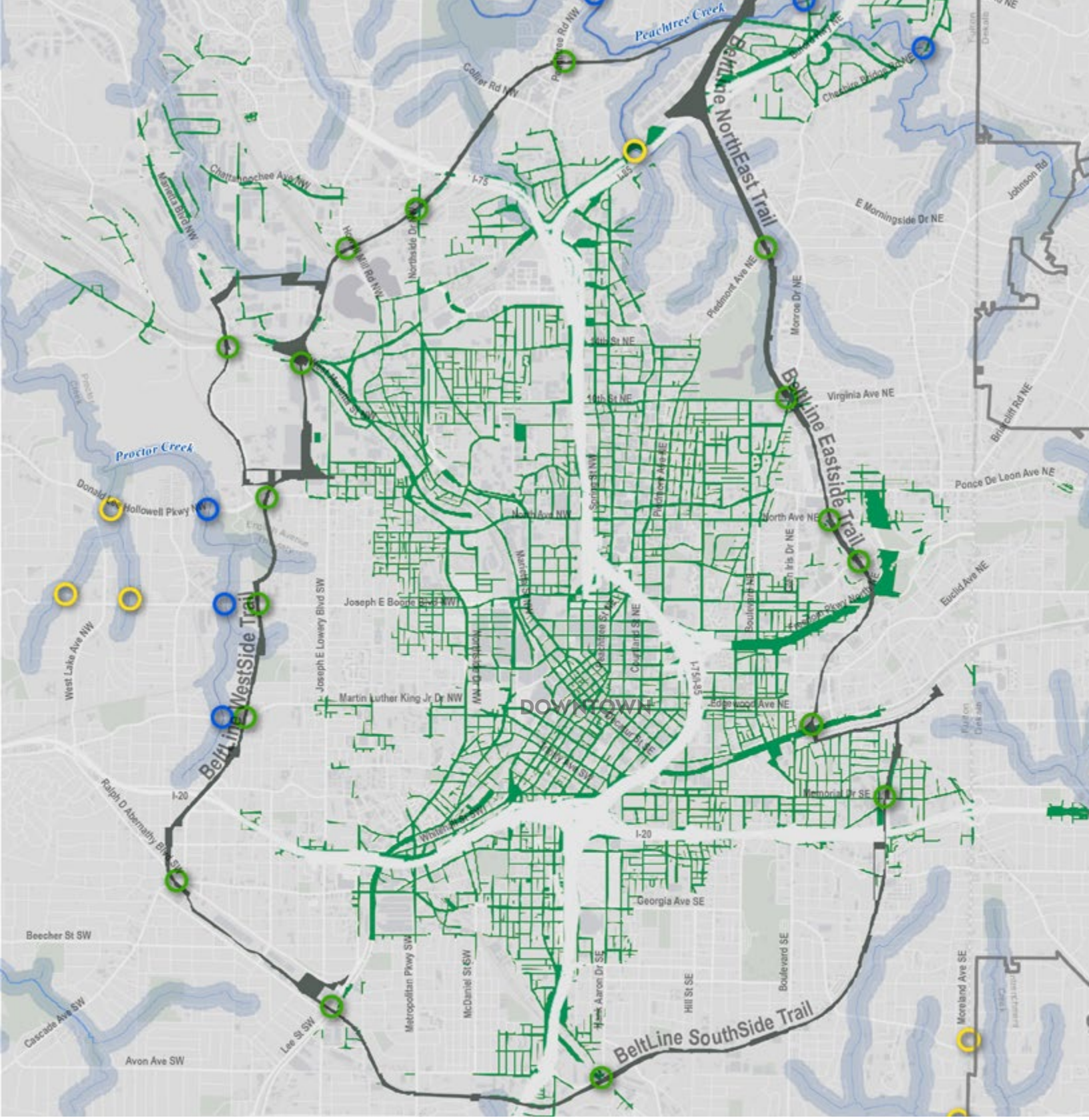
OPPOSITE Street tree needs in the urban core

Recommendations

- **Increase** tree canopy and vegetation by prioritizing a palette of diverse native species for canopy, understory, and groundcover in the public realm, and appropriate soil volumes to support them through maturity.
- **Celebrate** the urban forest through signage that highlights the importance of tree canopy in the urban core.
- **Invest** in active transportation infrastructure to reduce auto emissions and improve air quality within the downtown core.

Air Pollution and Urban Heat Island

- **Emphasize** streetscape revitalization in the urban core and growth corridors where urban heat island impacts are higher and air quality is lower.
- **Convert** traditional building roofs to green roofs and cool roofs, and implement the same in redevelopment, to reduce urban heat island impacts.



Legend

- Streams | Creeks | Rivers + Riparian Corridors
- BeltLine
- BeltLine Nature Spaces
- Waterway Nature Spaces
- Additional Nature Spaces
- Street Tree Increase Area

Descriptions

- 100yr floodplains, streams, and stream buffers measured from 300' on each side of stream centerlines
- Atlanta BeltLine corridor alignments
- Proposed Nature Spaces identified in City Design at Beltline/ Waterway and Radial Street/Waterway intersections
- Additional proposed Nature Spaces at Radial Streets within City Design Cores, Clusters, & Corridors, where they intersect areas of high Habitat & Biodiversity map values
- Areas of high urban heat island effect and high particulate air pollution that also have low tree canopy coverage

0 0.5 1 mile

OPEN SPACE ACCESS

Atlanta has many beautiful and well-used parks woven throughout its urban fabric. However, as discussed in Sec. 2.2, "Nature in the City" large areas of the city qualify as "park deserts," or areas where residents are beyond a 10-minute walk to a public park. Many of those same park desert areas are home to demographic groups that have been disproportionately affected by negative environmental impacts.

In proposing new locations for public parks, much consideration was given to park deserts and vulnerable populations. Additionally, recommendations factored in population density and the presence of high-quality forest and other habitat. New parks and trails that connect them can help ensure that all residents of Atlanta have reasonable walking access to quality public parks, while also protecting habitats that are important to the health of the city.

OPPOSITE **New park proposals for more equitable park access**

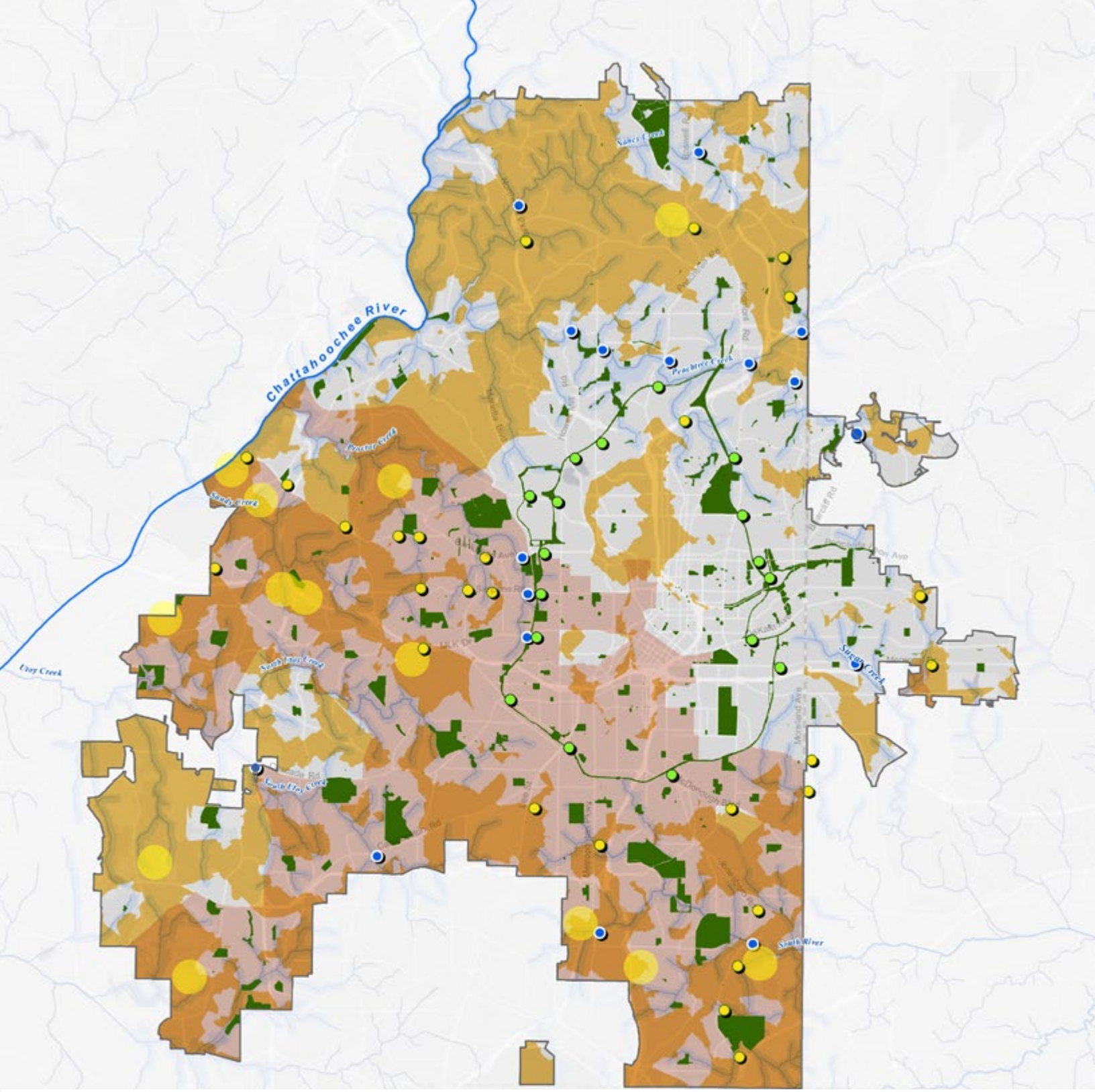
Recommendations

Park Deserts

- **Prioritize** new parks of Sec. 3.5 "Connections" and new trails of Sec. 3.4 "Retreat and Adventure" within park deserts.

Vulnerable Communities

- **Prioritize** new parks of Sec. 3.5 "Connections" and new trails of Sec. 3.4 "Retreat and Adventure" within socially vulnerable communities.
- **Restore** habitat in existing and proposed parks within socially vulnerable communities.



Legend

- Park Deserts
- Socially Vulnerable Areas
- Socially Vulnerable Park Deserts
- Parks + Atlanta BeltLine
- BeltLine Nature Spaces
- Waterway Nature Spaces
- Additional Nature Spaces
- Proposed Park in this Vicinity

Descriptions

- Park Deserts: Areas identified as lacking walkable accessibility to public parks
- Socially Vulnerable Areas: Areas in the most vulnerable 40% of GA census tracts on the Social Vulnerability Index
- Socially Vulnerable Park Deserts: Areas where Park Deserts overlap Socially Vulnerable areas
- Parks + Atlanta BeltLine: City of Atlanta Parks and Atlanta BeltLine corridor
- BeltLine Nature Spaces / Waterway Nature Spaces: Proposed Nature Spaces identified in City Design at Beltline/ Waterway and Radial Street/Waterway intersections
- Additional Nature Spaces: Additional proposed Nature Spaces at Radial Streets within City Design Cores, Clusters, & Corridors, where they intersect areas of high Habitat & Biodiversity map values

0 1 2 miles

3.6 LIFESTYLES

NEW GROWTH CLUSTERS FOR ECO-DEVELOPMENT.

Three new clusters of growth are proposed outside of the urban core, with an increased focus on nature and sensitivity to ecological resources:

Greenbriar

Bowen

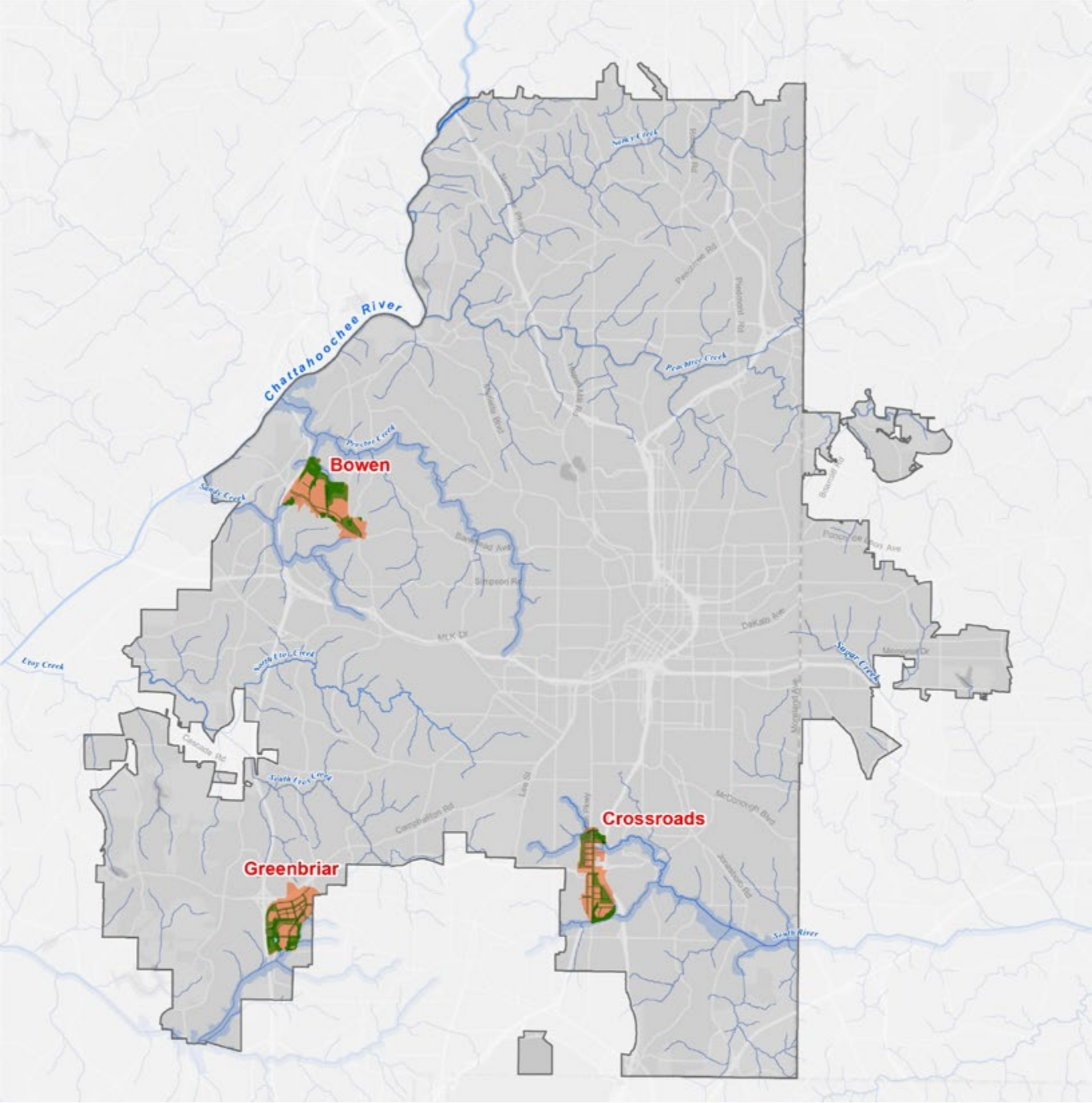
Crossroads

As nature-focused clusters for growth, these Eco-Developments establish a new development model and standard for sustainable urban design in Atlanta. They regenerate ecosystem services and protect and restore high quality urban habitat as part of the public realm. Here, development and resident lifestyles are organized around nature and ecological design principles.

OPPOSITE Proposed eco-developments

Recommendations

- **Focus** on protecting existing natural resources within Eco-Developments, including mature forest canopy, wetlands and stream habitat corridors, interior forest cores, habitat corridors, and high habitat and biodiversity zones.
- **Prioritize** integration of green infrastructure that reflects natural processes, celebrates water and the watersheds, and increases awareness of ecological connections in all new o
- **Integrate** healthy and diverse native tree canopy into streetscapes.
- **Implement** an awareness campaign to engage residents, highlighting the role that each individual has in promoting watershed health, reducing downstream impacts, and stewarding the existing high value resources found within the Eco-Development.
- **Support** denser development outside of the footprint of high value natural resources.
- **Follow** Eco-Development principles outlined in the Plan of Action.



Legend

- Atlanta City Limits + Major Streets
- Streams | Creeks | Rivers + Riparian Corridors
- Eco-Developments

Descriptions

- Major streets and radial streets identified in City Design, Design for Connections
- 100yr floodplains, streams, and stream buffers measured from 300' on each side of stream centerlines
- Identified in City Design, New Clusters for Eco-Development

0 1 2 miles

4 Plan of Action

Achieving the vision of Atlanta City Design: Nature requires cooperative and committed action, in undertakings both simple and grand. The Plan of Action to guide those efforts includes five strategies:

Equity —
create benefits for all of The Beloved Community.

Protect —
preserve The City in a Forest and its natural resources.

Restore —
revitalize and expand Atlanta's urban ecology.

Accentuate —
enhance the intersection of people and nature.

Steward and Engage —
actively care for the nature of Atlanta.

Together, these strategies support the realization of Atlanta City Design: Nature. These actions support each of the five design proposals from the previous section of Design for: Wildness, Comfort, Retreat and Adventure, Connections, and Lifestyles.

PREVIOUS **A Trees Atlanta volunteer performs maintenance along the BeltLine, where Trees Atlanta is working with partners to create an arboretum.**

Equity
Protect
Restore
Accentuate
Steward & Engage

4.1 EQUITY AND BENEFITS FOR ALL

The needs of all residents must be considered in any action that enhances nature in Atlanta. As Sec. 2 "Atlanta's Story of Place" described, specific resources such as public parks and tree canopy are not distributed equitably throughout the city. These disparities in access to ecological resources can limit the reach of the many benefits to physical and mental wellbeing that nature provides. Analysis identified several specific inequities including open space access, access to biodiverse green space, air pollution and urban heat island concentrations in vulnerable communities, and food access.

Enjoying the benefits of access to healthy and beautiful natural systems should be experienced equitably by all members of the community. Thus, equity is a consideration in any action set forth to implement Atlanta City Design: Nature. Examples are included throughout this framework plan.

OPPOSITE ABOVE **"Mother" Mamie Moore, community activist and equity advocate, speaks about the importance of new green infrastructure for a park in a westside neighborhood prone to flooding.**
OPPOSITE BELOW **Members of the Greening Youth Foundation construct compost bins at the city's first Urban Food Forest, in the Browns Mill neighborhood in southeast Atlanta. The Urban Food Forest allows community residents to harvest free fresh fruits and vegetables, year round.**

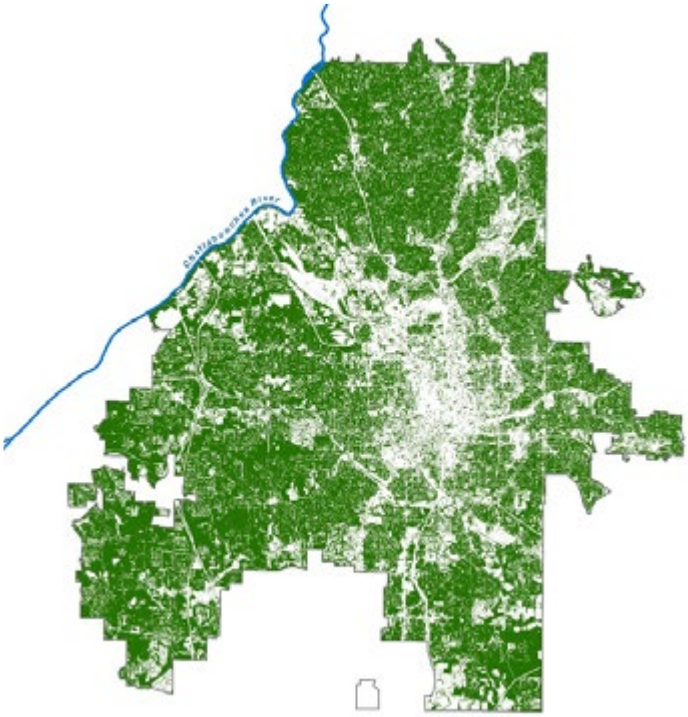
4.2 PROTECT

Atlanta's iconic urban forest provides numerous and diverse benefits. In the "City in a Forest," the aim is to protect all healthy trees. The unique circumstances of each site level protection and development decision must be balanced with the overall goal to protect unique and important forest resources throughout the city.

PROTECT PRIORITY

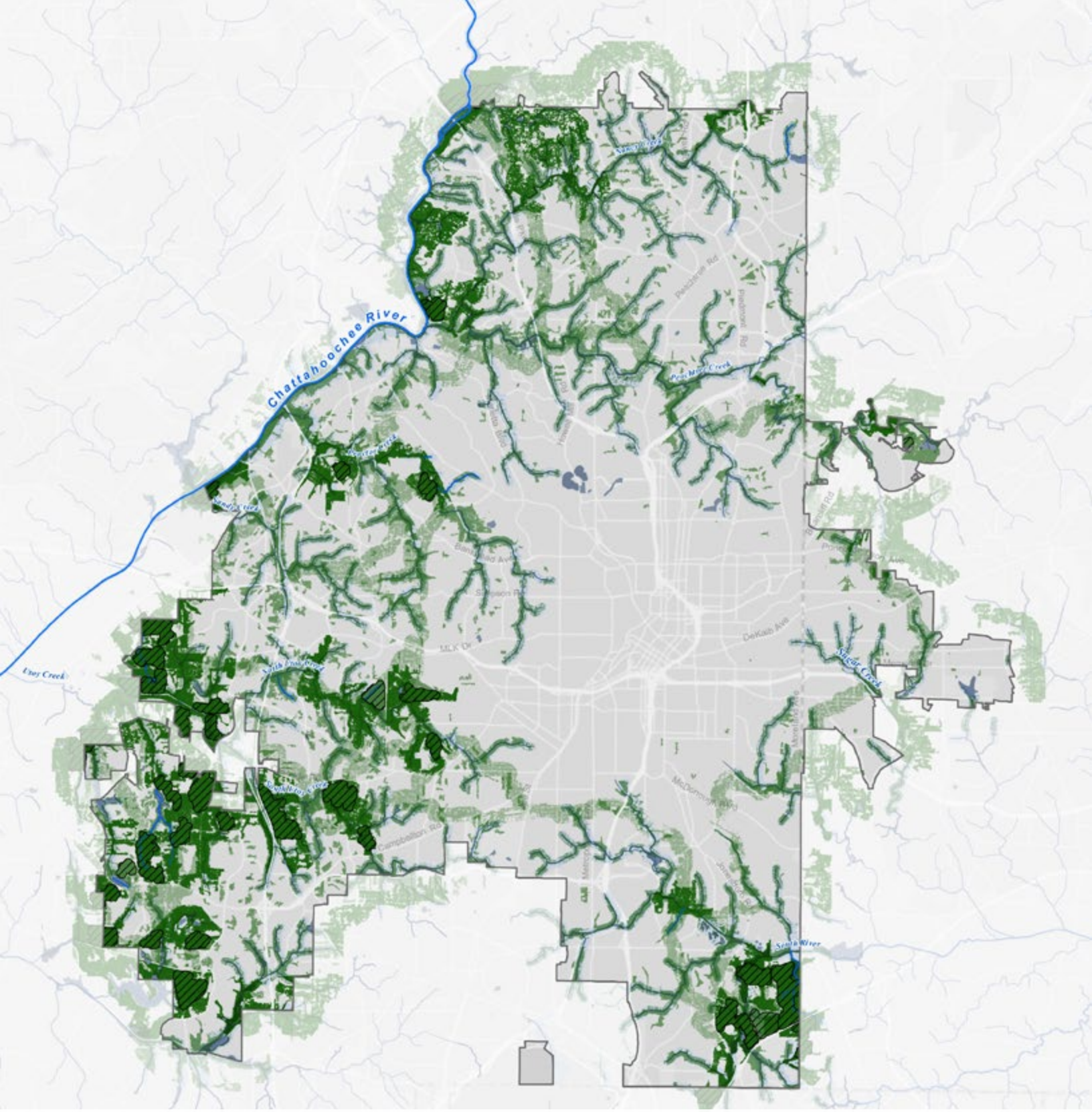
Forest of the highest value to Atlanta's urban ecosystems must have the most urgent protection priority to avoid the loss of critical habitat and biodiversity, ecosystem services, and park and open space resources. These priority areas will act as a guide for future development and redevelopment in the city. Their protection provides the foundation for the urban ecology of Atlanta's future. Protection in these areas must also prioritize management from threats such as non-native and invasive plant species and pests to ensure healthy plant communities and habitats.

OPPOSITE Areas most in need of ecological protection
INSET City of Atlanta Tree Canopy. In the "City in a Forest," the aim is to protect all healthy trees.



What is prioritized for protection

- Interior core forest and mature forest, rare species habitat, tree patches with city Champion trees, floodplain forest, and forest within 300' of streams.
- Existing wetlands and hydric soils with forest.
- Existing tree canopy within the forest connectivity corridors.
- Streams with less than 10% imperviousness in their local watershed, and the forest of those watersheds.



Legend

- Streams | Creeks | Rivers + Riparian Corridors
- Forest Connectivity Corridors
- High Ecological Value Areas
- Interior Forest Cores

Descriptions

- Streams and stream buffers measured from 300' on each side of stream centerlines
- Areas of high animal connectivity importance between Interior Forest Cores
- Areas of highest ecological value, including: interior forest cores, mature forest and soils, floodplain forest, wetlands, and areas with a value of 5 and 4 from Habitat & Biodiversity analysis
- Large intact forests that provide critical habitat for numerous woodland species

0 1 2 miles

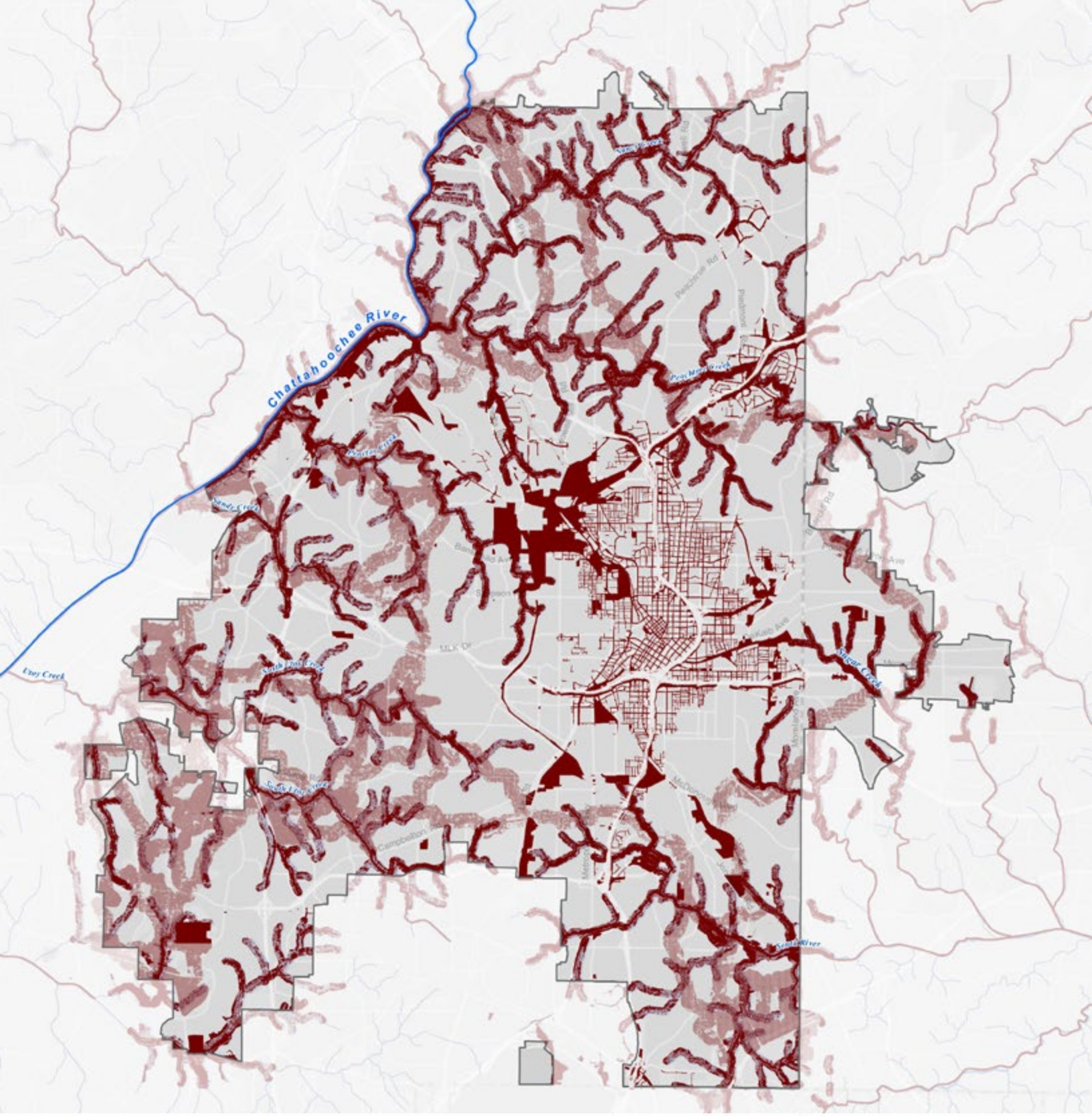
4.3 RESTORE

To achieve the vibrant and verdant city that Atlanta wants, the city must move beyond just protecting existing natural resources to restoring, expanding, and regenerating urban habitats, even as the city grows in population. Clearly communicating restoration priorities will provide all residents with an understanding of opportunities to promote improved health, habitat connectivity, and ecological function. These priorities will inform future development, redevelopment, and stewardship across the city.

OPPOSITE Areas most in need of ecological restoration

What is prioritized for restoration:

- Street tree canopy in urban core to improve air quality and decrease urban heat island impacts, with a diverse palette of native species.
- Streams with less than 60% tree canopy within the 75′ stream buffer.
- Unforested areas within forest connectivity corridors and 300′ stream habitat buffers-including reduction of pavement and addition of native vegetation, green infrastructure for stormwater, and green roofs.
- EPA 303d-listed impaired streams, streams with poorest water quality in the city.
- Brownfields and Heavy Industrial zoning outside of City Design Production areas.


Chattahoochee River
Peachtree Creek
Sandy Creek
Utoy Creek
South Utoy Creek
Nancy Creek
Peachtree Rd
Piedmont Rd
Ponce de Leon Ave
Boulevard
Bankhead Ave
MLK Dr
Cascade Rd
Lakewood Fwy
Metropolitan Pkwy
Campbellton Rd
Sylvan Rd
Cascade Ave
Sylvan Rd
Lakewood Fwy
Nancy Creek
Peachtree Creek
Sandy Creek
Utoy Creek
South Utoy Creek

TREE CANOPY EXPANSION

Tree canopy conservation and expansion in Atlanta are vital to the Protect and Restore strategies. Prior to this study, a previous City administration set a general goal for Atlanta to achieve a 50% tree canopy coverage. While a 50% tree canopy coverage is not a data-based ecological threshold derived from the Urban Ecology Framework analysis, there is value in rallying behind this specific, measurable tree canopy increase to motivate action and measure progress. Reaching this goal will be a challenge, especially considering the levels of growth anticipated in the city, but it is achievable. This goal requires not only stronger protection of Atlanta's existing tree canopy, but also bold actions to expand it. Canopy increase should be focused in Sec. 4.3 "Restore" priority areas, but also spread throughout the entire city to expand the benefits provided by the urban forest.

STATE OF THE CANOPY

- In October 2014, the **overall city tree canopy was 47.1%.**[1]
- An estimated **2.3% of 2014 tree canopy was temporary growth** in unfinished, permitted developments,[2] and therefore is not reliable long-term tree canopy. This early successional tree canopy will be cleared when construction restarts on these developments.
- From 2008 to 2014, **the greatest loss of tree canopy was in redevelopment of single-family residential homes.**[3]
- **20% of city trees are threatened by pests** that are present in the metro area, such southern pine beetle and emerald ash borer.[4]
- In a typical US city, **for every 100 street trees planted, 50 or fewer will survive to 13—20 years.**[5]

OPPOSITE The Chattahoochee River flowing through the Chattahoochee River National Recreation Area in northwest Atlanta.

1 Giarusso, A. (2019). *Assessing Urban Tree Cover in the City of Atlanta: The 2014 Canopy Study.* Center for Geographic Information Systems, Georgia Institute of Technology.
2 Ibid.
3 Ibid.
4 Kuehler, E. A. (2016). *i-Tree Ecosystem Analysis: Atlanta, Urban Forest Effects and Values.* USDA Forest Service, Northern Research Station.
5 Roman, L. A., and Scatena, F. N. (2011). Street tree survival rates: Meta-analysis of previous studies and application to a field survey in Philadelphia, PA, USA. *Urban Forestry & Urban Greening,* 10(4), 269-274.

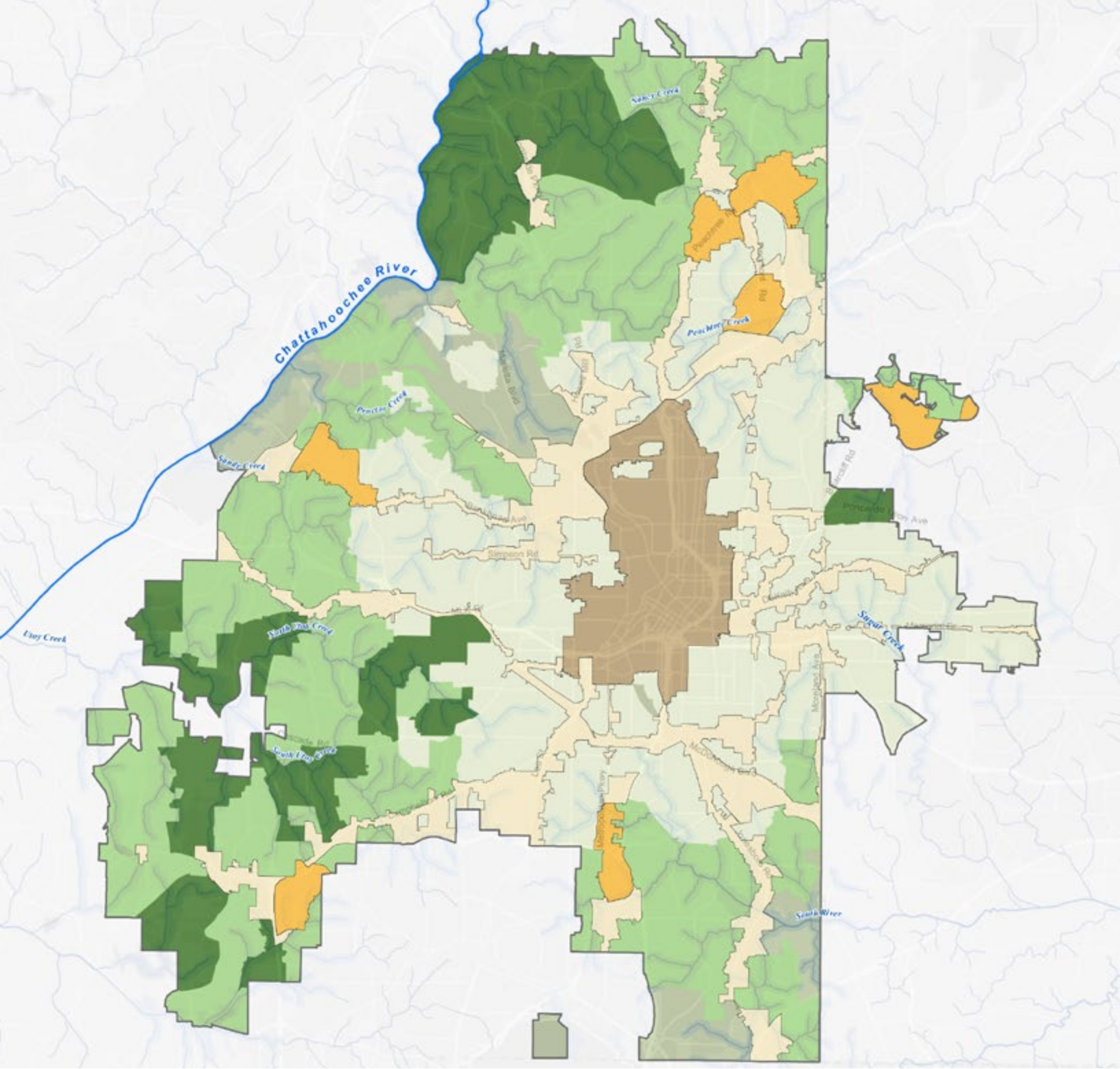
How Does Atlanta Get to 50%?

To meet and overcome these challenges the following is proposed:

- Develop a citywide Urban Forest Management Plan to incorporate and expand on these actions.
- Protect existing tree canopy coverage in neighborhoods throughout the city, with most urgent action within Sec. 4.2 "Protect" priority areas.
- Implement a major young forest initiative to plant the equivalent of 3,600 new acres of trees and manage them to maturity. This must include new plantings on private property as well as an extensive public-realm tree planting initiative of diverse tree species with soil volumes sufficient for trees to reach mature size.[6]
- Replace dead trees in managed landscapes such as parks, streetscapes, and around residences and businesses. Outside of land managed as forest, new trees in the city are generally planted by people.
- Conduct and maintain a citywide public realm tree inventory to inform new planting and management.
- Collect and assess statistics on city tree mortality and growth and quantity of newly planted trees to track the trajectory of forest and planted public realm trees. Tree mortality over time is inevitable, and tree canopy expansion requires exceeding tree mortality.

The table to the right proposes more detailed tree canopy goals based on Atlanta City Design plan areas. Goals are based on past canopy trends and area potentially available for tree planting. Core, Clusters, Corridors, and Urban areas will require significant canopy increase and public realm investment to meet this goal. This increase aligns with the public realm areas in Sec. 4.3 "Restore." As City Design Growth Areas of Core, Clusters, and Corridors increase in population and development density, development must balance the need for increased density with preservation of existing natural resources and growing new tree canopy. Production, Suburban, and Rural areas will require a focus on reversing their recent trend of canopy loss and planting new trees to increase canopy on private land.

[6] The 3,600 acres recommendation represents approximately 5.2% of the current city area. It is based on the estimated 2.9% tree canopy increase needed to go from 47.1% in 2014 to 50% and to offset for the approximate 2.3% of 2014 tree canopy that was temporary growth.



CITY DESIGN CATEGORY	% OF TOTAL 2014 CANOPY	2008 CANOPY	2014 CANOPY	CHANGE (2008-2014)	GOAL	CHANGE NEEDED	MAJOR INITIATIVE*	PROTECT & PLANT^
Core	2%	7%	11%	+4%	15%	+4%	X	
Clusters	1%	26.5%	26%	-0.5%	35%	+9%	X	
Corridors	8%	25%	27%	+2%	30%	+3%	X	
Production Areas	3%	28%	27%	-1%	27%	0%		X
Urban	19%	48%	50%	+2%	55%	+5%	X	
Suburban	39%	59%	58%	-1%	60%	+2%		X
Rural	28%	70%	65%	-5%	67%	+2%		X

0 1 2 miles

*Major public realm tree planting of diverse tree species, soil volume, tree management, and replacement initiative
^Protection of tree canopy and new planting of diverse species

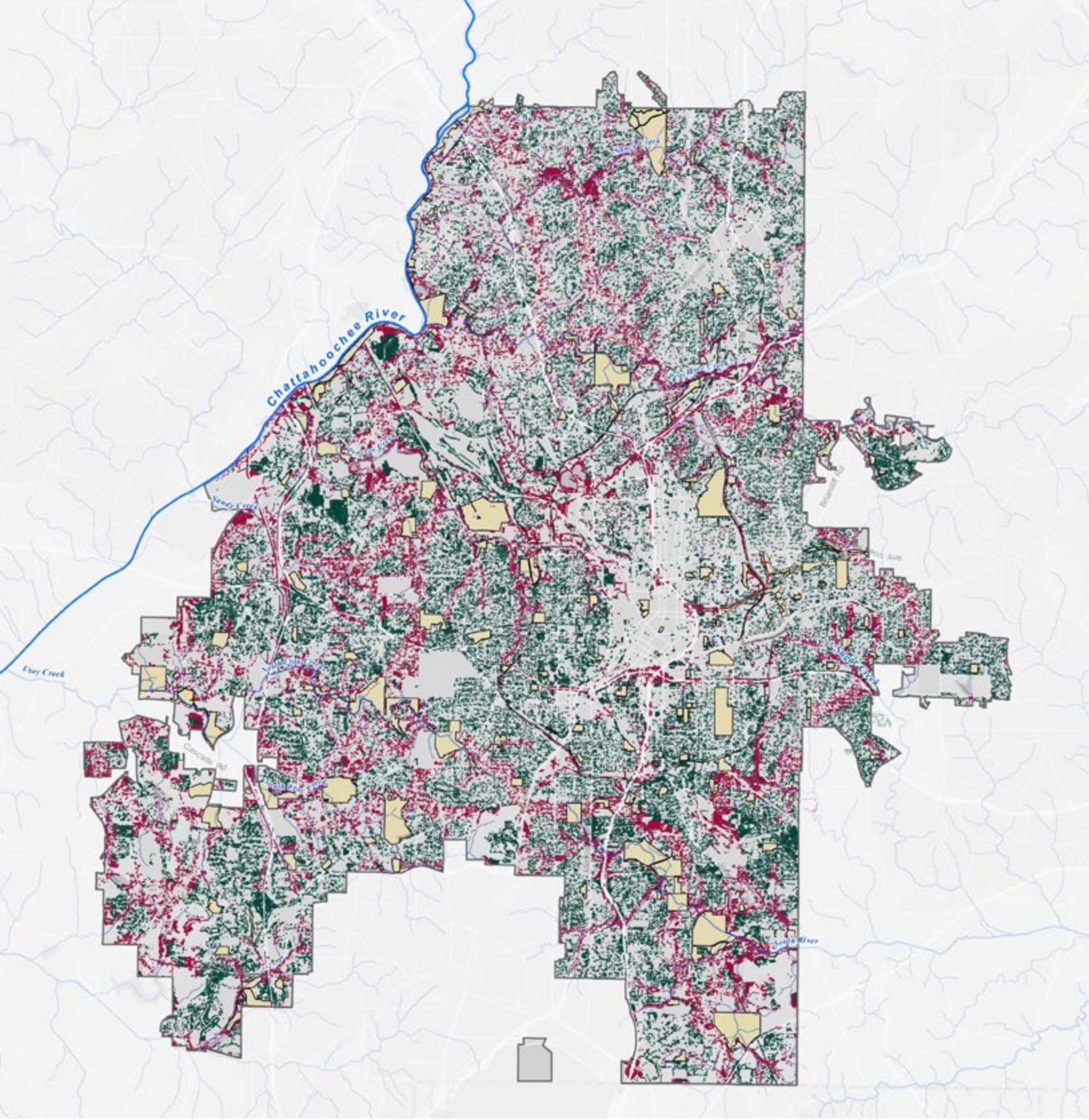
TREE CANOPY EXPANSION OPPORTUNITIES: WITHIN PARCELS

An analysis of land potentially available for new tree plantings supports the feasibility of the canopy goals on the previous page. This analysis began by looking at individual parcels across the city and identifying lawns and other landcover that is vegetated but lacks tree canopy. Several large areas such as major utility easements, cemetaries, golf courses, and sports fields were removed from that landcover selection due to physical or programmatic restrictions that may prohibit new tree plantings. As seen on the map of the resulting analysis to the right, there are thousands of small opportunities scattered across Atlanta, largely on private property. These numerous planting opportunities on private property call for a City strategy of incentivizing and assisting the planting of trees at residences and businesses. Strategies could include education and outreach on the benefits of planting new native trees, expanded planting partnerships with local non-profits, tree giveaways, and grants to neighborhoods and individuals.

Larger contiguous patches for potential tree planting on private land can be found in the north near Nancy Creek, in the west near the Chattahoochee River and in the Proctor Creek and Sandy Creek watersheds, in the southwest in the Utoy Creek watershed, and in the southeast in the South River watershed. Sec. 4.3 "Restore" priority areas should be prioritized for new planting, which often follow the floodplains of Atlanta's waterways, and are mostly on private property.

Many of the larger City-owned parcels are fully forested, but there are some important opportunities on properties near Peachtree Creek and its tributaries, Proctor Creek, Utoy Creek, and South River. In those parcels the City can take direct action. However, achieving a goal of a 50% tree canopy, and the associated ecological benefits, will require citizens on their own land to be engaged in new tree planting and stewardship.

OPPOSITE Areas of the city within parcels that have needs and opportunities for new tree planting.



Tree Planting Opportunities Within Parcels

- City-Owned Parcels (>= 2 acres)
- Tree Planting Opportunities in **Restore** priority areas
- Tree Planting Opportunities outside of **Restore** priority areas

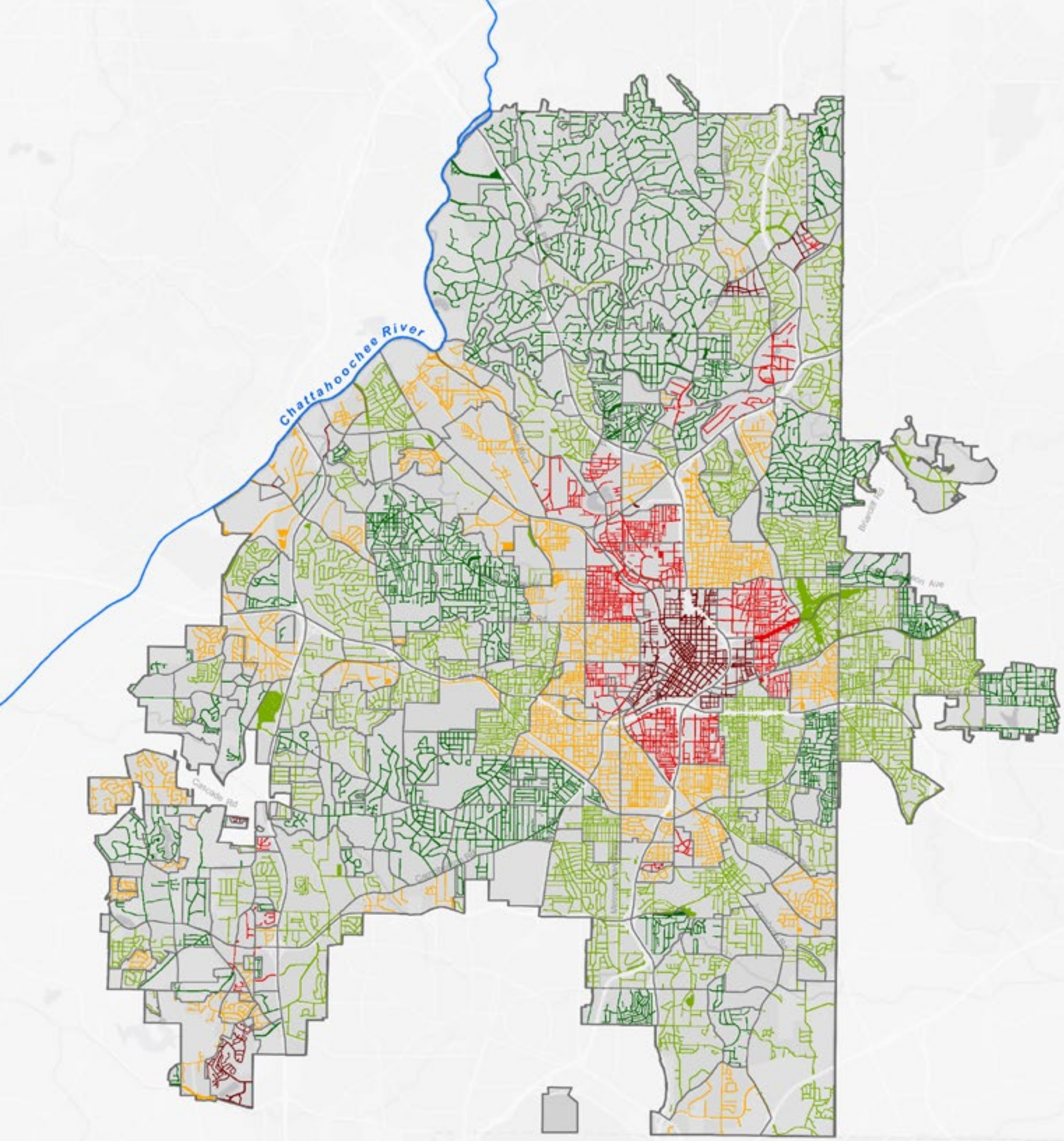
0 1 2 miles

TREE CANOPY EXPANSION OPPORTUNITIES: WITHIN STREET ROW

Street rights-of-way also offer significant opportunities for new tree planting in Atlanta to benefit urban habitat, ecosystem services, and the public realm experience. Sec. 3.5 "Connections" and Sec. 4.3 "Restore" have recommendations for street tree increase that primarily focuses on the downtown core because with its low tree canopy, higher air pollution, and high heat island conditions, tree planting here would create unique public health and environmental benefits. Other areas of the city also have street tree needs and right-of-way tree planting opportunities. A pattern of neighborhoods radiating out from the downtown core and stretching along the west boundary of the city has lower tree canopy coverage compared to some adjacent neighborhoods with right-of-way tree canopy coverage greater than 30% and up to 66%.

OPPOSITE Neighborhoods that have needs and opportunities for new tree planting in street rights-of-way.

ABOVE West Peachtree Street in Midtown is lined with Chinese Elms (*Ulmus parvifolia*). The Midtown Alliance has been responsible for significant street tree planting over the past two decades.



Percentage of Tree Canopy Cover Within Street ROW Summarized by Neighborhood

- 0% - 10%
- > 10% - 20%
- > 20% - 30%
- > 30% - 40%
- > 40% - 66%

0 1 2 miles

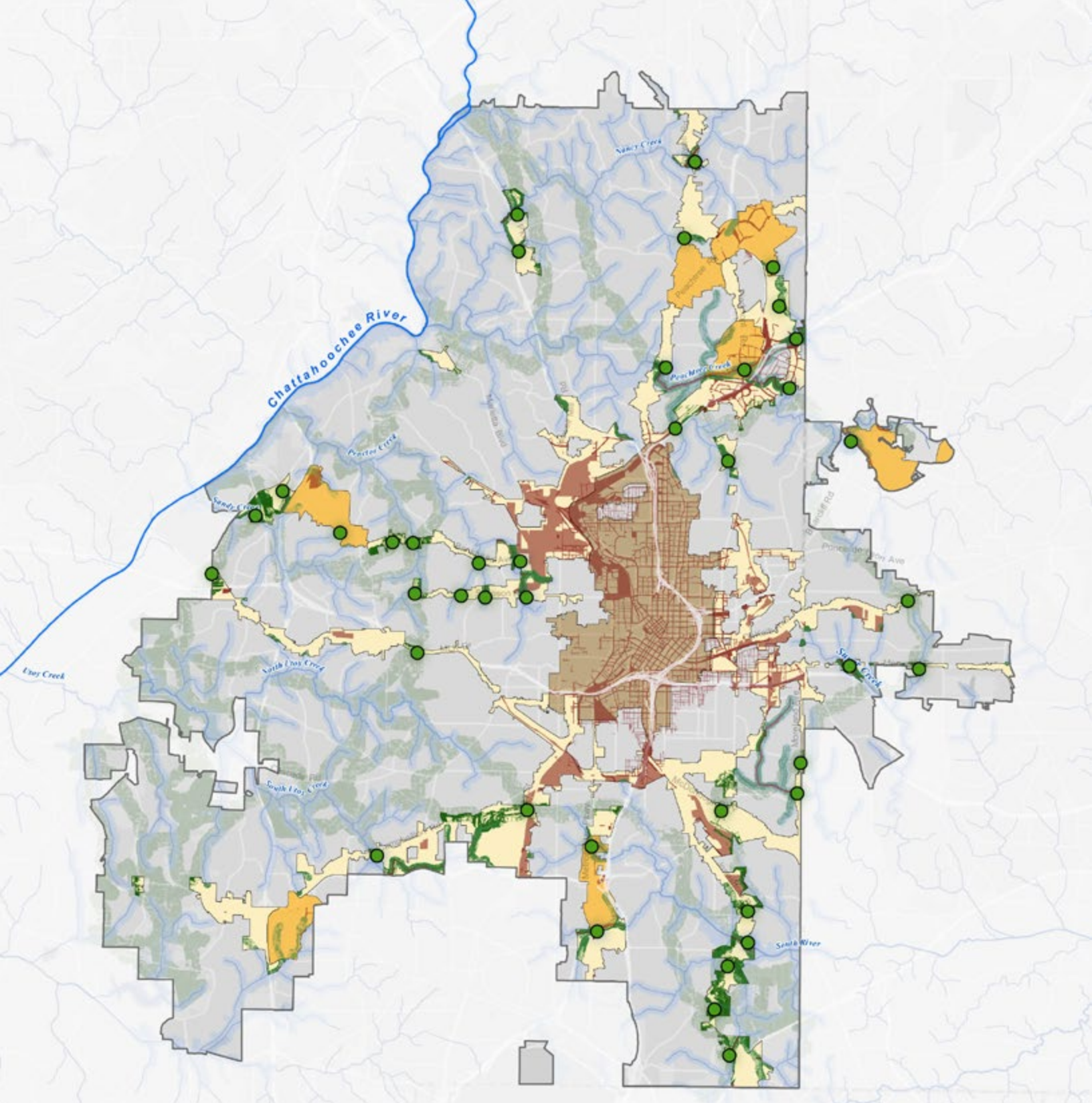
4.4 PROTECT AND RESTORE IN GROWTH AREAS

In practice, Sec. 4.2 "Protect" and Sec. 4.3 "Restore" will work together to guide change in Atlanta. For example, where forest currently exists in stream buffers and floodplains, it needs to be a protection priority. That same forest is often fragmented by lawn or paving, and reforestation and green stormwater infrastructure would help reconnect and restore integrity to the forest fragments.

This dynamic is further illustrated in the interaction of Atlanta City Design Growth Areas with "Protect" and "Restore." The growth called for in these areas and the predicted population increase is anticipated to trigger significant redevelopment. Even within the denser Growth Areas redevelopment must be sensitive to the natural resources that maintain the health and quality of life of Atlanta's residents and the integrity of its ecosystems.

The downtown Core calls primarily for restoration focused on the city streetscape. Clusters and Growth Corridors, however, contain some high value ecological resources that require protection even as redevelopment increases density in those areas. Streams and forest habitat connectivity corridors that cross these Clusters and Growth Corridors must also be protected to maintain ecosystem health on either side of the Growth Areas and beyond. If Growth Areas are redeveloped without regard to maintaining environmental connectivity at these stream and forest corridor crossings and intersections, important ecological functions would be impacted. In many instances, these environmental connections have already been disrupted by past development, and protection alone is not enough. Some areas will require restoration to enhance connections across existing and proposed development. Key intersections are marked by newly proposed Nature Spaces which should celebrate and improve these connections while providing opportunities for the public to engage with nature in the denser areas of the city. Here the vibrant city and the verdant forest interact directly.

OPPOSITE Ecological protection and restoration needs in Atlanta City Design Growth Areas



Legend

- Atlanta City Limits + Major Streets
- Streams | Creeks | Rivers
- Priority Protect Areas
- Priority Restore Areas
- Nature Spaces

Descriptions

- Major streets and radial streets identified in City Design, Design for Connections
- Streams and stream buffers measured from 300' on each side of stream centerlines
- Areas of high ecological importance prioritized in Sec. 4.2 "Protect"
- Areas prioritized in Sec. 4.3 "Restore"
- Nature Spaces at intersection of Priority Protect and Restore Areas with City Design Core, Clusters, & Corridors

0 1 2 miles

4.5 ACCENTUATE

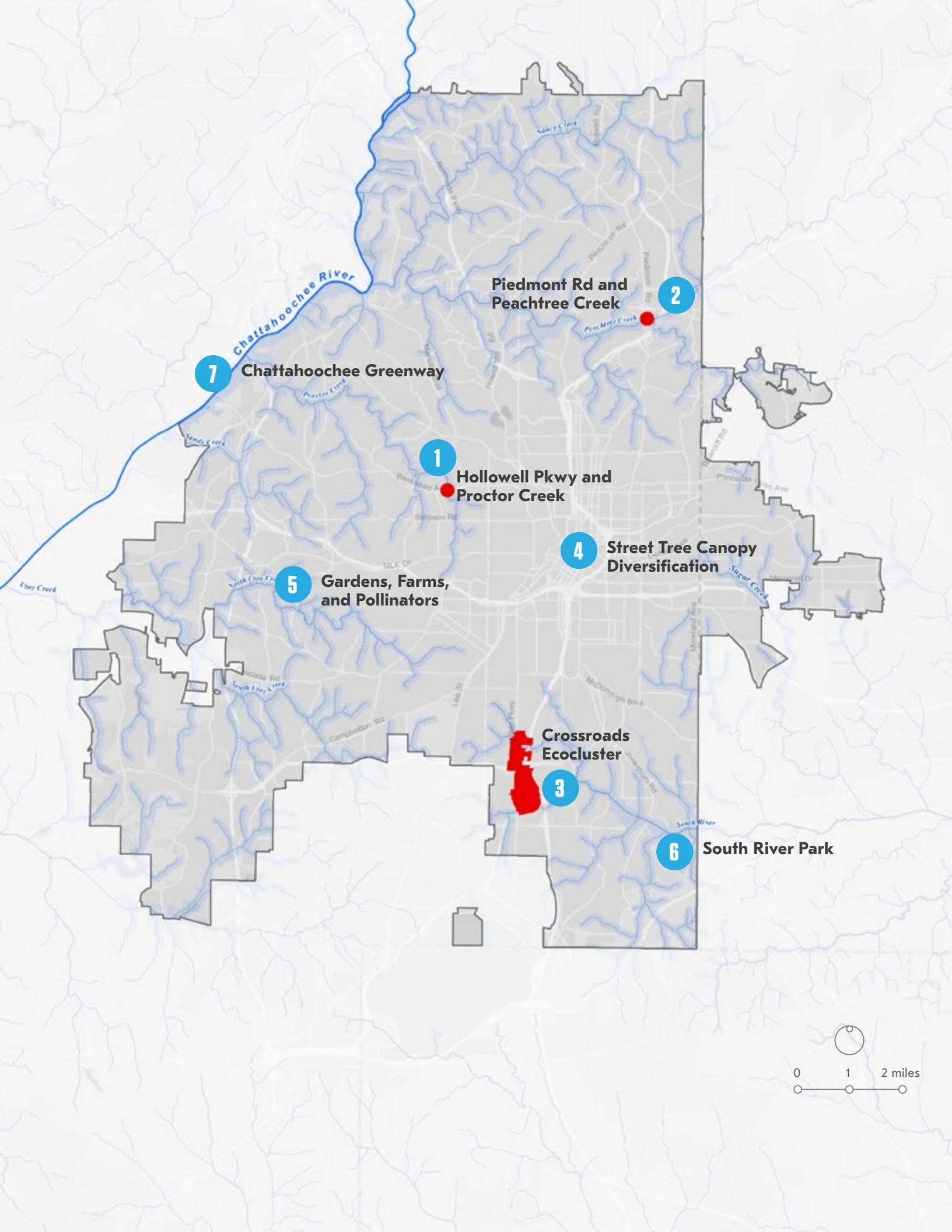
Within the urban ecological fabric of Sec. 4.2 "Protect" and Sec. 4.3 "Restore," Atlanta will also celebrate ecology through urban design and "Accentuate" the intersection of people and nature.

While "Protect" and "Restore" are continuous threads of a green network, "Accentuate" generally represents project-specific actions within that network, which may be part of short, medium, or long-term phasing for implementation. These opportunities make the Nature value of Atlanta City Design even more explicit in the city landscape. In addition to work at the sites highlighted to the right, efforts such as creating signage and mapping that highlight watershed identity will bring people into closer relationship with the natural framework that underpins their surroundings.

Projects featured on the following pages:

- ***Hollowell Parkway and Proctor Creek***
- ***Piedmont Road and Peachtree Creek***
- ***Crossroads Ecocluster***
- ***Street Tree Canopy Diversification***
- ***Gardens, Farms, and Pollinators***
- ***South River Park***
- ***Chattahoochee Greenway***

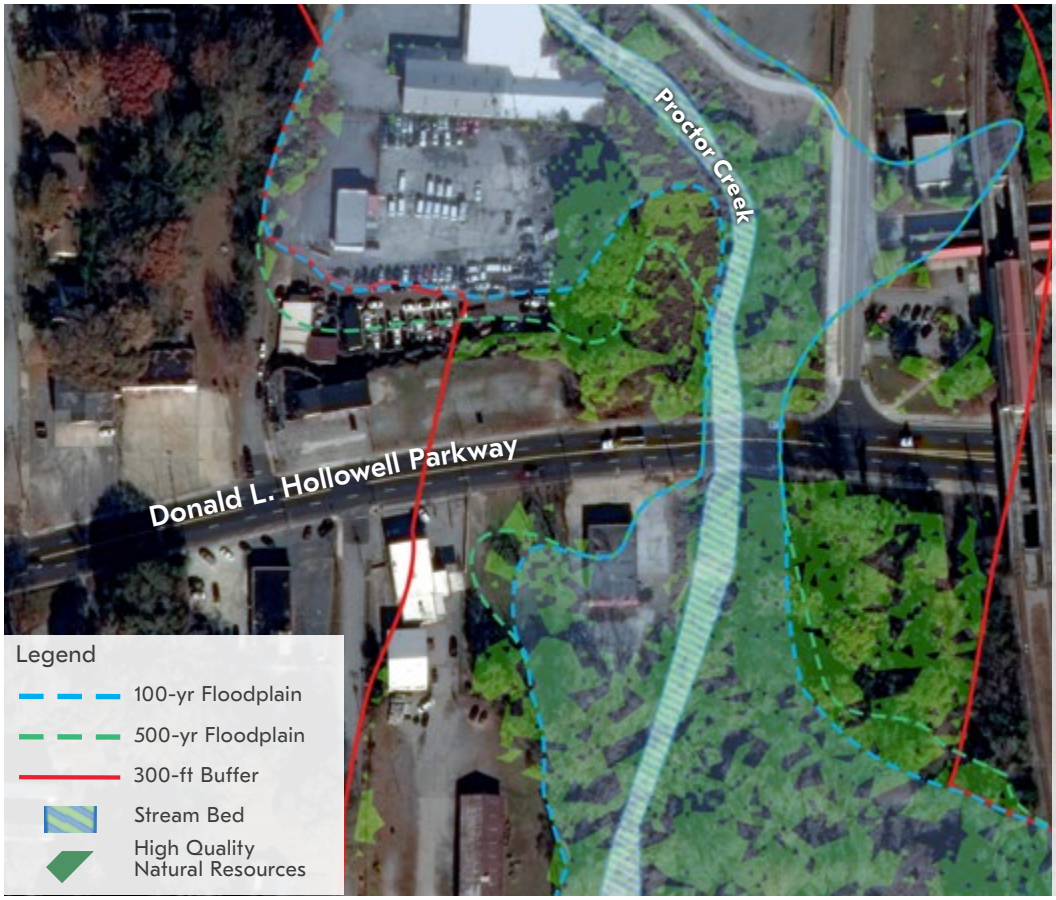
OPPOSITE Projects to integrate nature and urban design


Chattahoochee River
Piedmont Rd and Peachtree Creek
2
7
Chattahoochee Greenway
1
Hollowell Pkwy and Proctor Creek
4
Street Tree Canopy Diversification
5
Gardens, Farms, and Pollinators
Crossroads Ecocluster
3
6
South River Park
0
1
2 miles

1 Hollowell Parkway and Proctor Creek
Nature Space

The area along Donald L. Hollowell Parkway, where it crosses Proctor Creek, is poised for significant change. Anchored by the Bankhead MARTA station, the surrounding lots have featured a diverse mix of land uses in recent years, including Maddox Park to the southeast, a public office building to the northeast, vacant industrial land to the northwest, and vacant commercial land to the southwest. Running north through this urban environment is Proctor Creek, its banks overgrown with kudzu and littered with refuse. The stream's watershed drains an area of Northwest Atlanta that has suffered from disinvestment for decades, and struggled with issues including flooding and pollution, and the evidence of high stormwater flows are visible in the scouring of the banks.

For over a decade, planning for the creation of the city's largest park (Westside Quarry Park, less than a mile north) has prompted renewed interest in the area. In 2018, the PATH Foundation's Proctor Creek Greenway multi-use trail opened, providing a new active connection to nature and surrounding amenities. Quarry Yards, a major mixed-use project along the west bank of the creek is slated to bring hundreds of new housing units, in addition to office and commercial



EXISTING SITE

This site offers key opportunities to incorporate elements of **Protect** and **Restore**:

- **Protect** current high-quality natural resources.
- **Restore** the floodplain forest with increased plantings to better provide a functional habitat buffer along the creek corridor.
- **Restore** the creek by reconnecting it to its floodplain, providing improved ecological function and habitat.

space. These conditions, combined with a mandate to improve the quality of the stream (already underway with a DWM project south of Hollowell), made this location a prime candidate for a new Nature Space, as described in Sec. 3.5 "Connections."

This nature space concept seeks to build off the area's progress, improving the ecological health and functioning of the stream and its buffer, and elevating community awareness of the stream and interaction with a healthier natural corridor.

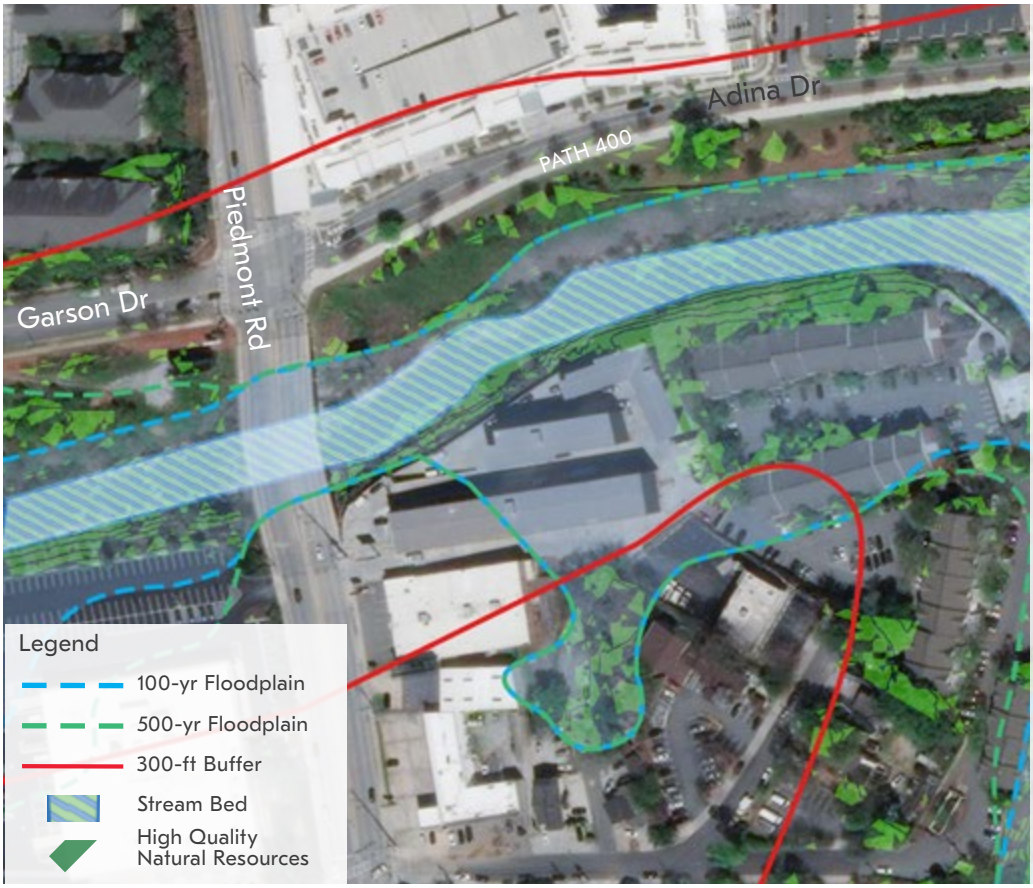
PROPOSED CONCEPT

1. New bridge with increased span, allowing for increased tree canopy in the streetscape, improved visibility of stream, and expanded/ reconnected floodplain
2. Expanded and enhanced floodplain, combining green infrastructure and recreation
3. 300' stream habitat buffer zone on each side of the creek with increased tree canopy and ecologically protective zoning
4. Increased access to the stream corridor with paths
5. Increased visibility of the stream, via new bridge and paths
6. Integrated green infrastructure stormwater management practices (DWM)
7. Integrated public art projects

2 Piedmont Road and Peachtree Creek
Nature Space

Piedmont Road is an arterial providing an important north-south connection between Midtown and Buckhead. Peachtree Creek is the city's largest stream, a prominent natural corridor that provides wildlife a critical connection through the built environment. The bridge where Piedmont Road passes over Peachtree Creek is only a few hundred feet west of where Peachtree Creek's two forks converge, combining the watersheds of thousands of acres. Less than half a mile to the northwest, Lindbergh Center is Atlanta's first Transit Oriented Development of a MARTA rail station, a successful mixed-use project that has helped attract significant new development nearby.

In recent years, the area has transitioned from primarily light industrial and commercial uses, to a more prominent mix of housing, with hundreds of units constructed on the north side of Peachtree Creek along Adina Drive and Garson Drive. New multi-use and pedestrian trails have been developed, including PATH 400 and the South Fork Conservancy's Confluence Trail. Additional trail connections have been planned for the coming years, with a BeltLine connection proposed to reach the area from the southwest and the Peachtree Creek Greenway to arrive along Peachtree Creek's North Fork.



EXISTING SITE

This site offers key opportunities to incorporate elements of **Protect** and **Restore**:

- **Protect** current high-quality natural resources.
- **Restore** the floodplain forest with increased plantings to better provide a functional habitat buffer along the creek corridor.
- **Restore** the creek by reconnecting it to its floodplain, providing improved ecological function and habitat.

CONNECTIONS

Short-Term Implementation

Given the prospect for this area becoming a hub of active transportation, and with the potential to make significant improvements to the ecological functioning of Peachtree Creek's riparian buffer, this site was chosen for a proposed Nature Space. This nature space concept seeks to build off the area's progress, improving the ecological health and functioning of the stream and its buffer, and elevating community awareness of the stream and interaction with a healthier natural corridor.

PROPOSED CONCEPT

1. New bridge with widened span, allowing for increased tree canopy in the streetscape and improved visibility of the stream
2. Expanded and enhanced floodplain, combining green infrastructure and recreation
3. 300' stream habitat buffer zone on each side of the creek with increased tree canopy and ecologically protective zoning
4. Increased visibility and access to the stream corridor with new paths and bridges
5. Complete greenway and BeltLine trail connections planned to converge at this intersection
6. Integrated green infrastructure stormwater management practices
7. Integrated public art projects

3 Crossroads EcoCluster
Eco-Development

Eco-Developments are a concept introduced in *Atlanta City Design.* They are intentional redevelopments that emphasize the community's relationship to nature, and model resilient and sustainable strategies for growth areas. They take a hybrid design strategy that combines compactness of built form, walkability, and transit within an ecologically-focused plan. They are supported by new or existing transit, and investments in parks and the public realm. Crossroads is one of the three clusters first proposed in *Atlanta City Design.*

EXISTING SITE

GUIDING PRINCIPLES

- Preserving and restoring wetlands and restoring native vegetation in hydric soils.
- All streams are supported by a 300′ stream habitat buffer on each side of the stream. When buildings are sited within that buffer, the first 75′ is vegetated.
- Sustainable SITES / LEED Neighborhood Design evaluation for all development.
- Goal of 50% tree canopy throughout.
- Decrease impervious surface on redevelopment sites by a minimum of 20%. Use green infrastructure for stormwater.
- Main arterial streets are prioritized for multimodal access.
- Providing a park or pocket park within 10-minute walking distance of every resident.
- Providing opportunities to compost on site.
- 75% of new vegetation is native species, with 25% available for non-invasive nonnative cultivars; 25% of species planted supporting native pollinator species; each block of tree canopy includes at least three distinct species.
- Green roofs for stormwater management and habitat.
- Use tree lawns/verges to create green space within streetscape.

PROPOSED CONCEPT

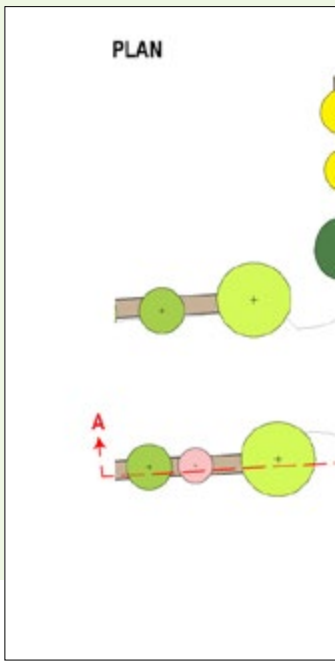
1. Innovative, ecologically-focused, mixed-use district, developed through complete environmental remediation of existing, highly impervious developed parcels
2. Protection and enhancement of existing high quality natural resource areas
3. Integrated parks and streetscape network with diverse tree canopy and green infrastructure practices
4. Innovative recreational, mobility, and public art practices, including complete street redesign of Metropolitan Parkway
5. Metropolitan Parkway and Langford Parkway Bus Rapid Transit, providing direct access to the Airport (3.5 miles) and Lakewood-Fort McPherson MARTA Station (1.25 miles)
6. Integration with Atlanta Metropolitan State College campus
7. All new construction to achieve SITES/LEED certification

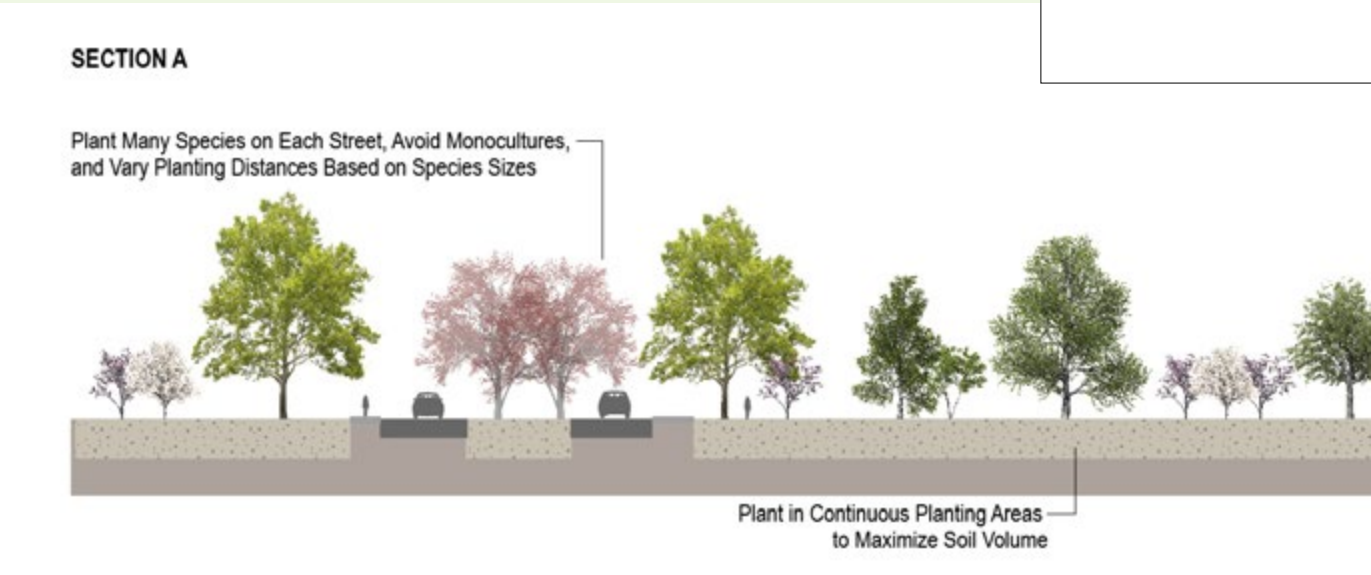
4 Street Tree Canopy Diversification

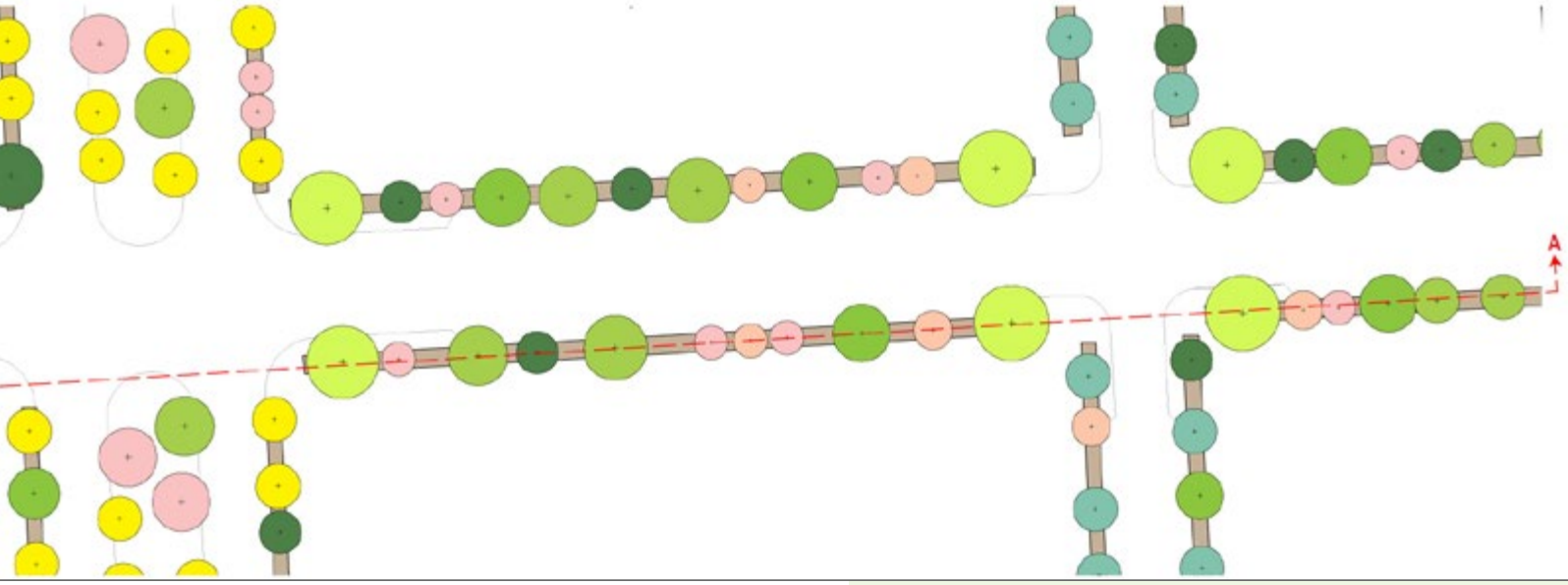
As part of the public realm improvements inside the Core and along Growth Corridors noted in Sec. 3.5 "Connections," streetscape standards should be revised to increase urban habitat and ecosystem services.

URBAN CORE STREET TREE CANOPY IMPROVEMENTS

- Diverse native palette — no monocultures.
- Adequate soil volumes or continuous beds for plantings to support mature trees
- Incorporate trees into green stormwater infrastructure



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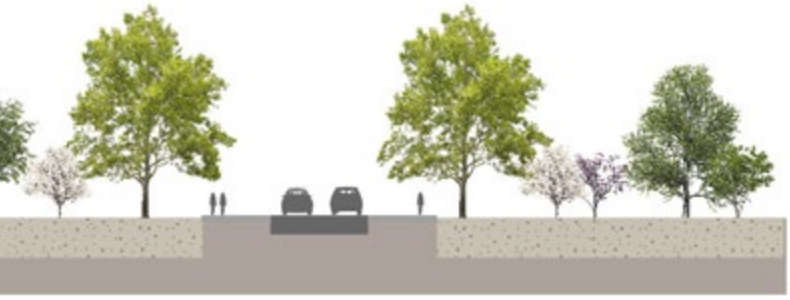


5 Gardens, Farms, and Pollinators

CONNECTIONS

Short- to Medium-Term Implementation

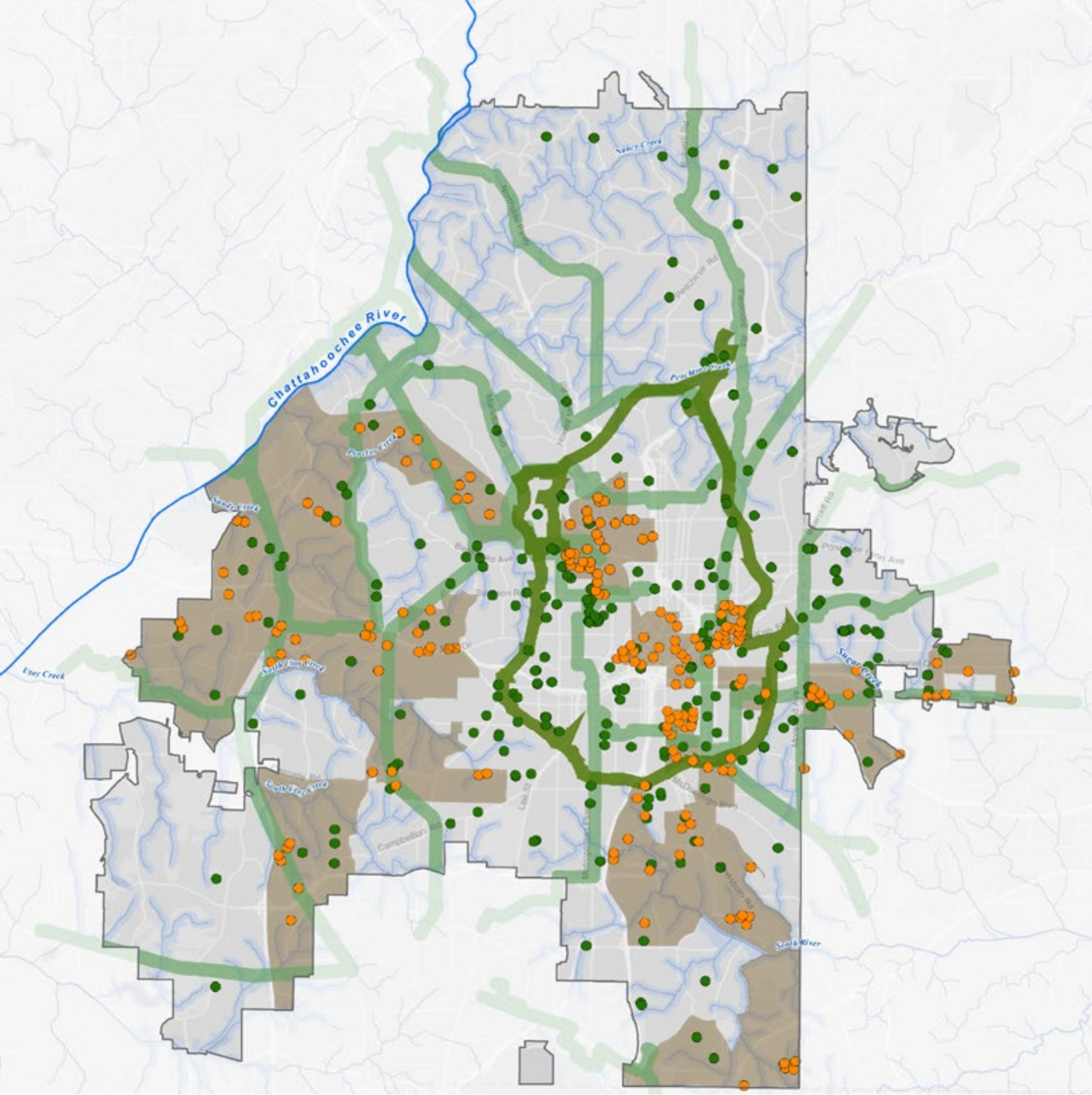
There are geographic disparities in access to fresh food in the city. "Food deserts," as defined by the US Department of Agriculture, are low-income areas with no supermarket access within one mile. These areas have less access to fresh food.

Vacant, unforested lots in urban areas are increasingly being converted to community gardens and urban farms to increase residents' access to healthy, fresh food and to foster neighborhood interaction. The AgLanta Grows-A-Lot program, run by the City of Atlanta, currently organizes the adoption of vacant, city-owned property or powerline easements for new urban gardens or urban farms. Numerous locations throughout Atlanta could be new candidates for an expansion of this program. Locating these food-focused greenspaces in food deserts can help address inequality in access to fresh food.

While planting species that attract pollinators alongside food crops is a good practice, pollinator plantings also benefit the ecology of the city where there is no nearby demand for urban food gardens. Utility transmission easements, which often must be maintained in grass or shrubs and not urban forest, can be candidates for urban farms as well as pollinator corridors. Pollinator corridors and pollinator gardens focus on native wildflowers and flowering trees and shrubs that support bees, butterflies, and other pollinator species. Larger corridors can also create habitat for grassland-dwelling birds. Maintenance requirements for utility transmission easements may only allow the planting of wildflowers and grasses. Locating pollinator corridors and pollinator gardens near existing and future community gardens, urban farms, and urban orchards can support their food productivity, while also increasing a unique urban habitat. Potential gardens, farms, and orchards are shown on the map to the right where there is unforested, vacant land within food desert areas.

Food Access

- **Create** new urban gardens and farms on vacant lands and in utility transmission easements.
- **Convert** utility transmission easement landscapes from grass-dominated landscapes to diverse pollinator corridors with native wildflowers.



Legend

- Atlanta City Limits + Major Streets
- Streams | Creeks | Rivers
- Food Deserts
- Existing Gardens, Farms, and Orchards
- Potential Gardens, Farms, and Orchards
- BeltLine
- Pollinator Corridors

Descriptions

- Major streets and radial streets identified in City Design, Design for Connections
- Streams and stream buffers measured from 300' on each side of stream centerlines
- Areas with low income populations without supermarket access within 1 mile
- Community gardens, public and private farms, public orchards
- Trail corridor
- Electric Transmission Corridor Easements

0 1 2 miles

6 South River Park

Planning efforts are underway for the two major parks identified in Sec 3.2 "Wildness." The Chattahoochee Riverlands is a study of greenway and public realm opportunities led by a collaboration between the Atlanta Regional Commission, the Trust for Public Land, the City of Atlanta, and Cobb County. The Nature Conservancy has led a plan for South River Park to redefine the southeast corner of the City as a riverfront district.
Atlanta City Design: Nature and its analysis of the entire city offers broad-based support to these two large regional park initiatives and links them to the public good for residents throughout the city. The Framework's strategies can serve to further guide park development and implementation of Chattahoochee River Park and South River Park. Sec 4.2 "Protect" and Sec 4.3 "Restore" place the natural assets of the parks in a wider context and highlight areas for targeted action. Potential park boundaries that consider those resources are sketched in Sec. 3.2 "Wildness." Potential trail networks and Nature Spaces are illustrated in Sec. 3.4 "Retreat and Adventure" and Sec. 3.5 "Connections."

BELOW Constitution Lakes (left) and the historic Honor Farm (right), are two sites slated to become part of the 1,000+ acre South River Park, as proposed by The Nature Conservancy.

1 Chattahoochee River Park

WILDNESS
Long-Term Implementation

LEFT Chattahoochee RiverLands rendering depicting aspects of the project's mission to provide amenities to connect the community to the river.

BELOW Chattahoochee Riverlands rendering depicting an activated riverfront and the project's focus on ecological restoration throughout the Chattahoochee River corridor and along its tributaries.

4.6 STEWARD AND ENGAGE

To fully implement the strategies in this document will require sustained and committed participation from the broader community behind shared goals and vision. It will require a shift in how residents, businesses, and public officials value and care for nature in the City of Atlanta. To achieve broader engagement for actively protecting, restoring, accentuating, and stewarding the nature of Atlanta, Atlanta City Design: Nature (ACD: Nature) has identified three key community-focused activities. Sec. 5 "Administrative Recommendations" that follows, focuses on City government action and policy for ACD: Nature implementation and stewardship of Atlanta's environmental resources.

- **Intensify outreach and engagement through consistent collaboration and dynamic messaging**
  Creating a broad coalition of public and non-profit organizations based on models from other cities, such as Chicago Wilderness, The Intertwine Alliance in the Portland metropolitan area, or Nature For All in Los Angeles, would strengthen existing citywide stewardship and education efforts and unify community outreach and engagement efforts. The numerous organizations in Atlanta involved with urban nature conservation and restoration, trails and outdoor recreation, and environmental education could more formally coordinate behind collective goals and messaging. Such a council could also organize efforts to tie stewardship and engagement opportunities to existing activities by schools and community groups.
- **Empower citizen science in partnership with local nonprofits, schools, and government agencies**
  Citizen science activities empower community members to become involved in their local environment through simultaneous learning and knowledge making. This interaction, and the information gathered from the process, can help guide management of urban ecosystems. Georgia Adopt-A-Stream is an excellent active example of this stewardship and engagement strategy. Housed in Georgia's Environmental Protection Division it provides citizens with tools and training to engage with, evaluate, and protect their local waterways.

  Another example is the harnessing of new citizen science mobile phone applications through coordinated BioBlitzes at Atlanta's treasured parks and forests, wherein teams of citizens identify as many species of animals and plants as possible during a fixed window of time. These shared experiences cultivate stewardship and educate nearby residents in features of the naturescape that may have been previously invisible to them. Atlanta has recently participated in the City Nature Challenge, an international, week-long BioBlitz style event organized by the Natural History Museum of Los Angeles County and the California Academy of Sciences. This annual event could be used to continue to build momentum for these activities. Further enhancing the use of parks as educational nodes could include increasing collaboration with Atlanta Public Schools, Parks and Recreation, and non-profit partners for STEM-based learning.
- **Employ residents in the emerging economy of restoration and stewardship**
  Pilot efforts in training landscaping contractors to maintain green infrastructure are expanding in the City. The broader efforts of Sec 4.3 "Restore" and 4.5 "Accentuate" should be linked to green job training programs and partnerships in a coordinated effort to create local sources of employment and hire nearby residents. Training can expand beyond stormwater-focused green infrastructure to include street tree planting and maintenance, reforestation, invasive species management, and stream restoration.

4

Administra
Recommend

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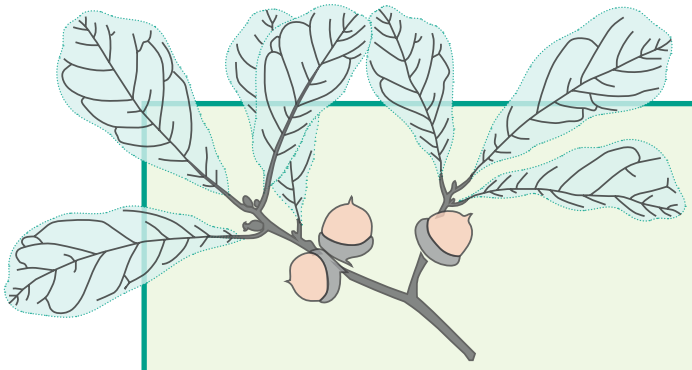
5.0 ADMINISTRATIVE RECOMMENDATIONS



The following administrative and policy recommendations are intended to connect vision with action to ensure that the findings and proposed actions in this Atlanta City Design: Nature are accepted and implemented. Some recommendations are based on current initiatives and discussions already underway, while others are far more aspirational. Many recommendations are specific policies and actions for the City of Atlanta to implement, but some will require cooperative partnerships with other organizations and agencies. To protect, restore, and enhance the ecological health and well-being of Atlanta will require working in collaborative and innovative ways as a dedicated community.

PREVIOUS Emblematic of the moniker "City in the Forest," Atlanta's City Hall (with Central Presbyterian Church in the foreground) rises above a mature canopy in Downtown Atlanta.

5.2
Regulation & Policy

5.3
City-led Natural Resource Management Initiatives

5.4
Guidance

5.1
Internal and Cross-Departmental Coordination & Processes

5.5
Funding Opportunities & Considerations

5.1 INTERNAL AND CROSS-DEPARTMENTAL COORDINATION & PROCESSES

1. City leadership to commit to Atlanta City Design: Nature (ACD: Nature) implementation.

2. Establish consistent ACD: Nature-supporting actions across City of Atlanta departments and offices: City Planning, Parks and Recreation, Watershed Management, Public Works, and Office of Resilience.

3. Increase and formalize coordination and decision-making across departments for public lands management and related regulation and policy enforcement.

4. Incorporate ACD: Nature recommendations and the focus on urban ecology into City of Atlanta Parks Master Plan (planning process running from January 2020 to February 2021).

5. Use ACD: Nature priorities to inform implementation and updates of Watershed Improvement Plans. ACD: Nature recommendations and data can help identify areas of greatest complementary benefits between stormwater management and water quality goals and other needs of the city.

6. Strengthen and expand the Arborist division as needed to meet new needs and approach resulting from ACD: Nature and an updated Tree Protection Ordinance (adoption anticipated by the end of 2020).

7. Further develop relationship between Atlanta Public Schools, Parks and Recreation, as well as non-profit partners such as Park Pride, the Nature Conservancy, and the West Atlanta Watershed Alliance to increase school and community engagement for access to natural areas and STEM-based learning.

8. Work with GDOT to allow expanded tree canopy and greening along state roads and possibly interstates within the city. This may be more challenging to implement and will require increased collaboration and coordination between state, federal, and local agencies to promote the greening of this infrastructure.

9. Designate a City staff person to be responsible for building broader coordination between city departments and the nature and ecology coalitions in the city. Increase engagement with Atlanta BeltLine Inc., local conservancies, "friends of parks" groups, and other non-profit partners on Atlanta City Design: Nature priorities.

5.2 REGULATION & POLICY

1. Update the city Tree Protection Ordinance (TPO) to more effectively protect healthy trees across the city. Bridge parcel-level and tree-level protection with citywide goals and ACD: Nature recommendations.

2. Incorporate ACD: Nature recommendations into the Zoning Ordinance Update.

3. Consider requiring the use of the GBCI Sustainable SITES Initiative, LEED for Neighborhood Development, or EarthCraft Communities rating systems for future public and private land development.

4. Create incentives for stormwater management green infrastructure practice retrofits, including grants or designated funding for public-private costs shares.

5. Work with City departments and outside partners to develop an approach to greening without gentrification. City greening investments such as new parks and other public amenities in low-income neighborhoods can increase real estate values and displace vulnerable populations from their residences over time. Implement additional anti-displacement strategies for equitable community development.

5.3 CITY-LED NATURAL RESOURCE MANAGEMENT INITIATIVES

1. Create and periodically update an Atlanta Urban Forest Management Plan.
   - Maintain and periodically update the ACD: Nature citywide database of ecological resources. Expand the database over time with site-specific management studies and citizen science data.
   - Build upon existing ACD: Nature database with a complete vegetation survey (and ongoing monitoring) of forest habitat corridors, riparian corridors, and parks across the city to inform future planning and management actions.
   - Dedicate the resources necessary to manage these important City-owned properties based on the initial survey and ongoing monitoring.

2. Site-specific forest management plans for the interior forest cores identified in Sec. 4.2 Protect" that are on public lands should be developed as part of the Urban Forest Management Plan. For interior forest cores on private land, incentivize landowners to develop forest management plans and implement management operations.

3. Increase biodiversity in all parks and public lands through invasive plant management, native planting, and stewardship opportunities and partnerships. Prioritize areas identified in Sec. 4.2 "Protect" and Sec. 4.3 "Restore."

4. Incorporate adaptive management approaches for habitat on public land. Adaptive management incorporates ongoing monitoring of forests and other plant communities to inform adjustments to management practices.

5. Consider creating specialized natural resource management field crews with expertise in non-native invasive species management and reforestation to manage city-owned natural areas.

6. Encourage and incentivize stream buffer restoration and enhancement on private properties based on City-established guidelines.

7. Coordinate with the management efforts of "friends of the park" groups and environmental organizations in the city.

5.4 GUIDANCE

1. Create and promote forest and landscape management guidance for landowners that reflects the recommendations of the ACD: Nature.

2. Create guidance and promotional brochures highlighting native plant palette aesthetics and benefits, signature wildlife species and their movement corridors, stream buffers, and riparian corridors.

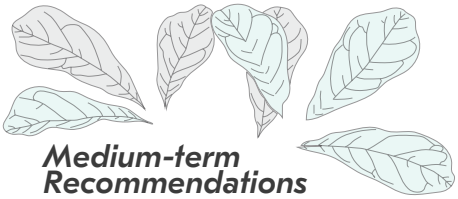
3. Create and adopt trail planning, design, and construction guidance based on national best practices to ensure new trails in the City create opportunities for residents to access nature without fragmenting habitats, degrading water quality, or otherwise negatively impacting Atlanta's natural systems.

4. Update streetscape and urban design guidelines for Atlanta's urban core and City Design growth areas to include green stormwater infrastructure and enhanced soil `volume for street trees.

5.5 FUNDING OPPORTUNITIES AND CONSIDERATIONS:

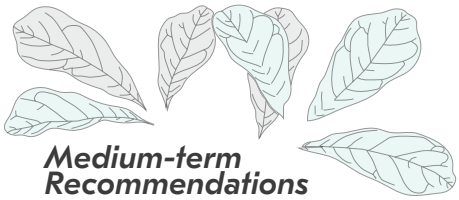
FOREST ACQUISITIONS

1. Celebrate the acquisition of the 216-acre Lake Charlotte Nature Preserve in the South River Park area. This greenspace acquisition, one of the largest in the city's history, is being funded by the City's Tree Trust Fund. Lake Charlotte Nature Preserve is an excellent example of high quality mature interior forest and a Sec. 4.2 "Protect" priority area.



2. Acquire additional unprotected forest.

   - Incorporate ACD: Nature recommendations into prioritization of forest acquisitions.
   - Utilize Tree Trust Funds and identify opportunities to leverage these funds for additional funding from state and federal government and private philanthropic sources to complete additional forest acquisitions after Lake Charlotte Nature Preserve.
   - Identify key corporate partners/ Fortune 500 companies in Atlanta to support forest protection. Use the UEF recommendations, the goal of a 50% tree canopy in the city, and the One Million Tree Initiative for the campaign.
   - The City has partnered with The Conservation Fund and Atlanta Canopy Alliance to create a list of potential high-quality forest acquisitions. Consider framing the larger need for 10 to 15 of the highest priority acquisitions to make a larger philanthropic ask.

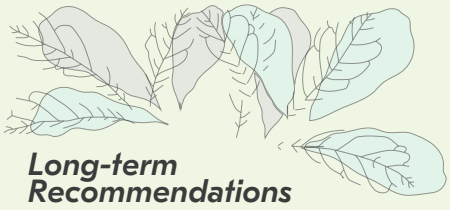


Medium-term Recommendations

3. Link forest acquisitions with the One Million Tree Initiative launched by Trees Atlanta and partners. This 10-year metro area initiative can help create momentum for philanthropic funding.

4. Use purchased forest land to establish Atlanta's first voluntary carbon offset sales program to help fund stewardship of individual forest acquisitions and highlight the city's focus on tree canopy protection and climate change.

    - The Conservation Fund and Trees Atlanta are working with City Forest Credits to pilot this approach for Lake Charlotte Nature Preserve, as well as exploring opportunities to sell carbon credits to local businesses following the examples of Seattle, Austin, and Pittsburgh.



Long-term Recommendations

5. Consider the future establishment of a new City Department or public-private partnership to promote, protect, and manage the urban forests and other natural resources in the City. A public-private partnership could create more flexibility for funding and more opportunities for public involvement.

5.5 FUNDING OPPORTUNITIES AND CONSIDERATIONS:

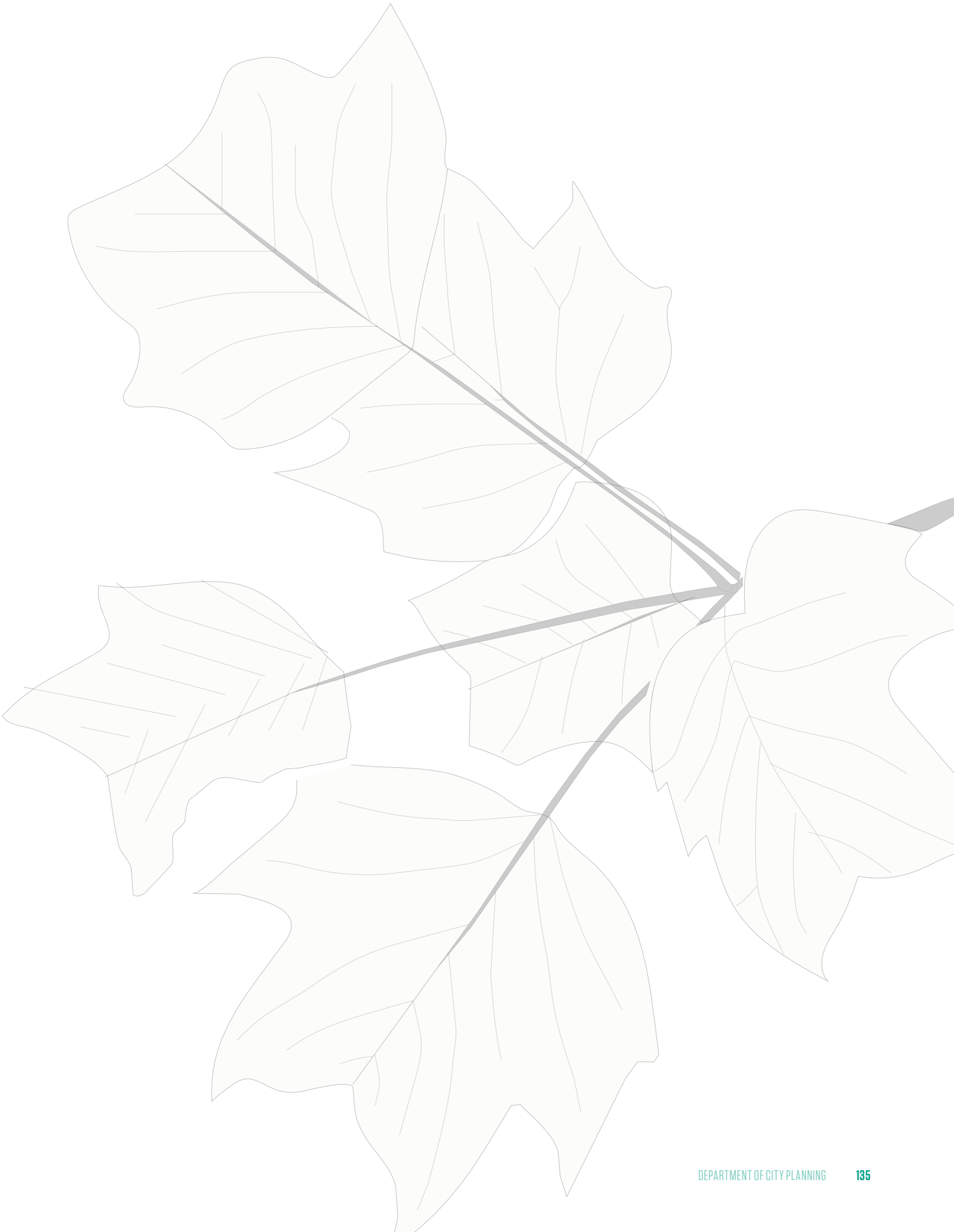
PARKS AND RECREATION

6. Update park impact fees. Park impact fees have not been adjusted in decades and are restricted to land acquisition. This is underway as an element in an overall building impact fee updating effort.

7. Prioritize forest land acquisition with a broader lens to incorporate priorities of ACD: Nature and a focus on natural areas and Sec. 4.2 "Protect" priority areas across the City. Include strategic acquisitions for the Chattahoochee River Park and South River Park and expansion of existing nature preserves. Expanding funding opportunities such as those noted in the forest acquisition section, will be critical to acquire and appropriately manage new forested parks.

8. Consider the creation of a Park District/ Parks Authority. This requires state legislation, creates taxing (property tax/ millage) and bonding authority for park funds, and establishes an outside appointed board.

9. Consider general bond to address the outstanding need to protect city natural areas.



5.5 FUNDING OPPORTUNITIES AND CONSIDERATIONS:

DEPARTMENT OF WATERSHED MANAGEMENT

10. Complete acquisitions for implementation of the Environmental Impact Bond (EIB)-funded restoration projects.

- The Conservation Fund is completing acquisitions for two large projects as part of the Department of Watershed Management's (DWM) current EIB in the Hunter Hills and Bankhead neighborhoods of the Proctor Creek watershed. These properties will be transferred to the City for DWM implementation of significant stream, floodplain and wetland restoration and stormwater green infrastructure projects that will provide community greenspaces.

11. Use ACD: Nature priorities to inform implementation and updates of Watershed Improvement Plans.

Medium-term Recommendations

12. Consider expanding Environmental Impact Bond program from Proctor Creek to other watersheds.

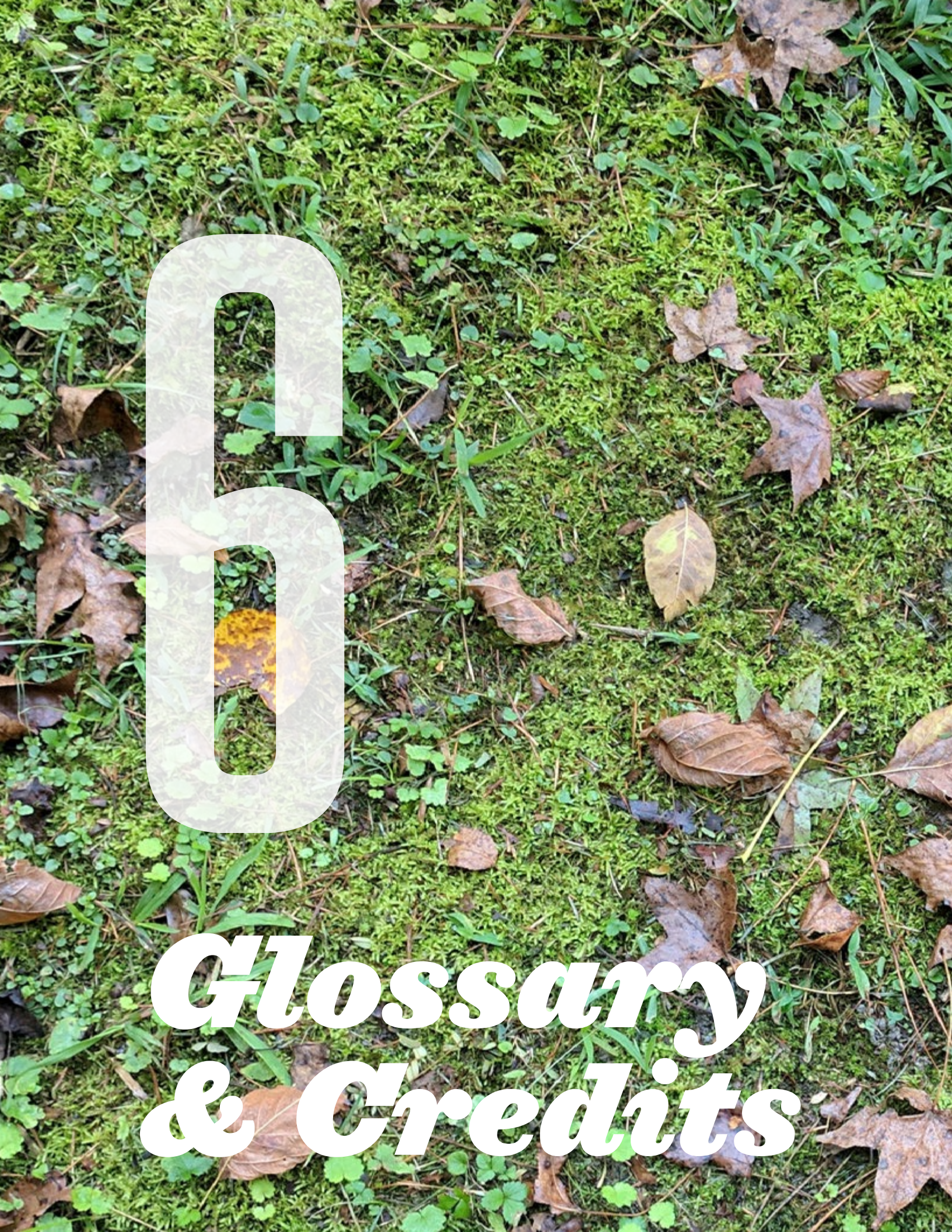
13. Utilize Municipal Option Sales Tax (MOST) funding for strategic stormwater management acquisitions.

14. Continue the strategic acquisition of floodplain properties under the FEMA Hazard Mitigation Program, DWM Consent Decree, etc.

Long-term Recommendations

15. Create a Stormwater Utility. This is the highest priority of the city's Green Infrastructure Task Force and is key for scaling up green infrastructure and restoration funding across the city.

16. Explore the potential of an offsite (watershed-wide or citywide) stormwater management credit system for Post-Development Stormwater Management Ordinance compliance.



6

Glossary & Credits

GLOSSARY

adaptive management
Incorporates ongoing monitoring of forest and other plant community health in order to inform future adjustments to management practices.

bioblitz
An intense period of field study in a designated open space, where groups of scientists and community volunteers collect biological survey data to record all the living species within the area.

biodiversity
A measure of biological variation at the genetic, species, and ecosystem level: the variety of life on earth. As biodiversity decreases our ecosystems become less and less stable, leading to extinction and loss of valuable resources that support life on earth.

blueway
Water trails in rivers and streams, enjoyed by kayakers, canoers, and boaters.

conservation easement
A voluntary legal agreement between a landowner and a land trust or government agency that permanently limits certain types of uses or prevents development of the land, in order to protect its ecological conservation values for future generations. Landowners retain many of their private property rights to live on and use the land, while also potentially enjoying tax benefits or the satisfaction of supporting long-term ecological resilience. According to the Nature Conservancy, conservation easements have protected millions of acres of wildlife habitat and open space.

cool roof
A roof that has been designed to reflect more sunlight and absorb less heat than a standard roof. This is primarily achieved through light colored coatings and materials. Cool roofs can reduce energy use, reduce urban heat island effects, and reduce associated air pollution.

core interior forest
Critically important habitat for forest species sensitive to fragmentation and disturbance associated with development.

eco-development
Emphasizes the community's relationship to nature and models resilient sustainable (re) development strategies and ecological best practices in this zone.

ecosystem
A group of interacting biological organisms and their physical environment, both abiotic and biotic.

PREVIOUS Fallen leaves collect on a sheet of moss in Lionel Hampton-Beecher Hills Park.

ecosystem services
The benefits that ecosystems provide to quality of life, including provisioning, regulating, supporting, & cultural.

food desert
As defined by the US Department of Agriculture, these are low-income areas with no supermarket access within one mile and less access to fresh food.

forest connectivity corridors
Corridors through the city of Atlanta which are most likely to provide direct connection for wildlife between interior core forest patches.

greenway
A linear corridor (trail or specially-designed street) with best landscape ecological practices and ample native tree canopy cover and understory vegetation, which allows the community to feel a greater connection to nature as they travel along this route. Often a greenway will begin and end at larger open space areas offering further connection to nature.

habitat
The specific natural environment for a particular species, where it can find its food, shelter, protection, mates, and conditions for successful reproduction.

habitat fragmentation
The act of cutting up large areas of intact forest — that support a wide variety of native wildlife species — into smaller pieces that lack connectivity or core habitat for sensitive species. Often fragmentation occurs with the addition of roads, trails, or new development in previously undisturbed natural areas. Fragmentation leads to decreased biodiversity, increased invasive species distribution, and lowered resilience to climate change and other impacts.

interior forest cores
Large intact forests that are least impacted by roads and development, providing critical habitat for numerous woodland species. They support a wide range of plants and animals that do no thrive in forest edges or smaller forest patches, and maintain ecological processes found only in unfragmented forest patches.

nature space
Spaces in the public realm formed at the intersection of major city streets with streams, greenways, and major forest habitat corridors.

non-native invasive plant species
A plant species not native to the ecosystem in a given location, whose introduction is likely to cause environmental degradation including outcompeting native plant species, shading or crowding out species, changes to soil chemistry, and causing the ecosystem to evolve toward a monoculture.

park deserts
Areas within the city where communities have more than a 10-minute walk to the nearest park space.

pollinator corridor
Linear planting zones, often along cleared utility corridors, where native plants are chosen for their attractiveness to pollinator species. These corridors become a lifeline for areas of the city where there is a lack of pollinator habitat, increasing productivity of urban farms and gardens.

social vulnerability index
An index based on demographic factors (ie. minority status, household composition and disability, socioeconomic status) that exacerbate environmental stresses on human health and well-being in vulnerable populations (as developed by the Centers for Disease Control and Prevention).

tributary
A smaller river or stream that flows into a larger stream or main stem river.

urban heat island
An urban area that has higher temperatures than the surrounding undeveloped area, based on how well the surfaces absorb and hold heat (dark paved surfaces absorb more heat than natural areas covered in vegetation).

watershed
An area of land that all drains into the same waterway, usually defined by ridges in the landscape.

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9 People raft, kayak and canoe down the Chattahoochee River on a hot summer day on July 25, 2015 in Atlanta, GA.; *Blulz60, shutterstock.com*

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33 Chinese Privet; *Chuck Bargeron, University of Georgia, Bugwood.org, https://bugwoodcloud.org/images/384x256/5302027.jpg*

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84—85 Trees Atlanta employee and young volunteer; *Trees Atlanta, AgLanta, https://www.aglanta.org/urban-food-forest-at-browns-mill-1*

86—87 Piedmont Park in Atlanta, GA; *ciapix, shutterstock.com*

100 All Saints Episcopal Church, Atlanta, GA; *JJonahJackalope, https://upload.wikimedia.org/wikipedia/commons/6/6e/All_Saints%27_Episcopal_Church%2C_Atlanta%2C_GA.jpg*

106 Aerial image of Proctor Creek at Hollowell Parkway; *Google Earth*

108 Aerial image of Peachtree Creek at Piedmont Road; *Google Earth*

116 Constitution Lake; *Ken Boff, The Nature Conservancy, https://www.nature.org/en-us/about-us/where-we-work/united-states/georgia/stories-in-georgia/south-river-atlanta-urban-conservation/*

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120—121 Atlanta City Hall*; wyliepoon, https://flic.kr/p/PpcU8t*

MAPS

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19 Migratory Flyways
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25 Watersheds & Hydrology
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29 Topography
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35 Habitat & Biodiversity
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37 Habitat & Biodiversity - Protected & Unprotected Areas
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41 Ecosystem Services - Carbon Storage
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43 Ecosystem Services - Flood Mitigation Potential
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45 Ecosystem Services - Air Pollution
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47 Ecosystem Services - Heat Island
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51 Environmental Justice - Heat Island
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53 Environmental Justice - Floodplains
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55 Parks and Open Space Access - Park Deserts
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59 Parks and Open Space Access - Environmental Justice and Park Deserts
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61 Needs and Opportunities
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63 Risks and Threats
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69 Integrated Urban Ecology Framework Plan
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83 Lifestyles
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90 City of Atlanta Tree Canopy
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93 Restore
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101 Tree Canopy Opportunities - Within Street ROW
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103 Protect and Restore in Growth Areas
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115 Gardens, Farms, and Pollinators
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