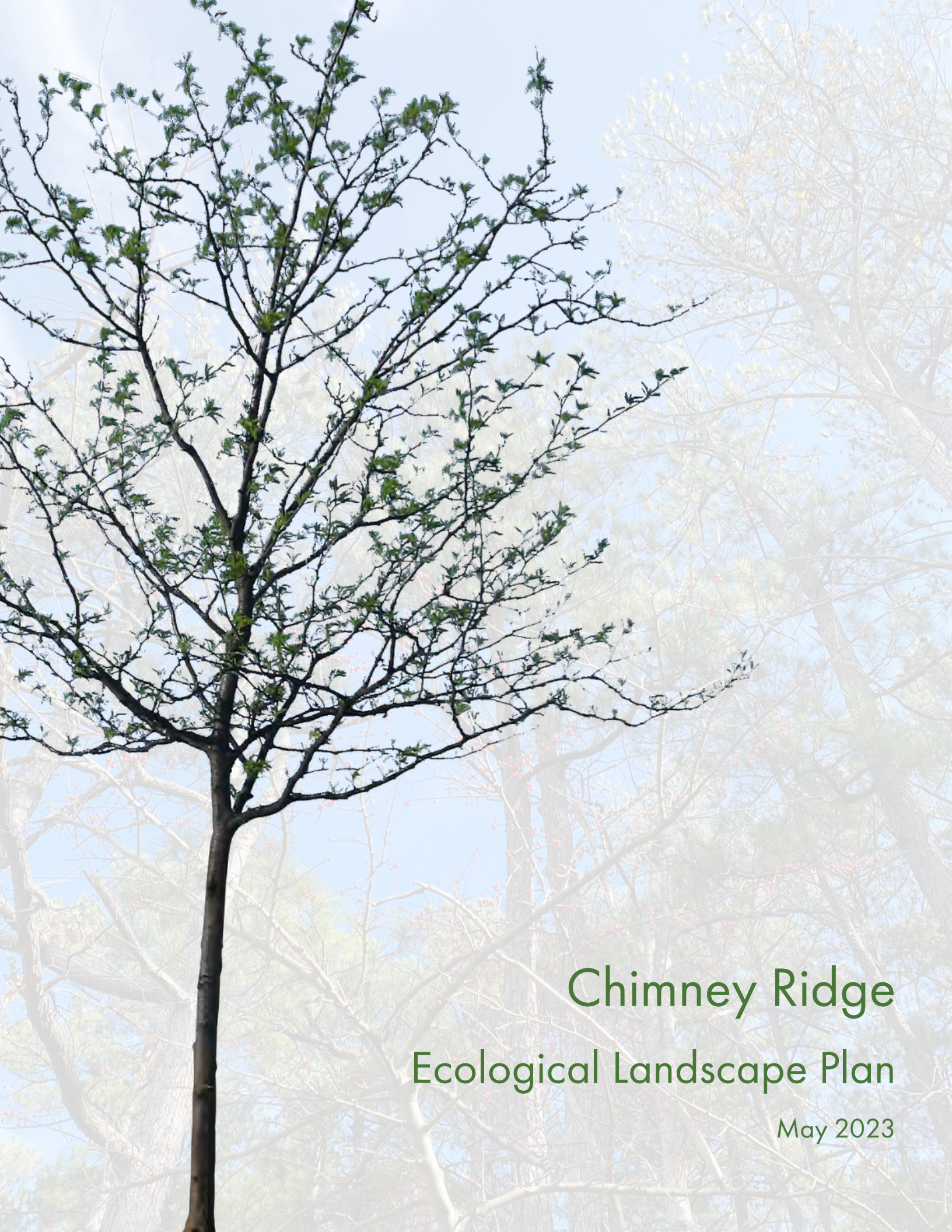


Chimney Ridge

Ecological Landscape Plan

May 2023

CONTENTS

WHY ECOLOGICAL LANDSCAPING?

Ecology is the study of how organisms interact with one another and with their physical environment. Ecological landscaping means understanding and supporting these interactions through the practice of designing, planting, and caring for landscapes over time.

Ecological landscaping fosters healthy living soils as the basis for all planting. This means eliminating toxic chemicals and encouraging the recycling of nutrients. Ecological landscaping also restores the balance of plantings to native plants, while eliminating invasive and exotic plant species.

Ecological landscaping builds the capacity of the landscape to soak up and infiltrate rainwater, and reduces erosion, thus improving water quality.

Ecological landscaping expands the tree canopy, which creates shade and improves the overall resiliency of the landscape to climate impacts.

We don't need to wait to have a positive impact on the world.

Neighborhood Goals

Protect Pollinators

Create Shade

Bring Beauty

Eliminate Erosion

Minimize Maintenance

Landscape Design Guidelines

GOAL: Protect Pollinators

- Plant native "keystone" plant species
- Eliminate neonicotinoid pesticides and other toxins from the landscape
- Remove invasive species to restore the balance to native plants

GOAL: Create Shade

- Plant and nurture shade trees to cool down temperatures off the parking lot
- Create a neighborhood policy to protect shade trees from removal
- Opt for green mulches over wood mulch to facilitate evaporative cooling

GOAL: Bring Beauty

- Utilize a simplified and unified plant palette
- Include flowering perennials strategically throughout the landscape
- Integrate ornamental trees into the "front yards" of the buildings

GOAL: Eliminate Erosion

- Soak up stormwater where it falls so it cannot gain velocity over land
- Improve the soil's capacity to absorb rainwater
- Direct rainwater into vegetated swales designed to infiltrate rainwater
- Seed an erosion control seed mix in areas where erosion is a concern

GOAL: Minimize Maintenance

- Utilize native plants that have minimal pest concerns
- Utlize native plants that are resilient to drought and flooding
- Cover ground with plants that do not need to be mowed regularly

VISUAL SURVEY RESULTS

58
participants

In the month of March, residents participated in an online Visual Preference Survey to rate alternatives for the Chimney Ridge landscape. A summary of results is shared below.

1st
ranked photo

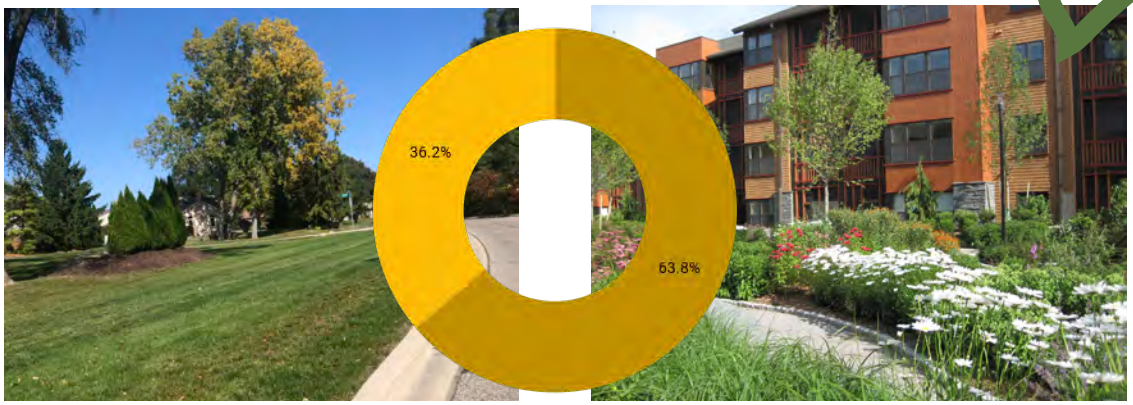
The highest ranking image from the visual survey was the image of river birches with groundcover plantings.

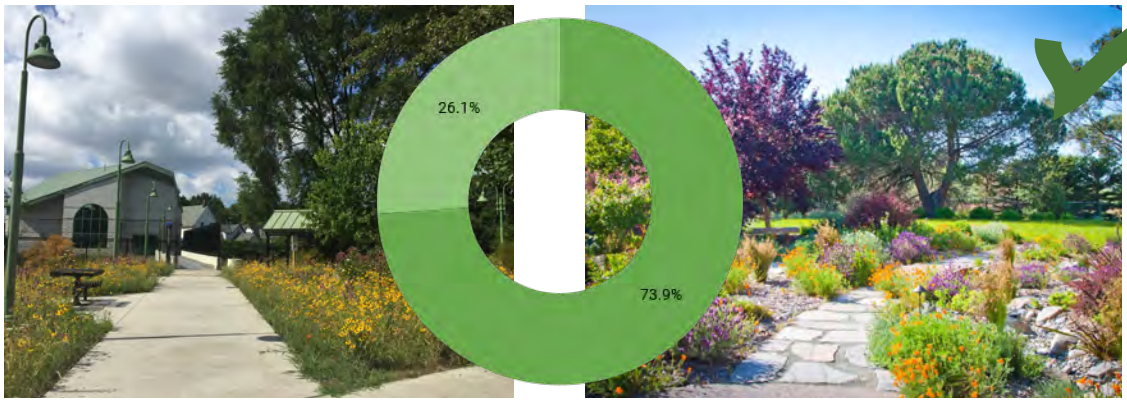
Community gardens was the least popular idea in the survey.

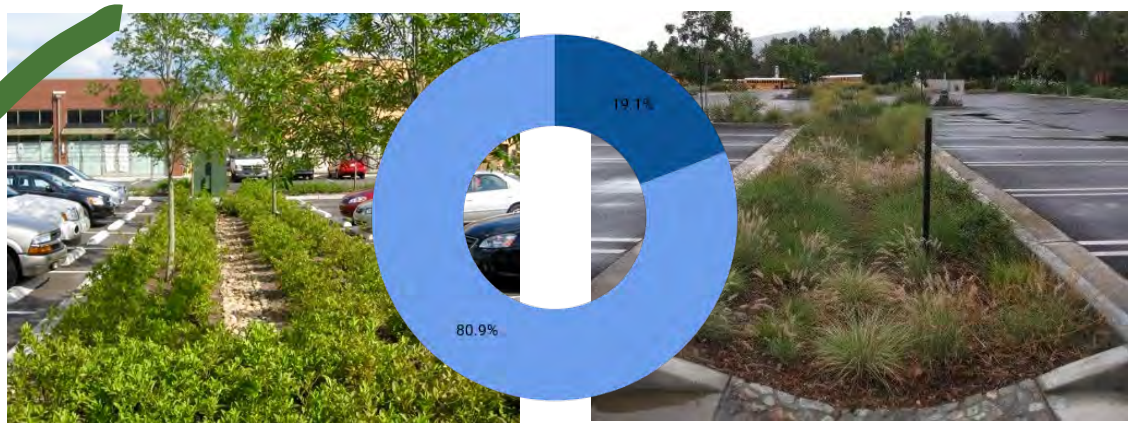
81%
preferred trees and groundcover in the parking lot islands

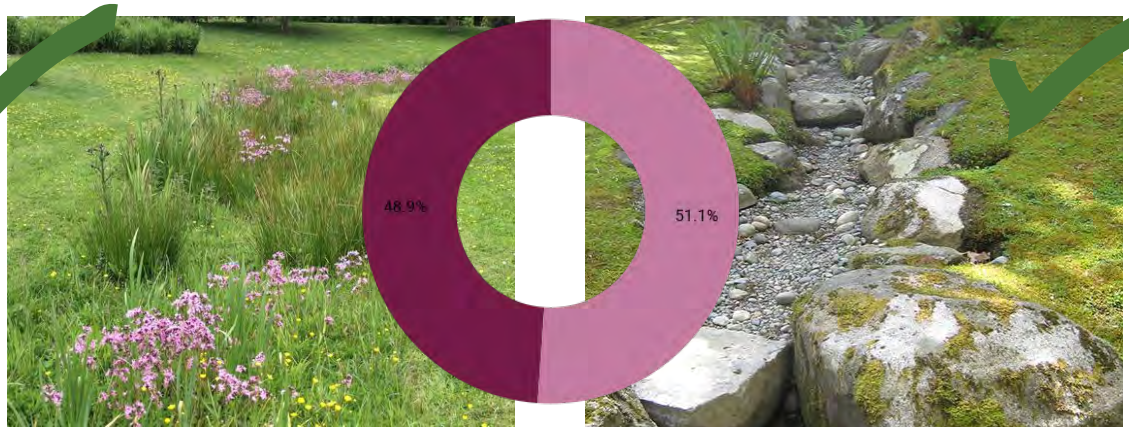
The creekside trail and planted swales were among the most popular ideas.

Residents preferences:









LET'S LEARN ABOUT THIS LAND...

Deep History and Surrounding Ecology

The forest types found in this area of Durham include pine, pine-hardwood, upland hardwood, and bottomland hardwoods. Oak-hickory is the most widespread of the upland hardwood types and occurs on a range of well-drained sites. Bottomland hardwood forests cover riparian zones throughout the region.

The most common species of pine found within the nearby surrounding forests are loblolly, shortleaf and Virginia pine. Oak-hickory forests are dominated by white oaks, northern and southern red oaks, and various hickory species. Understory trees include sourwood, dogwood, blackgum, red maple, and various viburnums.

Beavers have been known to inhabit areas of the Duke Forest along Mud Creek and Stony Creek and the tributaries of New Hope Creek watershed.

Existing Tree Canopy

Existing tree canopy cover is around 10%, compared to the 35-40% that would be desired for this type of development. This tells us that there is plenty of room here for expanding tree canopy cover, which would help manage stormwater, improve air quality, support local wildlife, and reduce ambient temperatures.

Expand the tree canopy with "keystone trees." Keystone trees are those trees that support 90% of caterpillar species. This will enable terrestrial bird species to thrive within your neighborhood.

Arborist Tree Assessment

1. Ash tree to be removed
2. Dying Maple tree to be removed
3. Dying Maple tree to be removed
4. Black Cherry to be removed
5. Dead & Decayed Pine to be removed
6. Red Oak to be pruned for clearance
7. Ash tree to be removed
8. Dying Silver Maple to be removed
9. Infected Red Maple to be removed
10. Callery Pear to be removed
11. Two Ash trees to be removed
12. Ash tree to be removed
13. Infected Silver Maple to be removed
14. Beech tree to be pruned
15. Crepe Myrtle to be pruned
16. Ash tree to be removed
17. Dying Maple tree to be removed
18. Dead & Decayed Sweet Gum to be removed

This tree assessment was conducted by Treeist in the month of April, 2023. This assessment identified specific trees that were deemed unsafe and need to be removed.

Sun/Shade Analysis

We performed a sun/shade analysis to identify areas of sun and shade at different times of day throughout the calendar year. Knowing sun and shade patterns helps ecological landscapers make suitable plant choices across the landscape.

January 9, 9:00 am

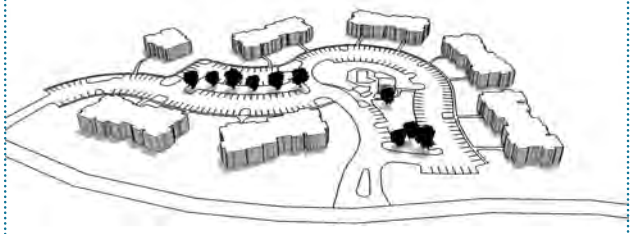
January 9, 12:00 pm

January 9, 3:00 pm

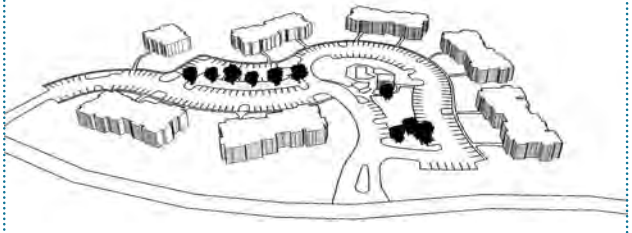
January 9, 6:00 pm

April 9, 9:00 am

April 9, 12:00 pm



April 9, 3:00 pm



April 9, 6:00 pm

July 9, 9:00 am

July 9, 12:00 pm

July 9, 3:00 pm

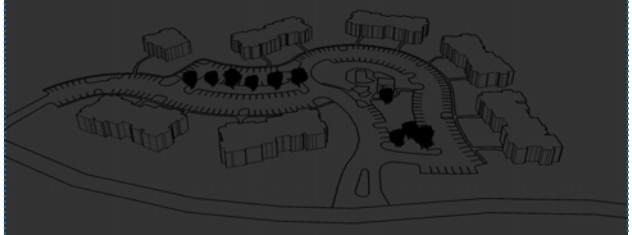
July 9, 6:00 pm

October 9, 9:00 am

October 9, 12:00 pm

October 9, 3:00 pm

October 9, 6:00 pm



Drainage Patterns

Third Fork Creek flows into New Hope Creek flows into Jordan Lake. The rainwater that erodes the slopes around the buildings of Chimney Ridge bring that sediment into the creek and carries it the whole way to Jordan Lake. This is why slowing down water and preventing erosion right in your neighborhood will help to clean up water throughout the region.

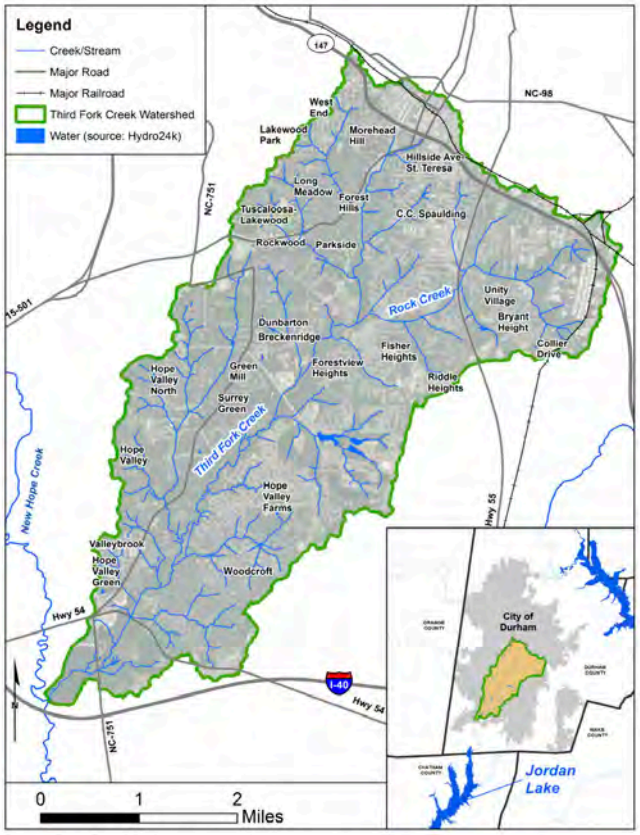
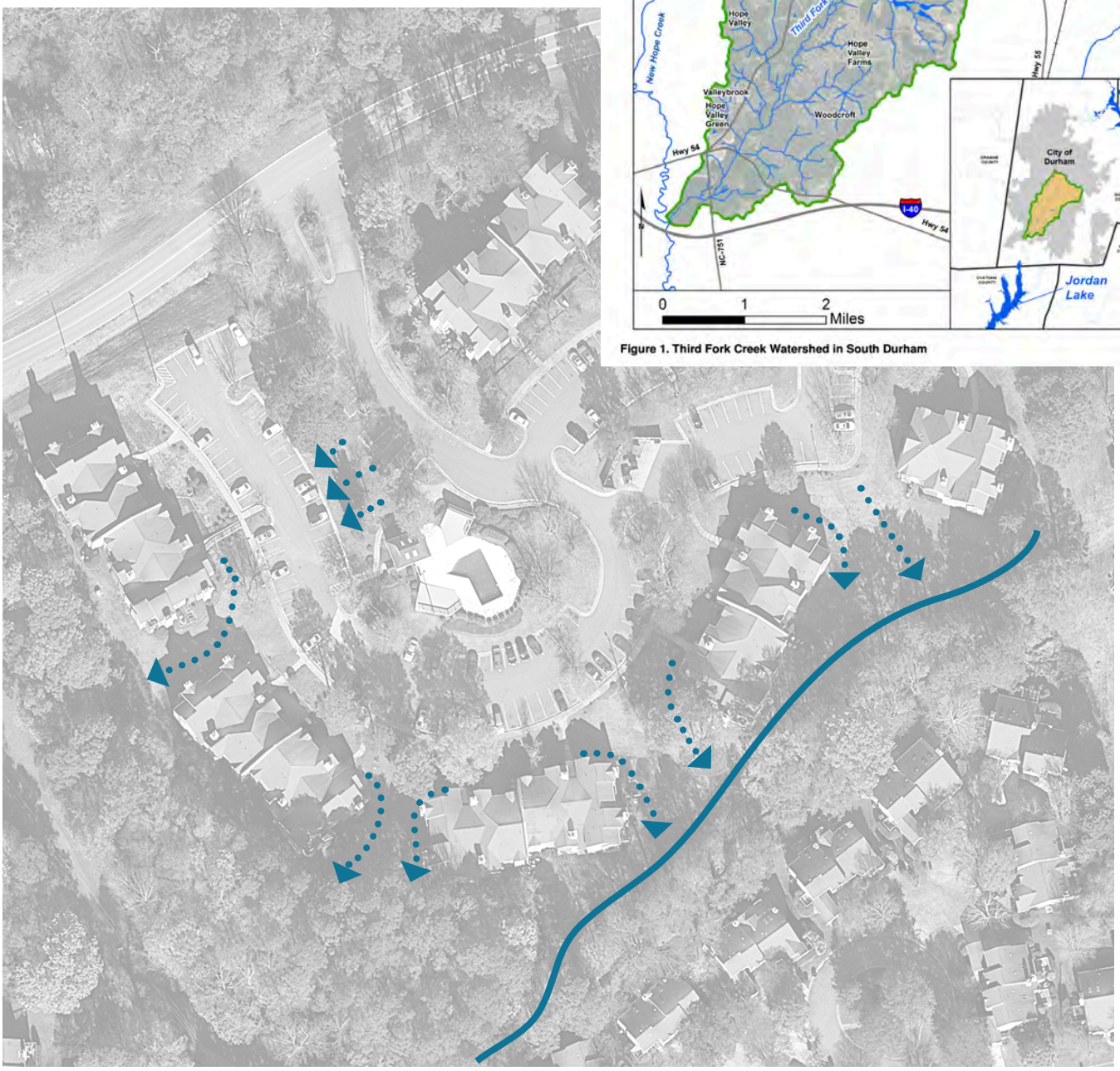


Figure 1. Third Fork Creek Watershed in South Durham



Areas of Erosion

LANDSCAPE ZONES

Community Entrances

Edge Zones

"Front Yards"

Foundation Landscaping

Planted Rainwater Swales

Parking Lot Islands

The Pollinator Garden

The Trail

The Food Forest

The Redbud Grove

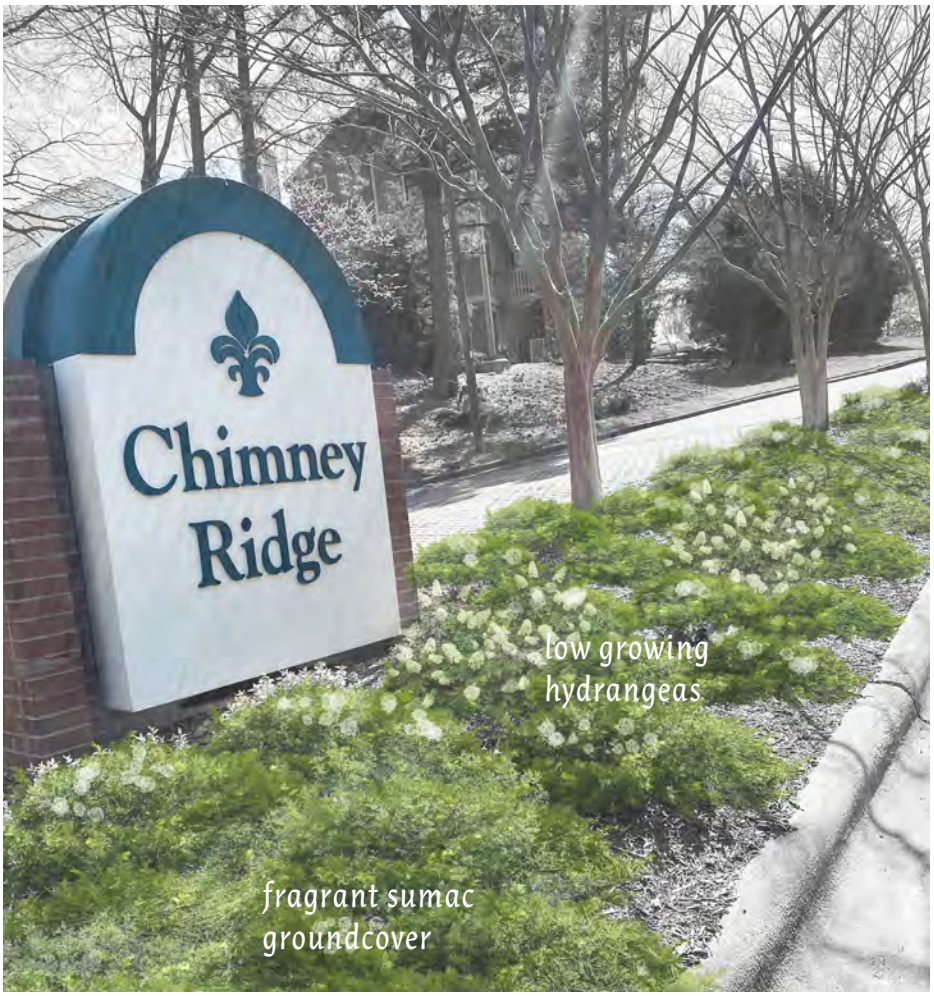
COMMUNITY ENTRANCES

The plantings at community entrances shall be simple and streamlined. Over time, existing invasive plantings shall be replaced with native alternatives.

PLANTS FOR COMMUNITY ENTRANCES


fragrant sumac


dwarf oakleaf hydrangea

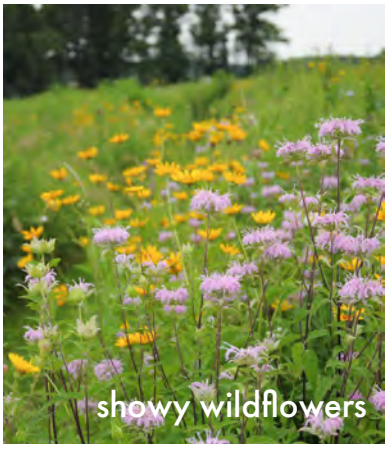


The plantings can be a matrix of fragrant sumac, a low-growing native groundcover with many benefits to pollinators. Low-growing oakleaf hydrangeas, which hold their shape through winter, can be interspersed for their showy flowers.

EDGE ZONES

The grass areas at the edge of Highgate Drive require regular mowing, which is a significant maintenance expense for the Chimney Ridge Neighborhood Association and also requires significant fossil fuel investment each year, impacting air and water quality. We recommend integrating a low-mow alternative of native grasses and wildflowers.

PLANTS FOR EDGE ZONES


showy wildflowers


native grasses

A mow strip at the base of the slope will signal that the longer grasses and flowers are intentional and show that this area is cared for.

FRONT YARDS

The areas in front of the buildings do not generally support healthy growth of grass, which causes bare and dusty patches that don't look great. The new plantings in front of buildings will be designed to cover ground and provide shade and beauty with ornamental flowering trees.

PLANTS FOR FRONT YARDS


fragrant sumac


dogwood


river birch

PARKING LOTS ISLANDS

Many of the trees in parking lot islands are unhealthy and need to be removed. Parking lot islands will be replanted with more resilient shade trees and the ground will be covered with a green groundcover.

PLANTS FOR PARKING LOT ISLANDS

FOUNDATION LANDSCAPING

As foundation shrubs need to be replaced, replace them with native alternatives. Include a mix of dwarf evergreen shrubs and flowering deciduous shrubs.

BENEFITS OF NATIVE SHRUBS AS FOUNDATION LANDSCAPING

- Native plants promote biodiversity.
- Native plants sequester carbon from the air.
- Native plants provide shelter and food for wildlife.
- Native plants require less water than other species.
- Native plants do not require fertilizers and require fewer pesticides.
- Native plants require less water than other species and help prevent erosion.

PLANT LIST FOR FOUNDATION LANDSCAPING


Virginia sweetspire


yaupon holly


distylium


inkberry holly


dwarf oakleaf hydrangea


chokeberry

With a consistent palette of native shrubs, each building can choose their preferred mix of shrubs. Some buildings may opt for more flowering shrubs, while some buildings may choose all evergreens. Shrub replacements can occur over time, as existing shrubs need to be replaced.

PLANTED RAINWATER SWALES

Planted swales are a great way to manage stormwater and reduce erosion while beautifying the neighborhood. Swales reduce the quantity of water that moves over the landscape by infiltrating into the ground and evapotranspiration. Swales also improve water quality by filtering out pollutants and sediment.

BENEFITS OF PLANTED SWALES

- The roots of plants help stabilize hillsides.
- Swales filter out pollutants and sediment from rainwater.
- The roots of plants help absorb water and keeps it from running off.
- Swales slow water down and keep it from running across the landscape.
- Swales are a more economical solution than underground pipes and curb and gutter.

PLANT LIST FOR SWALES

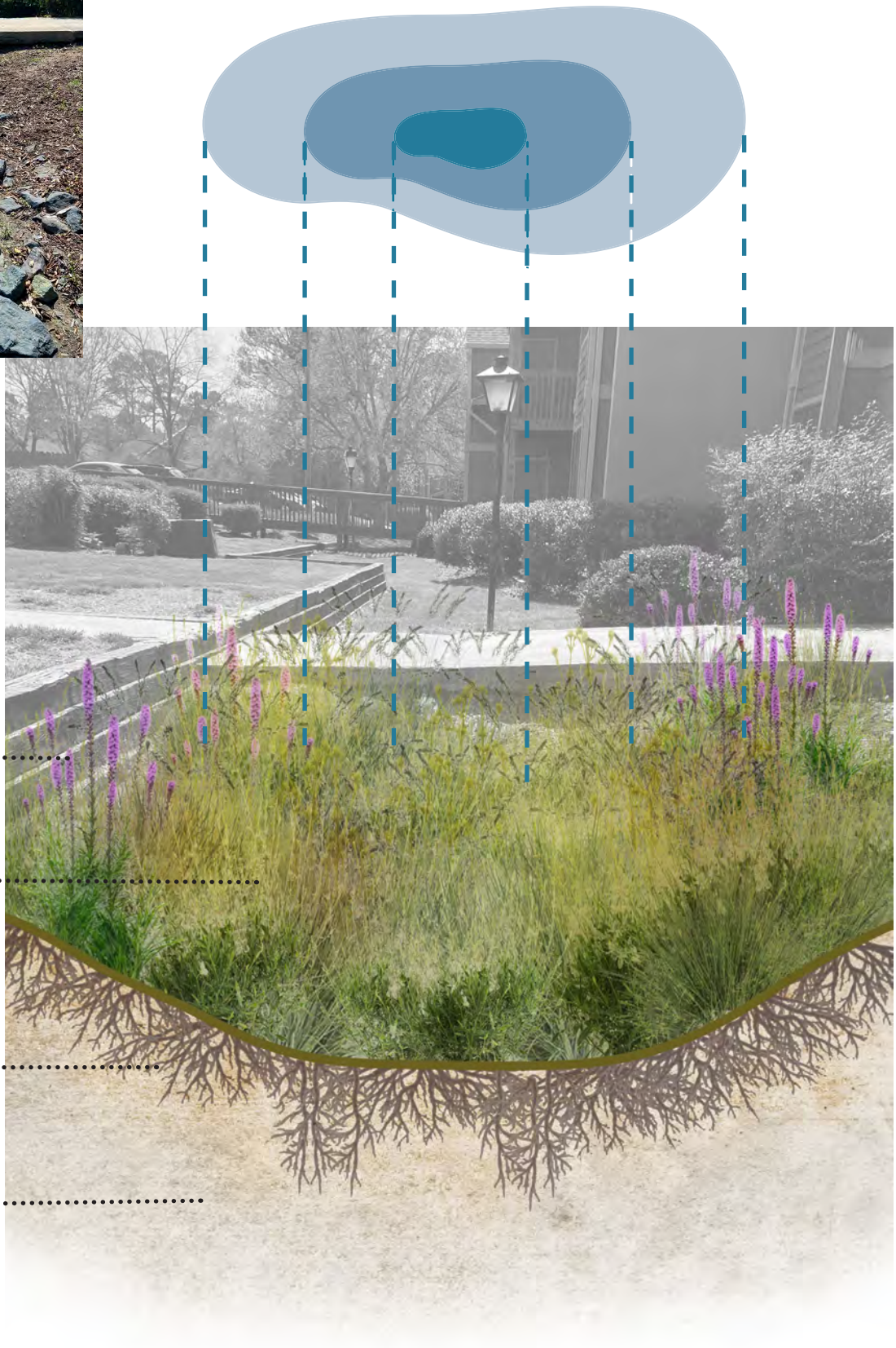

white turtlehead


creek sedge


blazing star


soft rush


blue flag iris


water-loving plants
runoff is directed into the swale
rainwater infiltrates over 1-2 days
rock and gravel base

THE POLLINATOR GARDEN

The existing pollinator garden, designed and planted by designer Alan Johnson, is planted with native flowers that provide nectar or pollen to a wide range of pollinators. Resident and migratory birds and native, non-stinging bees, butterflies and moths all enjoy the bounty provided by the pollinator garden.

PLANTS of the POLLINATOR GARDEN


hyssop


blanket flower


coreopsis


butterfly weed


goldenrod 'fireworks'


aster

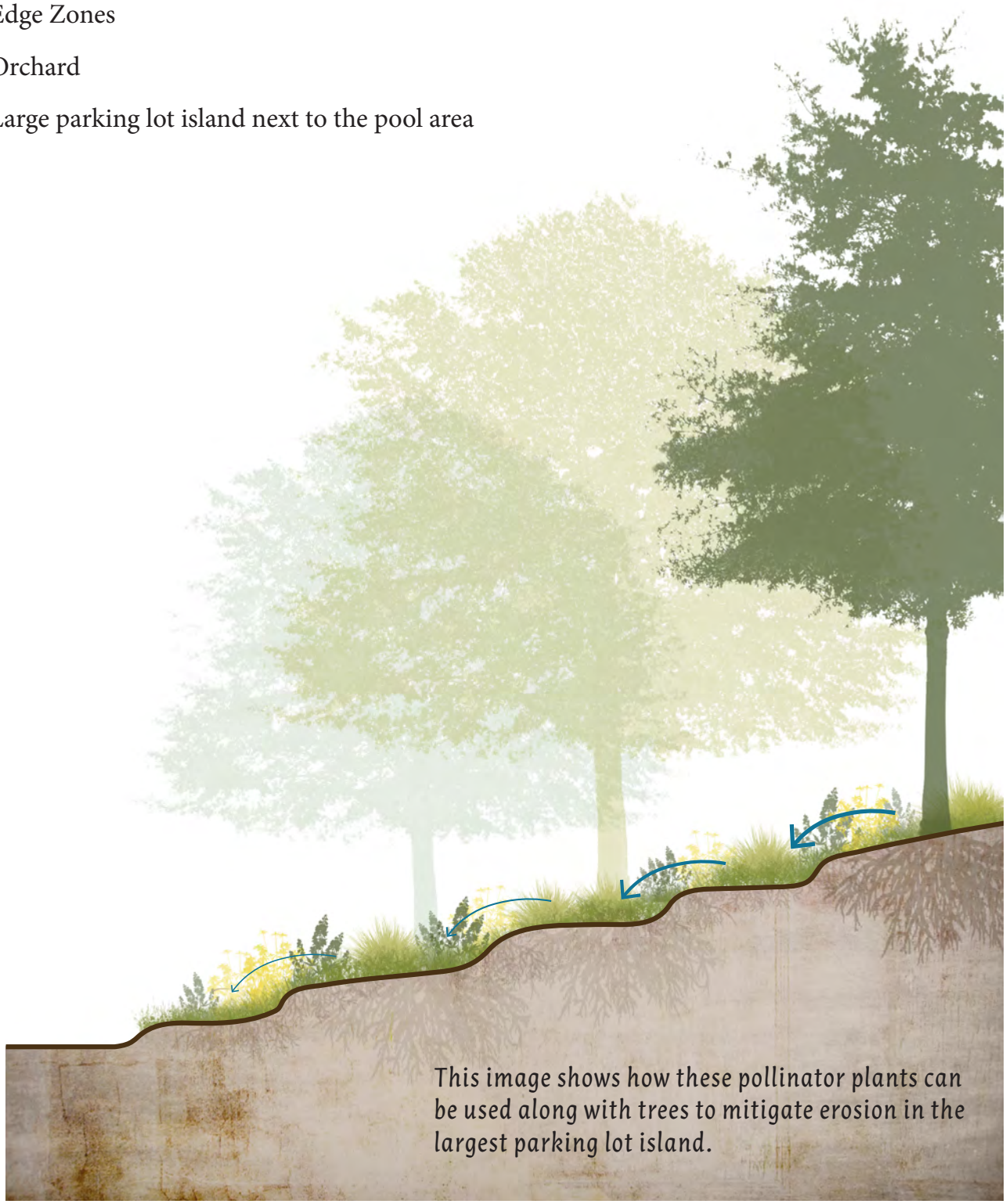

beardtongue


bee balm


swamp sunflower

This pollinator garden offers an excellent guide for integrating native perennials into and throughout the Chnimney Ridge neighborhood. Over time, these pollinator plants can be extended into the following areas:

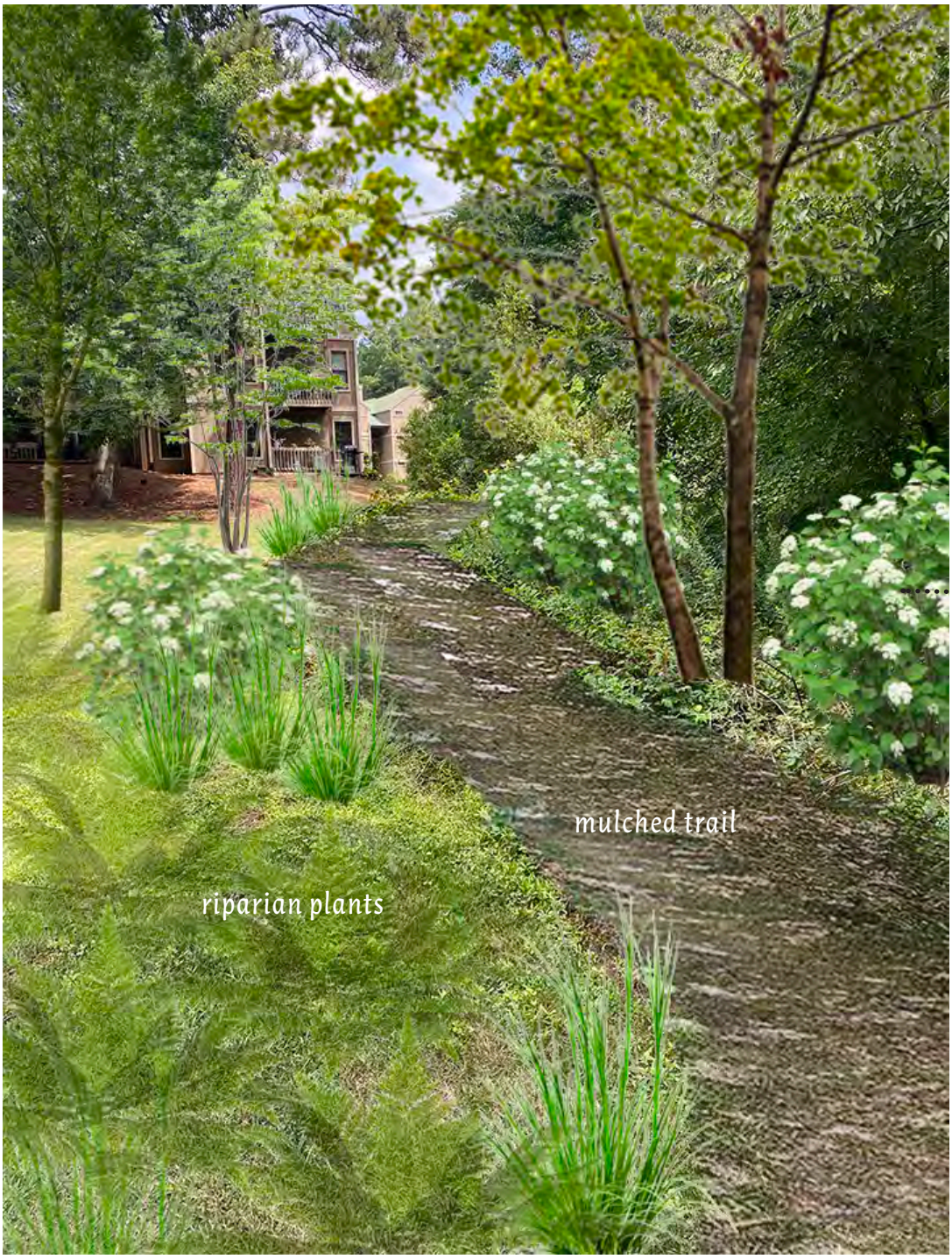
- Edge Zones
- Orchard
- Large parking lot island next to the pool area



This image shows how these pollinator plants can be used along with trees to mitigate erosion in the largest parking lot island.

THE TRAIL

There are many paved walking trails throughout the neighborhood, but no walking areas within Chimney Ridge other than the sidewalks next to the parking lots. A simple walking trail can be cut into the streamside vegetation to allow easier access for invasive plant removal, and to integrate native plants on either side of the trail.



REMOVAL OF INVASIVE PLANTS

There are many invasive species in the streamside area that shall be routinely removed to restore the balance toward native plants in this area. These plants include:

- English ivy
- Nandina
- Poison ivy
- Japanese stiltgrass
- Callery 'Bradford' pear
- Chinese privet
- Japanese Honeysuckle
- Multiflora rose
- Bicolor lespedeza
- Autumn olive

STREAMSIDE NATIVE PLANTS

The area on either side of a stream is called the *Riparian Zone*. In the riparian zone, include water-loving plants that typically grow on the banks of the stream.


spicebush


arrowwood viburnum


chokeberry


beautyberry


paw paw


buckeye

THE FOOD FOREST

Fruiting trees and shrubs can be planted in a forest configuration to create a low-maintenance way to have food plants in the neighborhood. A perimeter fence would be necessary to keep fruit safe from deer.

REDBUD GROVE

Redbud trees planted in a circle at the creek's edge will create a space for building residents to meet and hang out. Redbuds have vibrant pink flowers in the spring and substantial foliage in the summer to provide shade. Redbuds are a great tree for the neighborhood birds!

Multi-stemmed redbud trees arranged in a circle

MASTER PLAN


edge
community
entrance
edge zone
parking lot islands
pollinator
garden
front yard
redbud grove
creekside trail

The plans for each individual spot within the community will fit together into a cohesive and integrated whole. The master plan, once implemented in its entirety, will expand the tree canopy substantially. This tree canopy will support local pollinators and birds, provide shade, and improve air and water quality.

IMPLEMENTATION PHASING

ONGOING MAINTENANCE	PHASE 1: REMEDIATION
MOWING	
MULCHING (CONVERT TO COMPOSTED LEAVES)	
PRUNING	
	REPLANT PARKING ISLANDS
	CREATE PLANTED SWALES
	MANAGE STREAMSIDE INVASIVES

PHASE 2: RESTORATION

PHASE 3: REGENERATION

PLANT REDBUD GROVE

REPLACE INVASIVES AT ENTRANCES WITH NATIVE

FOUNDATION PLANTINGS - REPLACE INVASIVES WITH NATIVE

BUILD AND MAINTAIN STREAMSIDE TRAIL

PLANT THE FOOD FOREST

CONVERT COMMUNITY EDGES TO MEADOW

EXPAND POLLINATOR PLANTINGS/MEADOW

PROPOSED IMPLEMENTATION BUDGET

	2023	2024	2025
ONGOING MAINTENANCE			
+ Mowing and Blowing	$16,886	$15,000	$10,000
+ Dog Stations	$1,647	$1,500	$1,500
+ Pruning and Weeding	$4,283	$5,000	$5,000
+ Winter	$1,418	$1,400	$1,400
+ Leaf Mulching	$2,641	$2,500	$2,500
+ Pollinator Garden Care	$1,000	$1,000	$1,000
+ Arborist tree care/removal	$12,940	$1,500	
PHASE 1: REMEDIATION			
+ Replant Parking Islands	$2,580*	$10,000	$2,500
+ Create Planted Swales		$4,500*	$3,500
+ Remove Invasive Plants	$2,500	$2,500	$2,500
PHASE 2: RESTORATION			
+ Plant the Redbud Grove			$2,500
+ Native Plants at Entrance			$2,500
+ Native Plants, Foundations		$1,000	$1,000
+ Build Streamside Trail			$2,500
PHASE 3: REGENERATION			
+ Plant the Food Forest			
+ Edges Converted to Meadow			$10,000*
+ Expand Pollinator Plantings			
TOTAL FOR YEAR	$45,895	$43,400	$45,900

2026	NOTES
$10,000	Overall mowing costs reduced through lawn conversion
$1,500	
$5,000	
$1,400	
$2,500	
$2,000	Alan Johnson regular garden care
	Frontload arborist work in 2023
	Bradford pear replacement to be state funded; *Request for extra in 2024
$1,500	Do demo project; in early 2024; *Up to $5,000 from CCAP
$2,500	This becomes an ongoing maintenance need to be allocated for each year
	Cost share with building owners?
$1,000	Replacements to occur as needed; Allowance for up to 10 replacements/year
$2,500	Boy Scout project for initial build; Incremental plantings added each year
$7,500*	*Pursue grant funding for community orchard
	*Pursue grant funding for lawn to meadow conversion
$10,000	Cost includes installation and ongoing maintenance.
$45,900	Goal to hold total landscape budget to around $45,000