Notes from the
CTA Bradford/Callery Pear Town Hall
August 14, 2023, 6:00 p.m.

Interested residents attended the town hall presentation on the Traceway Bradford/Callery Pear issue ("Bradford Pear"), held in the ballroom at the Carolina Trace Country Club ("CTCC"). These notes are provided as a courtesy to those who missed the meeting.

Background/Creation of the CTA Bradford Pear Committee

In April 2023, the CTA Trace Roads and Maintenance Committee (TRAM) Tree representative had an inspection of the trees on CTA's property by the Lee County horticulturalist. It was discovered that the 45 Bradford Pears that are on CTA property, as well as an additional eight that are on CTCC property, are not only well past their life expectancy (20 years, and these trees were planted in 1986), but many are currently diseased and dying. The Bradford Pear is also on the NC invasive species list, and Lee County has introduced a bounty program to help tree owners replace these trees at no cost. (Note: for interested homeowners, there is link at the end of this document to pre-register for the program.)

TRAM reported these findings to the CTA Board in May 2023 and the Board agreed that an *ad hoc* committee should be formed to research and present a plan for Board consideration. The Bradford Pear Committee currently includes five members: CT residents Rod Loss (TRAM Tree representative), Peggy Hudson (Master Gardener), Karen Glaser (Geologist) and Deanne Boone; and NC State employee Amanda Wilkins (Horticulture Agent at the NC Cooperative Extension Office in Lee County, NC). The committee called for a town hall meeting on August 14 to help the community understand exactly what is going on.

August 14 Town Hall Presentation by Amanda Wilkins

Rod Loss introduced Amanda, whose opening remarks included thanking the members of the Bradford Pear Committee for their work this past summer, which included research such as topographic map and sun exposure analysis (see slides 22-24), taking soil samples from the 13 different sites, and culling a list of tree choice for consideration. Amanda thanked the Trace community for leading the way for other county actions involving the removal of the many Bradford Pears in the county.

Amanda presented a detailed slide show (included in this packet) and these notes will refer to those slides.

Invasive Species Defined. Amanda's presentation covered what is meant by an "invasive species," and how the thought of *"…but my tree in my yard is OK…"* is an understandable, but wrong thought process. It's simply a matter of time until Bradford Pears will do harm to other plants and trees. While Bradford Pears were designed to be a nice-sized tree for landscaping accents, they ended up being overused, and cross pollination and nursery seed propagation all led to their winding up on the invasive species list in many states. See slide 10 for issues with the Bradford Pears. Slide 11 shows two photos of Bradford Pear-lined landscape examples, which would never occur in nature.

What disease has infected the CT Bradford Pears? "Fire Blight." This is a highly contagious disease and several trees currently have this. It is caused by bacteria and can move quickly through a tree and spread

to other trees. CT is a beautiful forest ecosystem, with many native trees and plants, including species that are notable in CT, such as Beech trees, Mountain Laurel and American Holly. The Bradford Pears can negatively impact these trees and ruin the forest ecosystem in CT.

The Bradford Pear Committee, working at the direction of the CTA Board of Directors, will come up with a plan to determine whether or when the tree removal will occur. Amanda stressed the importance of consulting with credentialed professionals as this is skilled work, so a thorough vetting of the credentials of the contractors is important. While CTA may have contractors they trust and that is fine, not doing the job properly the first time will just waste CTA's money and create problems that will haunt the community in a few years' time and cost even more to fix.

Soil analysis at current Bradford Pear sites. Slides 32-36 show the analysis of soil samples that were collected and tested in July. (Thanks to Peggy Hudson for collecting these samples!) The soil analysis shows dire need for amendment, including professional aeration (using a machine) for compacted soil, introducing two inches of "Brooks Contractor mix" (this includes lime), application of appropriate fertilizers, and then mulch or reseeding. Amanda advised to never leave bare ground and to not reseed within six feet of any tree trunk. Mulch applications in general tend to be overkill (example: examination of the trees on Traceway indicate they have a long tradition of being over mulched, and are currently over mulched by about 3 inches), so the contractor should be mindful of this. Do not use landscape fabric with mulch. Mulch should be refreshed every 12-18 months. Mulch should always allow water to penetrate, mulch that has a 'crust' on it is diseased and will not allow water to get to the plants, nor will it allow the mulch to break down.

Recommended replacement trees. The *ad hoc* committee identified eight possible trees from which to choose. The criteria for selecting trees for this list were:

- trees that would mature to a size comparable to the existing Bradford Pears
- trees that have a spring or early summer bloom
- trees that have colorful fall foliage
- trees whose fallen leaves break down rapidly and decay easily (i.e., no waxy leaves)
- provide nectar and pollen sources for bees, butterflies, etc.

Based on the above criteria, the trees being considered by the committee are featured on slides 39-47.

Community Questions for Amanda Wilkins

Q: If nothing is done, how long will the current trees last?

A: Approximately five years, assuming there are no hurricanes or ice storms to bring them down sooner.

Q: Residents living along Traceway are used to these trees for landscaping and noise abatement. How long will it take for new trees to provide this?

A: The noise question cannot be answered in this forum. To get a good growth from new trees, it is suggested that CTA obtain the smaller size (i.e., 3 gallon) as these trees are just 2-3 years old and will therefore spend less time getting acclimated to new soil and growing conditions, and therefore grow faster. This assumes the appropriate recommended soil amendments as per the soil sample test result are done.

Q: The trees lining Traceway provide a dramatic visual impact. Can the new plantings be done in stages to help preserve the visual impact? Could every other tree be removed and replaced?

A: In theory yes, but in practice, no. The Bradford Pears are "allelopathic," meaning that they produce chemicals that inhibit growth of other nearby plants. Trees could be removed by group, though. Planting new trees should be along the lines of removing Bradford Pears (including all prep work, stump grinding, etc., as outlined earlier) and then planting the new tree between two Bradford Pear stump remains.

Q: How long until soil is ready following the roots/stumps/herbicide procedure?

A: If you don't add nutrients, the soil would need to be left alone for two- to three years. If you add nutrients to the soil as described, the soil is ready for new planting as soon as you have them.

Q: Why are Crepe Myrtles not being considered?

A: Crepe myrtles are also overused, and need far more maintenance. They also don't provide nectar and pollen sources. The trees chosen for this community will not be larger than the Bradford Pears, which is also a reason why the Red Maple isn't part of the Bounty program or being considered.

Q: Can't the current trees just be pruned back and kept under control?

A: This will not minimize negative effects, especially on trees as old as these Bradford Pears. It would be a short term bandaid, but not good in the long term.

Q: What is the actual time line for the cutting down/cleaning up/replanting?

A: It will depend on what the CTA Board decides; however, fall is the perfect time for all of this work.

Q: How much will this project cost?

A: It depends on who wins the bid, but most likely $20-30k. Amanda emphasized that no one is saying local contractors do bad work; but that CTA should just do their homework and aim for better. For the naysayers who do not believe in this investment, Amanda believes the tree line is part of the "crown" of Carolina Trace, so the question is what is that worth to its residents?

Q: Can you give more information on the impact of diseases?

A: Fire Blight is the biggest concern. Within a week, a healthy tree can be dead. As mentioned, Bradford Pears were once resistant, but now Fire Blight is a terminal disease. To build on the earlier mention of pruning: pruning opens trees up to more disease due to open cuts on trees. Applying salves, waxes, bandages, etc., to open tree cuts is not recommended.

Q: What are the precautions to take for removal and where we plant new trees?

A: The suggestion is to plant the new trees in between the stumps (which will have been treated; i.e., don't remove stump, but grind down and apply herbicide to kill the roots). Amanda also recommends planting a mixture of tree types, to be planted in larger blocks.

Q: How long after applying herbicide to the old tree roots can we plant new trees nearby?

A: Seven days.

Q: Could we remove and replace trees over a several year period, taking the five bounty trees annually from Lee County by showing proof of removal of some trees each year, thus spreading this over a few years?

A: Removal of the problem trees needs to be the priority, but obviously, whatever the CTA Board decides.

Q: Do you know the price of the soil amendment you are recommending?

A: Depending on the brand and/or exact formula, it's around $20-30 a yard, including delivery.

Q: What is the upkeep on newly planted trees?

A: Following soil amendment, watch the application of mulch, which should be around three inches to avoid the 'crust' that won't allow for water penetration. For watering, those overseeing the trees should watch the weather. Throughout the winter, one five-gallon bucket of water every two weeks would suffice; however, if it's hot in the winter (e.g., 80° F for a week in February), then provide additional watering. Regular watering through that first year is crucial, then afterwards the trees should be able to get enough from the rains. The recommended trees are also resistant to warming trends in the climate.

Q: If Lee County provides only five trees each year, could residents sponsor or adopt a tree?

A: Of course you can purchase extra trees outside of the exchange (but not from the exchange), and due to CT's status in the community, many vendors would help with sourcing and pricing. Peggy Hudson (former sourcing person for the Big Bloomers Flower Farm) and others can advise further. Amanda is also available if needed.

CTA thanked Amanda for her work thus far and appreciate that she will remain as a member of the Carolina Trace Bradford Pear Committee while that group works with the CTA Board to come to a solution.

Community Questions for Carolina Trace Bradford Pear Committee Members

Q: The trees have value primarily to North Shore POA residents but since this is CTA property, are the other 17 POAs expected to pay as well?

A: This program is a decision of the CTA Board using CTA funds since it's CTA property that happens to run through North Shore POA.

Q: Are there issues with roots under the asphalt that will need to be addressed?

A: This work does not have a root problem, nor will it impact any utility easements that run along Traceway. The trees will be removed and the stumps ground down six inches, per Rod Loss.

Q: North Shore POA experiences issues with leaves in their drainage system, and would like confirmation that the trees being considered have leaves that deteriorate quickly.

A: That was a criteria of the committee, along with spring blooms and good fall color.

Q: What are the next steps?

A: The committee will finalize their recommendation to the CTA Board. The CTA Board, comprised of a director from each POA, is the official voice of the community. If you have opinions or further questions, make them known to your POA's CTA Director. Once a plan is approved, the committee will work on getting bids and take those back to the CTA Board for review and consideration.

Q: It was reported that the Club has eight trees in the same predicament. Can Kate Woods clarify whether the Club is working in the same time line?

A: Kate does not know their time line at this point.

Q: CTA is currently working on its 2024 budget. Would this project change that budget?

A: Kate Woods spoke on behalf of CTA's budgeting. Unless we decide to take all trees right now or change contractors for removal, we are in budget for 2023 and there will be no change to the 2024 budget.

Q: If we have to use certified professionals, won't we see the price rise dramatically instead of using our volunteers and our current contractors?

A: Amanda clarified in her earlier remarks that CTA just needs to vet its contractors a little better; not that we cannot use them. We will know the scope of the work once a plan is presented to and approved by, the CTA Board.

Q: In looking at the tree line on Traceway North, is there a possibility that while we are redoing the trees, we could look at whether or not we could add additional turnarounds in place of a few trees to enhance ease of getting to homes by resident and visitors?

A: That is a question for the TRAM committee as a whole to review; not the Bradford Pear Tree Committee. However, it's a good question and one worth exploring, even though the cost of creating additional turnarounds would be more than the savings of not planting a tree or trees in that same spot.

Q: Who will be tasked with watering the new trees and who will pay for the water?

A: CTA's current landscape contractor (Barry Walls, Walls Lawn Care and Landscaping, LLC) has a tanker truck and has agreed to provide regular watering for any new plantings.

Thanks to the community members who showed up for the presentation and the Q&A. CTA will provide regular updates as they become available, through the CTA News. Questions can be addressed to TRAMCommittee@gmail.com or reach out to any committee member.

Notes by Sharon Sheldon, CTA Secretary

Note to all residents: Lee County's Bradford Pear Bounty Program is October 28, 2023. On this date – and only this date - you can pick up free trees to replace your removed Bradford Pears. You can pre-register using this link: https://docs.google.com/forms/d/e/1FAIpQLSeyc-BqAqzj4asiyBM9Tlufr3vmQu7QkmTALXw19ISlyLlEww/viewform

Questions about the bounty program can be addressed to Amanda (see slide 48).

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- **Thursday, August 10-** Knowledge is Pollinator Power, 1-3 p.m.- state-wide, open to the public pep rally!
- **Friday, August 18-** Count!
  - Pollinator Haven at 2420 Tramway Road, Sanford, NC 27332
- **Saturday, August 19-** Count!
  - Sanford Farmers' Market
  - Pollinator Haven at 2420 Tramway Road, Sanford, NC 27332

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REMOVE NC Bradford Pear Bounty REPLACE

Fee: $25

Learn about chainsaws with the experts!
Staff from Bartlett Tree Experts are teaching the basics of chainsaw usage and safety.
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REGISTRATION: HTTPS://GO.NCSU.EDU/CHAINSAWCLASSLEECO2023

BARTLETT TREE EXPERTS
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Right Under Our Noses: Carolina Trace and Bradford Pears

Amanda Wilkins

Horticulture Agent

NC Cooperative Extension- Lee County Center

August 14, 2023

- Pollinator Haven Garden, NC Cooperative Extension- Lee County Center, 2420 Tramway Road

Why am I here today?

- What is NC Cooperative Extension?
- What are Bradford Pears?
- What are invasive species?
- What is the Bradford Pear Bounty?
- What is up with all those Bradford Pears along Trace Way?

Find yours: https://www.ces.ncsu.edu/local-county-center/

Mission

- NC State Extension extends research-based knowledge to all North Carolinians, helping them transform science into everyday solutions that improve their lives and grow our state.

Vision

- We are the trusted, go-to resource for connecting research and education to the communities, economies and families of our state, creating prosperity for all North Carolinians.

NC STATE

Extension Master Gardener

Photo by Amanda Wilkins

Our mission
is to connect people
to horticulture
through science-based
education and outreach
that empowers
North Carolinians
to cultivate healthy
plants, landscapes,
ecosystems, and
communities.

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What are "Bradford Pears"?

- Scientific name: *Pyrus calleriana*
- Cultivar of Callery Pear
- Native to China
- Brought into the US in the 1960s as a landscape tree, popularized in the 1990s
- Wasn't an issue until:
  - Other varieties introduced
  - Nursery-people propagating from seeds
  - Overused as a landscape tree

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All the Reasons to Keep Them…

- They're perfectly healthy plants
- The bees love them!
- They were my [special person's] plant
- I don't like to use chemicals on my property
- "My" birds nest in them
- It would look so different in my yard
- It is too much work to remove them

1 It's invasive!

Bradford pears are cultivars of the Callery pear, which was brought to the U.S. in the early 1900s in an attempt to improve disease resistance of pear trees.

It was believed that these trees would not be able to spread. However, different cultivars are able to cross, allowing them to escape into our natural forests. These trees spread quickly and outcompete native plants by shading them.

2 It's weak, annoying, and stinky!

Bradford pear trees are structurally weak. They readily break during storms, creating an annoying mess for homeowners following wind, snow, or ice. And while they may have pretty flowers, this beauty comes at a cost! Many people report that the flowers of the tree have a scent similar to rotting fish.

3 We have plenty of look-alikes!

The beauty of Bradford pears may make you reluctant to let them go, but don't worry! We have plenty of native trees that have very similar blossoms, such as the flowering dogwood, black cherry, and serviceberry. Native trees are beneficial for our ecosystems, allowing other native species to flourish.

Cut down your Bradford pear trees and get up to five free native trees at our events!

- Source: Bradford Pear Bounty Program

Joe Daniel Jesus
APR 16 AT 8:29 PM

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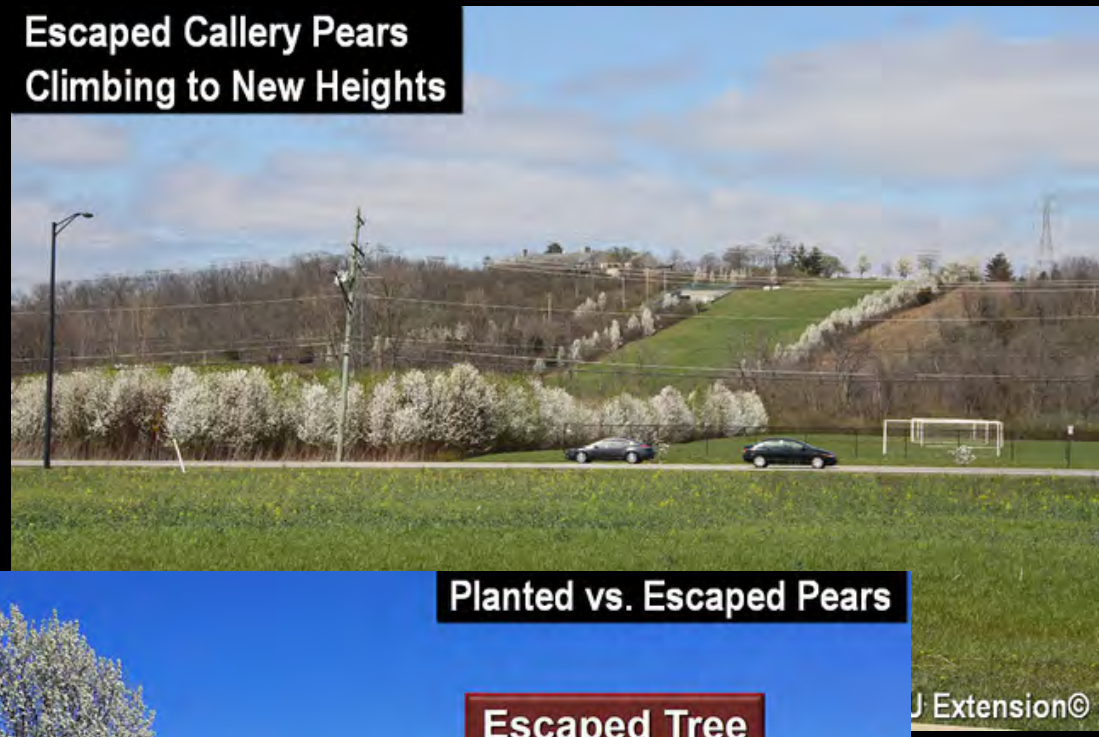
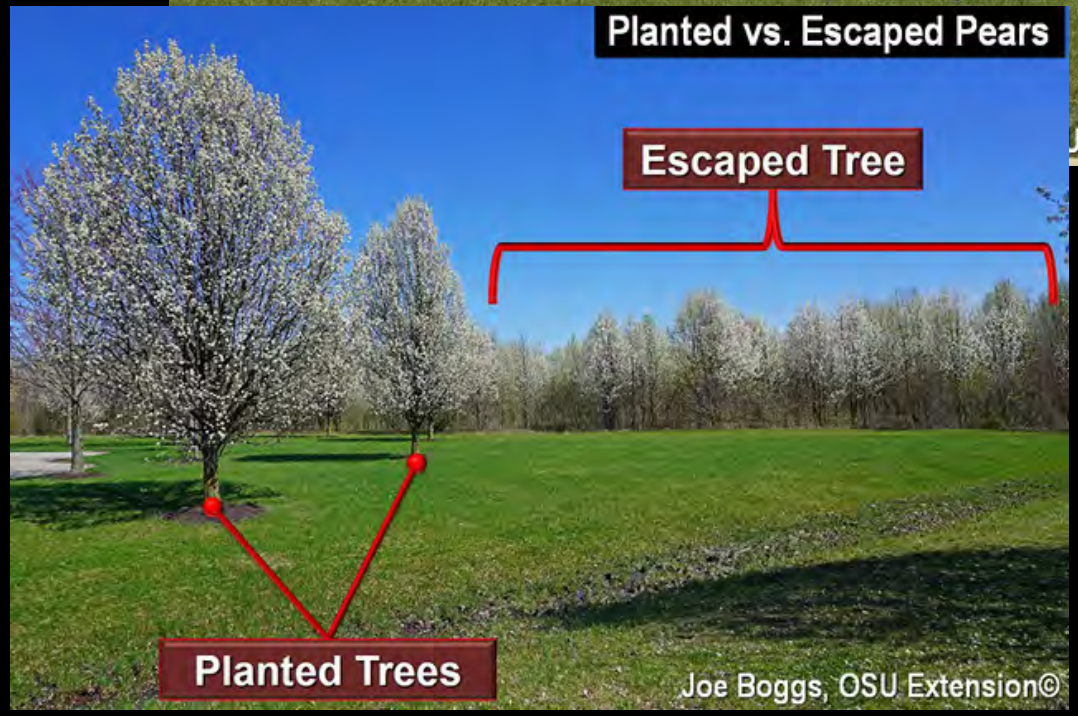
What's the problem?

- Extremely invasive, fast-growing tree
- Often forms dense stands
- Chokes out native trees and overtakes open areas and fields
- Supports very little insect life, which means every callery pear tree represents a "food desert" for many songbirds
- Can produce viable fruit in as little as three years; fruit are spread by birds
- If the top of the tree dies, many sprouts emerge from the base
- Has large thorns capable of drawing blood and puncturing tires

Source: Clemson Cooperative Extension





Photos by Joe Boggs, Ohio Cooperative Extension; https://bygl.osu.edu/node/1476

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The cost to control invasive species and the damages they inflict upon property and natural resources in the U.S. is estimated at

$137 billion annually

https://cnr.ncsu.edu/news/2020/02/invasive-species-how-exotic-plants-animals-and-insects-impact-north-carolina/

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What is an Invasive Plant Species?

- (a) is nonnative to a specified geographic area,
- (b) was introduced by humans (intentionally or unintentionally),
- and (c) does or can cause environmental or economic harm or harm to humans.

Photo by Amanda Wilkins

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Invasive Species Term Definitions

(Iannone, et al. 2020, Journal of Extension)

Monarda clinopodia
and Bumble Bee, both Native!
Video by Amanda Wilkins

- **Native**
  - A species that occurs naturally in a specified geographic area.
- **Nonnative**
  - A species that does not occur naturally in a specified geographic area.
- **Introduced**
  - A species brought to a new geographic area intentionally or unintentionally by humans.

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Invasive Species Term Definitions

(Iannone, et al. 2020, Journal of Extension)

- **Established**
  - A species having a self-sustaining and reproducing population in a specified geographic area without the need for human intervention.
  - Applies to both native and nonnative species.
- **Nuisance**
  - An individual or group of individuals of a species that causes management issues or property damage, presents a threat to public safety, or is an annoyance.
  - Can apply to both native and nonnative species.
- **Range change**
  - The circumstance of a species' current/existing range growing, shrinking, or shifting over time.
  - This change can happen to native and nonnative species with or without human assistance.

Passionflower Vine, *Passiflora incarnata*
Photo by Amanda Wilkins

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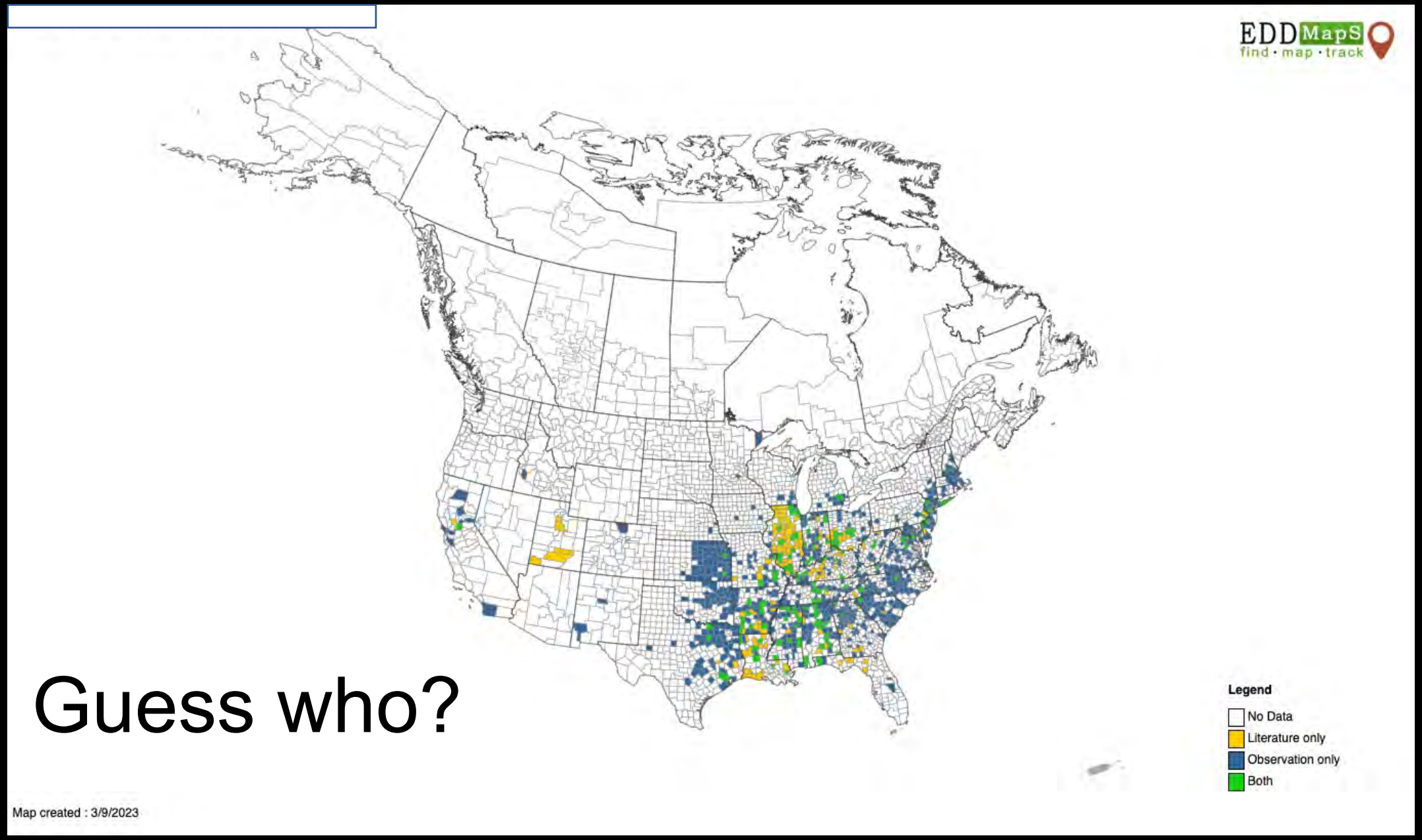
Why are they so successful?

- Produce large quantities of seed
- Thrive on disturbed soil
- Seeds are often distributed by birds, wind, or unknowingly humans allowing seed to moving great distances
- Aggressive root systems that spread long distances from a single plant
- Dense root systems that smother the root systems of surrounding vegetation
- *Allelopathy*- produce chemicals in their leaves or root systems which inhibit the growth of other plants around them

https://www.fs.usda.gov/wildflowers/invasives/index.shtml



Guess who?

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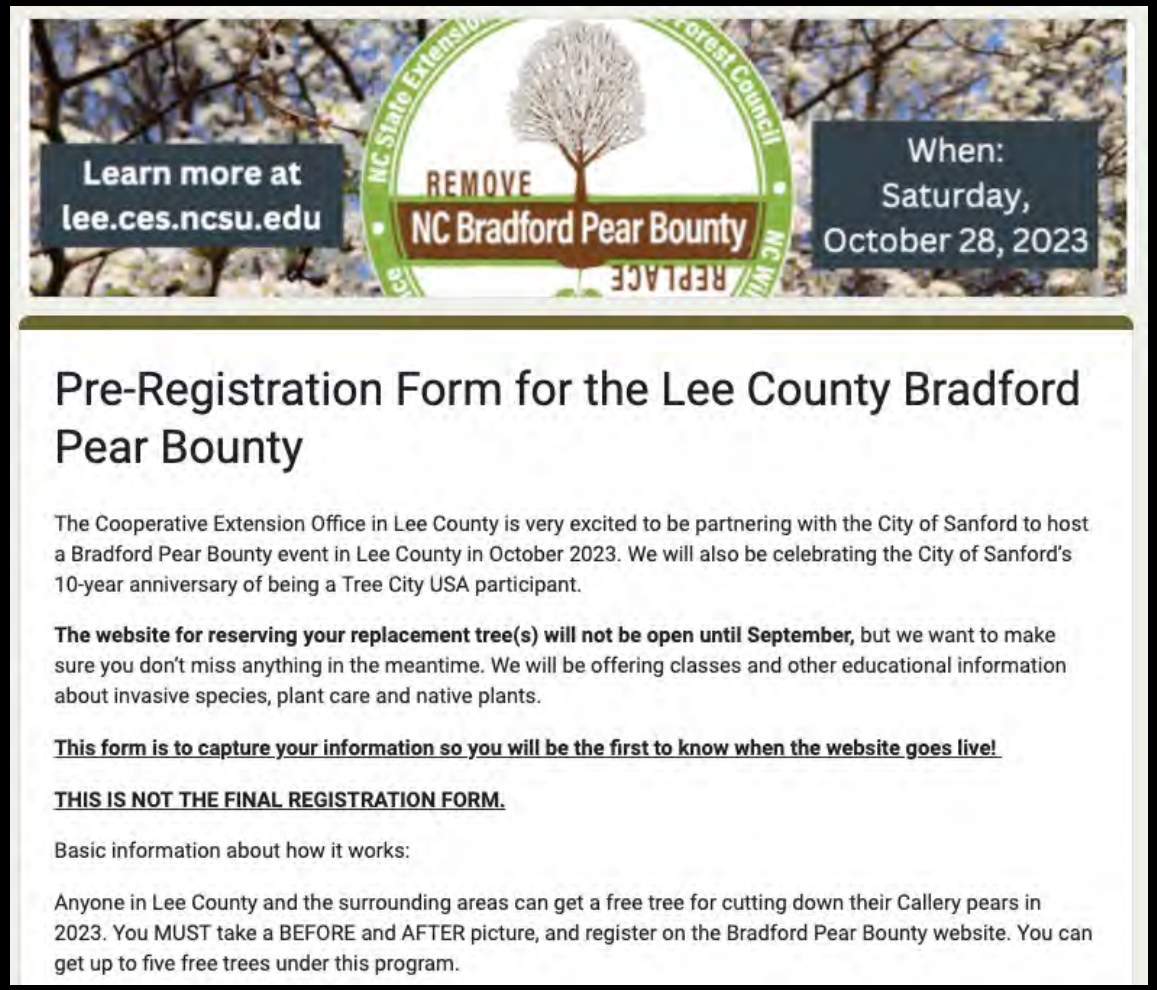

https://go.ncsu.edu/bradfordbountyprereglleeco2023

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The Bradford Bounty Program

NC Bradford Pear Bounty is a collaborative program between NC State Extension, NC Urban Forest Council, NC Forest Service, and NC Wildlife Federation

- Started by Clemson Cooperative Extension in South Carolina as an outreach program, and is still going strong today
- Started in North Carolina in 2022
- Lee County became a partner in November 2022
- Event in Lee County: Saturday, October 28, 2023
- 10-Year Anniversary of Sanford being a Tree City USA

Requirements for the Bradford Pear Bounty Program

storm damage (general), Photo by **Rebekah D. Wallace, University of Georgia, Bugwood.org**, **Image Number:** 5561871; **https://www.invasive.org/browse/detail.cfm?imgnum=5561871**

- Pre-registration is required
- **Tree removal is the homeowner's responsibility**
  - Several tree care service providers are offering discounts for those participating in the program
- This is an event-based program. Participants MUST attend at the location and date/time of the event to pick up their trees.
- Only the homeowner can register and receive replacement trees.
- Any North Carolina resident is eligible.
- **A before and after photo must be brought to the event** (i.e., a picture of the tree standing and a picture of the tree on the ground/cut).
  - If the tree was not flowering when cut, an additional photo with a close up of the leaves or bark is required.
- Replacement trees are free, native, and offered on a first-come, first-served basis.
- One native tree is exchanged for each Bradford/Callery pear tree removal. **Up to five (5) trees can be exchanged.**

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Source:
https://www.facebook.com/ctain
nc/

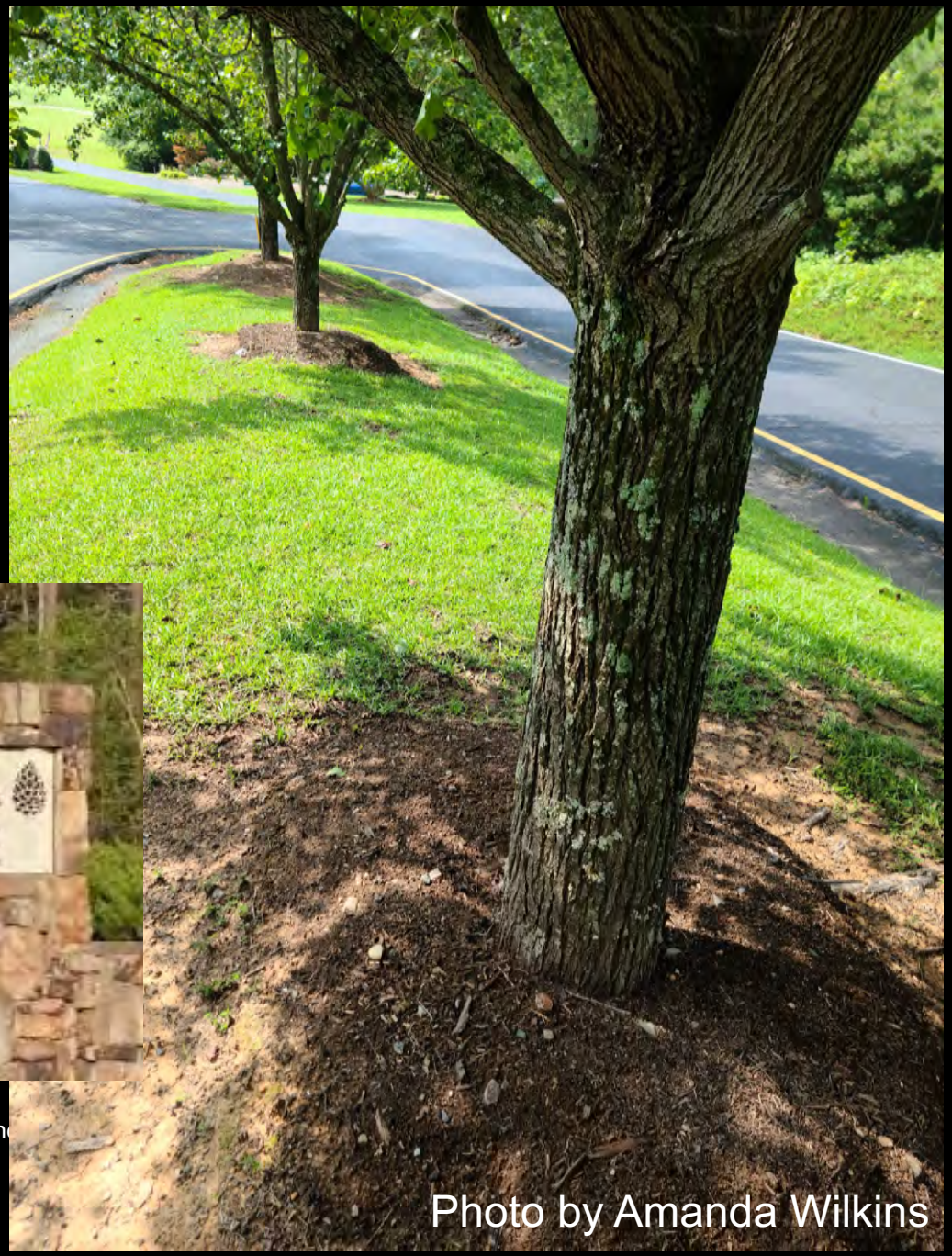

Photo by Amanda Wilkins

What does this have to do with Carolina Trace?

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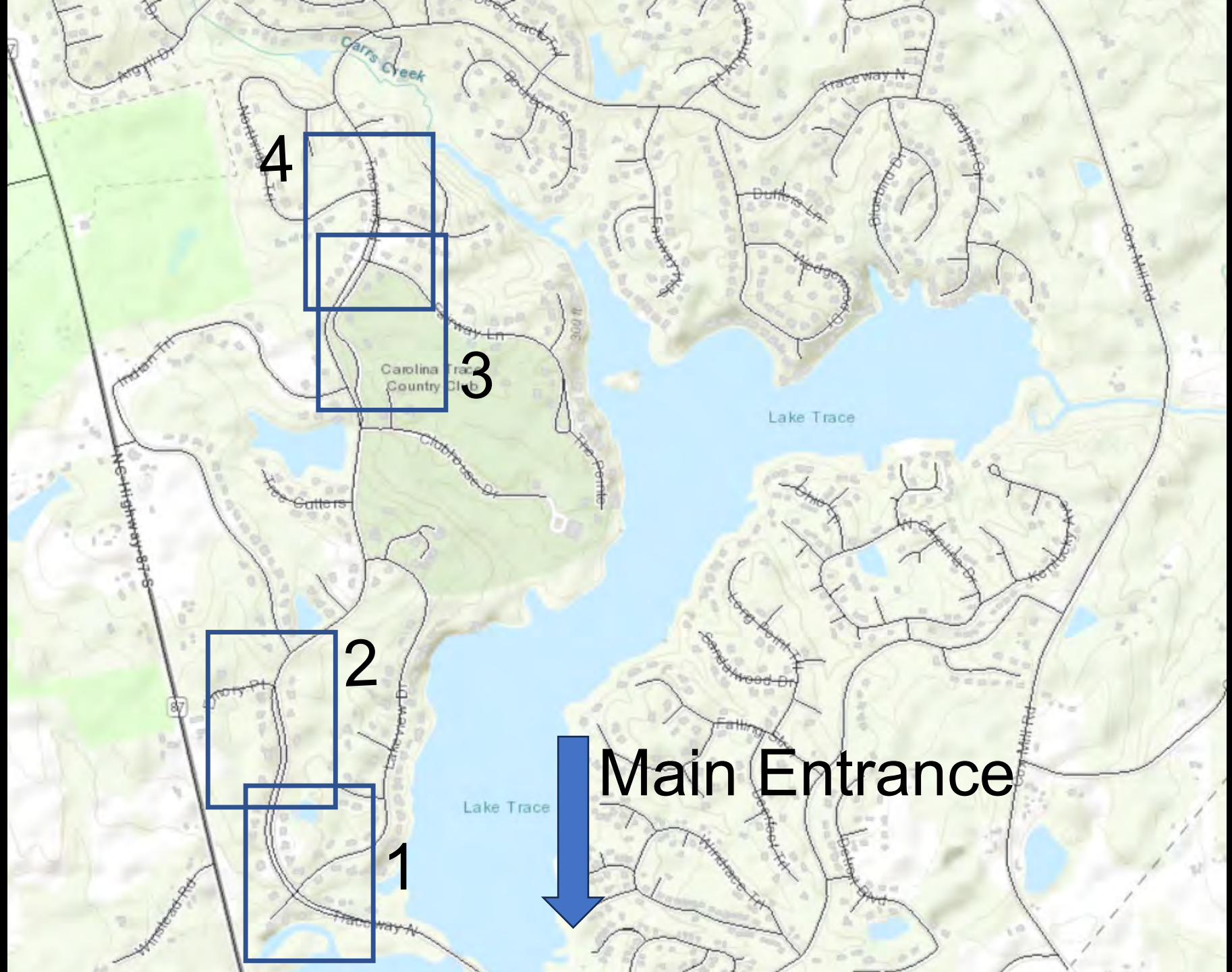

Viewed
at 2:45 pm,
8 June, 2023.
Developed by
Karen Glaser

45 in CTA
8 on Golf
Course
Property

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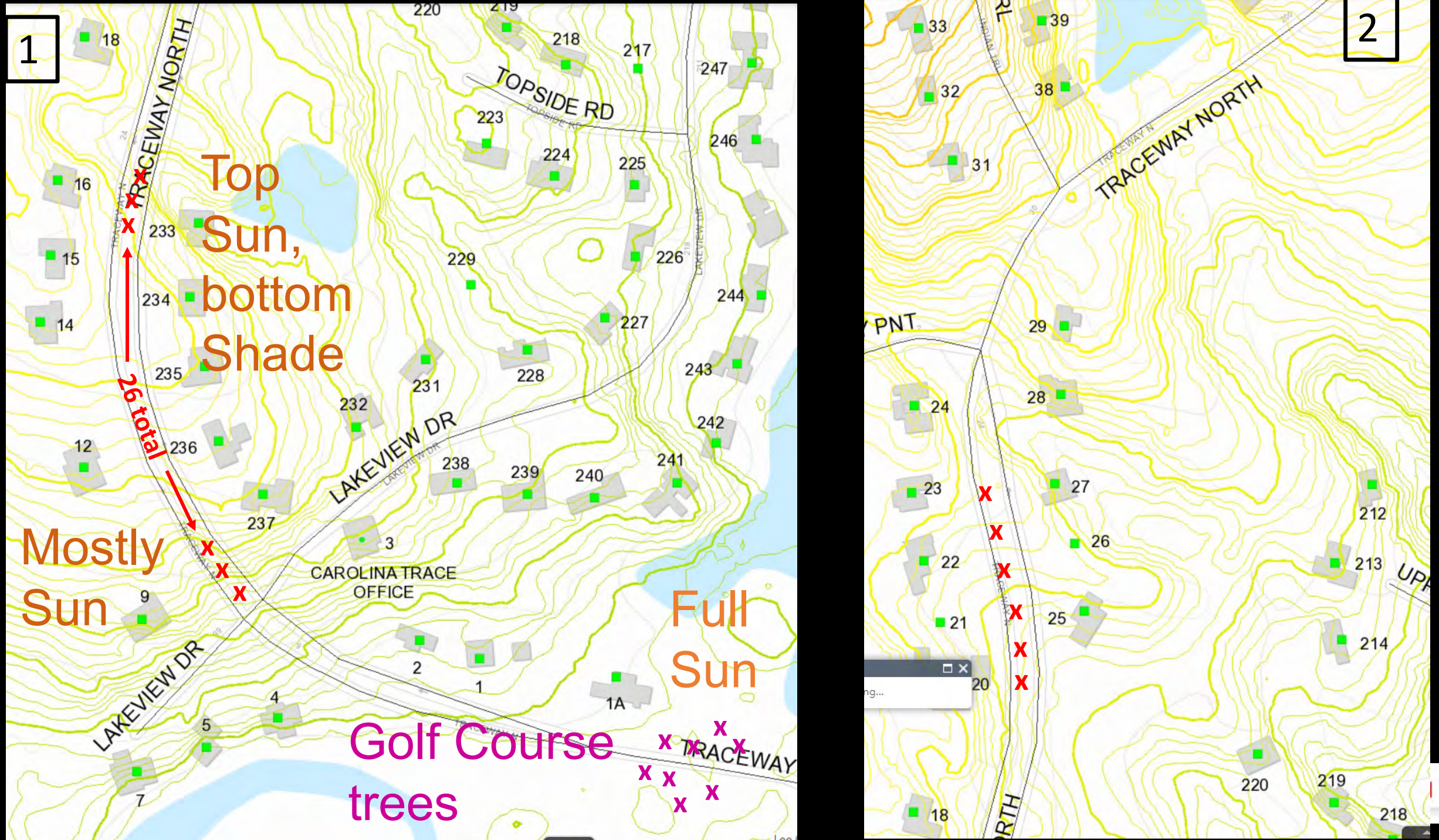
1
2
TRACEWAY NORTH
TOPSIDE RD
LAKEVIEW DR
CAROLINA TRACE OFFICE
Top Sun, bottom Shade
26 total
Mostly Sun
Full Sun
Golf Course trees
18
16
15
14
12
9
7
5
4
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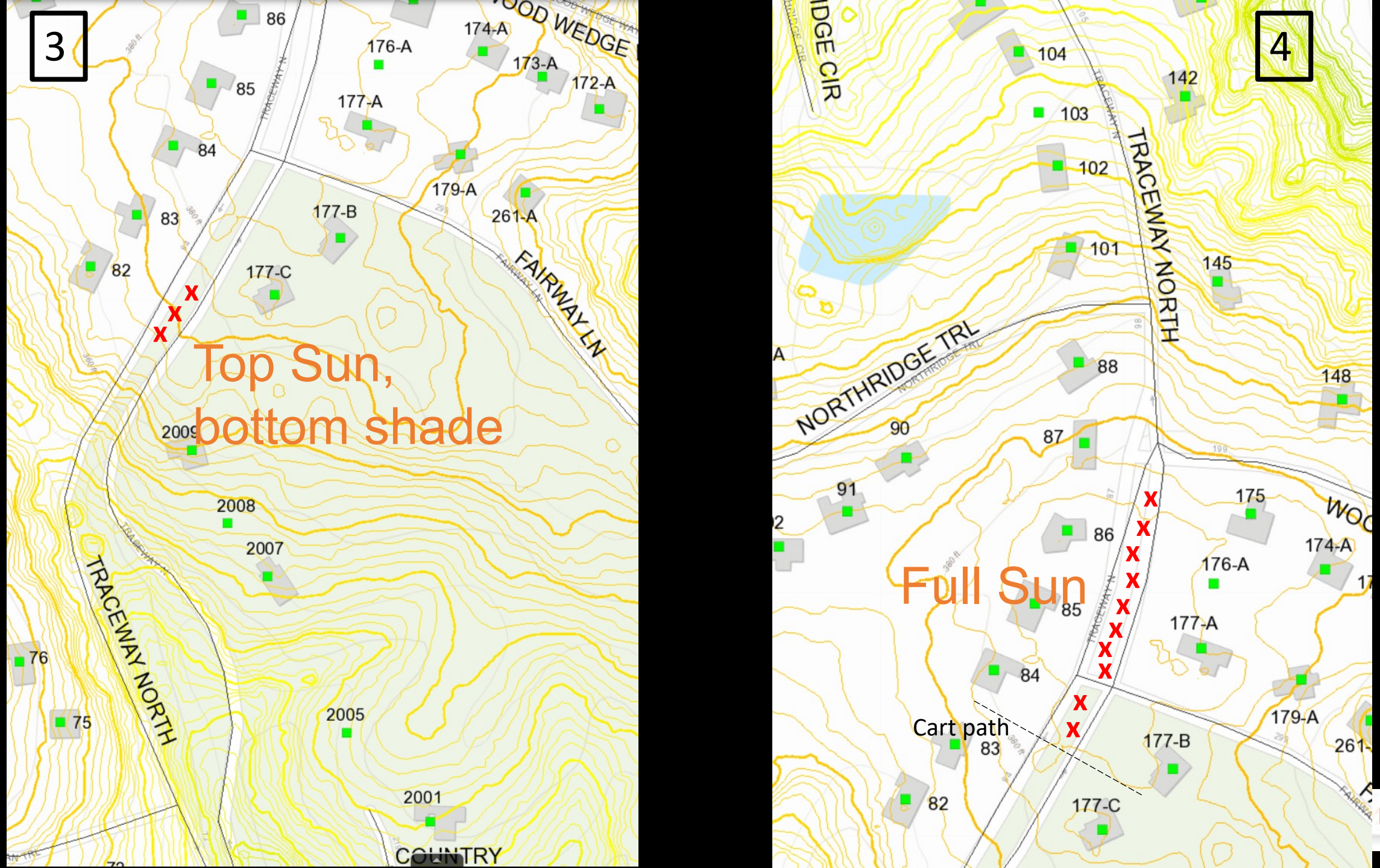
3
4
Top Sun,
bottom shade
Full Sun
Cart path
FAIRWAY LN
TRACEWAY NORTH
NORTHRIDGE TRL
NORTHRIDGE CIR
COUNTRY
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84
83
82
177-C
177-B
179-A
261-A
174-A
176-A
173-A
172-A
177-A
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177-C
179-A
174-A
176-A

Negative Impacts on Forest Ecosystems

Photo by Amanda Wilkins

- Reduce forest health and timber productivity
- Impact ecosystem services
- Displace native plants
- Affect wildlife habitat and populations
- Reduce biodiversity

https://content.ces.ncsu.edu/invasive-plants-and-your-forests

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Photo by Amanda Wilkins

Why you should care

- **Native Ecosystem Integrity:**
  - Human health depends on healthy, functioning ecosystems
- **Invasive plants don't recognize property lines or political boundaries:**
  - free from the natural competition, herbivores, insects and diseases that normally keep populations in check
- **The Unknown Future:**
  - The long term effects of invasive plants on biodiversity are just beginning to be understood
  - Forests are complex systems of interacting organisms; the loss of one plant species can affect many other plants, animals, and microorganisms.

https://ncforestservice.gov/forest_health/invasives.htm

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Process and Plan

1. **Decide to remove trees**
   a) Bradford pears are invasive species and are becoming diseased
2. **Write out plan of work**
   a) See ”What to Budget For”
3. **Put out bids for work**
   a) See “Hiring a Professional”
4. **Get work done**
   a) Tree Removal
   b) Soil Amendments
   c) Plant Trees
   d) Maintain Trees

Photo by Amanda Wilkins

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Hiring a Professional

- It is important!!
- This is SKILLED work
- Save time and money
- Education
  - Secondary education not necessarily required
  - **Some** education is CRITICAL
- What's involved
  - Certification exam
  - Continuing education requirements
  - Bonded and insured

North Carolina Landscape Contractors' Licensing Board

NC CERTIFIED PLANT PROFESSIONAL
North Carolina Nursery & Landscape Association

CERTIFIED ARBORIST
ISA
TM

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Hiring a Professional

- NC Landscape Contractor's License
  - (must have if job is +$30,000 cost)
- NC Irrigation Contactor's License
- ISA Certified Arborist Certification
- NC Pesticide Applicator's License
- NC Certified Plant Professional
- NC Certified Residential Rain Garden Professionals
- NC Board of Landscape Architects

Read more here: https://lee.ces.ncsu.edu/2022/12/finding-good-qualified-help/

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What to Budget For To Make Sure It is Done RIGHT

- **Materials**
  - Soil amendments
  - Fertilizer
  - Mulch
  - Plants
- **Labor**
  - Cutdown
  - Removal of material
  - Stump grinding
  - Herbicide application
  - Proper Planting*
  - Time

Photo by Amanda Wilkins

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Soil Sampling is Important!

Photos by Amanda Wilkins

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Soil Test Results

- Low Potassium
- Low Phosphorus
- pH well below the optimal range
- Low in key micro nutrients
- Lime recommendations: ~100 lbs per 1,000 square feet
- Low humic matter

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Soil Results

Sample ID: 105

Lime History:

Amanda Wilkins

Crop 1- Tree, shade
Crop 2-

Lime Recommendations
110.0 lb per 1,000 sq ft
0.0 lb per 1,000 sq ft

Test Results:

pH = 4.6

Optimum pH range

3.0 5.8 6.5 8.0

N-P-K Fertilizer Recommendations *
20 lbs [illegible] ft 5-10-5 Group B

Phosphorus Index (P-I) = 7

Potassium Index (K-I) =54

50 70
Below Optimum Optimum Above Optimum

Additional Test Results

Soil Class	HM%	W/V	CEC	Mn-I	Zn-I	Cu-I	S-I
Mineral	0.32	0.93 g/cm^3	7.7 meq/100 cm^3	103	131	99	82

*If you cannot find the fertilizer recommended here, choose one from the same Group (A, B, C or D) listed on the last page of this report.
Note: This soil test does not measure nitrogen (N) levels. N fertilizer recommendations are based only on needs of the designated crop.

Sample ID: 106

Lime History:

Amanda Wilkins

Crop 1- Tree, shade
Crop 2-

Lime Recommendations
105.0 lb per 1,000 sq ft
0.0 lb per 1,000 sq ft

Test Results:

pH = 4.8

Optimum pH range

3.0 5.8 6.5 8.0

N-P-K Fertilizer Recommendations *
20 lbs per 1,00[illegible] sq ft 5-10-5 Group B

[illegible]sphorus Index (P-I) =10

Potassium Index (K-I) =65

50 70
Below Optimum Optimum Above Optimum

Additional Test Results

Soil Class	HM%	W/V	CEC	Mn-I	Zn-I	Cu-I	S-I
Mineral	0.32	0.94 g/cm^3	8.8 meq/100 cm^3	135	157	61	78

*If you cannot find the fertilizer recommended here, choose one from the same Group (A, B, C or D) listed on the last page of this report.
Note: This soil test does not measure nitrogen (N) levels. N fertilizer recommendations are based only on needs of the designated crop.

Sample ID: 107

Lime History:

Amanda Wilkins

Crop 1- Tree, shade
Crop 2-

Lime Recommendations
110.0 lb per 1,000 sq ft
0.0 lb per 1,000 sq ft

Test Results:

pH = 4.7

Optimum pH range

3.0 5.8 6.5 8.0

N-P-K Fertilizer Recommendations *
20 lbs per 1,00[illegible] sq ft 5-10-5 Group B

[illegible]osphorus Index (P-I) =16

Potassium Index (K-I) =96

50 70
Below Optimum Optimum Above Optimum

Additional Test Res[illegible]

Soil Class	HM%	W/V	CEC	Mn-I	Zn-I	Cu-I	S-I
Mineral	0.32	0.97 g/cm^3	8.9 meq/100 cm^3	98	123	59	66

*If you cannot find the fertilizer recommended here, choose one from the same Group (A, B, C or D) listed on the last page of this report.
Note: This soil test does not measure nitrogen (N) levels. N fertilizer recommendations are based only on needs of the designated crop.

- Low Phosphorus
- pH well below the optimal range
- Lime recommendations: ~100 lbs per 1,000 square feet
- Low humic matter

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Soil Results

Sample ID: 601

Lime History:

Amanda Wilkins

Crop 1- Tree, shade
Crop 2-

Test Results:

pH = 5.1

Optimum pH range

3.0 5.8 6.5 8.0

Lime Recommendations

40.0 lb per 1,000 sq ft
0.0 lb per 1,000 sq ft

N-P-K Fertilizer Recommendations *

10 lbs per 1,000 sq ft 10-10-10 Group A

Phosphorus Index (P-I) =29

Potassium Index (K-I) =41

50 70

Below Optimum Optimum Above Optimum

*If you cannot find the fertilizer recommended here, choose one from the same Group (A, B, C or D) listed on the last page of this report.
Note: This soil test does not measure nitrogen (N) levels. N fertilizer recommendations are based only on needs of the designated crop.

Additional Test Results:

Soil Class	HM%	W/V	CEC	Mn-I	Zn-I	Cu-I	S-I
Mineral	0.22	1.29 g/cm^3	3.0 meq/100 cm^3	68	29	34	27

Sample ID: 602

Lime History:

Amanda Wilkins

Crop 1- Tree, shade
Crop 2-

Test Results:

pH = 4.8

Optimum pH range

3.0 5.8 6.5 8.0

Lime Recommendations

45.0 lb per 1,000 sq ft
0.0 lb per 1,000 sq ft

N-P-K Fertilizer Recommendations *

10 lbs per 1,000 sq ft 10-10-10 Group A

Phosphorus Index (P-I) =47

Potassium Index (K-I) =26

50 70

Below Optimum Optimum Above Optimum

*If you cannot find the fertilizer recommended here, choose one from the same Group (A, B, C or D) listed on the last page of this report.
Note: This soil test does not measure nitrogen (N) levels. N fertilizer recommendations are based only on needs of the designated crop.

Additional Test Results:

Soil Class	HM%	W/V	CEC	Mn-I	Zn-I	Cu-I	S-I
Mineral	0.27	1.32 g/cm^3	2.4 meq/100 cm^3	74	41	20	27

- Low Potassium
- Low Phosphorus
- pH well below the optimal range
- Low in key micro nutrients
- Lime recommendations: ~45 lbs per 1,000 square feet
- Low humic matter
- Very compacted soils

Soil Results

- Low Potassium
- Low Phosphorus
- pH well below the optimal range
- Low in key micro nutrients
- Lime recommendations: ~50 lbs per 1,000 square feet
- Low humic matter
- Slightly compacted soils

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Soil Recommendations

- **Aerate soils using an aerator**
- **Apply two inches of Brooks Contractor Mix evenly over the area**
  - Has the ability to raise the pH of soils, due to egg shell components
  - Reduce liming costs***
- **Apply appropriate fertilizers**
- **Mulch or reseed**
  - If reseeding DO NOT reseed within six feet of trunk of new trees
  - Always maintain grass-free buffer between turf and tree trunk
  - Reapply mulch annually- pine straw, triple shred or arborist chips are appropriate

Photo by Amanda Wilkins

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Make Sure Trees are Properly Mulched

Photos by Amanda Wilkins

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Improperly-mulched Bradford Pears along Traceway
- No root flair
- Chronic
- Terminal
- Not beneficial

Photo by Amanda Wilkins

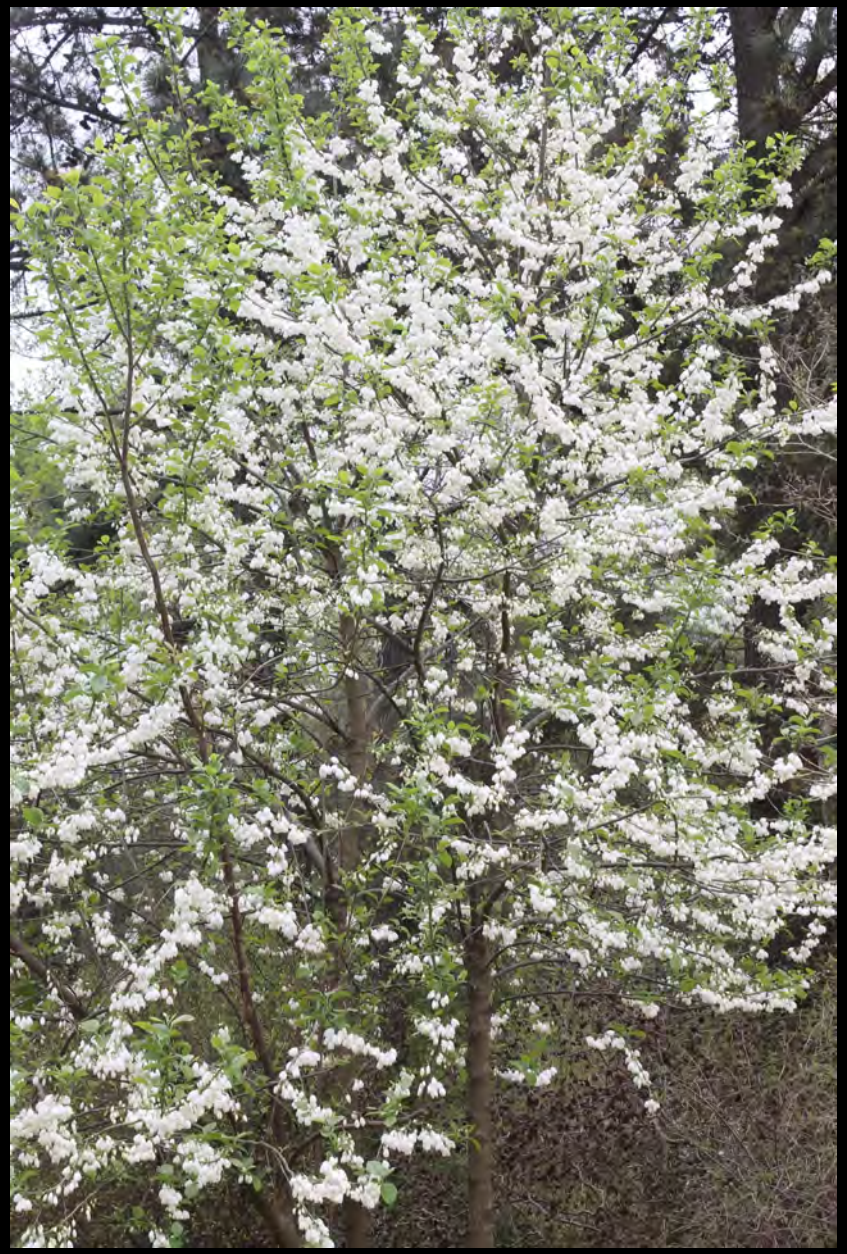

Photo by Amanda Wilkins

Plant Recommendations

- *Amelanchier canadensis*, Serviceberry*
- *Benthamidia florida*, Flowering dogwood*
- *Cercis canadensis*, Redbud*
- *Chionanthus virginicus*, White fringetree*
- *Halesia diptera var. magniflora*, Carolina Silverbell
- *Magnolia virginiana*, Sweetbay Magnolia
- *Magnolia* ssp., Tulip Magnolias
- *Oxydendrum arboretum*, Sourwood*

***Available through Bradford Pear Bounty

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Amelanchier canadensis, Serviceberry*

- **Habit:** Upright, vase-shaped tree
- **Size:** 15’ x 15’
- **Bloom time:** March-April
- **Fall color:** Bright red to orange
- **Other characteristics:** Host plant for butterfly, birds like the fruit, fruit prone to cedar apple rust, edible fruit

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Benthamidia florida, Flowering dogwood*

- **Habit:** Wide small tree
- **Size:** 15-20’ wide by 15-20’ tall
- **Bloom time:** Spring
- **Fall color:** Red to purple
- **Other characteristics:** State Flower of NC, good pollinator plant, fruit desirable to birds,

Photos by Amanda Wilkins

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Cercis canadensis, Redbud*

Photos by Amanda Wilkins

- **Habit:** Wide, arching, multi-trunked small tree
- **Size:** 15-20’ wide by 15-20’ tall
- **Bloom time:** Late Winter to Spring
- **Fall color:** Yellow to orange
- **Other characteristics:** Lots of leaf and flower colors available, leaves are heart-shaped, bright purple flowers in winter, great pollen source for early pollinators, leaves breakdown quickly, very tough plant

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Chionanthus virginicus, White fringetree*

Photos by Amanda Wilkins

- **Habit:** Upright, vase-shaped
- **Size:** 15-20’ wide by 15-20’ tall
- **Bloom time:** Late Winter to Early Spring
- **Fall color:** Yellow
- **Other characteristics:** Beautiful long leaves, plants are male or female, females make berries preferred by birds, fast-growing once established

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Magnolia virginiana, Sweetbay Magnolia

- **Habit:** Upright, multi-trunked tree
- **Size:** 15-20’ wide by 20-40’ tall
- **Bloom time:** June to August
- **Fall color:** Evergreen, but will drop leaves in spring
- **Other characteristics:** Fruits are very desirable to birds, flowers for a long period, mostly evergreen, leaves breakdown quickly

Oxydendrum arboreum, Sourwood*

Siddarth Machado, CC BY-NC-ND 2.0

Martin LeBar, CC BY-NC 2.0

- **Habit:** Small to medium tree, arching
- **Size:** 15’ wide to 30’ tall
- **Bloom time:** Summer
- **Fall color:** Red to purple
- **Other characteristics:** Makes excellent honey, very tough tree, excellent fall color, slow growing, long-lived tree

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Photos by Amanda Wilkins

Tulip Magnolia

- **Habit:** Upright, flame-shaped
- **Size:** 15’ wide to 30’ tall
- **Bloom time:** February to March
- **Fall color:** Yellow to orange
- **Other characteristics:** NOT native to Eastern North America, leaves breakdown very quickly, prone to late frosts some years, tough once established, needs little to no pruning, comes in a lot of colors, fast growing

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Halesia diptera, Carolina Silverbell

Photo by Amanda Wilkins

- **Habit:** Upright, square tree
- **Size:** 15-20’ wide by 15-20’ tall
- **Bloom time:** April to May
- **Fall color:** Yellow
- **Other characteristics:** Interesting fruits, leaves breakdown quickly, excellent pollinator plant, VERY heavy flower production, slow growing

Thank you for your time!

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