

Ten Counties. One Upstate. Stronger Together.

#### **Upstate Professional Planners**

**July 30, 2019** 







# Pause to Plan for Nature: Water Quality

Katherine Amidon





## Agenda

- TATT context
- Brief History: Planning for Nature
- Planning for Water Quality
  - APA "One Water"
  - Section 303(d) and 319 of the CWA
  - E.coli: A Local Case Study
- Q&A



ıre: Water Quality

text







#### Why Plan for Nature?

Every project has a potential impact that garners thoughtful environmental planning, with the public interest in mind.

Inaction also has the potential to impact the environment...the status quo may not be acceptable.





## Old Concept, Reinvigorated



Ian McHarg

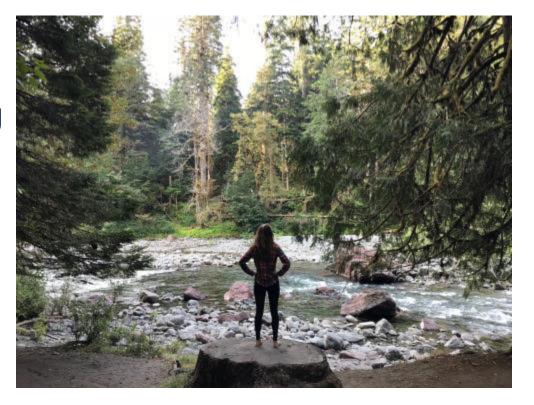
Design with Nature (1969)
Great Coffee Table Book





#### Points of Consideration

- There is no quick fix
- Environmental Planning
  - Time
  - Analysis
  - Reflection
  - Revision
- Constantly Changing







## Pausing is Required







## BUT Action is also required







## Regional Thinking & Watershed







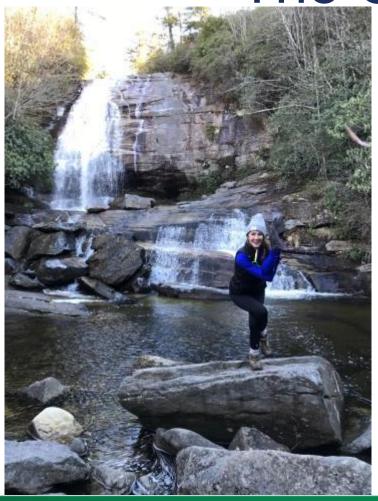
#### **APA: One Water**







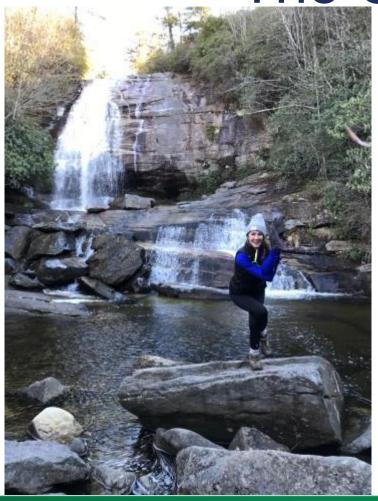
The Clean Water Act 1972



- Section 303
  - Water Quality Standards (WQS)
  - TMDLs
  - 303(d) places the responsibility on states to identify water bodies not meeting the standards set by the WQS



The Clean Water Act 1987



- Section 319
  - Nonpoint source
  - Funding issues
  - Lacking planning participation







Waterbody (Number)*	Impairment	Туре	Funding	Problem	Solutions
Coneross Creek (3)	Fecal Coliform	TMDL	Section 319, EQIP, match	Failing Septic and Ag.	Education, lg.
	40	4/1/	Section 319, match	Urban Runoff and Ag.	Education, \( \dag{g}. \\ \dag{Ps} \\ Education, \( \dag{g}. \\ \dag{g}. \\ \dag{eq}. \\dag{eq}. \\ \dag{eq}. \\dag{eq}. \\ \dag{eq}. \\dag{eq}. \\ \dag{eq}. \\dag{eq}. \\da
			match		
			Section 3 match Section 3		
	11		EQIP, main-kind Section 3 EQIP, main-kind Section 3 match, ir kind Section 3		
Shellfishing Area 7 (7)	Fecal Coliform	303(d)	SCDNR, match, in- kind, Nature Conservancy , Charleston	Ag., Pet Waste, Marine Vessels, Illicit Discharge and Wildlife	rargeted bidPs, shellfish bed restoration replaced septic
			Charleston	Wildlife	replaced septic
			A. See	7.1.	- "
and the second	725				La Carlotte La Car













#### Let's Talk National: Bacteria

Bacteria is a major problem

- 180,000 miles of Rivers and Streams threatened or impaired due to pathogen pollution (EPA)
- Urbanization leads to increased bacteria loads within U.S. waters
- Ecological and human health concerns

Greater than 50% of surface water pollution is a result of nonpoint sources



↑ Sewer Overflow ↑





#### Let's Talk Local: Bacteria













1. Wet weather sampling conditions are statistically significant with increased *E.coli* levels.





- 1a. When is it appropriate to use species-specific fecal indicator bacteria?
- 1b. Can we increase understanding of wet weather conditions?







2. There is an inverse relationship between permits (e.g. NPDES, agricultural) and E.coli levels.





2a. If permits have been shown to work, what policies could you incorporate to mitigate bacterial pollution?







3. Greater amounts of developed land cover and developed land use have a direct relationship to elevated levels of *E.coli*.





- 3a. How well do I know my jurisdiction's stormwater policy and stance on BMP usage?
- 3b. Who owns maintenance of BMPs?





- 3c. Will the choices I make related to urban growth affect water quality?
- 3d. How can I collaborate more with engineers & other planners to implement green infrastructure, low-impact development, and stormwater plans?





3e. How can I promote more collaboration and data

sharing?

Get in the room!
Break down silos!







#### Be an Environmental Planner

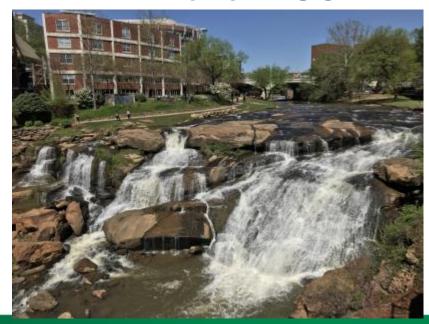
- Pause to Plan for Nature
- Think "One Water"
- Break Down Silos
- Time, Analysis, Reflection, Revision





#### Alternatives to TMDLs

- Category 4b
  - No TMDL: Other pollution control requirements that are expected to reach attainment of the WQS within an reasonable period of time
  - None in SC



- Category 5R
  - Reedy River
  - Began as a pilot in EPA Region IV
  - Focused on Local Knowledge

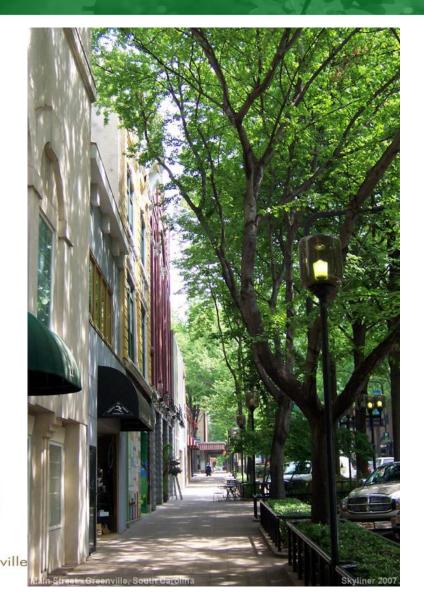


## Planning a Healthy & Mature Urban Forest





## WHY? Trees provide Environmental, Economic, and Public Health Benefits.



#### \$ Money does grow on TREES!

- **✓ \$ IMPROVE** water quality
- **✓ \$ CAPTURE** stormwater
- **✓ \$ SAVE** energy
- √ \$ COOL the air
- ✓ \$ CLEAN the air
- ✓ \$ PREVENT ground level ozone from forming
- √\$ IMPROVE air quality
- \$ Clean air is good for public health.
- \$ Meeting federal and state air quality is good for the **economy.**

#### Planting trees is a local carbon offset

Trees in Greenville County sequester more than **1.6** million tons of carbon annually.

Benefit = \$59,708,091.03

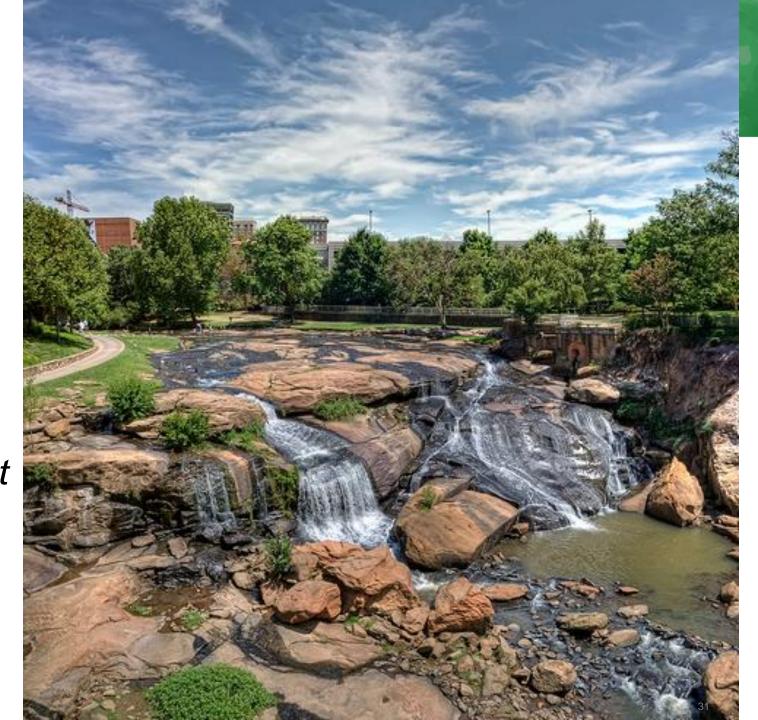
USDA Forest Service, i-Tree Eco Analysis





Trees in Greenville County remove over **25 million pounds** of air pollutants annually.

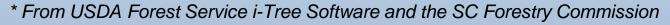
USDA Forest Service, i-Tree Eco Analysis



#### 6759 Trees Planted: 25 year iTree Benefits

- Can remove over 18 million pounds of carbon dioxide from the atmosphere
- Can capture over 138 million gallons of stormwater runoff
- Can remove the equivalent of over 74 million miles of car emissions.

 Over \$2.3 million in air quality & stormwater savings









Development without tree preservation & green space increases stormwater runoff.





## Runoff carries pollution into our streams, rivers, and oceans.



According to the USDA Forest Service Southern Research Station (2018):



A large tree can capture and retain as much as 332 gallons of water. The estimate assumes the widest part of the tree's crown is 33 feet.

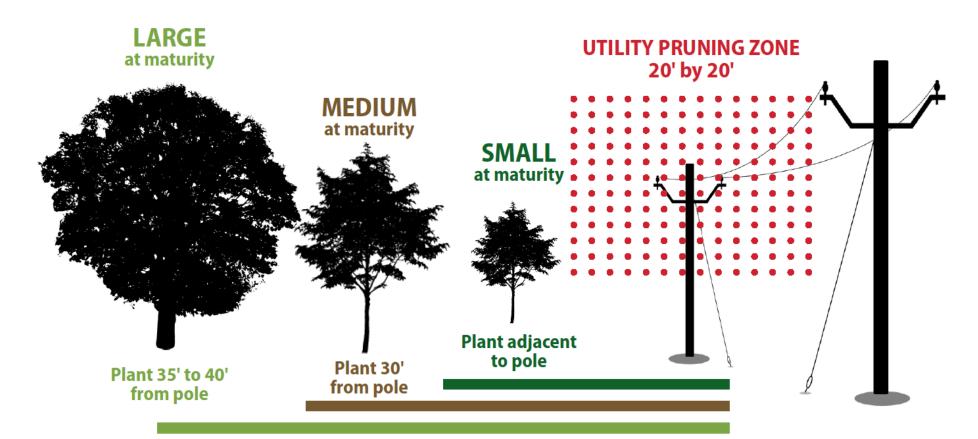
Trees planted over impervious surfaces such as parking lots could reduce stormwater runoff by as much as 20%.

How can we successfully plant trees on urban sites and in urban soils?

Follow ANSI A300 and ANSI Z60.1 industry standards and best management practices.



# RIGHT TREE RIGHT PLACE



maintain 20' clearance near power lines



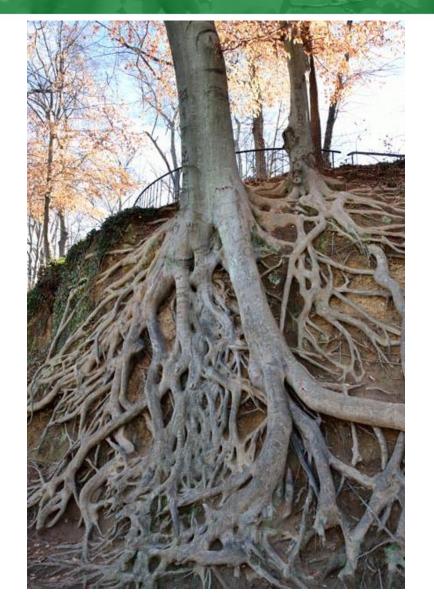


# **SPACE**

- ROOT Space
- Overhead Space
- Mature Width







# **Basic ROOT SPACE Requirements**

	TREE SIZE	Minimum Width of Planting Area	Minimum Distance from pavement or wall
	SMALL	4'	2'
	MEDIUM	4 - 7'	4'
nvi	LARGE	7'	6'





# Proper Planting Depth Is Critical

The root flare must be at or above grade after planting.

Create a level planting surface. Compact the soil in the bottom of the hole to prevent settling.











# Prevent future problems:

Remove straps, wire and burlap.

#### **ANSI A300 Standards:**

Make sure they're in the planting specifications, general landscape notes, RFP, call for bids, etc.

#### Do an inspection.





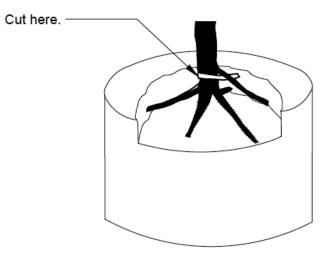
Properly planted and mulched, a tree will show its root flare.



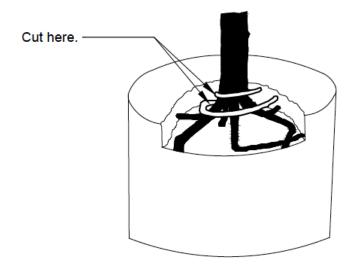


# **Correct Circling roots**

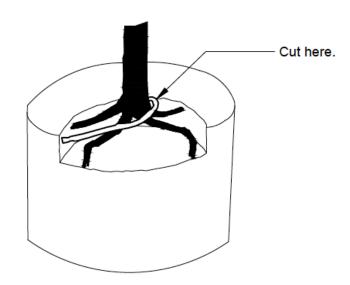




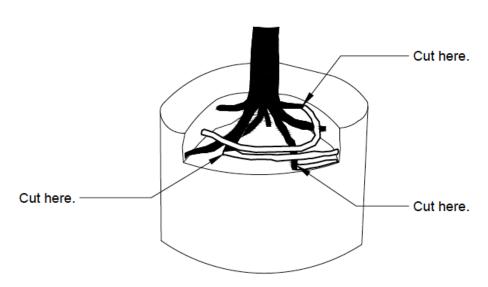
Five structural (large) roots shown in black. Remove structural root (white) wrapping root collar.



Six structural roots shown in black. Remove roots (white) growing over root collar by cutting them just before they make an abrupt turn.



Four structural roots shown in black. Remove root (white) growing over structural roots.



Seven structural roots shown in black. Remove structural roots (white) growing around or over root collar by cutting them just before they make an abrupt turn.



Backfill will native soil.

Gently tamp.

Add amendments to the top 1/3 of the backfill.

Water backfill to settle soil.



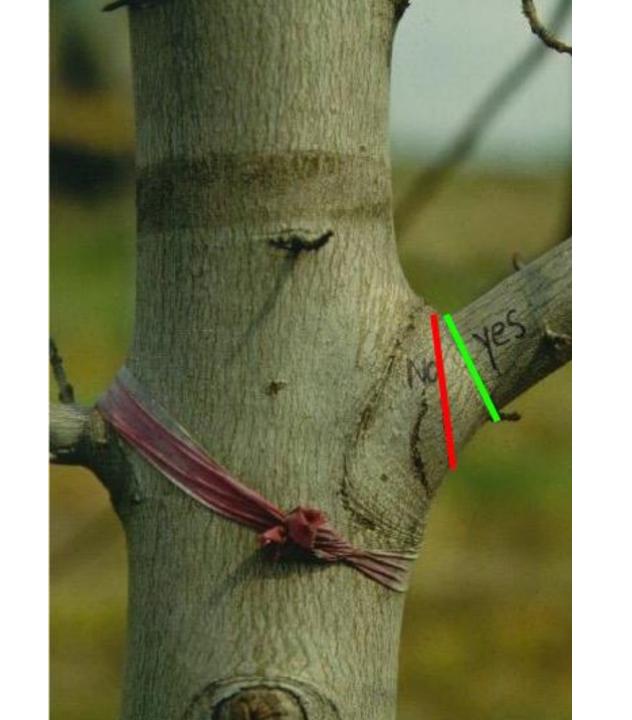






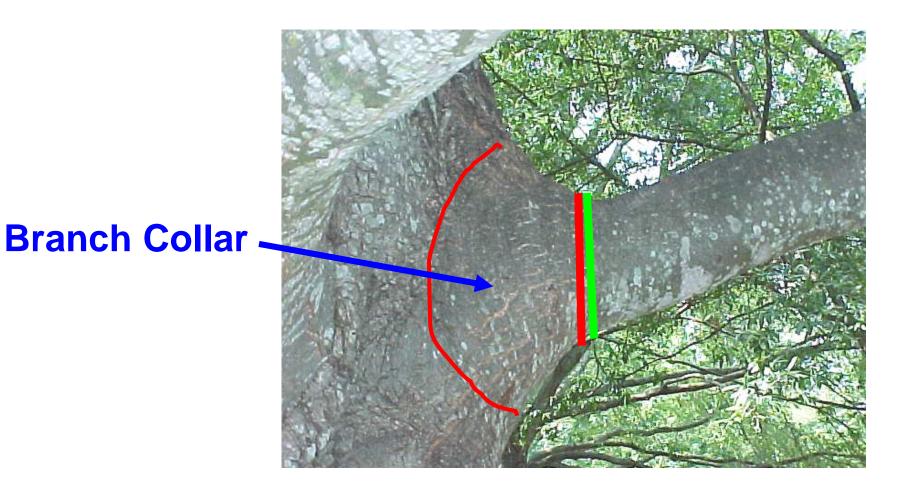






- Apply 2" to 4" thick
- Apply a thinner layer of mulch over the root ball
- Keep mulch away from the trunk
- Mulch should not touch the trunk





#### **TARGET PRUNING:**

The *branch collar* includes the *branch protection* zone; pruning cuts should preserve this collar.



Remove all stakes, wraps, labels, tags, flagging, etc. to prevent wounding or girdling.

# Staking:

- Stake only as necessary.
- Use soft, broad material.
- Allow the tree to sway.
- •Remove after 1<sup>st</sup> year.



### **Contact Us**

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TreesUpstate
Executive Director
ISA Certified Arborist

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www.TreesUpstate.org





#### Our Team

- Manage design & construction projects for GVL Parks & Recreation Department
- Streetscape, parks, open space, zoo exhibit design & construction
- ADA Transition Plan
- Supervise the Design & Planning Group
- Developer Coordination for open space / public space
- Oversee Trails & Greenways budget and projects
- Defacto tree guy for planning purposes
- Landscape and Tree Preservation Ordinance

apps (\\cityfs01\ch4\$) (G:)	Laurens Alley	1/9/2018 9:33 AM File folder	
gisprojects (\\gisfileserver) (K:)	LAURENS ROAD STREETSCAPE	7/31/2018 9:02 AM File folder	
	LEGACY KIOSK	6/29/2018 3:31 PM File folder	
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Network	MCPHERSON	3/18/2019 4:28 PM File folder	
	MCPHERSON ADA	3/18/2019 4:27 PM File folder	
	McPHERSON SHELTER	10/23/2017 4:11 PM File folder	



### MEDUSA MAGNOLIA





#### ORIGINAL LOT w/ MEDUSA MAGNOLIA

- SINGLE OWNER
- +/- 2 ACRES
- 8,000 SF HOUSE
- 900 SF SECONDARY STRUCTURE



### FIRST PLAN

• 8 PRIVATE LOTS



### PUBLIC'S REACTION

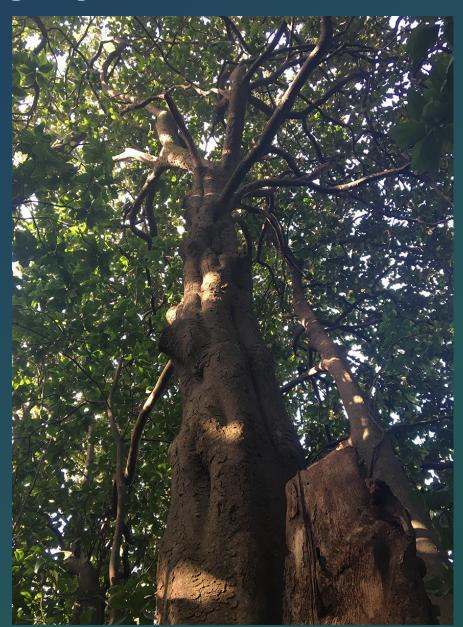


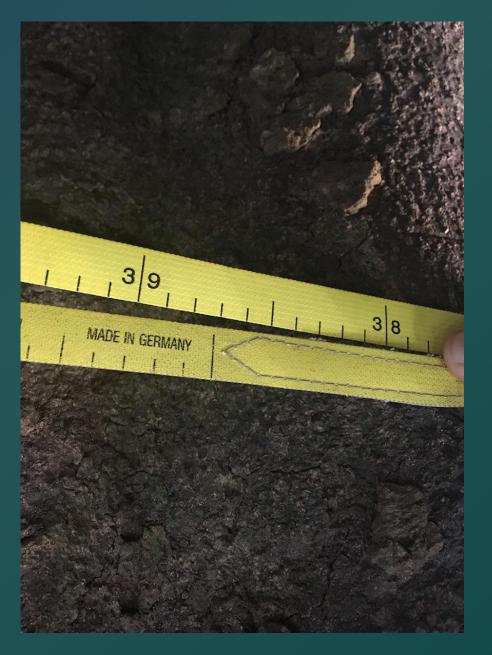
### FIRST PLAN

• 8 PRIVATE LOTS



19-6.2(C)(1)





19-6.2(C)(1)(d)

Heritage or historic trees shall not be cut, removed, pushed over, killed harmed, trimmed, sprayed, or destroyed without written approval by the parks and recreation department.





19-6.2(C)(1)(d)

Heritage or historic trees shall not be cut, removed, pushed over, killed harmed, trimmed, sprayed, or destroyed without written approval by the parks and recreation department.











On Tuesday, October 16<sup>th</sup>, the tree was inspected by two certified arborists with the city's Parks & Recreation Department: Drow Smith (Arborist Certification #50-55498), and myself (Arborist Certification #AT-0678A). The tree was determined to be a *magnolia grandiflora* with a central trank of 39.7". The tree has generated multiple suckers which, upon first glance, would appear to be individual trees. However, given the well-documented growth and reproductive pattern of *magnolia grandiflora*, and based upon inspection of roots, limbs, and trunks, it was our determination that what appear to be individual trees, are in fact secondary and tertiary trunks of the central 39.7" tree.

According to municipal code 19-6.3.2 (C) "A heritage tree is any tree greater than 20 inches in diameter and a historic tree is any tree greater than 30 inches in diameter and is located within any required setback or buffer area." Furthermore, municipal code 19-6.3.2 (C) (4) states that "Heritage or historic trees shall not be cut, removed, pushed over, killed, harmed, trimmed, sprayed, or destroyed without written approval by the Parks and Recreation Department."

Our determination is that the magnolia at 808 McDaniel Avenue is an 'historic tree' and shall not, by municipal code, be trimmed or destroyed without approval.

# DEVELOPER'S REACTION



## ORIGINAL LOT w/ MEDUSA MAGNOLIA

19-6.2(C)(1)



## FIRST PLAN

19-6.2(C)(1)



### FIRST PLAN

19-6.2(C)(1)

A heritage tree is any tree greater than 20 inches in diameter and a historic tree is any tree greater than 30 inches in diameter and is located within any required setback or buffer area.



 MEDUSSA MAGNOLIA INSIDE BUFFER ZONE

## DEVELOPER'S REACTION



### FINAL PLAN

- 6 PRIVATE LOTS
- 1 PUBLIC LOT
  - DEEDED TO CTIY
  - CONSERVATION EASEMENT
  - STORMWATER DETENTION



MEDUSSA MAGNOLIA
 OUTSIDE BUFFER ZONE,
 BUT IN ITS OWN LOT

#### 19-6.2(C)(1)

- Approached by district councilor and at large councilor
- How can we preserve more trees?
- Reviewed other cities' ordinances
  - Conway, Mauldin, Camden, Rock Hill, Charleston, Atlanta, Charlotte
- Stakeholder reviews
  - GRAC, Natural Systems
  - Realtors
  - CE's
  - LA's
  - Furman

- Nature Conservancy
- ULI
- Architects
- Developers
- Arborists

- Planning staff
- ED staff
- P&R staff
- CD staff
- Legal staff

19-6.2(C)(1)

A heritage tree is any tree greater than 20 inches in diameter and a historic tree is any tree greater than 30 inches in diameter and is located within any required setback or buffer area.

19-6.2(C)(1)

A heritage tree is any tree greater than 20 inches or greater in healthy and disease free condition, located anywhere within city limits. A heritage tree which is removed shall be replaced with trees in a quantity that equals the caliper inches of the tree removed or a fee paid in the amount of \$150.00 per caliper inch of the heritage tree removed.

#### How can we preserve more trees?

Assigns a burden to development that can be mitigated through better design at the
outset of the planning process, ideally resulting in tree preservation through better
building orientation, more responsive road networks, LID practices, and minimal grading.

# COUNCIL'S REACTION



#### 19-6.2(C)(1)

A heritage tree is any tree greater than 20 inches or greater in healthy and disease free condition, located anywhere within city limits. A heritage tree which is removed shall be replaced with trees in a quantity that equals the caliper inches of the tree removed or a fee paid in the amount of \$150.00 per caliper inch of the heritage tree removed.

- ASSUME DEVELOPER CLEAR CUTS FOREST
- ASSUME FEES ARE PAID BUT ARE PASSED ON TO THE CONSUMER
- ASSUME HIGHER HOUSING PRICES AS A RESULT
- HOW WILL THIS EFFECT OUR PUSH FOR AFFORDABLE HOUSING?



#### 19-6.2(C)(4)

For new multi-family developments the standard \$150 per-caliper-inch-of-tree fee, may be waived at the administrator's discretion with the inclusion of at least 10% affordable and/or work-force housing as defined by the Community Development Division.

- Back out to stakeholder and public review (late Aug)
  - Neighborhood Associations
  - Key stakeholders
- Planning Council (Oct)
- City Council (Dec)

- (C) Protection and replacement of heritage trees.
- (1) In order to protect significant trees, the city has established the heritage tree designation. A heritage tree is any tree 20 inches or greater DBH in healthy and disease free condition, located anywhere within city limits. A heritage tree which is removed shall be replaced with trees in a quantity that equals the caliper inches of the tree removed or a fee paid in the amount of \$150.00 per caliper inch of the heritage tree removed.
  - (a) New trees used to comply with heritage tree replacement requirements shall not count toward the street tree requirements.
- (b) New trees used to comply with heritage tree replacement requirements shall not count toward the interior parking lot landscaping requirements.
- (c) No construction, grading, equipment, material storage, or any other activity, shall be allowed within the critical root zone of a heritage tree unless the steps taken to adequately ensure the health of the tree are submitted to the parks and recreation department in writing. The critical root zone is defined as a per foot distance from the base of the tree equal to the caliper inches of the tree. For example, a 25 inch caliper tree will have a critical root zone radius of 25 feet from the base of the tree. Deviations from this critical root zone definition must be approved by the administrator.
- (d) Heritage trees, or trees found to have cultural significance, shall not be cut, removed, pushed over, killed, harmed, trimmed, sprayed, or destroyed without written approval by the parks and recreation department.
  - (e) Permits for trimming, removing or replacing heritage trees can be obtained by contacting the parks and recreation department.
  - (f) Appeals of denied removal permits may be submitted to the administrator.
- (2) If the administrator determines that there is insufficient space on the property to replace a heritage tree, the replacement tree(s) may be planted on public property approved by the administrator.
- (3) Trees in genus *pinus*, or those listed in Appendix E, Table C. Prohibited Trees, are exempt from the heritage tree designation regardless of size.
- (4) For new multi-family developments the standard \$150 per-caliper-inch-of-tree fee, may be waived at the administrator's discretion with the inclusion of at least 10% affordable and/or work-force housing as defined by the Community Developed Division