



Zebulon Parks & Recreation Department
Tree Board
September 21, 2020

The Town of Zebulon Tree Board will hold a meeting on Monday, September 21st, 2020 immediately following the Parks and Recreation Advisory Board Meeting. The Parks and Recreation Advisory Board Meeting begins at 6:00 PM. Both meetings will be held at the Zebulon Town Hall, 1003 N. Arendell Avenue.

Meeting Agenda

1. Call to Order
2. Approval of Agenda
3. Public Comment: Due to Covid-19, all wishing to speak must submit comments, 400 words or less, to Hannah Blische (hblische@townofzebulon.org) by 3 PM on September 21st. Comments will be read as written to the Parks and Recreation Board at the time of public comments.
4. Consent
 - a. Adoption of Minutes
 - i. October 21st, 2019
5. Presentation
 - a. Tree City USA Projects
 - b. Urban Forestry Plans
6. Open Discussion
7. Staff Update
 - a. Next Meeting: October 19th
8. Adjournment



Zebulon Parks & Recreation Department
Tree Board
October 21st, 2019

The Zebulon Parks and Recreation Advisory Board will meet Monday, October 21st following the Parks & Recreation Advisory Board Meeting at 6pm in the Zebulon Community Center located at 301 S. Arendell Avenue.

Board Member Attendance: Rayford Fulghum, Erica Parsons, Brandon Wiggins, Michelle Glidewell, Debbie Wheless.

Meeting Agenda

1. Approval of Agenda

- Ray made a motion to approve the agenda
- Michelle Glidewell 2nd the motion
- All voted in favor.

2. Presentation

a. Tree City USA Projects

Tim Hale presented information about Tree City USA. Their theme for the year is Crape Myrtles. Staff met with Public Works and will plant 8 Crape Myrtles at Wakelon Elementary School on the upper soccer field to create shade for field users and to beautify the road and tie in with the existing trees on Pippin Rd. These trees will also replace trees that had been removed after they died. The Steel Magnolias have agreed to support the Arbor Day Celebration where we celebrate the plantings of these trees on November 14th at 10 AM where the Mayor will read his Arbor Day Proclamation. Maturity of trees planted will be below the existing overhead power lines.

Erica Parsons asked what trees were there? Tim Hale responded that crape myrtles had previously been planted.

- Brandon Wiggins made a motion to approve the project for submission to Tree City USA
- Michelle Glidewell 2nd the motion
- All voted in favor.

3. Open Discussion

No discussion.

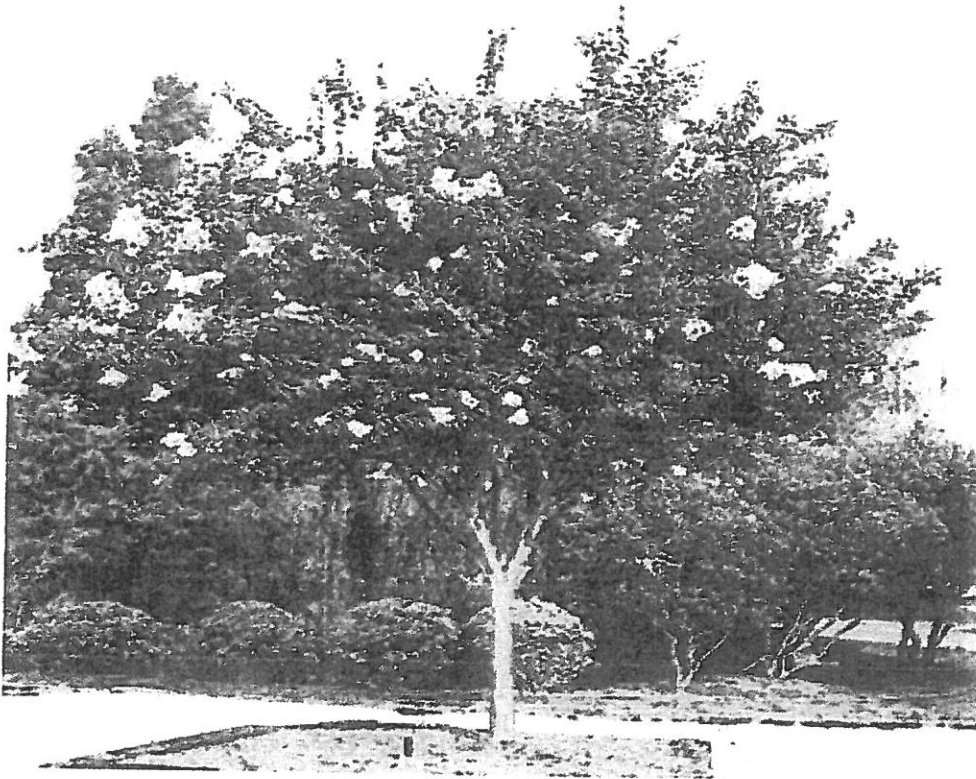
4. Staff Update

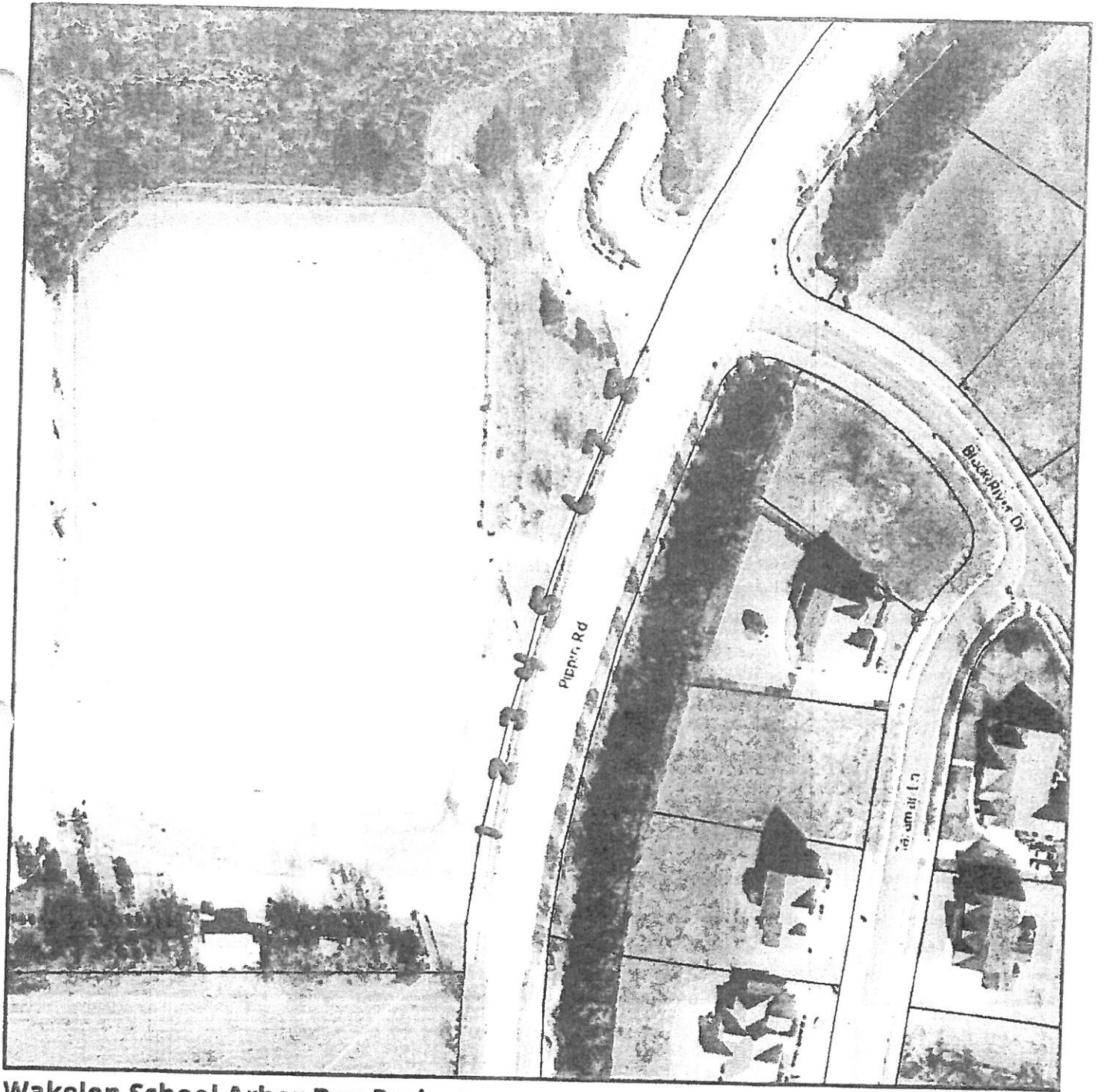
No Update.

Tree City USA Planting Project (2019)

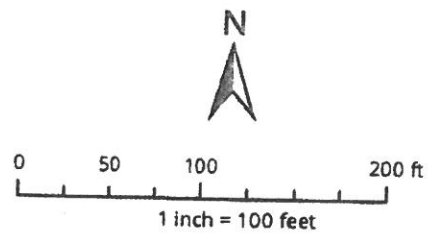
In order for the Town of Zebulon to maintain its "Tree City USA" recognition, the town must meet 4 standards established by the Arbor Day Foundation and the National Association of State Foresters. The 4 standards include a tree board, a tree care ordinance, a community forestry program with an annual budget of at least \$2 per capita, and an Arbor Day Observance and Proclamation. These standards were established to ensure that every qualifying community would have a viable tree management plan and program. The Town of Zebulon has proudly earned the Tree City USA distinction 14 years in a row, dating back to 2005 and has also received the Tree City USA Growth Award in 2008.

For our 2019 Arbor Day Observation, staff has planted 8 single stem white Crape Myrtle's at the Wakelon Elementary School Upper Soccer Field. These new trees will take the place of existing trees that have died, and in some cases, been removed from this site. Once mature, these Crape Myrtle's or Natchez Crape Myrtle officially, will be a large shrub or small tree with smooth, dark, cinnamon brown, exfoliating bark. Glossy dark green leaves turn vibrant orange-red in fall. Panicles of pure white, soft-textured flowers bloom all summer. These trees make an excellent specimen or accent and are perfect for group planting.





Wakelon School Arbor Day Project



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Tree City USA®

Take Pride in a Greener Community

You have seen the signs along the road and perhaps a Tree City USA flag flying at city hall in other communities. Towns and cities that have received their Tree City USA recognition take pride in this distinction. And the people who live there enjoy the valuable benefits of having a greener, healthier community.

Tree City USA is a national recognition program that began in 1976 and is sponsored by the Arbor Day Foundation in partnership with the U.S. Forest Service and National Association of State Foresters. By meeting four fundamental standards, an incorporated municipality of any size can qualify.

Applying for the Tree City USA award is easy and the recognition is outstanding. There are now thousands of communities that proudly receive roadside signs, fly the flag of Tree City USA and — knowing the value of participation — renew their application every year.

“Tree City USA is a great way to get the community involved in green space. A community that feels involved will take better care of their environment.”

— ALISON LITCHY, FORT SMITH, AR

FUNDAMENTAL COMPONENTS OF TREE CITY USA

■ STANDARD 1: A TREE BOARD OR DEPARTMENT

The formation of a tree board or department often stems from a group of citizens. In some cases a mayor or city officials have started the process. Either way, the benefits are immense. Involving residents and business owners creates wide awareness of what trees do for the community and provides broad support for better tree care.

■ STANDARD 2: A TREE CARE ORDINANCE

City ordinances reflect the values of a community. That is, they speak about what its residents believe are worth protecting to create or maintain their quality of life and an environment that is both safe and pleasant. Trees are certainly worthy of this formal attention for the common good.

A public tree care ordinance encourages beautification, air cooling and purification, noise abatement, property

value enhancement, and all the other attributes of trees in cities of all sizes. It also enables city government to prevent and control destructive insects and diseases, avoid unnecessary costs and liability from hazardous trees and tree-related accidents, and protect residents from unscrupulous or careless operators.

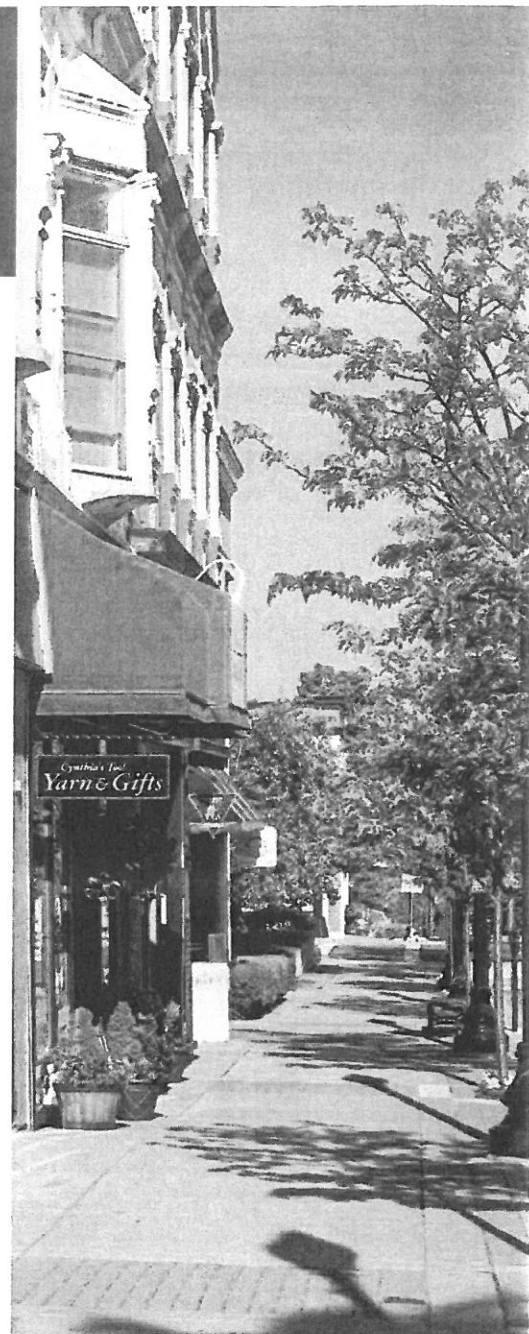
■ STANDARD 3: A COMMUNITY FORESTRY PROGRAM WITH AN ANNUAL BUDGET OF AT LEAST \$2 PER CAPITA

Most communities probably already spend at least \$2 per capita. Also, community trees — when cared for — can actually save money. A managed program can ensure benefits that surely outweigh costs. It does require dollars to plant and keep trees in healthy condition, but this should not be a barrier to becoming a Tree City USA.

■ STANDARD 4: AN ARBOR DAY PROCLAMATION AND OBSERVANCE

The importance of this tree-planting holiday provides an excellent opportunity to educate about trees and tree care. It also creates pride within the community and can help garner public support for the city's entire urban forestry program.

Part of the fun of Arbor Day is creating something that will be enjoyed by the whole community. Visit arborday.org/celebrate for ways to make your community celebration a memorable one.



HOW TO EARN TREE CITY USA RECOGNITION

1. Get Your Community Interested
— Find Allies and Partners
2. Contact Your State Urban and Community Forestry Coordinator
3. Work Together to Fulfill the Four Tree City USA Standards
4. Celebrate Arbor Day!
5. Submit your Application

Communities that receive Tree City USA recognition receive support that helps make the celebration easy to plan and conduct. Here is some of what you will receive in your first year:

- Two road signs.
- A 4' x 6' Tree City USA flag.
- Beautiful wall plaque.



With a bit of organizing, virtually any community — large or small — can qualify for Tree City USA recognition. The end result will be safer community trees, better informed citizens, and a higher quality of life for residents and businesses.



TREE CITY USA®: *Your Community Is Ready*

As the first step in helping your town or city become a Tree City USA community, an important person for you to contact is the urban and community forestry coordinator in your state forester's office.

Visit arborday.org/coordinators for your contact's information and a directory list of all states.

Your state coordinator is the resource for beginning your Tree City USA application. He or she will have answers to your questions and will be more than happy to help your community become a Tree City USA.

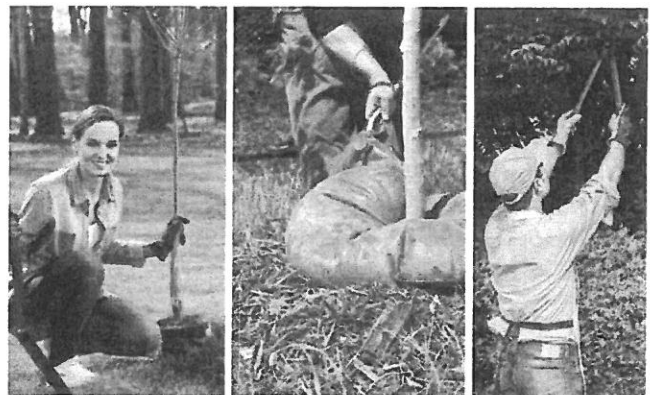
How to Apply

Simplicity is one of the principles of the Tree City USA application and annual recertification process. Experience has shown that getting started as a Tree City USA often results from a single individual or a small group taking the lead. Here is all you have to do:

A Talk with the person in your community currently responsible for trees (city forester, park superintendent, public works director, etc.). Also discuss with your mayor, city manager, city clerk, a key council person, or whomever else in your city government should be informed and whose support you will need.

B Go to portal.arborday.org. The Tree City USA application can easily be completed online.

C The application is normally completed by the city forester or other person responsible for trees, or the tree board chair. Once your application is submitted, it's reviewed at a state level and then it will be reviewed by the Arbor Day Foundation at a national level. To learn more about applying and your state's deadlines visit arborday.org/treecityusa.





North Carolina Department of Agriculture
and Consumer Services
N.C. Forest Service



Steven W. Troxler
Commissioner

Scott Bissette
Assistant Commissioner

NC Forest Service, District 11
3314 NC 86 South
Hillsborough, NC 27278
Phone: 919-732-8105
September 17, 2019

D-11-FM (Urban Plan 33 acres)
Project-Wake County
Town of Zebulon: Zebulon Community Park
Lat. 35° 49.142'/Lon. -78° 18.41'

Ms. Sheila Long
Parks and Recreation Director, Town of Zebulon
1003 N. Arendell Ave.
Zebulon, NC 27597

Dear Ms. Long:

Wake County Ranger Chris Frey and I appreciated the opportunity to meet with you and discuss management objectives for the Zebulon Community Park.

A "Urban Plan Map" of the property is enclosed for reference. Areas on the map correspond to each area in this plan. Also, please note that acreage and boundaries are approximate based on Wake County GIS data and therefore are not to be used for surveying or contractor payment.

This plan will provide information and recommendations on various areas of management that we discussed during our meeting. These recommendations can be modified as needed. If you need additional information for items not mentioned in this plan, please contact me.

Also, note that information in this plan is based on a general walk through of the property. A detailed inventory of the property was not done.

Please note the invoice for this plan is enclosed. Please submit payment within 30 days to avoid late charges. Payment consists of a check made out to the N.C. Forest Service (attach a copy of the invoice with the payment in the enclosed envelope) or you may pay on the internet (instructions on the invoice).

I hope the following Urban Plan is useful as you consider management of the park property.

If you have any questions or need additional assistance, please contact Wake County Ranger Chris Frey or Wake Assistant County Ranger Randolph Harrison at 919-841-4046 or me at 919-732-8105.

Sincerely,



Robin Roberson,
Service Forester
NC Registered Forester

Enclosures:

Urban Plan Map
Soils Map
Red Heart
Lifespans of Common Trees in Virginia
Bark Beetles of North Carolina
Emerald Ash Borer
Emerald Ash Borer: Making Treatment of Removal Decisions (NCFS Publication)
Emerald Ash Borer: Insecticide Guide (NCFS Publication)
How to hire an arborist (NCUFC Publication)
How to hire a Tree Care Professional (NC Coop Extension Service, AG-691)

CC:

NC Forest Service-District 11 Office Files, Hillsborough
NC Forest Service-Wake County Office Files, Raleigh

Soils

This is a brief description of the soils on the property and is based on the Wake County Soil Survey issued in 1971. A Soils Map is also provided for reference.

ApB: Appling sandy loam, 2 to 6% slopes

ApB2: Appling sandy loam, 2 to 6% slopes, eroded

ApC: Appling sandy loam, 6 to 10% slopes

ApC2: Appling sandy loam, 6 to 10% slopes, eroded

ApD: Appling sandy loam, 10 to 15% slopes

DuB: Durham loamy sand, 2 to 6% slopes

- These soils are well drained.
- These soils are suitable for pine and hardwood timber growth and are moderate to moderately high in productivity.

- At age 50 years old, loblolly pines and yellow-poplar can reach heights of 75 to 85 feet tall, and shortleaf pines and southern red oak 65 to 75 feet tall.
- Erosion hazard is slight on slopes less than 6%, moderate on 6 to 10% slopes, and severe on slopes greater than 10%.
- It is important to perform work on contour as much as possible and to maintain ground cover as much as possible.
- Slopes can limit some forms of recreational use.

Cn: Colfax sandy loam

- This soil is nearly level to gently sloping.
- This soil is somewhat poor to moderately well drained.
- This soil is suitable for pine and hardwood timber growth and is high in productivity.
- At age 50 years old, loblolly pines and yellow-poplar can reach heights of 85 to 95 feet tall, longleaf and shortleaf pines 65 to 75 feet tall, and southern red oak 75 to 85 feet tall.
- Wetness of the soils can be a limitation to use and management. It is important to perform activities during dry conditions.

Wn: Wehadkee silt loam

Wy: Worsham sandy loam

- These soils are poorly drained and are nearly level to gently sloping.
- These soils are located on first bottoms and flood plains. Wetness is a major limitation to use and management.
- Flooding, a high-water table, and ponding can also present limitations.
- These soils are suited to pine and hardwood growth and is highly productive.
- At age 50 years old, loblolly pines can reach heights of 85 to 95 feet tall and yellow-poplar 85 to 100 feet tall.

Hazard Trees

All trees are not a hazard tree and not all dying, dead, or defective trees are a hazard tree.

A hazard tree is a tree that is likely to fall or have branches likely to fall and cause injury, damage, or destruction to people, structures, or items with value.

Typically, a healthy tree is not a hazard tree, but might be considered one under some cases. A living tree which has been compromised can be a hazard tree and dying and dead trees can be a hazard tree.

Trees would more commonly be considered hazard trees in areas moderately to heavily used by people and containing structures. Trees that are highly unlikely to harm people or structures may not be considered a hazard tree.

Conditions that might cause a hazard tree can include pest infestation, disease, hollow stem with

inadequate sound wood, multi-stemmed tree with incised bark, root sprung tree, leaning tree, tree with dead wood, dying, dead, etc.

Each tree needs careful evaluation to determine if it is a hazard tree.

Please keep this in mind as you see the term "Hazard Tree" in this document.

If your park staff or other town staff is not able to evaluate trees for hazard conditions, you can contact us. We may be able to provide some limited assistance. However, you may need to contact a certified arborist for assistance.

Area 1, approx. 31 acres

This area consists of woods, walking paths, and a frisbee golf course.

The woods consist of stands of pine, stands of pine and hardwoods, and stands of hardwoods. The areas of pine can be seen on the aerial photograph on the Urban Plan Map as green while the areas of hardwoods are gray. Pines are generally present on the upland areas, while the hardwoods are generally present in the wetter natured areas.

Examples of trees present are loblolly pines, various oak species, maple, red cedar, dogwood, sweetgum, yellow-poplar, magnolias, elm, hickory, and miscellaneous other species. Diameters of these trees at breast height (4.5' above ground level) ranged from 2 to 33 inches. Samples of pines across the area primarily found the pines to be approximately 50 to 60 years old.

Periodic mowing is used to maintain areas along the walking paths and frisbee golf course with the remainder of the area maintained in native vegetative understory cover and growth.

During our walk, we noticed that many of the pines along the frisbee golf course are taking a beating from the frisbees hitting them. The frisbees are knocking bark off the trees but does is not exposing live tissue on the trees.

Concerns/Recommendations for Area 1:

Pine Beetles:

As the pines continue to age and grow, they may become more susceptible to pine beetle attack. With age, growth will decline. Also, growth will be affected as the trees continue to grow and close canopy.

Foot traffic around the pines can compact the soil and cause damage to the roots of the trees though compaction and people walking on the roots where exposed. Some stem damage can also occur from people rubbing against the stems as they walk by or people climbing on the stems.

This could lead to a decline in tree health.

Injury to the stem causing live tissue to be exposed can also help attract pine beetles.

Periodic monitoring of pines on the property should occur to look for pine beetle infestation with prompt removal of infested trees. Monitoring would be extremely important where pines are located within heavily used areas of the park and extending outwards 100 feet. The 100-foot distance is used given that most trees will typically remain shorter than 100 feet tall. However, some trees can exceed this distance given enough time to grow.

Reference the enclosed "Bark Beetles of North Carolina" for information. You may also wish to reference our pest handbook at https://www.ncforests-service.gov/forest_health/pdf/FHH/ForestHealthHandbook_complete.pdf for additional information on bark beetles.

Where possible, mulching cover can be added around trees to help reduce soil compaction. The mulching cover should only be 2 to 3 inches deep and not allowed to touch tree stems.

Emerald Ash Borer:

You should survey the woodland for the presence of ash trees.

You can expect that likely all the ash trees will eventually be killed by the Emerald Ash Borer.

The Emerald Ash Borer is present in Wake County and continues to expand. Pesticides can be used for prevention. However, the pesticide must be started before the Emerald Ash Borer is found in the area and periodic treatment must continue. The pesticide treatment is costly, so therefore is typically only done on ash trees which are highly valued. For additional information on the Emerald Ash Borer see the enclosed information and reference our website at: https://www.ncforests-service.gov/forest_health/forest_health.htm

Knowing where the ash trees are will help you determine if you want to try and save any. Or, if they are located in heavily used areas of the park or within 100 feet of heavily used areas, you will know to monitor them for death and then removal as a hazard occurs. The 100-foot distance is used given that most trees will typically remain shorter than 100 feet tall. However, some trees can exceed this distance given enough time to grow.

Ground Cover:

Along portions of paths, the frisbee golf course, and portions of the sewerline, ground cover is sparse to bare. The bare conditions can lead to erosion and in some places is already occurring, particularly on sections of the sewerline.

You can perform an assessment and determine where erosion concerns are present and then implement measures for control. This might include seeding of grass, adding mulching, adding

water diversions, etc.

Periodic monitoring should occur to look for new erosion concerns and stabilization as needed.

If you need assistance with assessing the area and determining site specific recommendations, you may wish to contact the Wake Soil and Water Conservation Office and the Natural Resources Conservation Service to determine how they might assist you (Phone: 919-250-1050). The NC Cooperative Extension Service-Wake County Office may also be of assistance (Phone: 919-250-1100).

Tree Monitoring:

You need to plan to periodically monitor the trees for pests, disease, decline, dying, death, storm damage, or other conditions affecting the health and growth of the trees. Trees should also be looked at to determine if they present a hazard. Where problems are found immediate action should be taken to correct the situation. In some cases, this could involve proper pruning to correct problems; use of pesticides to control pests or disease problems; or tree removal.

Monitoring would be done more often in heavily used portions of the area, with an emphasis within 100 feet of heavily used areas. The 100-foot distance is used given that most trees will typically remain shorter than 100 feet tall. However, some trees can exceed this distance given enough time to grow.

Note that during our walk, we noticed hypoxylon canker, which has killed some oaks. You may want to monitor for the presence of this and where the oak is a priced tree or want you want to maintain it take actions to maintain it (reference our pest handbook at https://www.ncforestservic.gov/forest_health/pdf/FHH/ForestHealthHandbook_complete.pdf). Where the tree has died, remove it if it presents a hazard.

Note that during our walk, we noticed that a high percentage of the pines have fusiform rust. This is particularly present along the frisbee golf course and walking paths. Pitch canker can also commonly be found around fusiform rust. These diseases can cause a defect which weakens the tree stem and makes it more susceptible to breaking during storms and with accumulation of ice and snow. Trees located in heavily used areas of the park should be assessed to determine if adequate sound wood is present for continued growth or whether removal is warranted.

Reference our pest handbook at

https://www.ncforestservic.gov/forest_health/pdf/FHH/ForestHealthHandbook_complete.pdf for additional information.

Future Trees:

Many of the trees are of species that have potentially long lifespans (see enclosed "Lifespans of Common Trees in Virginia"). Keep in mind these are average and maximum. Conditions can occur that kill the trees before the average lifespan, and once again this an average so some trees

die before this and some live past this. The maximum lifespan would typically be for a few trees verses a whole stand of trees of that species.

Therefore, many of the existing trees have the potential for continued growth well into the future; but periodic monitoring is needed as already recommended.

As the pines approach 70 to 80 years of age, you may begin to see some health/disease problems occurring in some trees with some scattered mortality possible. Beginning around this age, the pines will also start to become more susceptible to "red heart" disease, which is a rot disease (see enclosed information on "red heart").

The pines occupy a large percentage of the tree cover along the paths and frisbee golf course. Therefore, you will need to start making plans for how you want to replace trees in this area as they die or are removed. Based on samples of pines, you will have roughly 20 to 30 years before the pines are around 80 years old.

Non-native Invasive Plants:

During our walk, we encountered numerous non-native invasive plants (Chinese privet, leatherleaf mahonia, nandina, Japanese stilt grass, Autumn olive, English ivy, and sericea lespedeza).

Non-native invasive plants can rapidly spread following disturbance. As they spread, they can choke out beneficial native plants in the understory and form dense ground cover and thickets. They can also hinder the successful regeneration of desired trees and native ground cover.

Invasive plants can produce abundant seed which can remain viable for many years. The seeds of many of these plants are also widely digested by birds which helps spread the plants. Because of these conditions, typically one treatment will not rid the area of the plants, but several treatments over several years may be needed. Even with treatment, you may never rid the property of them. If they are present on neighboring property, they can invade your property.

Therefore, you might hope to rid the area of them as much as possible, while living with them as long as they are not a major hindrance. Using appropriate control treatments as needed to provide the desired stand condition is a key.

You may want to target control of these plants in the heavily used portions of the area and extend control outwards 50 feet from the edge. You could then target control in less used portions of the area as desired. Keep in mind that you will continually need to treat the edges of property lines or the edge of areas not being controlled to prevent spread on the property.

There are a variety of ways to control these plants. You will need to decide how much effort and expense you want to put into the work and then pick the method that meets your abilities.

For control information, I recommend that you reference "A Management Guide for Invasive

Plants in Southern Forests” (website: <http://www.treesearch.fs.fed.us/pubs/36915>). This offers various management strategies that you may want to consider, and it also provides recommended herbicides and rates.

Another site you may wish to reference is <http://www.invasive.org/eastern/srs/> or <https://www.bugwood.org/>

We also have a series of handouts that addresses these plants, as well as many other invasive plants. They can be found at our website: <http://www.ncforestservice.gov/publications.htm> under the Forest Health section.

There is also abundant information available by searching the internet.

Note that where the non-native invasive plants are dense and make access difficult, grazing with goats may be a desired method to help clean the area to provide access for control. Mechanical methods may also be used (reference the plan I prepared for Little River Park for additional information).

Area 2, approx. 2 acres

This area contains a playground, picnic area, restrooms, and parking. Pines provide the dominant tree cover here.

Recommendations for Area 2:

Apply recommendations for Area 1 to this area also.

One additional note of reference is that you have many pines located in this area which are crooked, forked, and multi-stemmed. These deformed trees should be assessed to determine if removal is warranted.

You may also want to consider some removal of the smaller and suppressed pines and where the tree crowns are touching each other to provide adequate growing room for adjoining trees.

Area 3, approx. 16 acres

This area contains athletic fields, basketball courts, walking paths, restrooms, and parking. Very few trees are present in this area.

Recommendations for Area 3:

Apply recommendations from Area 1 to this area as suitable with the most likely considerations being for non-native invasive plants and the condition of trees adjoining this area.

Area 4, approx. 3 acres

This area contains the community building, parking lots, and a maintenance shed.

Recommendations for Area 4:

Apply recommendations from Area 1 to this area as suitable with the most likely considerations being for non-native invasive plants and the condition of trees adjoining this area.

Additional Considerations

Tree Planting and Financial Assistance:

If you decide to perform any tree planting in the park and need specific recommendations, please contact us for additional assistance.

Financial assistance for tree planting may be available from the National Arbor Day Foundation.

Financial assistance for tree planting and other tree establishment practices may also be available through our Urban Forestry Grant Program (contact Andrew Pleninger at 919-857-4842 for information).

Neuse River Basin Riparian Buffer Rules:

This property is located within the Neuse River Basin therefore wooded buffers must be maintained on each side of intermittent or perennial water sources. The buffers must be maintained without disturbance except as allowed by the rules. The buffer is 50 feet wide on each side of the water source.

For additional information on the Neuse River Basin Riparian Buffer Rules contact the NC Division of Water Resources.

Bird Boxes:

Erecting and maintaining bird boxes on the park property might be something you want to consider. Predator guards must also be used as part of the installation process. Once established, the nest boxes will need to be checked annually for repair and cleaning out. Also, one major consideration to this is can the boxes be erected and maintained without vandalism.

If you need diagrams for various bird boxes, please let me know.

Pollinator Habitat:

You may want to consider the establishment of pollinator habitat to help educate the public on the various species that utilize pollinating plants and the importance of it. Many of our foods require pollination by bees and other insects, birds, animals. Many species are dependent on having pollinator habitat presence for their life cycle.

Volcano Mulching:

Make sure that volcano mulching around the trees does not occur. Doing this can be detrimental to tree growth.

Mulching around trees should be no more than 1 to 3 inches deep and not touch the stem of the tree.

Stream Restoration:

Several streams are present on the property. Portions of the streams are in very poor condition with deep channels being cut and stream bank erosion.

You should consider performing stream restoration to help stabilize the streams, improve water flow, return the streams to a more natural condition, to improve the aesthetics, and to help educate the public on the importance of water and streams.

For assistance and additional information on stream restoration, you can contact the Wake Soil and Water Conservation Office and the Natural Resources Conservation Service (Phone: 919-250-1050). They may also be able to refer you to other agencies or organizations that can also aid or assist with stream restoration. You should also inquire about possible grants or cost-share assistance programs that can help reduce the cost of stream restoration projects.

Property Lines:

If the park property lines are not marked and maintained, you should consider doing this.

Signs could be placed along the property line to distinguish ownership. Signs could be nailed to trees or placed on posts. You can determine how far apart signs would be placed, but you want them placed close enough, so people see them, possibly every 25 or 50 feet apart.

Because of possible vandalism, you could also consider painting trees to help establish the property line.

The lines should be checked yearly, and signs replaced as needed. If painting trees, you might need to repaint them every 5 years.

Periodic trimming of vegetation along the property line may also be desired to help indicate the line and provide access for maintenance.

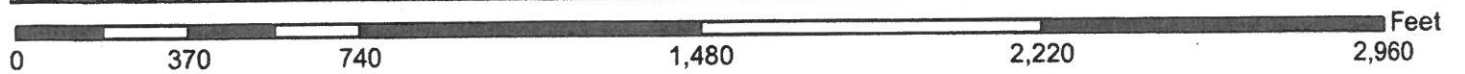
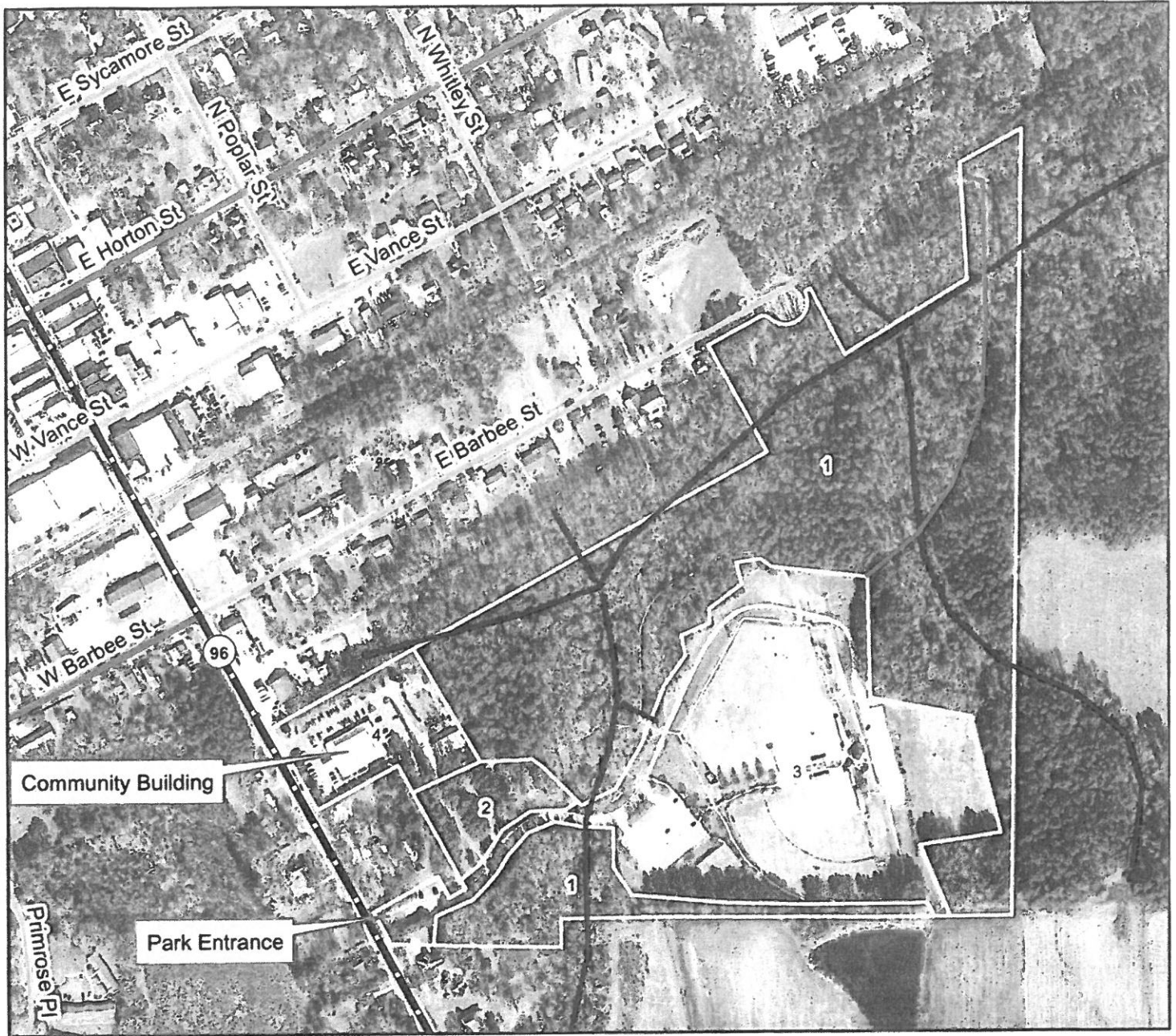
Marking the property lines helps to clearly show where they are. This can be beneficial in helping to keep people from encroaching onto park property and to address cases where trespass may be a problem. This also helps to keep your personnel or workers on your property.



North Carolina Forest Service Urban Plan Map



Boundaries and Acreages are Approximate



Landowner: Town of Zebulon
Zebulon Community Park

County: Wake

Latitude: 35° 49.142'

Longitude: -78° 18.41'

Drawn By: R. Roberson

Date: 9/16/19

Photo Yr.: 2017 winter

River Basin: Neuse

Legend

- Sewerline
- Misc_Streams
- Stand_Boundary

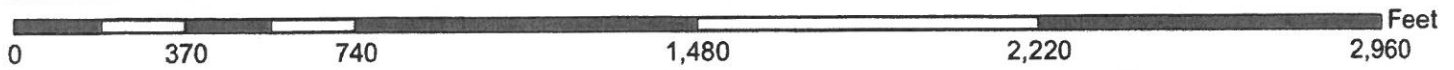
- 1: Woods, walking paths, frisbee golf course, 31 acres
- 2: Parking, playground, restrooms, picnic shelter, 2 acres
- 3: Athletic fields, basketball courts, walking paths, restrooms, parking, 16 acres
- 4: Community building, parking, maintenance shed, 3 acres



North Carolina Forest Service Urban Plan Map



Boundaries and Acreages are Approximate



Landowner: Town of Zebulon
Zebulon Community Park

County: Wake

Latitude: 35° 49.142'

Longitude: -78° 18.41'




Drawn By: R. Roberson

Date: 9/16/19

Photo Yr.: 2017 winter

River Basin: Neuse

Legend

-  Sewerline
-  Misc. Streams
-  Stand_Boundary

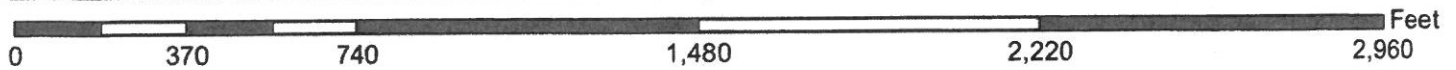
- 1: Woods, walking paths, frisbee golf course, 31 acres
- 2: Parking, playground, restrooms, picnic shelter, 2 acres
- 3: Athletic fields, basketball courts, walking paths, restrooms, parking, 16 acres
- 4: Community building, parking, maintenance shed, 3 acres



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Steven W. Troxler
Commissioner

North Carolina Department of Agriculture
and Consumer Services
N.C. Forest Service



Scott Bissette
Assistant Commissioner

NC Forest Service, District 11
3314 NC 86 South
Hillsborough, NC 27278
Phone: 919-732-8105
September 13, 2019

D-11-FM (Urban Plan 17 acres)
Project-Wake County
Town of Zebulon: Little River Park
Lat. 35° 49.356'/Lon. -78° 21.121'

Ms. Sheila Long
Parks and Recreation Director, Town of Zebulon
1003 N. Arendell Ave.
Zebulon, NC 27597

Dear Ms. Long:

Wake County Ranger Chris Frey and I appreciated the opportunity to meet with you and discuss management objectives for the Little River Park.

A "Urban Plan Map" of the property is enclosed for reference. Areas on the map correspond to each area in this plan. Also, please note that acreage and boundaries are approximate based on Wake County GIS data and therefore are not to be used for surveying or contractor payment.

This plan will provide information and recommendations on various areas of management that we discussed during our meeting. These recommendations can be modified as needed. If you need additional information for items not mentioned in this plan, please contact me.

Also, note that information in this plan is based on a general walk through of the property. A detailed inventory of the property was not done.

Please note the invoice for this plan is enclosed. Please submit payment within 30 days to avoid late charges. Payment consists of a check made out to the N.C. Forest Service (attach a copy of the invoice with the payment in the enclosed envelope) or you may pay on the internet (instructions on the invoice).

I hope the following management plan is useful as you consider management of the park property.

If you have any questions or need additional assistance, please contact Wake County Ranger Chris Frey or Wake Assistant County Ranger Randolph Harrison at 919-841-4046 or me at 919-732-8105.

Sincerely,

Robin Roberson,
Service Forester
NC Registered Forester

Enclosures:

Urban Plan Map
Soils Map
Enclosures listing of enclosed information

CC:

NC Forest Service-District 11 Office Files, Hillsborough
NC Forest Service-Wake County Office Files, Raleigh

Soils

This is a brief description of the soils on the property and is based on the Wake County Soil Survey issued in 1971. A Soils Map is also provided for reference.

ApB2: Appling sandy loam, 2 to 6% slopes, eroded

ApC2: Appling sandy loam, 6 to 10% slopes, eroded

ApD: Appling sandy loam, 10 to 15% slopes

- These soils are well drained.
- These soils are suitable for pine and hardwood timber growth and are moderate to moderately high in productivity.
- At age 50 years old, loblolly pines and yellow-poplar can reach heights of 75 to 85 feet tall, and shortleaf pines and southern red oak 65 to 75 feet tall.
- Erosion hazard is slight on slopes less than 6%, moderate on 6 to 10% slopes, and severe on slopes greater than 10%.
- It is important to perform work on contour as much as possible and to maintain ground cover as much as possible.
- Slopes can limit some forms of recreational use.

LoB: Louisburg loamy sand, 2 to 6% slopes

LoC: Louisburg loamy sand, 6 to 10% slopes

WkE: Wake soils, 10 to 25% slopes

- These soils are well to somewhat excessively drained.
- These soils are best suited for pine timber growth and are moderate in productivity.
- At age 50 years old, loblolly pines can reach heights of 70 to 80 feet tall.
- Erosion hazard is slight on slopes less than 2%, moderate on 2 to 6% slopes, and severe on slopes greater than 6%.
- It is important to perform work on contour as much as possible and to maintain ground cover as much as possible.
- Recreational use can be limited due to slopes, presence of rock, and depth to bedrock.

Cn: Colfax sandy loam

- This soil is nearly level to gently sloping.
- This soil is somewhat poor to moderately well drained.
- This soil is suitable for pine and hardwood timber growth and is high in productivity.
- At age 50 years old, loblolly pines and yellow-poplar can reach heights of 85 to 95 feet tall, longleaf and shortleaf pines 65 to 75 feet tall, and southern red oak 75 to 85 feet tall.
- Wetness of the soils can be a limitation to use and management. It is important to perform activities during dry conditions.

Wo: Wehadkee and Bibb soils

- This soil is poorly drained and is nearly level to gently sloping.
- This soil is located on first bottoms and flood plains. Wetness is a major limitation to use and management.
- Flooding, a high-water table, and ponding can also present limitations.
- This soil is suited to pine and hardwood growth and is highly productive.
- At age 50 years old, loblolly pines can reach heights of 85 to 95 feet tall and yellow-poplar 85 to 100 feet tall.

Area 1: Trees/Open, approx. 3 acres

Roughly the western 1/3rd of this area is a pine stand. Tornado damage occurred in this area earlier in the year. Damaged trees were removed, and the debris was mulched and ground up in place creating a ground cover of woody debris. The area is basically void of understory growth. During tornado clean up portions of the area had excessive soil disturbance, which has likely damaged the root systems of remaining trees. Some of the stems on the remaining trees were damaged by removing bark.

The remainder of the area is primarily open space with sparse pine cover and a few hardwoods. Tornado damage occurred in this area earlier in the year. Damaged trees were removed, and some of the debris was mulched and ground up in place. It appears that excessive soil disturbance occurred either as part of tornado clean up or prior to tornado clean up as evidenced by the circle around trees and a drop in soil level. Various grasses are present as ground cover but is sparse in some areas and erosion is a concern. Many of the trees in this area are also being volcano mulched where a circle is formed around the tree and then mulch is piled over the

existing root system and up the tree base in the form of a volcano.

Concerns/Recommendations for Area 1:

Pine Beetles:

During our exam of this area, we found the presence of Ips and Black Turpentine Beetles (see enclosed "Bark Beetles of North Carolina"). You may also wish to reference our pest handbook at https://www.ncforestsERVICE.gov/forest_health/pdf/FHH/ForestHealthHandbook_complete.pdf for additional information on bark beetles.

The presence of these beetles is most likely contributed to the recent tornado clean up activities, damage to roots from soil disturbance, and damage to tree stems during tornado clean up, which has caused stress to the trees.

Ips beetle attack will likely kill infested trees due to blue stain fungus introduced in the tree. If a few black turpentine beetles attack a tree it may not die but would need to be monitored.

The potential is present for these beetles to infect additional pines in this area. It also possible that southern pine beetles could also be drawn to the area.

Removal of Ips beetle infested trees and trees infested with multiple Black Turpentine Beetles should be done to remove the trees while they are still sound and easy to work with verses dead and decaying wood. Removal would also help eliminate safety hazards from dead trees. If possible, completely remove the trees from the area. If the trees cannot be removed, you can chip/mulch them into a pile that is located away from pines and in an open area. Lastly the infested trees could be felled to the ground toward the center of the area and left to decay.

If you do not want to remove trees now, you could continue to monitor the trees and see which trees die and which may survive. This would involve a regular check of the trees by looking for needle color change. Green needles turning to red turning brown would indicate a dead tree which must be removed. The concern with this approach would be the possible spread of beetles to other pine trees.

If you want to maintain some type of tree canopy in the area, you may need to consider planting of trees to replace ones that are removed. This decision will be based on how dense a future canopy you want present. Trees would be planted based on mature tree sizes. Trees would also need to be suited to the drier soils present here, particularly if any hardwoods are desired for establishment.

Ground Cover:

Grassy vegetation is present on roughly the eastern 2/3rds of Area 1 and is maintained by mowing. It does appear that excessive soil disturbance occurred in some of this area due to

tornado clean up. Therefore, the grassy vegetation varies across the area. In portions of the area ground cover is sparse and erosion is a concern.

You should address measures to provide for a satisfactory ground cover to address erosion concerns. This would likely involve over seeding the area in the fall with grasses or at least providing a temporary cover to supplement the already occurring grasses. This would be largely based on your desired objectives for the area as to what grasses would be suitable and what the budget would allow.

If you need assistance with assessing the area and determining site specific recommendations, you may wish to contact the Wake Soil and Water Conservation Office and the Natural Resources Conservation Service to determine how they might assist you (Phone: 919-250-1050). The NC Cooperative Extension Service-Wake County Office may also be of assistance (Phone: 919-250-1100).

Portions of the area in the eastern 2/3rds that is not in grassy cover (this would be parts of the area that were primarily trees damaged by the tornado and cleared of the debris, but ground cover is not grass – generally along the northern boundary) will naturally regenerate to various grasses, weeds, brush, and trees. You will need to decide whether you want:

- to establish grasses here and maintain them,
- leave the area for natural regeneration,
- plant desired trees and establish grasses,
- or, plant desired trees and maintain the area by periodic weed/brush cutting to promote planted trees.

Portions of the area in the eastern 2/3rds that currently contain open space with sparse tree cover and grasses could have some minor tree planting done if desired. This would consist of planting small to medium sized hardwood or evergreen trees that would tolerate some shade. Planting would also need to utilize trees suitable to the drier soils present in this area.

If tree planting recommendations are needed, please contact us for assistance.

The small stand of pines on the western 1/3rd of the area had extensive understory disturbance due to tornado clean-up. The understory here will begin to naturally regenerate with a variety of grasses, weeds, brush, and trees. The understory growth will likely be dense. Letting the understory naturally develop may be acceptable to you. However, if you want to maintain an open understory, you need to plan on periodically cutting the vegetation every several years or clearing the area and establishing grasses, which would then need to be mowed.

Note if you decide to establish grass around or under any trees, you need to disturb the soil as little as possible and try to keep implements out of the ground to avoid damaging the roots of the trees that are present. Work should also be done under dry soil conditions to avoid rutting the site and compacting the soils, which can damage the root systems of existing trees. Extreme care must also be taken not to damage the stems of existing trees.

Volcano Mulching:

Stop volcano mulching around the trees. Doing this can be detrimental to tree growth.

Mulching around trees should be no more than 2 to 3 inches deep and not touch the stem of the tree.

Future Trees:

If the existing pines in this area are still the dominant trees present and they have not been removed or additional trees planted, you may need to start evaluating how and when you replace them. In another 20 to 30 years, these trees will be approaching maturity at which time age and biological conditions are more likely to be of concern. The trees may well live beyond this, this is just to say this is a consideration.

Area 2: Kudzu, approx. 8 acres

This area is primarily a kudzu patch with some small pockets of trees present. Note that the kudzu does extend into the borders of surrounding areas.

I understand that you are interested in ridding the area of the kudzu.

In order to rid the area of kudzu, you must rid it from your property as well as adjoining properties. If present on adjoining properties without control, you will continue to have the potential for it to spread to your property again.

If kudzu is not controlled on adjoining properties, you would have to continually monitor the property line and treat any kudzu as it crosses onto your property.

Kudzu control would also need to involve the control of any kudzu located within the fences and yard area of the water filtration plant (Area WF) and water intake pipe and pump house (Area WI).

In order to rid the area of the kudzu, you can choose to mow, graze, treat with herbicides, or use a combination of these methods. You will need to decide which method best suits your objectives for use on the property, costs, length of control, etc.

Keep in mind that regardless of the method used, ridding the area of kudzu is a long term practice which could take anywhere from 3 to 10 years. The older the kudzu is the harder it is to control. One treatment alone will not rid the area of it. Multiple treatments will be needed. And, even when you think you have the kudzu gone, you need to continue monitoring for several years to make sure no new growth appears.

Grazing:

If you want the friendliest way to control the kudzu, you could utilize goats. Other livestock can be used, but goats will consume the leaves and the vines. Livestock and particularly goats can also readily traverse the terrain.

Close grazing for at least 4 years has been effective when 80% or more of the kudzu is continuously consumed and particularly if overgrazing occurs in August and September each year.

After this 4-year time period, you can establish the area in desired grasses.

Continued grazing for another 2 years is typically recommended.

After this 6-year time period, grazing could stop. Trees could be planted as desired. Periodic monitoring of the area for new kudzu growth will still need to occur with spot applications of herbicide being used on new kudzu.

Doing a quick search on the internet, I found several companies/farmers located in North Carolina that rent goats. Rental typically includes fencing, supply of the goats, any supplemental feeding, watering, and monitoring. A dog may also be placed with the goats for protection. Several companies/farmers located were Wells Farm Weed Management (Kudzu Goat Gang), Goat Squad, Rent A Goat, and Goldmine Goat Farm. The Goat Squad is located in the Raleigh-Chapel Hill area. Once again this was a quick search and there may be others who provide the service.

With livestock grazing, it is extremely important that any vines that are climbing trees, fences, etc. be severed low enough so that the livestock can reach the foliage and vine and consume it.

Mowing:

Repeated multiyear cutting to groundline can achieve control over many years. Using this method is of course based on the fact that the terrain will allow safe mowing with a tractor and bush-hog. With the existing kudzu cover it is hard to tell if any obstacles are present (ex. gullies, holes, old fences).

Initial mowing may require heavy duty mowing equipment or even a Bobcat or similar piece of equipment equipped with a mulching/grounding head.

This method will require additional work to treat vines climbing or growing in trees or fences. This method will also be difficult where kudzu is present in the adjoining wooded areas.

Once you feel you have adequately controlled the kudzu, you can establish the area in desired grasses and continue to mow the area. You could also incorporate spot herbicide treatments to

help eradicate any new kudzu growth. You can also consider planting trees as desired for future aesthetics, shade, wildlife habitat, and soil stabilization.

Herbicides:

Herbicides would generally provide the most cost effective and best eradication method. However, keep in mind that multiple treatments will still be needed.

If the area can be safely traversed, a skidder equipped with a spray rig would be the most appropriate way to initially apply herbicides. However, if there are questions about whether obstacles are present, the area may need to be cleared first (this could be done by grazing or mowing).

In surrounding wooded areas, where the skidder cannot go, kudzu will need to be treated by hand using backpack applications and/or cutting and spraying the vine. It may also be possible to use a spray hose attached to the skidder.

Any vines climbing up that can not be reached by the skidder, spray hose, or backpack would need to be severed and the stump treated, or the individual vine could be treated.

In choosing what herbicides to use, you need to consider:

- If the water filtration plant is in operation and pulling water from the river. Some herbicides have restrictions on how close they can be used to water intakes. Some of the kudzu does extend near the water intake pipe and pump house. Kudzu is also present around and in some of the water filtration plant area.
- If herbicides will be applied near or over the water, is the herbicide properly labeled for such use?
- Since this area is located near the river and the water intake, what is the potential of the herbicide to leach through the soil?
- Will the herbicide affect only the kudzu or will it also effect trees that it contacts or through root absorption? Some of the herbicides will target all the vegetation while some herbicides can be safely used around trees.

I have provided several enclosures for additional reference on kudzu control. I also recommend that you reference "A Management Guide for Invasive Plants in Southern Forests" page 79 (website: <http://www.treesearch.fs.fed.us/pubs/36915>). Another site you may wish to reference is <http://www.invasive.org/eastern/srs/> or <https://www.bugwood.org/> There is also abundant information available by searching the internet.

If you do not have the ability to control the kudzu yourself, you can hire a contractor. I have provided a list of contractors whom may perform the work for you. This list is based on contractors who have performed forestry work. There may also be other contactors such as tree service companies or landscape companies who can provide the service.

Contact several to determine interests, specific services provided, licensing, insurance coverage,

and costs. Once a contractor is chosen be sure to complete a contract.

Establishing Grasses and Trees:

Either as part of kudzu control or after kudzu control, you will need to establish a desirable cover of grasses which meets your needs for the park. Planting of flowers or pollinator habitat may also be desired. If you need assistance with this, you may wish to contact the Wake Soil and Water Conservation Office and the Natural Resources Conservation Service (Phone: 919-250-1050). The NC Cooperative Extension Service-Wake County Office may also be able to provide assistance (Phone: 919-250-1100).

If establishing grasses, be sure to take measures to reduce/prevent the chance of erosion and sedimentation.

You may also decide to establish trees. If tree planting recommendations are needed, please contact us for assistance.

Area 3: Trees, approx. 2 acres

This area is stand of trees containing hardwoods and pines.

A trail runs through the area and it also adjoins the parking lot.

Recommendations for Area 3:

Control kudzu located in this area during kudzu control in Area 2.

Area 4: Trees, approx. 3 acres

This area is primarily a mixed hardwood stand.

This area is in the flood plain and is prone to flooding. Ponding, a high-water table, and wet conditions are also associated with this area.

A small portion of a trail is in this area which appears to have been created by people fishing in the river.

Considerations for Area 4:

Control kudzu located in this area during kudzu control in Area 2.

Due to the flooding potential and wet conditions of this area it is assumed that no access or active use of this area will occur, except as people continue to fish the river. However, if an elevated boardwalk is ever created, there may be some additional considerations for tree management.

Trees in this area can be allowed continued growth for water quality, aesthetics, and wildlife habitat.

Ash is dominant in this area. You can expect that likely all the ash trees will eventually be killed by the Emerald Ash Borer. The Emerald Ash Borer is present in Wake County and continues to expand. Pesticides can be used for prevention. However, the pesticide must be started before the Emerald Ash Borer is found in the area and periodic treatment must continue. The pesticide treatment is costly, so therefore is typically only done on ash trees which are highly valued. For additional information on the Emerald Ash Borer reference our website at: https://www.ncforestservice.gov/forest_health/forest_health.htm

Area 5: Trees, approx. 1 acre

This area is a small stand of trees. However, I was not able to tell if some of the area is also pasture.

Since the area is located separate from the larger park area and is small, I understand that the plan is to basically leave this area as is.

However, if some of the area is openland, you could consider establishing trees in it. Contact us for assistance if tree planting is desired.

Since a stream does run through this area, simply letting the trees grow would be desirable to help provide a stream buffer.

Area 6: Water, Sand, Rocks, approx. 3 acres

This area contains the Little River and water being held behind the old dam. Sand bars are also located in the area, as well as several rock outcroppings.

People will venture into this area to view the old dam and to fish.

Additional Considerations

Tree Monitoring:

You should perform periodic assessments of the park property to check for dead, dying, or hazard trees and remove them as needed to eliminate the hazard.

This assessment is critical in areas of the park that are heavily used. You may also want to consider assessing the trees within 100 feet of the edge of trails, parking lots, picnic areas, and along the edge of use areas.

Tree Planting and Financial Assistance:

If you decide to perform any tree planting in the park and need specific recommendations, please contact us for additional assistance.

Financial assistance for tree planting may be available from the National Arbor Day Foundation.

Financial assistance for tree planting and other tree establishment practices may also be available through our Urban Forestry Grant Program (contact Andrew Pleninger at 919-857-4842 for information).

Neuse River Basin Riparian Buffer Rules:

This property is located within the Neuse River Basin therefore wooded buffers must be maintained on each side of intermittent or perennial water sources. The buffers must be maintained without disturbance except as allowed by the rules. The buffer is 50 feet wide on each side of the water source.

For additional information on the Neuse River Basin Riparian Buffer Rules contact the NC Division of Water Resources.

Non-native Invasive Plants:

Besides the kudzu located on the property, we observed Japanese stilt grass, Chinese privet, and bamboo.

These are non-native invasive plants. Non-native invasive plants can rapidly spread following disturbance. As they spread, they can choke out beneficial native plants in the understory and form dense ground cover and thickets. They can also hinder the successful regeneration of desired trees and native ground cover.

Invasive plants can produce abundant seed which can remain viable for many years. The seeds of many of these plants are also widely digested by birds which helps spread the plants. Because of these conditions, typically one treatment will not rid the area of the plants, but several treatments over several years may be needed. Even with treatment, you may never rid the property of them. If they are present on neighboring property, they can invade your property.

Therefore, you might hope to rid the area of them as much as possible, while living with them as

long as they are not a major hindrance. Using appropriate control treatments as needed to provide the desired stand condition is a key.

You may want to concentrate control in the areas of the park that are used heavily (Area 1, 3, and 6). You might want to also perform control within 50 feet of the edge of trails, parking lots, etc. to help provide a buffer area.

Control then might be performed as desired in Area 5 for aesthetics and since this area is highly visible from the state roads.

Control in Area 4 would likely be done lastly and then only if you are desiring to do so. Because of the location of Area 4 and flooding, as well as the presence of invasives on surrounding property, invasives will continually be a problem in this area.

There are a variety of ways to control these plants. You will need to decide how much effort and expense you want to put into the work and then pick the method that meets your abilities.

For control information, I recommend that you reference "A Management Guide for Invasive Plants in Southern Forests" (website: <http://www.treesearch.fs.fed.us/pubs/36915>). This offers various management strategies that you may want to consider, and it also provides recommended herbicides and rates.

Another site you may wish to reference is <http://www.invasive.org/eastern/srs/> or <https://www.bugwood.org/>

We also have a series of handouts that addresses these plants, as well as many other invasive plants. They can be found at our website: <http://www.ncforestservice.gov/publications.htm> under the Forest Health section.

There is also abundant information available by searching the internet.

Bird and Duck Nest Boxes:

Erecting and maintaining bird and duck boxes on the park property might be something you want to consider. Predator guards must also be used as part of the installation process. Once established, the nest boxes will need to be checked annually for repair and cleaning out. Also, one major consideration to this is can the boxes be erected and maintained without vandalism.

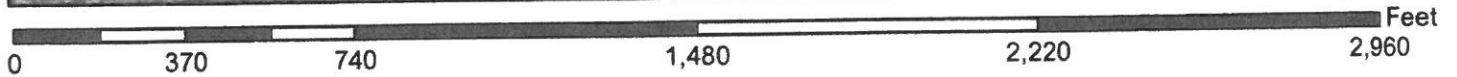
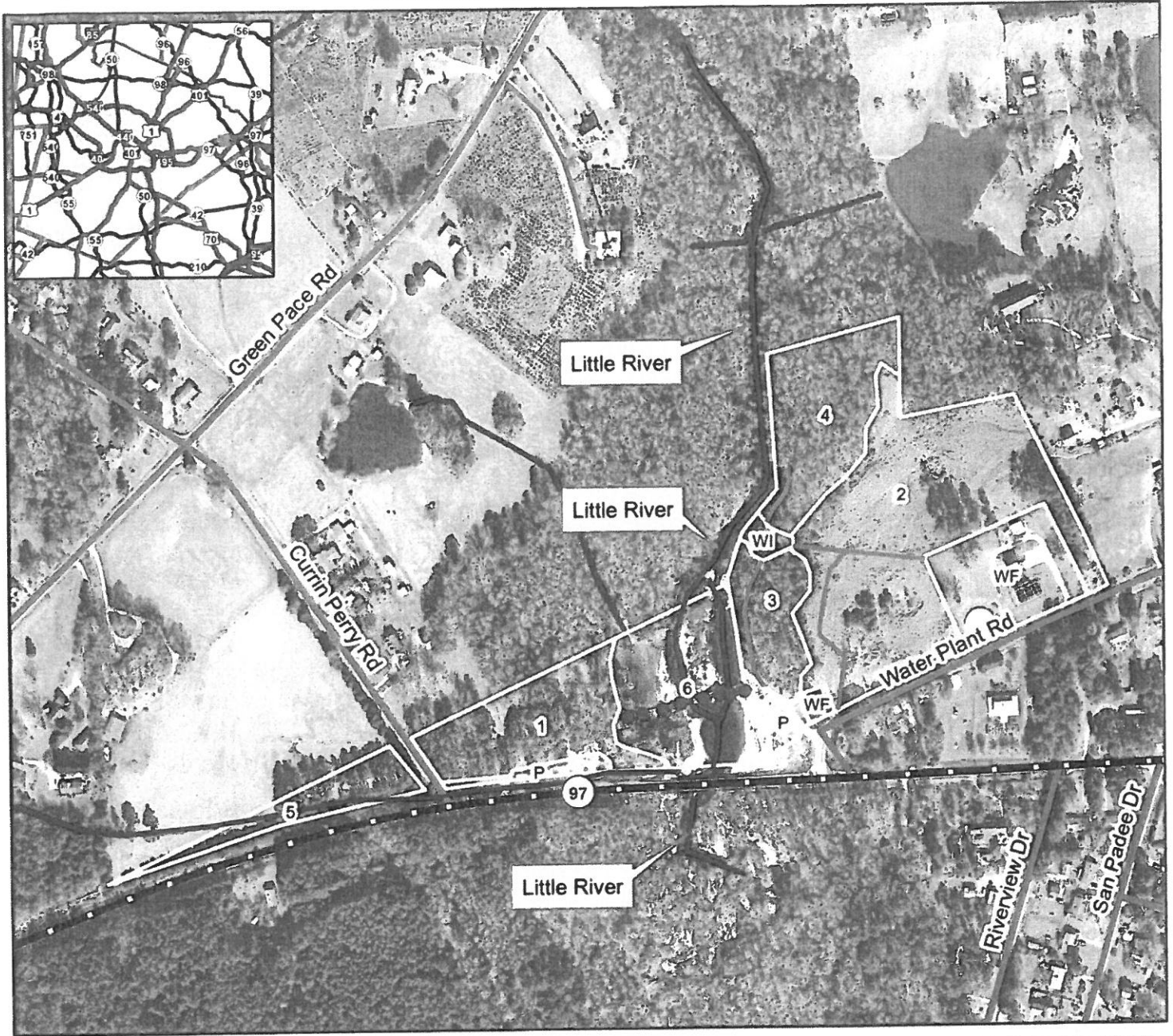
If you need diagrams for various bird boxes and wood duck boxes, please let me know.



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Longitude: -78° 21.121'
Drawn By: R. Roberson
Date: 9/9/19
Photo Yr.: 2017 winter
River Basin: Neuse

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- 1:Trees/Open, 3 acres
 - 2:Kudzu, 8 acres
 - 3:Trees, 2 acres
 - 4:Trees, 3 acres
 - 5:Trees, 1 acre
 - 6:Water/Sand/Rocks, 3 acres
 - WF:Water Filtration Plant, 2 acres
 - WI:Water Intake Pipe and Pump House
 - P:Parking, 1 acre

Legend

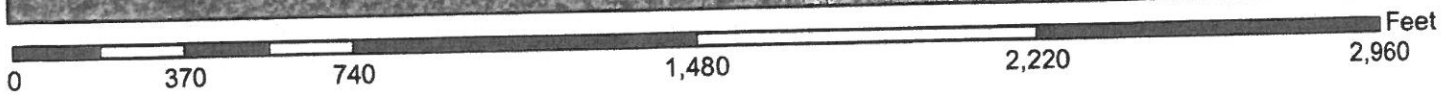
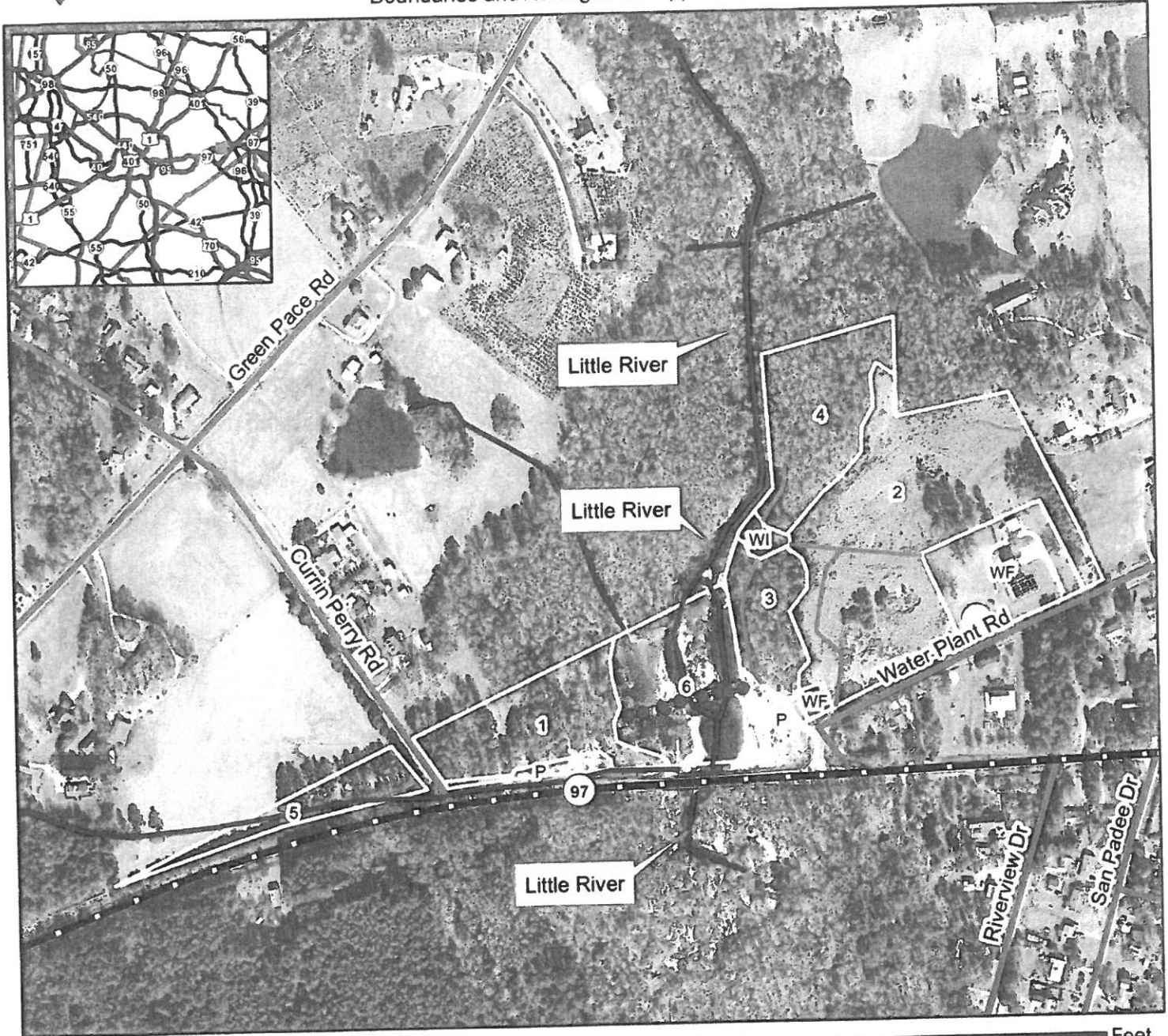
- Old Dam
- Path
- Misc_Streams
- Stand_Boundary



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September 9, 2020

Project: Little River Park, Town of Zebulon : Kudzu Treatment

On behalf of Restoration Systems (RS), we appreciate the opportunity to propose a quote for managing kudzu within the Town of Zebulon's Little River Park off Water Plant Road. As we discussed in person, multiple treatments are required to fully control this species in this setting. There is plenty of literature regarding effective treatment approaches- I recommend the [NC Invasive Plant Council website](#) as a starting point to learn more. Ideally you would develop an integrated pest management plan (IPM) for all of your properties that allows you to rely on your regularly scheduled grounds crews for necessary treatments once you have the larger areas back under control. In the long run this is the most cost-effective way to keep invasive species in check. If you decide to follow that approach we are happy to work as a consultant to assist with the plan development and execution.

Our current proposal is focused on the +/- 8 acres of kudzu off of Water Plant Road. We suggest that you begin the treatment effort with a chemical treatment in the 2020 growing season, to be completed by October 9th, 2020. Low vines would be treated with a broadcast foliar treatment, while larger climbing vines would be treated with a cut stump application. See Quote 1.

Because multiple treatments will be required for full control I have added a second option for your review. Quote 2 includes the initial 2020 treatment (as in Quote 1) and adds two additional treatments to be performed next growing season. Table 1 details each quote along with our methods and pricing.

Table 1: Methods and Prices

Proposal:	Method	Treatment Period	Number of Treatments	Price
Quote 1	Broadcast Spraying, Cut and Stump Spray	September 2020 – October 2020	1	\$5,865.00
Quote 2	Broadcast Spraying, Cut and Stump Spray	September 2020 – October 2021	3	\$11,471.25

Payment for Quote 1 would be due upon completion of the work. Table 2 details the payment terms for Quote 2 based on treatment milestones.

Table 2: Quote 2 Payment Milestones

Milestone	Percentage of total price	Payment Amount
Late-Growing Season Sept - Oct 2020	50%	\$5,735.63
Early-Growing Season March - June 2021	25%	\$2,867.81
Late-Growing Season June – Oct 2021	25%	\$2,867.81

Feel free to contact me with any questions at 252-299-1655 or mharrell@restorationsystems.com.

Sincerely,

Matthew Harrell
 Restoration Systems, LLC

