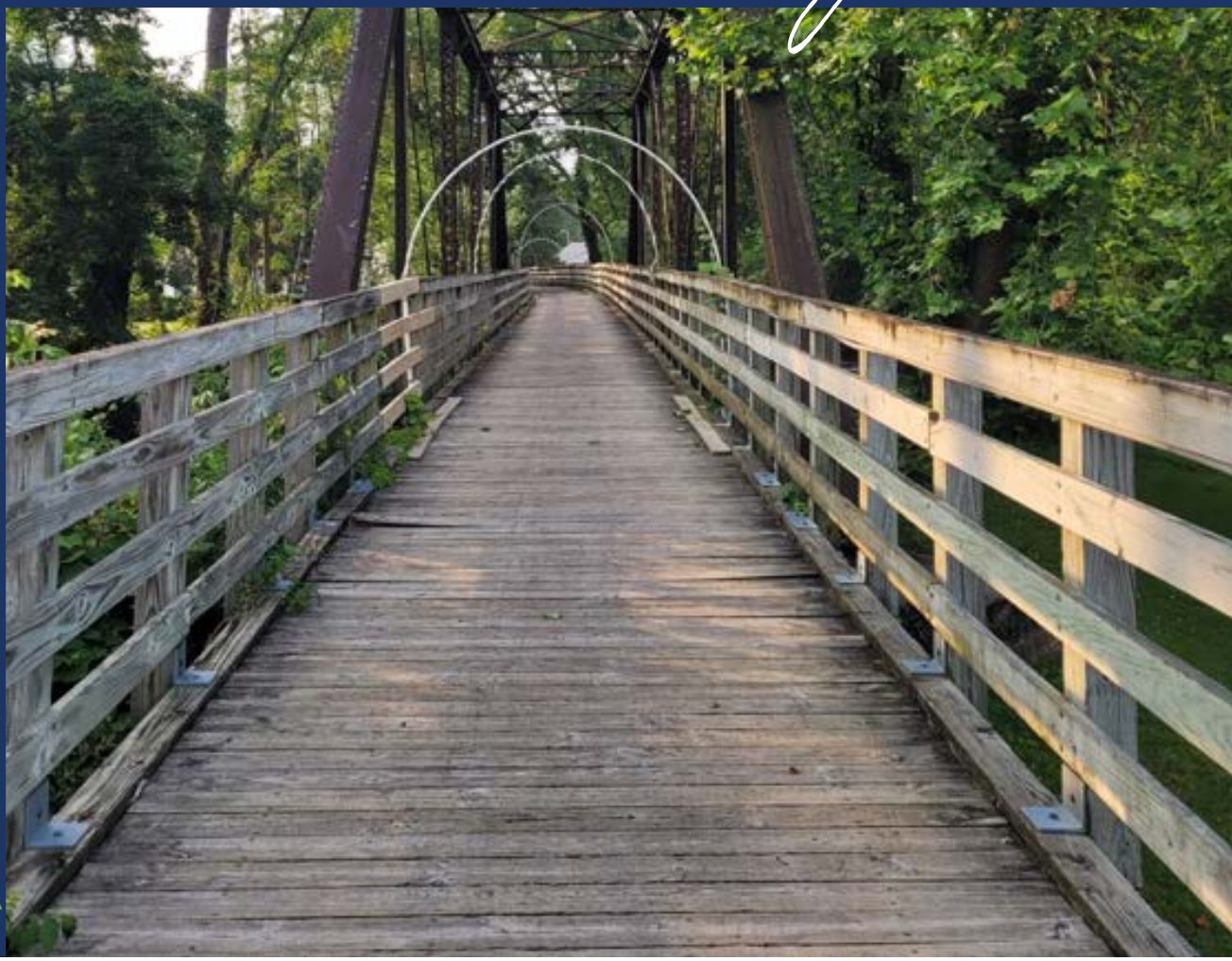
Strategic Tree Canopy Plan

APRIL 2026

The Town of

Damascus, Virginia



Prepared by the Green Infrastructure Center Inc.

DAMASCUS

Green Infrastructure Center

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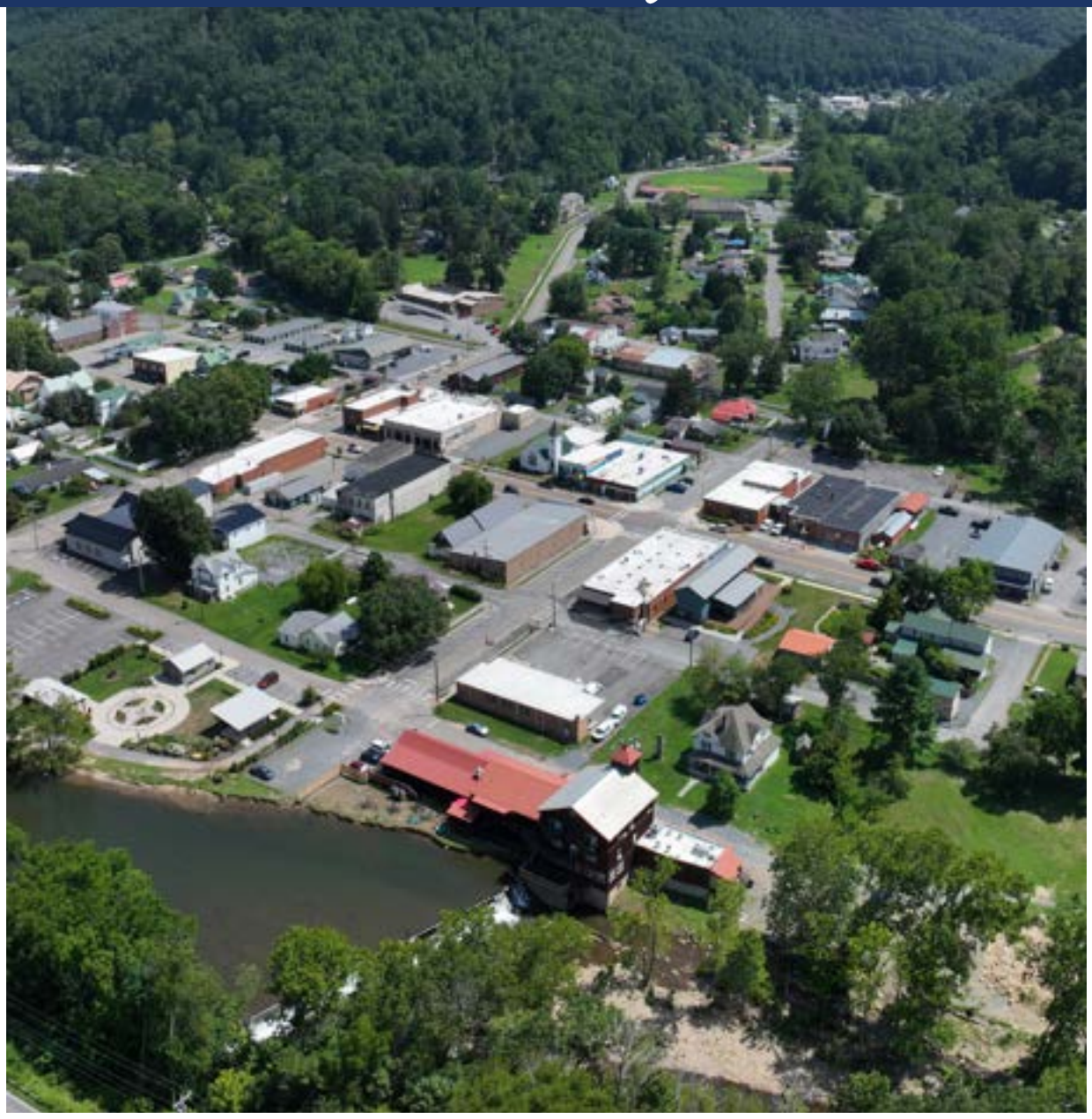

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Executive Summary

The urban forest is a critical asset for healthy, resilient, and sustainable towns. Trees provide benefits that directly support public health by cleaning the air and filtering and reducing stormwater runoff, reducing urban temperatures, and fostering greater economic development. However, these benefits are at risk because tree canopy cover is declining across many U.S. localities. This Strategic Tree Canopy Plan provides data and strategies for maintaining and restoring tree canopy in the Town of Damascus.

This plan is the culmination of a nine-month planning process that included workshops and strategic planning sessions led by the Green Infrastructure Center Inc. (GIC) with Town staff. The extent of urban forest cover was determined by analyzing aerial imagery to map the town's land cover. Open space was evaluated to determine the Potential Planting Area where future trees might be planted, along with assessments of the environmental and social benefits the town's trees provide. Strategies for retaining, protecting, and restoring tree canopy coverage were created.

Town Vision and Goal

The vision for the Town of Damascus's urban forest is a robust and healthy resource that creates a high quality of life for residents, a friendly, welcomimg place for visitors, and a healthy, resilient system of streams and forests. Currently tree canopy coverage town-wide is 45%. **The Town's goal is to maintain 45% tree canopy over the next 10 years.** Tree planting will be needed to maintain 45% canopy because trees will still die from pests, storms, landowner removals, additional development, or old age. The Town will maintain 45% tree canopy coverage by:

1. Planting a mix of trees on public property in the town to increase resilience and quality of life.
2. Establishing a public tree maintenance program to ensure a healthy and safe town tree canopy.
3. Creating an education program focused on trees and resilience to grow tree canopy on private land.

How Trees Benefit the Town

Tree canopy provides benefits such as cleaner air, urban cooling, stormwater capture, wildlife habitat, and natural beauty. This plan quantifies and identifies strategies to increase these benefits.

Air Quality

Trees sequester carbon and clean the air of particulate matter and ground-level ozone. Each year, Damascus's trees remove:

- 1,119 metric tons of carbon
- 5,558 lbs. of ground-level ozone (O_3)
- 1,452 lbs. of airborne particulate matter (including PM2.5 and PM 10)

Urban Cooling

Excessive pavement and lack of shade create urban heat islands. Damascus's trees counter urban heating by shading hot areas. Tree canopy cover lowers surface temperatures and cools the town.

Stormwater Uptake

Trees capture rainfall and filter pollutants. During a ten-year/24-hour rainfall event (3.63 inches) the town's trees:

- soak up 1.4 million gallons of water
- reduce runoff pollution loads for nitrogen by 28%, phosphorus by 33%, and sediment by 16%.

Canopy Goals

Damascus's goal is to maintain 45% tree canopy coverage over the next 10 years. This goal requires planting at least:

- 6 trees on Town-owned land annually
- 24 additional trees on private property through education and tree giveaways

Tree Canopy and Potential Planting Area

The Town of Damascus now has baseline data to identify opportunities to plant new trees for shade, energy savings, increased stormwater uptake, and improved air and water quality.

Introduction

The Town of Damascus was established as a mill town in 1821 and named Damascus in 1886 by former Confederate general John Daniel Imboden, on the ancestral lands of the Cherokee and Shawnee people. The Abingdon Branch railroad line was built through the town to support iron ore speculation and the timber industry. The timber industry boomed through the 1920's leading to economic growth in the region. The Appalachian Trail, completed in 1937, provided additional economic growth in the town, with Damascus being one of the few towns the trail passes through to provide accommodations for hikers. In the 1980's the Virginia Creeper Trail was built and dedicated as a National Recreation Trail. Tourism began to build through the 1990's and today Damascus is a popular destination for outdoor recreation and vacation, with access to public lands and trails, restaurants, and shops. The town is considered a gateway community to the popular Mount Rogers National Recreation Area and is know for its Trail Town USA and Friendliest Town on the Trail identities. Several trails pass through the heart of Damascus, including the Virginia Creeper Trail, Appalachian Trail, Iron Mountain Trail, Mid-Atlantic Backcountry Discovery Route, TransAmerica Bicycle Trail, Trans Virginia Bike Route and the Crooked Road. The town strives to be a beautiful, welcoming, friendly place that has a reciprocal relationship to the surrounding streams and forests. In 2024 the town experienced damaging floods from Hurricane Helene and as recovery continues, the town seeks to build resilience through nature-based design, including urban forest management and planting trees.

The town, partially surrounded by the George Washington and Jefferson National Forest and Cherokee National Forest, has a wealth of natural features including urban trees, parks, forests, wetlands, and streams that provide social, economic, and ecological benefits to residents and visitors while creating a sense of place. By protecting and restoring its natural features and cultural sites, Damascus can ensure a healthy, green, and vibrant future. This Strategic Tree Canopy Plan supports the Town's mission, by encouraging economic growth while conserving its natural assets through the preservation and expansion of the Town's tree canopy.

Trail Town, USA

"The mission of the Town of Damascus is to steward a people-friendly, beautiful, environmentally friendly, resilient, and sustainable community that supports outdoor recreation and a thriving downtown which is built of small businesses."

Damascus Fast Facts

Population: 788 people*
Total Town Area: 1 sq. miles
Land Area: 1 sq. miles
Open Water: 31 acres
Wetlands & Marshes: 14 acres
Streams: 9 miles
Tree Canopy: 277 acres

Potential Planting Area: 106 acres
Impervious Surfaces: 122 acres

**(U.S. Census 2024 estimate)*

The Virginia Creeper Trail and the Appalachian Trail pass through the Town Park.

Tree Benefits

Trees benefit communities ecologically, economically, and socially. Some of the many benefits include:

- Cleaner air and water
- Enhanced natural beauty
- Bird and wildlife habitat
- Reduced urban heat
- Reduced levels of crime
- Reduced traffic accidents
- Increased revenues from sales and property taxes
- Lower vacancy rates
- Improved mental health and focus
- Improved metabolic function
- Increased access to outdoor fitness opportunities.

Large canopy trees provide greater benefits than smaller trees. The USDA Forest Service found that in 2025 dollars, a large tree is worth $7,411 in annual benefits while a small tree is worth just $450 (Center for Urban Forest Research and Southern Center for Urban Forestry Research & Information 2006).

Trees Are Green Infrastructure

Trees and other vegetation serve as the Town's "green infrastructure." Just as localities manage gray infrastructure (roads, sidewalks, bridges, and pipes), they should also manage vegetation as infrastructure. Trees support a vibrant, safe, and healthy community while adding to its historic character. They enhance sustainability by filtering stormwater and reducing runoff, cooling streets, cleaning the air, capturing carbon emissions, and increasing property values.

Gray vs. Green

The image on the left shows the Town of Damascus's gray infrastructure, including buildings and roads. Classified high-resolution satellite imagery (*on the right*) adds the Town's green infrastructure (trees and other vegetation). This green infrastructure provides cleaner air and water, energy savings, and natural beauty.

Trees filter and clean stormwater runoff before it enters surface waters, ensuring healthy rivers and creeks for recreation and habitat.

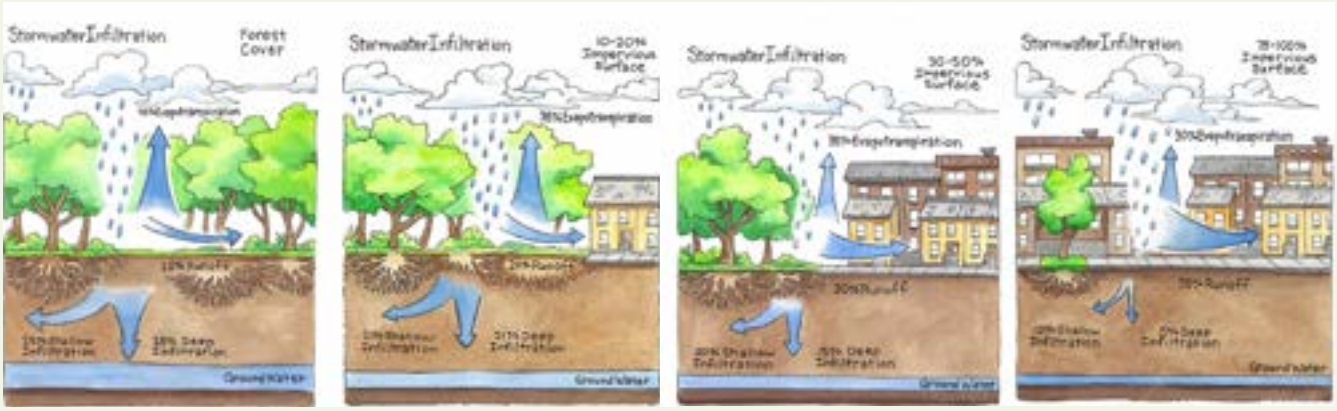
Reducing Stormwater Runoff and Filtering Pollutants

Trees protect cities from problems associated with stormwater runoff. As forested land is converted to impervious surfaces, such as roads, buildings and parking lots, urban stormwater runoff increases. Excess stormwater runoff can cause temperature spikes in receiving waters, increased pollution of surface and ground waters, and greater potential for flooding.

Trees reduce nitrogen, phosphorus, and sediment in stormwater by filtering runoff of these pollutants. Increased loads of nutrients in stormwater runoff reduce oxygen in surface water, causing harm to fish and other aquatic life. Nitrogen and phosphorus can cause harmful algal blooms, while sediment can clog fish gills, smother aquatic life, and necessitate additional dredging of canals and waterways. As tree cover is lost and impervious areas expand, excessive urban runoff of these harmful pollutants greatly increases. The presence of trees means fewer pollutants will enter Laurel Creek, Beaverdam Creek, and eventually the Holston River.

The average annual precipitation in Damascus is 49.5 inches (National Weather Service 2026). Some of this runoff flows into the stormwater system, transporting surface pollutants from the land to local waterways. Large paved areas contribute significant volumes to this runoff. While stormwater ponds and other best management practices (BMPs) are designed to mimic natural land cover rainfall release by detaining and filtering runoff, they do not fully replicate pre-development hydrology. In addition, older parts of the town may lack updated stormwater management practices required for new developments, so not all runoff is captured or treated before it flows into open waterways.

Infiltration Rates with Development



Runoff increases as land is developed. *Graphic adapted by GIC. Data Source: U.S. EPA Watershed Academy 2025.*

Impervious surfaces cause hotter temperatures and increased runoff. Planting shade trees along streets and trails will make for shady, cooler summer walks and bike rides and will reduce the urban heat island effect.

Since trees filter stormwater and reduce overall flows, planting or conserving trees is a natural, cost-effective way to mitigate stormwater. Each tree plays an important role in stormwater management. Based on the GIC's review of canopy rainfall interception studies, a typical street tree's crown can intercept between 760 and 4,000 gallons of water per year, depending on the tree's species and age.

The trees on this residential property provide stormwater management benefits for this home and the surrounding watershed.

Buffering Storm Damage with Green Infrastructure – Trees!

Another benefit of conserving trees and forests is buffering against storms and reducing losses from flooding. According to the U.S. Environmental Protection Agency (EPA), excessive stormwater causes increased flooding, property damage, and public safety hazards. The EPA recommends ways to use trees to manage stormwater in its book *Stormwater to Street Trees*. https://www.epa.gov/sites/default/files/2015-11/documents/stormwater2streettrees.pdf

Retaining trees and forests along streams prevents erosion and provides key habitat for fish, birds, animals, and people too. Tree planting is a nature-based solution that builds community resilience by reducing standing water, preventing erosion, serving as windbreaks, and shading areas to reduce excessive temperatures.

As Damascus continues its recovery from Hurricane Helene, stream restoration work will be followed by replanting riparian forest buffers along Laurel Creek and Beaverdam Creek where possible. The town will plant buffers on town-owned properties and will work to educate private landowners on the benefits of riparian forests for storm buffering.

Riparian buffers prevent stream erosion and reduce the risk of flooding.

Improving Air Quality, Public Health, and Economic Values

Trees Clean the Air

Higher tree canopy cover is correlated with better air quality. Trees reduce ground-level ozone (O_3) while filtering out fine particulate matter, which can damage lungs and lead to respiratory distress and conditions such as asthma. In fact, well-treed neighborhoods have lower rates of respiratory illness (Rao et al. 2014). Trees capture such greenhouse gases as sulfur dioxide and carbon dioxide. These gases contribute to a warming planet and are associated with health problems from excessive heat. Trees also sequester carbon by storing it as wood, preventing its release into the atmosphere and mitigating the impact of climate change.

Trees Cool the Town

Tree shade provides important refuge for children and the elderly during hot summers. Excessive heat can lead to heat stress, especially affecting infants and children up to four years of age, and people 65 years of age and older, or people with obesity or other health issues. (Centers for Disease Control and Prevention 2024).

Tree canopy shades streets, sidewalks, parking lots, and homes, making urban locations cooler and more pleasant for outdoor activities, such as hiking, gardening and playing in town parks. Multiple studies have found significant cooling (2-7°F) and energy savings from shade trees in urban areas (McPherson et al. 1997, Akbari et al. 2001). Individual trees can transpire hundreds of liters of water per day, which represents a cooling effect equivalent to the energy needed to power two average household central air-conditioning units (Ellison et al. 2017). Proper tree placement can reduce summer air conditioning costs by up to 35% (Arbor Day Foundation 2025). Pavement shaded by trees has a longer lifespan than pavement in full sun, reducing maintenance costs of roadways and sidewalks (McPherson and Muchnick 2005).

Trees Improve Cognitive Function

Exposure to green spaces such as parks or treed landscapes for just 20 minutes a day can significantly improve cognitive function, emphasizing the need for green spaces around schools, allowing children to learn to their best ability. People with Attention Deficit Hyperactivity Disorder (ADHD) benefit from exposure to greenspace. Children who regularly play in green spaces have milder symptoms of ADHD (Faber, Taylor, and Kuo 2011).

Trees Improve Walkability

Trees result in people walking more and walking farther. The cooler temperatures, aesthetics, and traffic slowing effect increase a community's walkability, which is a priority of the Town of Damascus. When trees are not present on a street, people perceive distances to be longer, hotter, and less pleasant, making pedestrians less inclined to walk than if streets are well-treed (Tilt, Unfried, and Roca 2007).

Home buyers will pay more for homes with mature trees.

The town's trees reduce temperatures during hot summers through evapotranspiration and by casting shade.

Trees and green space downtown encourage people to walk and shop at stores or the weekly farmers market.

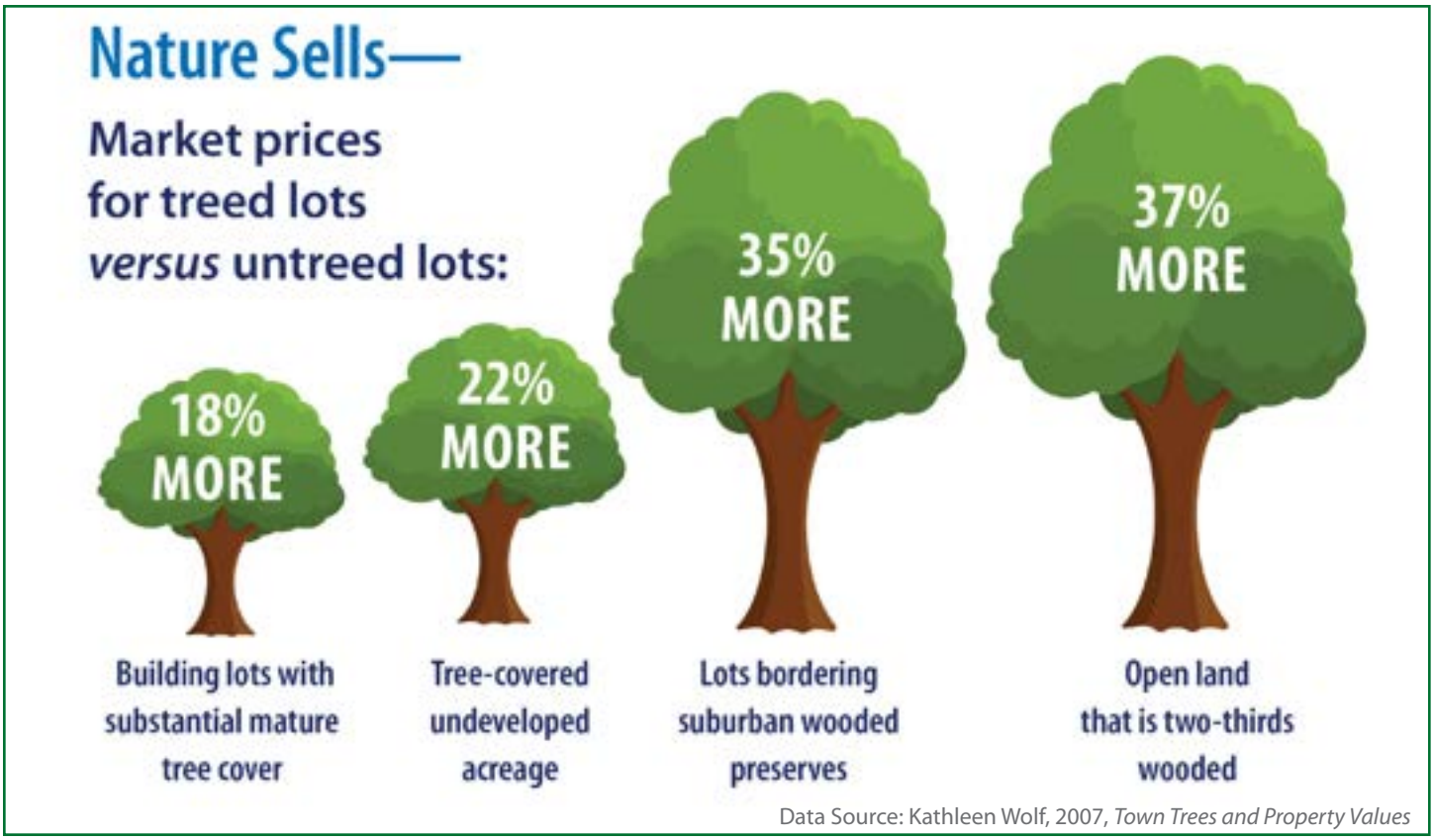
Trees Increase Property Values

Developments that include green space or natural areas in their plans sell homes faster and for higher profits than those that take the more traditional approach of building over an entire area without conserving natural space (Benedict and McMahon 2006). Individual trees and forested open spaces make lots more valuable. Trees on developed lots add about 18% to property assessments and real estate value. (Wolf 2007). [*See the Nature Sells graphic, below.*]

Trees Pay Us Back

As the Town considers the cost of planting and caring for more trees, it's important to note that "every dollar invested in planting a tree results in an average return on investment of $2.25" (Endreny 2018). In fact, even a newly planted tree will immediately begin to provide benefits. So, while the Town will need to expend more funds to increase and maintain its canopy coverage, those trees will more than pay their way. This includes increases in property values, and thus in property tax revenues, more tourism revenue, rejuvenation of business districts, and new businesses attracted to the town. For example, people were seen to shop longer and spend more in treed commercial shopping districts, which benefits the town through increased sales revenues (Wolf 2007). Planting trees should not be seen in isolation, but as part of a wider cycle of urban renewal and growth, in which trees spur development and raise incomes, business sales and that "feel-good factor", which can, in turn, lead to a desire for more trees, parks and outdoor leisure facilities.

People shop longer and spend more in treed commercial shopping districts.



Data Source: Kathleen Wolf, 2007, *Town Trees and Property Values*

Tree Canopy Analysis Methods

The tree canopy analysis was performed to map historic (2014), pre-storm (2023) and post-storm (2025) tree canopy in the Town of Damascus and the Creeper Trail Spur. A change detection analysis was undertaken to estimate changes in the tree canopy historically and after damage caused by Hurricane Helene (post-storm). The 2025 tree canopy data were used to quantify the ecosystem services these trees provide, map potential planting areas, and estimate potential future canopy based on plantable areas. These new tree canopy data can be used to analyze urban cooling, walkability, and street tree plantings; or to inform area plans, urban forestry planning, and comprehensive plan updates.

Satellite imagery from the National Agricultural Imagery Program (NAIP) distributed by the USDA Farm Service Agency was classified to determine the types and extent of different land covers in Damascus for 2014 and 2023 at 1 meter resolution. In June of 2025, GIC used drones to fly new aerial imagery of the town to assess changes post-Helene. The drone aerial imagery was used to create a 2025 land cover map at .5 meter resolution. An ArcGIS Pro extension named Feature Analyst was used to classify the 2014 and 2023 imagery using a supervised classification approach. For the 2025 land cover, a digital elevation model derived from drone imagery through photogrammetry was used to determine height, in order to distinguish between large shrubs and trees. This allows the GIS analyst to separate bushes from trees and other vegetation. This distinction of tree/non-tree vegetation is very important when modeling tree benefits, since the modeled pollution-removal benefits are based on trees, and do not necessarily translate to smaller, non-woody vegetation. In addition, various vector data were used where possible (e.g. sidewalks, driveways, and other impervious surfaces) to aid in mapping other land cover classes.. The 2025 tree canopy was mapped at 98% accuracy, with an overall land cover accuracy of 92%.

Determining Plantable Acreage

Potential Planting Areas

In urban areas, a realistic goal for expanding urban canopy depends on an accurate assessment of the total plantable open area. A Potential Planting Area (PPA) map estimates areas where it may be feasible to plant trees. The PPA is estimated by selecting land cover types that have space available for planting trees and accounts for the overlap of canopy (canopy that is intermingled or a large canopy tree that partially covers an understory tree).

Of the nine land cover types mapped, only pervious and bare earth were considered for the PPA. However, some paved areas could be removed or reduced, soils conditioned, and then used to plant new trees. For example, a parking lot could be redesigned in order to accommodate more tree canopy to absorb and clean stormwater runoff and provide shade for cars.

Eligible planting areas are also limited by their proximity to features that interfere with a tree's natural growth (such as buildings) or where a tree might affect the feature, such as power lines, street signs, or road junctions. The GIC buffers potential planting areas to exclude trees from these features. Town staff and the GIC reviewed the draft PPA map and removed playing fields, cemeteries, and other land uses where trees would not be appropriate. The resulting PPA represents the maximum potential places trees can be planted and grow to full size.

Based on an analysis of existing pervious surfaces (e.g. lawn or turf), 12% of the town's land area, or 502 acres, could be planted with additional trees. The GIC recommends that no more than half the available PPA, 6% or 251 acres, is realistic to plant, since many other uses, such as vegetable gardens or swimming pools, require full sun.

Potential Planting Spots

Potential Planting Spots (PPS) are created from the PPA. A GIS modeling process is applied to select spots where a tree can be planted, depending on the desired mature size. For this analysis, expected canopy spreads of 20ft. and 40ft. diameter for individual mature trees were used, with priority given to 40 ft. diameter trees, since larger trees provide more benefits.

Potential Canopy Area

The Potential Canopy Area (PCA) is created from the PPS. Once the PPS are selected, a buffer around each point is created to represent the mature canopy spread. For this analysis, that buffer radius is either 10ft. or 20ft., which represents a 20ft. or 40ft. diameter canopy. These individual tree canopies are then merged to form a Potential Canopy Area.

NAIP Aerial Image, 2023

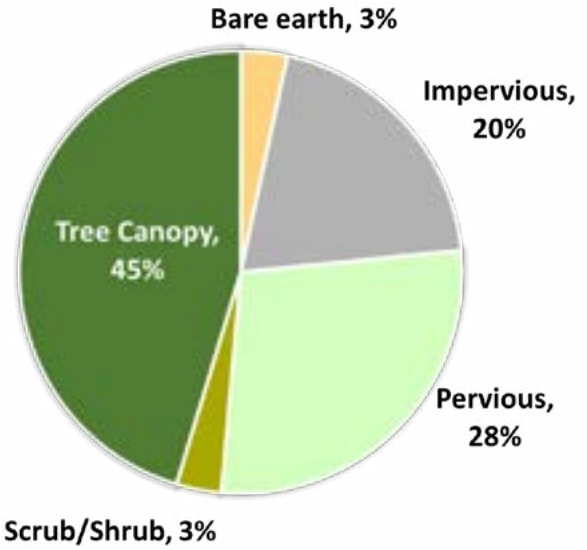
Potential Planting Area (PPA)

Potential Planting Spots (PPS)

Potential Canopy Area (PCA)

There are many places in the town where new trees can be planted,
such as along Beaverdam Creek in the Town Park (left) and along the Creeper Trail (right).

Canopy Analysis Maps and Findings



The Tree Canopy Analysis for Damascus included historic (2014), pre-storm (2023) and post-storm (2025) tree canopy assessments. These data have been used to understand the Town's canopy changes over time and loss due to storm damage. The 2025 tree canopy assessment has been used to plan the tree canopy goal and will act as a benchmark to gauge the future status of the Town's tree canopy. An ArcGIS geodatabase with digital shape files produced during the study has been provided to the Town.

The area of analysis includes land in the Town of Damascus as well as along a Creeper Trail Spur beginning at the western edge of town and stretching to Drowning Ford Rd. All statistics include both areas.

In addition, the Town received tree canopy statistics for the following areas:

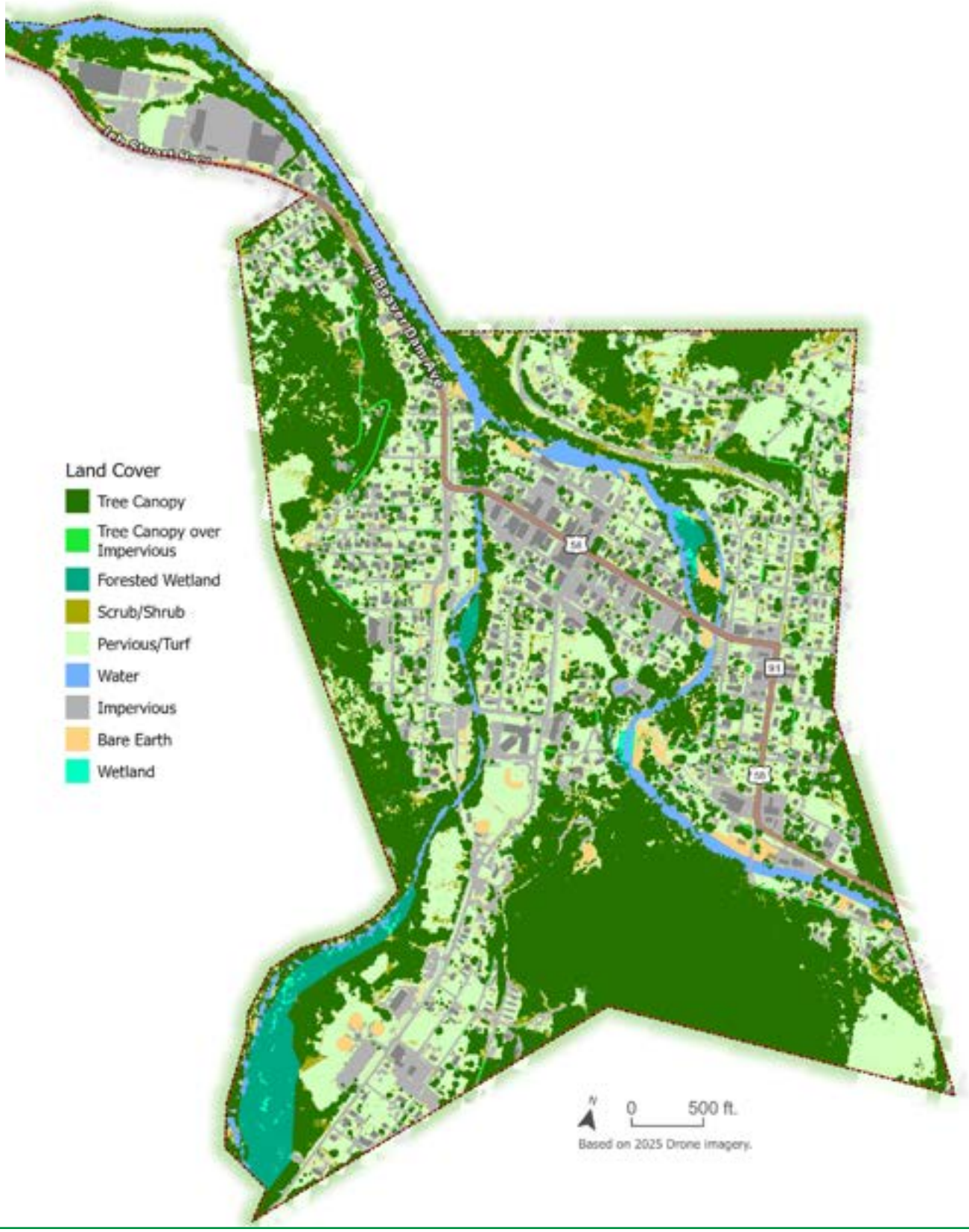
- Town-owned Land
- Riparian Corridors
- Streets
- Trail Corridors

The Tree Canopy Analysis can inform tree planting decisions to meet many objectives, such as walkability, greenhouse gas emission reduction, energy savings, urban heat reduction, and economic revitalization.

The following pages contain Damascus's Tree Canopy Analysis Maps. The maps have been broken into town boundary and Creeper Trail spur sections for legibility.

Town Land Cover

GIC classified 9 land cover types for the Town of Damascus from 2025 aerial drone imagery.

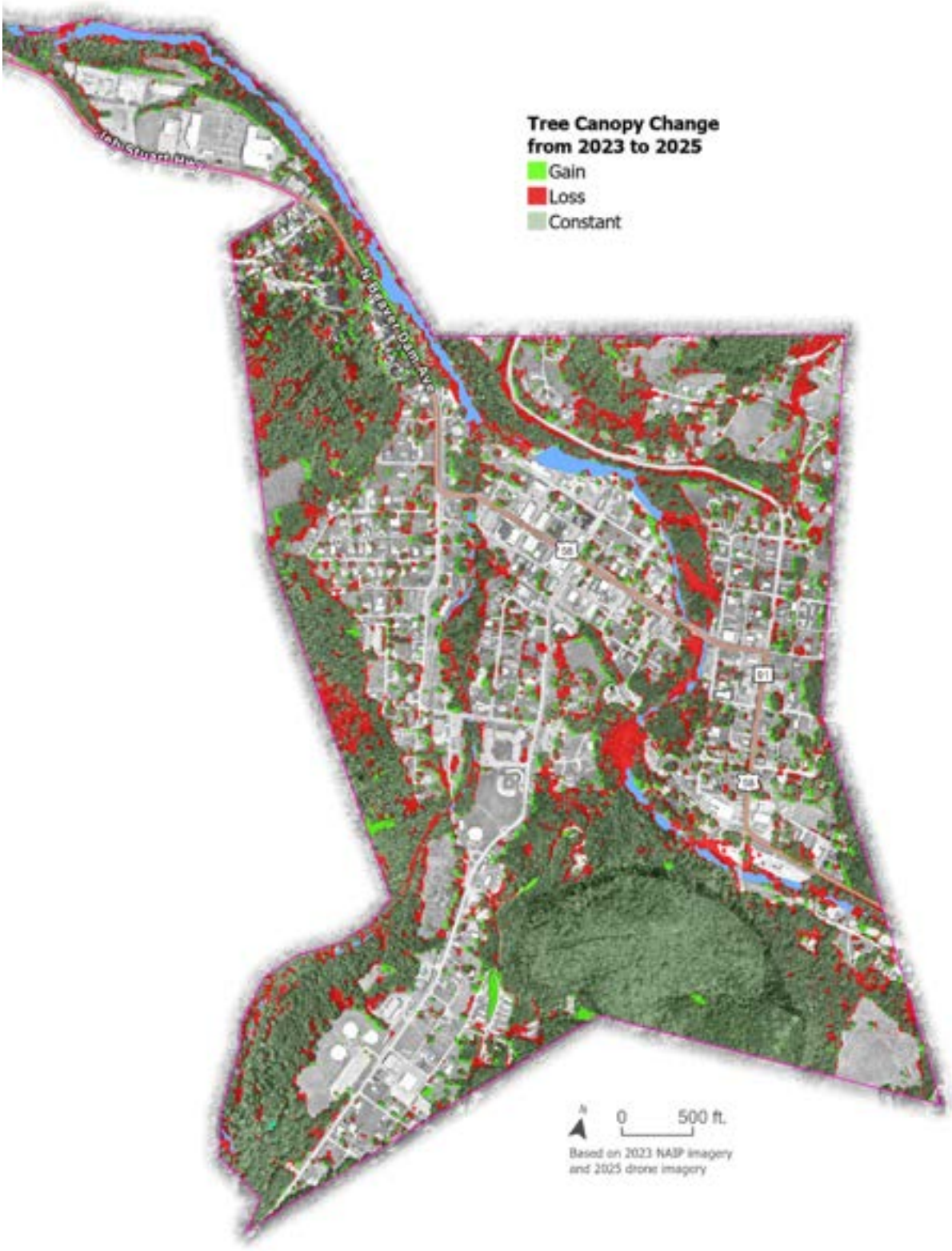


Town Tree Canopy and Potential Planting Areas

Existing tree canopy (green) and potential planting area (gold) were determined based on land cover data and input from the Town. Potential planting areas (PPA) depict areas where it may be possible to plant trees. All sites would need to be confirmed in the field prior to planting. The map shows PPA on both private and public lands. There are 106 acres of PPA in Damascus with space for 11,982 more trees.

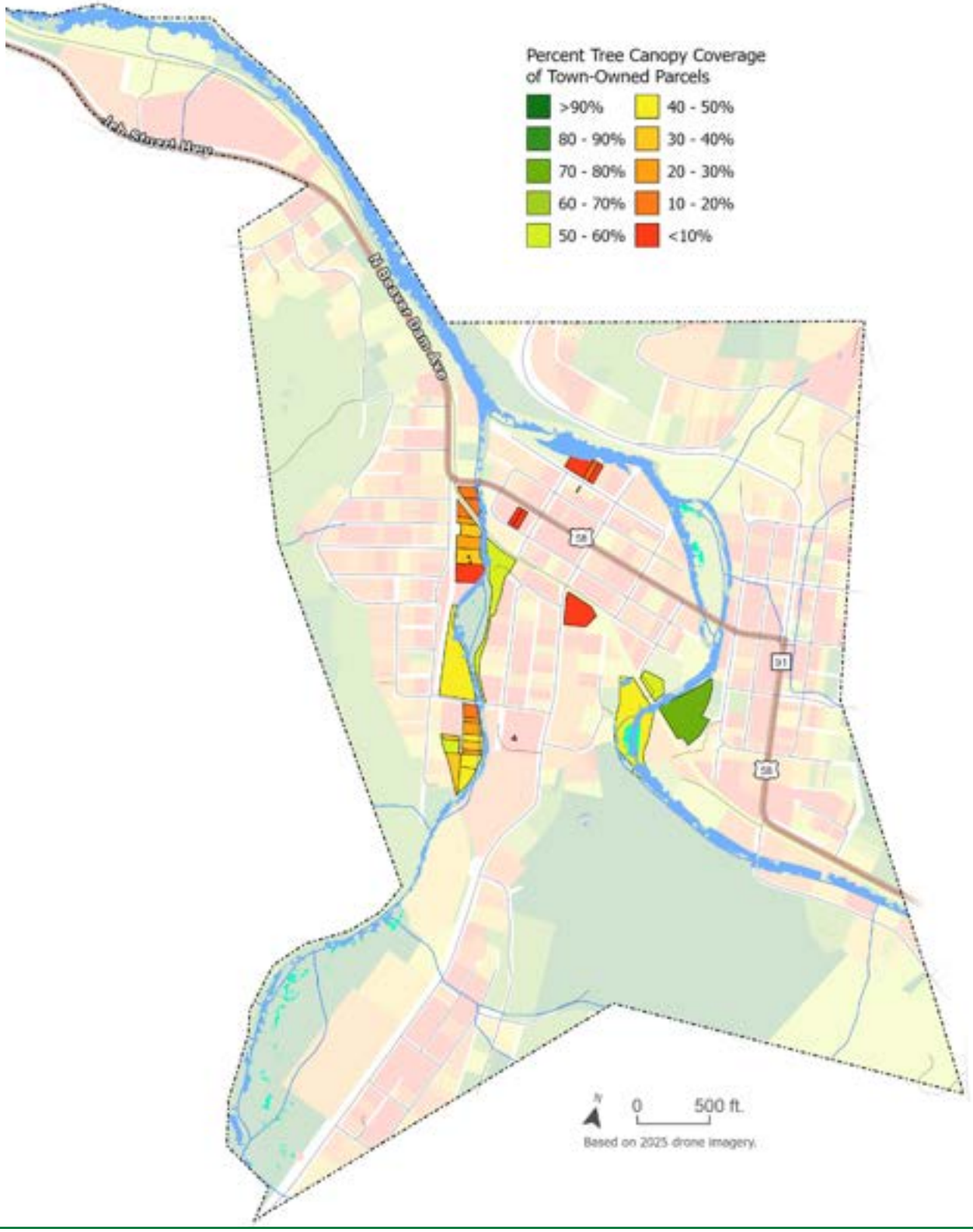
Tree Canopy Change 2023-2025

A change detection of tree canopy based on 2023 NAIP aerial imagery and 2025 drone imagery shows a relative loss of up to 7% tree canopy or 43 acres after Hurrican Helene. Some of this loss may not be true loss as there are differences in image quality and shadows between the years as well as a margin of error. However, it is clear that real loss was widespread across town due to storm damage.



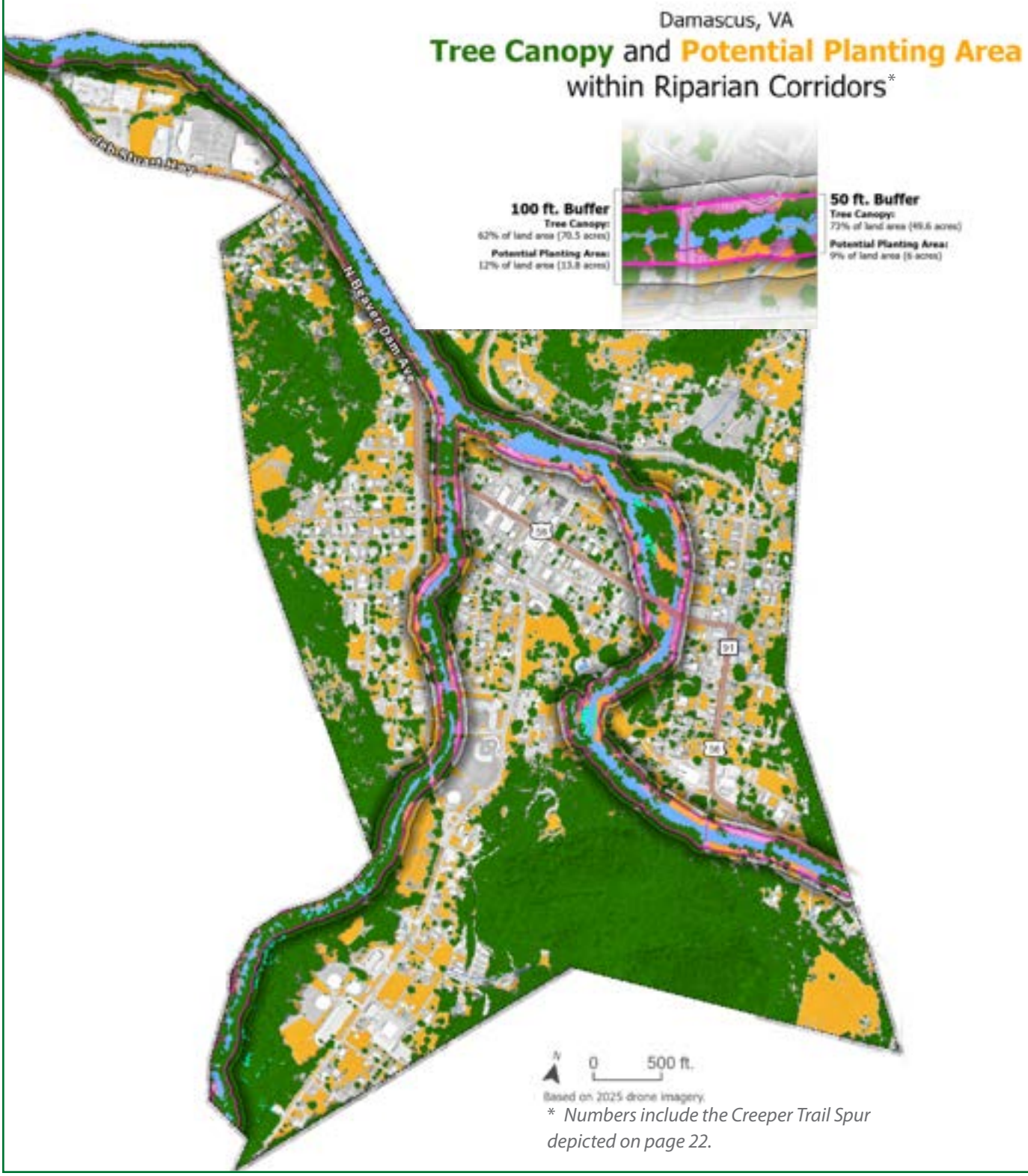
Tree Canopy on Town-owned Land

On average, publicly owned land makes up 20%, while privately owned land makes up 80%, of the total land in a town. This map shows tree canopy on public parcels in Damascus. To successfully meet the Town's tree canopy goal, saving existing trees and planting trees must occur on both public and private land.



Tree Canopy and PPA in Riparian Corridors

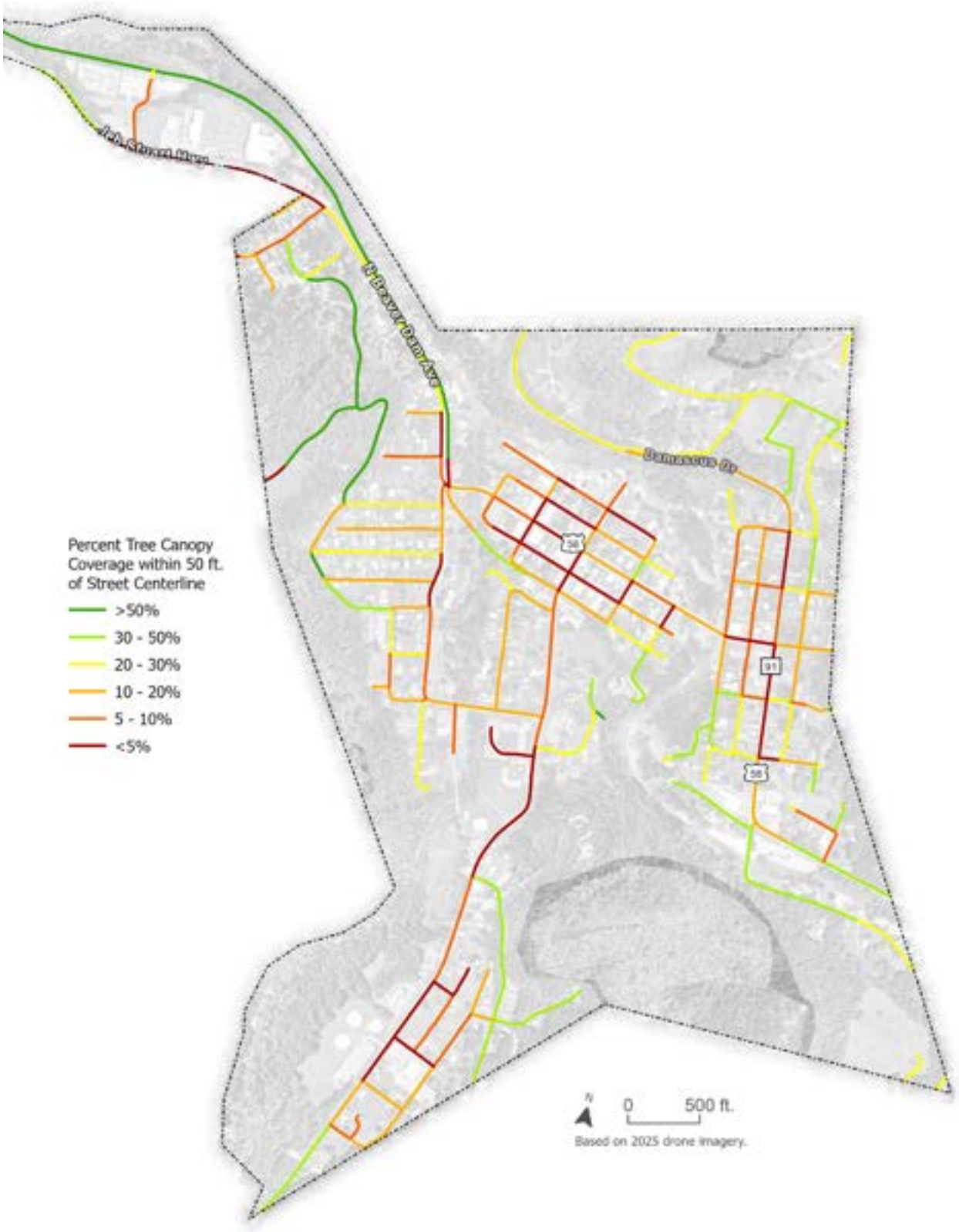
Trees in riparian corridors buffer against flooding, reduce erosion, filter pollutants from runoff, and keep stream temperatures cool. As the Town works toward flood resiliency, planting trees in riparian corridors on public land and encouraging plantings on private land will be critical.



* *Numbers include the Creeper Trail Spur depicted on page 22.*

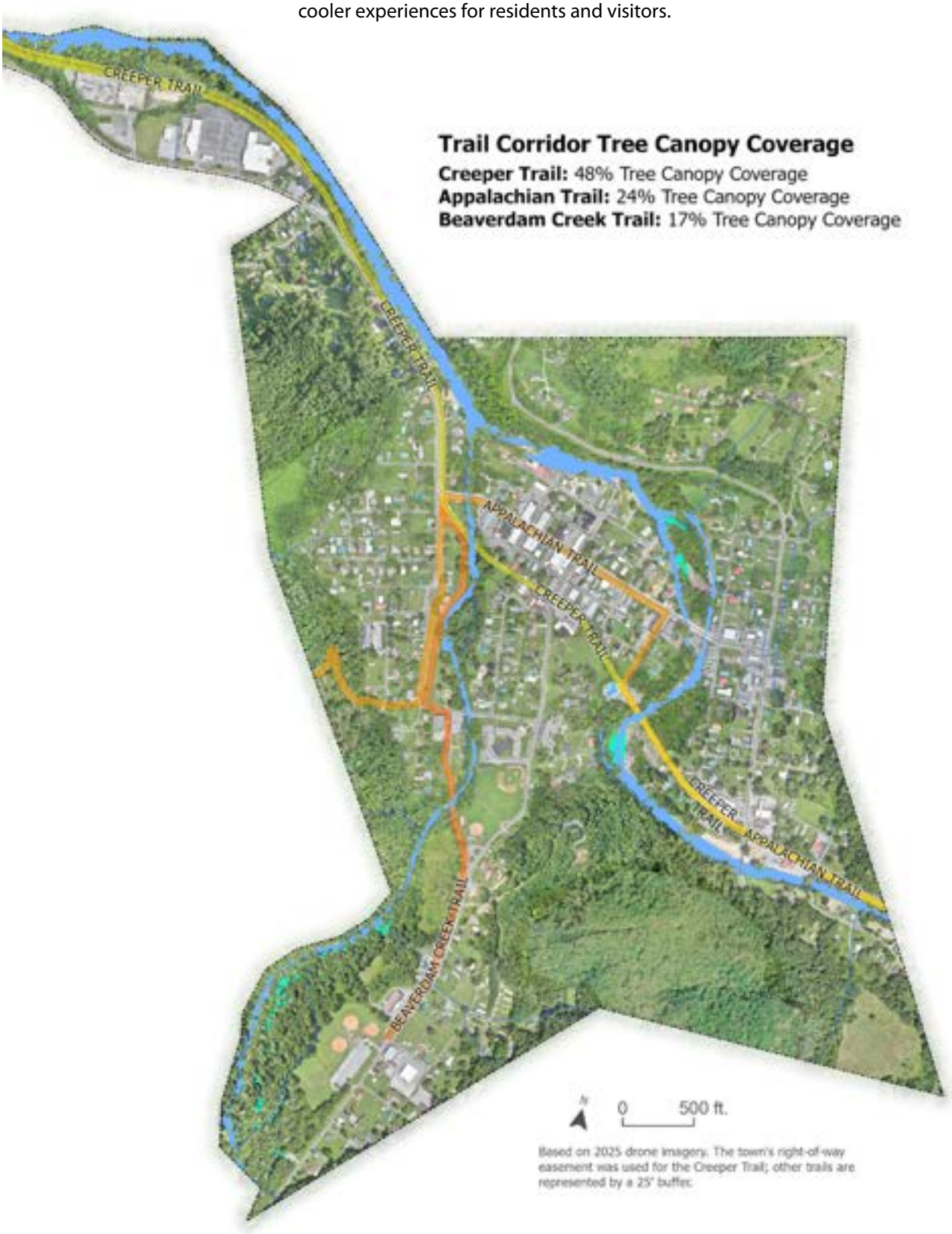
Tree Canopy Coverage Along Streets

Streets that have the most canopy are depicted as dark green and those that have the least canopy as red. Streets that lack good tree coverage can be targeted as appropriate for planting to facilitate specific Town objectives, such as beautifying a shopping district or entrance corridor.



Tree Canopy Coverage Along Trail Corridors

Tree canopy along trails was analyzed within a 25 ft buffer for the Appalachian Trail and Beaverdam Creek Trail and within the Town's right-of-way for the Creeper Trail. Tree planting along trails will create shaded, cooler experiences for residents and visitors.



Creeper Trail Spur

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Calculating Environmental Benefits

Stormwater Uptake

Trees and forests are the best land cover for taking up urban stormwater and are recognized as such by forestry scientists and civil engineers (Kuehler 2017, 2016). Tree canopy stormwater interception varies from 100% at the beginning of a rainfall event to about 3% at maximum rain intensity (Xiao et al. 2000).

Trees help capture and filter stormwater runoff. The Trees and Stormwater (TSW) Tool developed by the GIC estimates the stormwater interception, infiltration, and runoff of different land cover types. This methodology uses a modified version of the "curve number" approach, originally developed by the Natural Resources Conservation Service (NRCS) which factors in impacts of hydrologic soil groups, land cover types, hydrologic condition, and design/management practices that impact runoff. The modified TR55 curve numbers (CN) include a factor for canopy interception. This approach allows for more detailed assessments of stormwater uptake based on the landscape conditions of the town's forests. It distinguishes whether the trees are within a forest, a lawn setting, a forested wetland, or over pavement, such as streets or sidewalks. This is because the conditions and the soils in which the tree is living affect the amount of water the tree can intercept. For more about this methodology, please visit: https://gicinc.org/projects/resiliency/trees-and-stormwater/

The GIC used its TSW Tool to model stormwater and pollution reductions by town tree canopy. The model shows that, during a 10-year/24-hour rainfall event (3.63 inches), trees take up 1.4 million gallons of runoff, or about 2 Olympic swimming pools of water. Damascus's trees capture:

- **2,286 nitrogen lbs. annually**
- **28 phosphorus lbs. annually**
- **183 sediment tons annually**

The TSW Tool takes into account the interaction of land cover and hydrologic soil conditions within each watershed. The TSW Tool can also be used to run 'what-if' scenarios, specifically losses of tree canopy from development or storm damage, or increases in tree canopy from additional tree planting.

Lawn trees in a park soak up more stormwater than trees over pavement.

Tree Canopy Coverage by Watershed

The conditions under and around a tree, such as the size of its planting box, the amount and type of open space, surface soils, drainage and root spread affect the infiltration of water. The TSW Tool uses plantable open spaces to determine how many more trees could be planted and how much additional nitrogen, phosphorus, and sediment pollutants new trees and their surrounding soils could absorb.

Removal of mature trees and existing forests results in the greatest increase in stormwater runoff. As more land is developed, the Town should maximize tree conservation and encourage new tree plantings to maintain surface water quality and groundwater recharge. The following maps use soil types and tree cover to show the areas where it is most important to retain trees for stormwater uptake and areas where tree planting will have the most benefits for stormwater uptake.

The TSW Tool allows the Town to model water uptake by the existing canopy and impacts from changes, whether positive (adding trees) or negative (removing trees).

Air Quality

Air pollution removal values were calculated by applying the pollution removal values for each acre of tree cover from the i-Tree model. i-Tree is a peer-reviewed software suite from the USDA Forest Service that provides urban and rural forestry assessment tools.

Trees mitigate climate change by storing carbon in their tissue and sequestering atmospheric carbon from carbon dioxide (CO_2) in new tree growth. Current trees in the town are storing 12,221 metric tons of carbon that will be released back into the atmosphere when these trees die. Trees also capture particulate matter, ground-level ozone (O_3), nitrogen dioxide, and sulfur dioxide from the air, resulting in better air quality and healthier neighborhoods.

Air pollution and greenhouse gases removed annually by trees in Damascus						
CO (carbon monoxide)	**NO_2** (nitrogen dioxide)	**O_3** (ozone)	**PM_{10}** (particulate matter 10 microns)	**$PM_{2.5}$** (particulate matter 2.5 microns)	**SO_2** (sulphur dioxide)	**C seq** (carbon sequestered)
176 lbs	910 lbs	5,558 lbs	1,240lbs	212 lbs	1,720 lbs	183 MT

Investments in town tree canopy levels can improve the respiratory health of residents.

Best Tree Canopy to Save for Stormwater Infiltration

The TSW Tool was applied to map the locations where tree conservation will result in the greatest amount of stormwater capture and infiltration (dark green).

Best Tree Planting Locations for Stormwater Infiltration

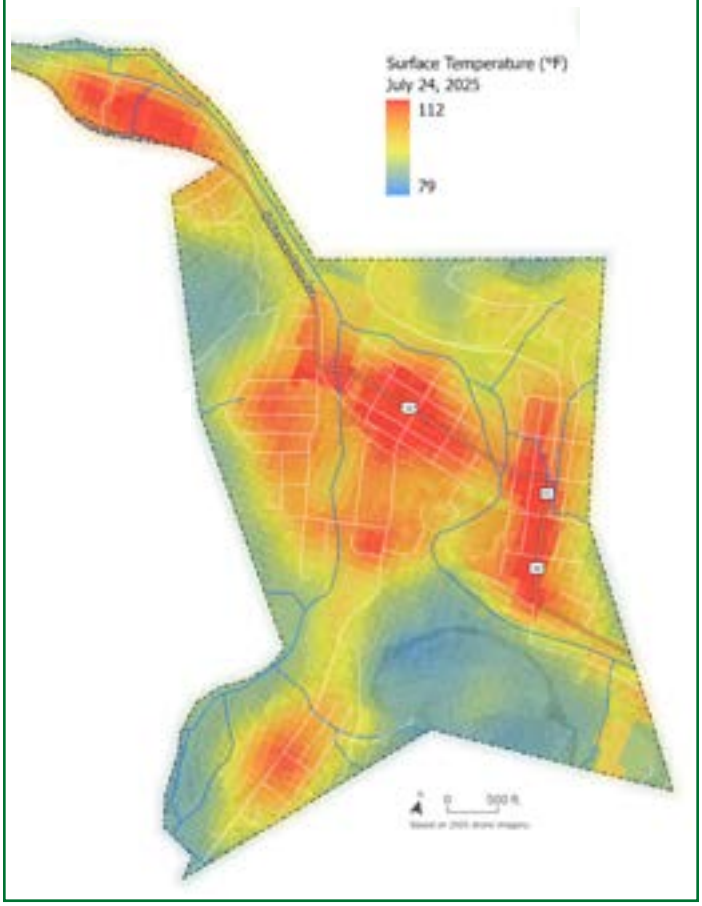
The TSW Tool was applied to map locations where planting trees will result in the greatest amount of stormwater capture and infiltration (orange).

Urban Heat

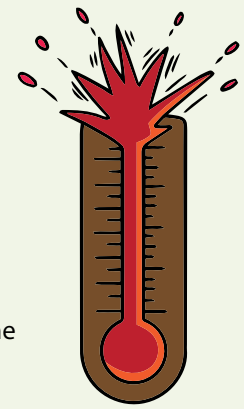
Urban heat is a growing concern as extreme heat continues to increase in Virginia with the changing climate. In Damascus, the number of days with a heat index above 90˚F is projected to rise from the historic average of 7 days per year to 88 per year by the year 2070. To reduce temperatures, the Town can plant trees to cool the landscape.

Surface Temperature

The surface temperature map captures the hottest to coolest places in the town on a typical summer day.



How much hotter is your hometown now than when you were born?



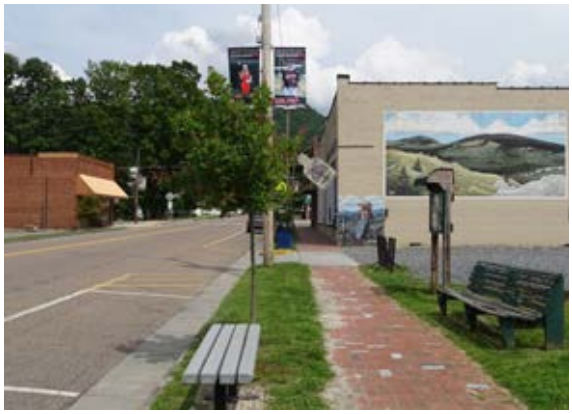
This interactive online tool allows a user to put in their hometown and birthdate to see how their hometown has changed since then and how much hotter it may get. The tool provides the average number of days over 90°F.

https://www.nytimes.com/interactive/2018/08/30/climate/how-much-hotter-is-your-hometown.html

Extreme Heat

Where we are now	Where we are currently headed		If bold action is taken
Historically 1971-2000	Midcentury 2036-2065	Late Century 2070-2099	Extreme heat limited to
Average days per year temperatures over 90˚F			
7 days	**50** days	**88** days	**42** days

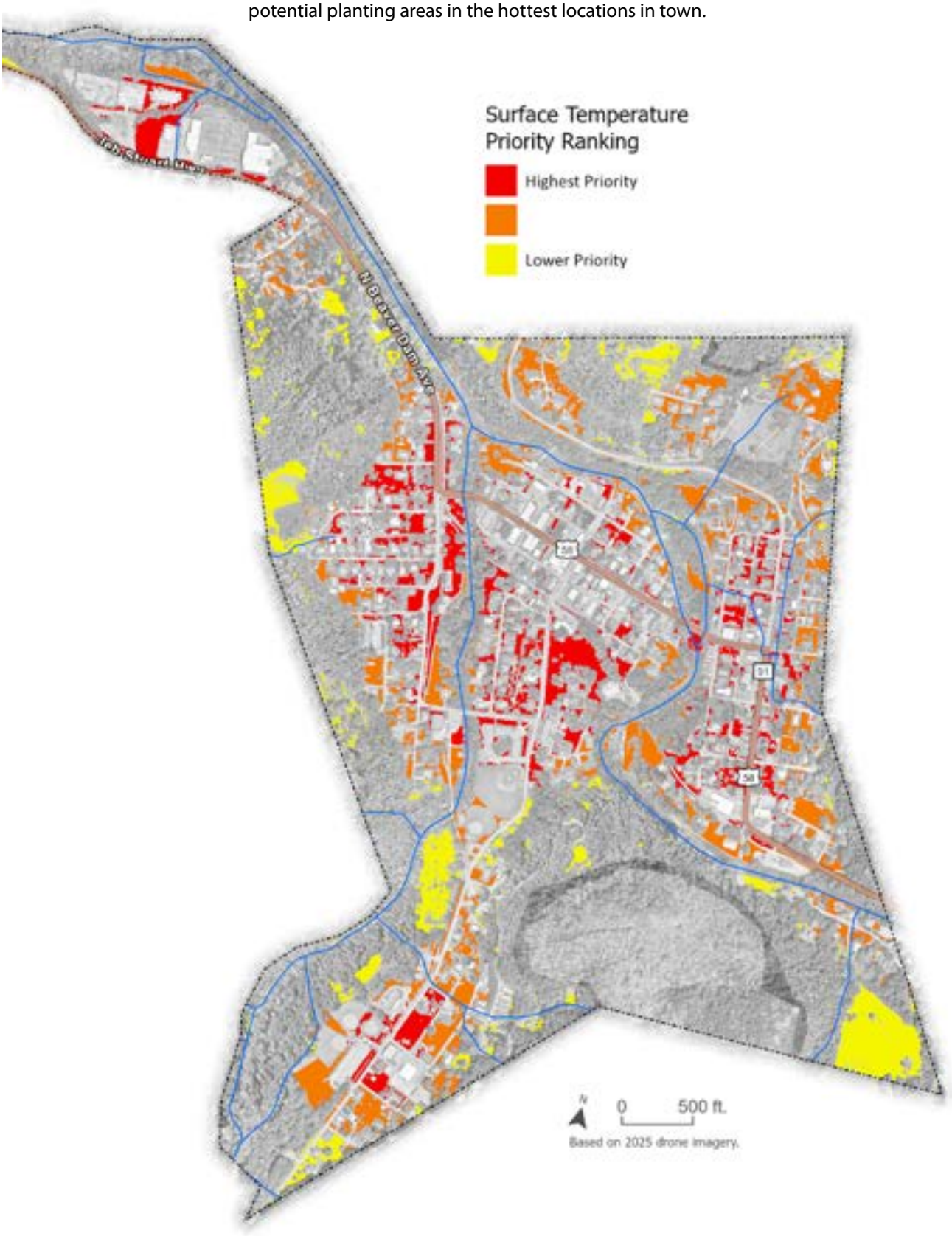
In this table "bold action" refers to reductions in greenhouse gases through energy conservation. It does not consider the effects of planting more trees.
Source: Union of Concerned Scientists.
2019, Killer Heat Interactive Tool.



The surface temperature map above shows downtown is the hottest area in the town. This is due to lots of pavement and buildings with little vegetation. Large trees would shade and cool this area creating an appealing space for walking and shopping.

Priority Tree Planting Locations by Temperature

This map uses surface temperature data to prioritize potential tree planting areas. The areas in red represent the potential planting areas in the hottest locations in town.



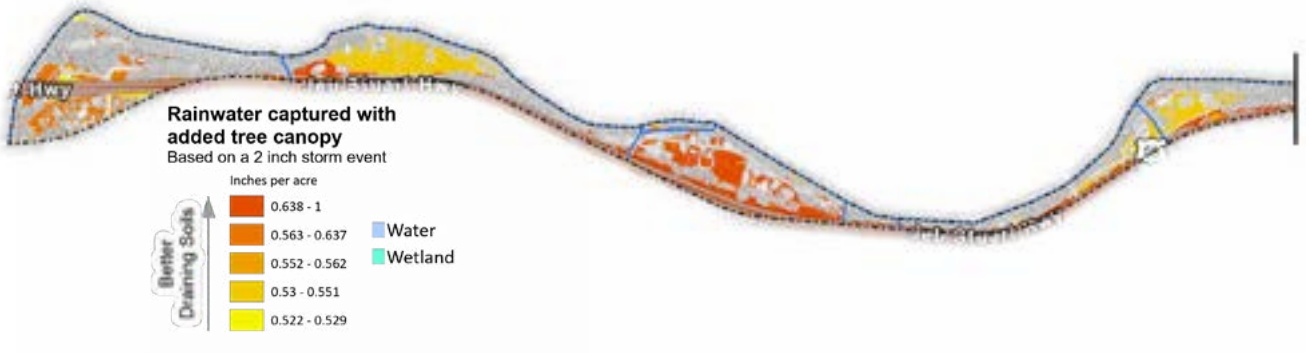
Creeper Trail Spur

Best Tree Canopy to Save for Stormwater Infiltration

The TSW Tool was applied to map the locations where tree conservation will result in the greatest amount of stormwater capture and infiltration (dark green).

Best Tree Planting Locations for Stormwater Infiltration

The TSW Tool was applied to map locations where planting trees will result in the greatest amount of stormwater capture and infiltration (orange).



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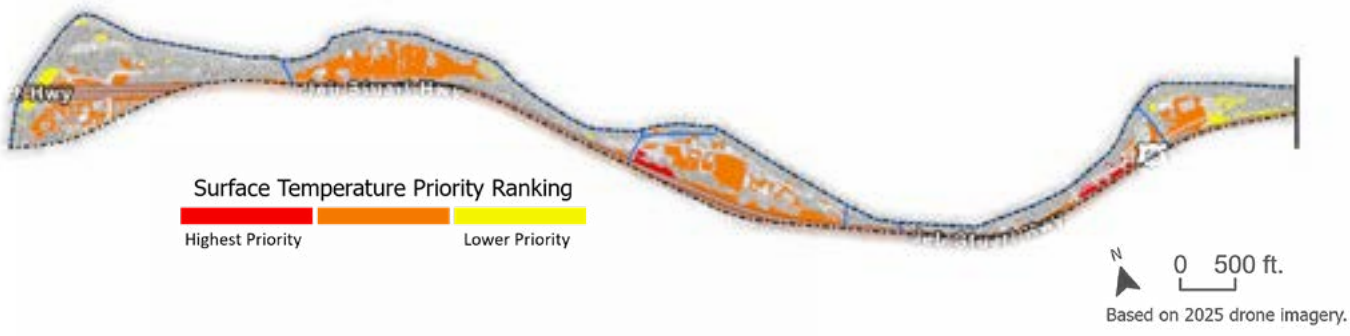

Vision, Goals, and Objectives

The Town of Damascus's vision is of a robust, healthy urban forest that creates a high quality of life for residents, a friendly, welcoming place for visitors, and a healthy, resilient system of streams and forests.

The Town's tree canopy goal is to maintain coverage at 45% over the next 10 years.

Recent national data show urban and suburban tree canopy cover is trending downwards at a rate of 175,000 acres lost per year – approximately 36 million trees lost annually (Nowack and Greenfield 2012). Trees are lost due to development, disease, storms, and old age. Damascus has experienced recent losses due to insect pests such as Emerald Ash Borer and storm damage from Hurricane Helene. This plan establishes a vision, goals and objectives for the urban forest, to mitigate tree loss, and manage existing trees for a healthy, resilient urban forest.

The Town of Damascus and the GIC partnered in a nine-month effort to create this Strategic Tree Canopy Plan. GIC and Town staff engaged in a series of workshops from the summer of 2025 to the winter of 2026 to evaluate tree canopy cover, determine plantable areas, set a canopy goal and evaluate policies and practices that support tree canopy cover. The Town identified the following vision and tree canopy goal to guide the goals and strategies that follow:

Vision: The Town of Damascus has a robust and healthy urban forest that creates a high quality of life for residents, a friendly, welcoming place for visitors, and a healthy, resilient system of streams and forests.

Tree Canopy Goal: The Town of Damascus plans to maintain 45% over the next 10 years and work toward increasing tree canopy in the future.

Achieving this tree canopy goal requires a coordinated effort by both the Town and private property owners. Since town-owned land makes up about 20% of the total land area, the Town is committed to replanting 20% of any annual tree loss, while the remaining 80% will be replanted on private property by residents, businesses, and developers. Estimating annual tree loss at 30 trees, the Town will plant at least 6 trees per year on town owned land and will engage with private landowners and businesses through outreach, education, and tree giveaways to encourage the planting of at least 24 trees per year on private property.

The tree canopy goal, objectives, and action items for Damascus's urban forest are on the following pages. These, and other practices, will provide long-term care, protection, and best planting practices for the urban forest, and will ensure that investments in town trees pay dividends by reducing stormwater runoff, cleaning the air and water, lowering energy bills, raising property values, and providing natural beauty long into the future.

The following is organized into goals, objectives, actions and timeframes. Timeframes include:

- ST= Short term, 1-2 years
- MT= Middle term, 2-5 years
- LT= Long term, 5-10 years
- Ongoing= continous

Tree Canopy Goal: Maintain tree canopy cover at 45% over the next 10 years.

1 GOAL 1:
Plant a mix of trees on public property in the town to increase resilience and quality of life.

- **Objective 1.1:** Adopt diversity and native tree standards for tree planting on public land and in the right-of-way.

  The town aims to plant 100% native species and when more than 5 trees are being planted, no more than 20% of trees shall be of the same genus.

  Timeframe: ST

- **Objective 1.2** Plant trees in town-owned parks and properties to mitigate tree loss and increase tree canopy.

  Action: Plant trees at the following locations to mitigate tree loss from Hurricane Helene, pests, and aging canopy through a Virginia Department of Forestry grant:

  - Creekside Park
  - Dog park
  - Island by Pool
  - Tent City
  - Town Park North
  - Town Park South

  Action: As additional properties are acquired, such as the Bayer Site and Railroad Ave. property, develop plans for these sites that integrate tree planting.

  Timeframe: ST-ongoing

- **Objective 1.3** Plant trees in the riparian buffer on town land to filter runoff and shade waterways.

  Action: As streambank restoration projects are completed, evaluate 50 ft and 100 ft riparian buffers on public land for reforestation. Forests act as glue holding the soil in place and limiting erosion. Forests are more effective than single trees.

  Timeframe: MT-ongoing

- **Objective 1.4** Plant trees along streets for shade and walkability.

  Action: Target future street tree plantings to the following streets:

  - South Shady Ave.- past the ballfields- in right-of-way with VDOT approval
  - Damascus Dr. & Douglas Dr.- focus on front yard plantings on private property

  Timeframe: MT-ongoing

- **Objective 1.5** Plant trees along trails through town for shade beginning with large shade trees.

  Timeframe: MT-ongoing

Data on trails and potential for more trees:

Trail	Corridor	% Tree Canopy	Acres of PPA*	#of Trees *Small, Large**
Appalachian Trail	25ft buffer	24%	1.2	124, 64
Beaverdam Creek Trail	25ft buffer	17%	1.5	149, 66
Creeper Trail	Town's ROW	48%	5.5	372, 304

*PPA is potential planting area for new trees. Small trees are those with a 20' diameter or smaller canopy and large trees are those with a 40' diameter or larger canopy.

2 GOAL 2:
Establish a public tree maintenance program to ensure a healthy and safe town tree canopy.

- **Objective 2.1:** Invest in training and credentialing a staff member as an International Society of Arboriculture (ISA) certified arborist to direct town tree planting and care.

  Action: Train the Recreation Program Director who currently assesses trees ahead of events season and would benefit from ISA training and certification.

  Cost: Initial investment of $900, with ongoing education credits required annually.

  Funding: May be able to get training covered by Virginia Department of Forestry scholarship.

  Timeframe: ST

- **Objective 2.2:** Establish annual tree maintenance goals and plan.

  Action: Develop a written and spatial annual work plan for the urban forest. Revise and revisit each year.

  Timeframe: ST-ongoing

- **Objective 2.3:** Establish funding sources and partners for tree care and tree removal.

  Action: Seek grant funding for public tree maintenance.

  Action: Continue to work with state agencies and local government partners such as the Virginia Department of Forestry, Virginia Department of Corrections, and the Town of Abington on tree assessments, tree care and hazard tree removal.

  Action: Establish a line item in Town budget for tree care.

  Action: Request an initial budget based on projected costs.

  Action: Track spending and maintenance needs over the year documenting all spending including grant funds and donated labor.

  Action: Review spending and work completed as well as work still to be done to determine budget request for the next fiscal year.

  Timeframe: ST-ongoing

GOAL 3:

3 Create an education program focused on trees and resilience to grow tree canopy on private land.

- **Objective 3.1:** Hold a public event at the Damascus Trail Center in collaboration with the Appalachian Trail Conservancy (ATC) and other town partners to educate the community on the value of trees and encourage tree planting on private property.

  Action: Educate residents and business owners on the value of riparian buffers, tree planting, rain gardens and rain barrels for stormwater management on their land.

  Action: Work with the Holston River Soil and Water Conservation District to identify funding sources for residents to be reimbursed for riparian plantings, rain gardens etc. on their properties.

  Action: Offer free trees and rain barrels for residents at event.

  Timeframe: ST

- **Objective 3.2:** Hold an annual community tree planting event on town land to engage the community.

  Action: Work with the ATC and other town partners on a community planting event once the Town has recovered from more immediate storm related volunteer needs.

  Timeframe: MT

- **Objective 3.3:** Integrate tree giveaways and education about tree benefits into other town events.

  Timeframe: ST-ongoing

Conclusion

Damascus has new data and strategies in this plan to guide the management of its urban forest. Implementing these tree strategies will ensure that current and future residents enjoy the continued benefits of trees and a healthy, sustainable, and beautiful town for all.

This plan is a living document that is intended to be integrated into on-going staff work plans, annual budgets, grant proposals, and partnerships with outside agencies. It is recommended that staff review the objectives and actions quarterly to document the plan's progress and adapt its strategies as needed. The Town has also been provided with an implementation plan to guide internal planning and management of its urban forest.

In the spring of 2026, the New River Conservancy in collaboration with Town staff, planted trees across town. The focus on riparian plantings will benefit stream health and resilience for Laurel Creek and Beaverdam Creek.

Appendix A: Funding Opportunities

VA Funding Opportunities

For tree campaigns to be successful, there must be dedicated funds. These funds can come from a variety of sources; including federal, state, local, and private resources. Examples of these opportunities are listed below.

Virginia Department of Forestry

- Virginia Trees for Clean Water Grant Program
- Urban and Community Forestry Grant Program
- Emerald Ash Borer Cost-Share Program

For more information: https://dof.virginia.gov/urban-community-forestry/urban-forestry-community-assistance/financial-assistance-for-urban-and-community-forestry-projects

Virginia Environmental Endowment

- Virginia Program
- Various grants, updated yearly

For more information: https://www.vee.org

Appalachian Power Company Foundation

- A yearly fund awarded to create meaningful change and help build a brighter future for Appalachia.

https://www.appalachianpower.com/community/caring/giving

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