NC Master Naturalist

Impact Projects

October 24, 2026

November 14, 2026

Impact Project: Bluebird Trails

Cari Votava
votavacari@gmail.com



Photo: Ethan Nicholas, 2026



20 nestboxes: Neuse River Greenway

(N. Raleigh)

Other birds enjoy nestboxes

- Bluebirds
- Nuthatches
- Carolina Chickadees
- House Wrens



Lesson: Predator guards are needed!





Herpetology Study & Wildlife Camera Traps at Bluestem Conservation Cemetery

Heather Stafford & Kara Solomon



Bluestem Conservation Cemetery

A Conservation Cemetery:

- Looks and feels like the natural area that surrounds it

- Natural burials coexist with the care, restoration, and protection of the land's natural resources

- Required to partner with a conservation organization who hold & monitor a conservation easement on the land





In March 2025, Bluestem donated it's conservation easement to **Eno River Association** and **Triangle Land Conservancy**

Methodology- Presence/Absence Survey



Coverboard/PVC Pipes

5 Transects

4-5 coverboards/transect

Coverboards 50ft apart

3-6 PVC pipes/transect











Methodology



Frog Call Surveys

- 1hr observations, starting at dusk
- Every week Mar- May
- Once a month Jun- Aug







Results



Frogs & Toads-

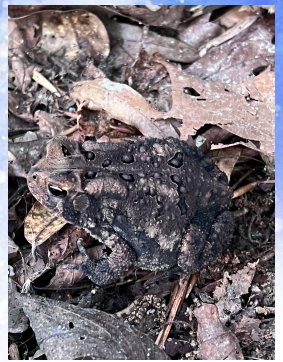
Observed 10 out of 13 possible species:

Northern Cricket Frog
Spring Peeper
American Toad
Pickerel Frog
Cope's Grey Treefrog
Green Frog
American Bullfrog
Fowler's Toad
Green Treefrog
Southern Leopard Frog









Salamanders-

Observed 5 out of 12 possible species:

Four-toed salamander
Southern two-lined salamader
Spotted salamander (egg mass)
Slimy Salamander (egg mass)
Red-spotted newt







Results

Snakes-

Observed 4 out of 24 possible species:

- Worm Snake
- Black rat snake
- Black racer
- Green tree snake







Lizards-

Observed 2 out of 8 possible species:

- Eastern Fence Lizard
- Unknown Skink





Turtles-

Observed 3-4 out of 9 possible species:

- Eastern Box Turtle
- Common snapping Turtle
- Possible painted turtle
- Possible yellow-bellied slider



Camera Trap Survey









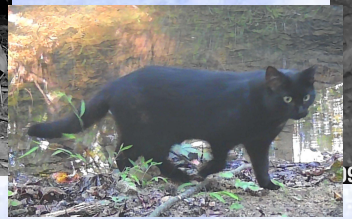














Camera Trap Survey





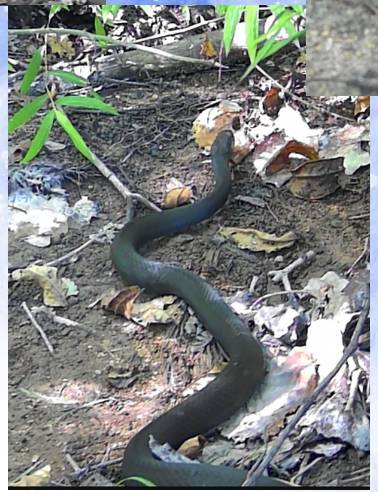


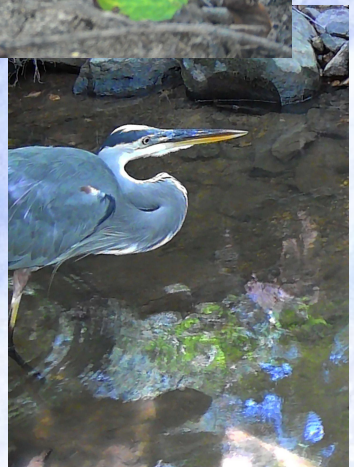














Camera Trap Survey











Thank you Jeff Masten & Heidi Hannapel!

NC MASTER Naturalist Volunteer



nature journaling the HAW RIVER



julia soplop

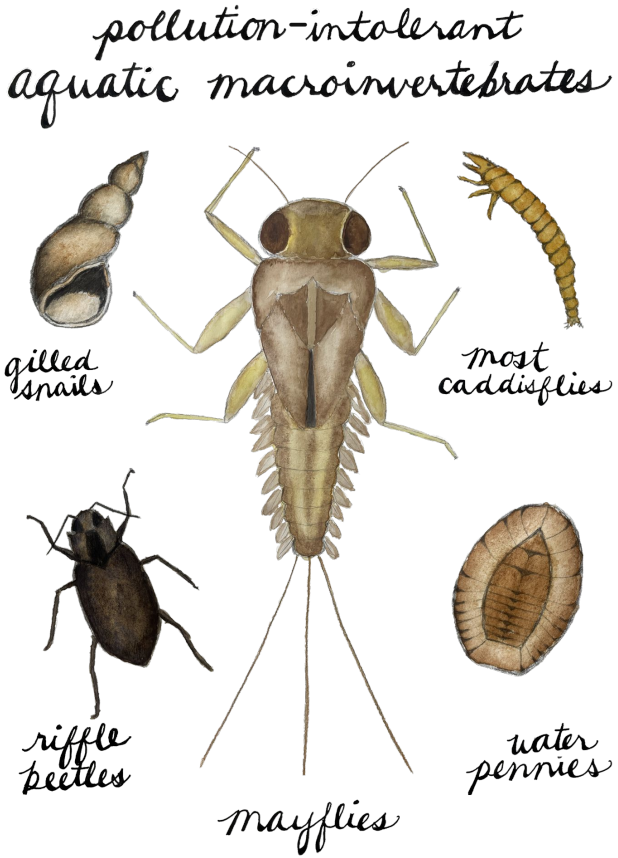
NC COOPERATIVE EXTENSION

N.C. A&T STATE UNIVERSITY

NC STATE UNIVERSITY

Connection sparks caring.

Caring sparks *action*.



- Partnered with Haw River Assembly
- Created 38-page guide:
  Nature Journaling the Haw River
- Developed and led two-hour, in-person workshop in Saxapahaw
- Intend to make the workshop a regular part of HRA's annual programming

NC MASTER Naturalist Volunteer



great blue HERON



ARDEA HERDIAS

CALL: RASPY "GAWK." SOUNDS LIKE A GOOSE THAT SMOKES.

WEIGHS JUST 5-6 POUNDS.

WINGSPAN: 5.5-6.6 FT
AVG. HEIGHT: 3.2-4.5 FT
AVG. LIFE EXPECT: 15 YRS
OLDEST RECORDED: 24.5 YRS

WADING BIRD



BOTH SEXES HAVE SAME PLUMMAGE, THOUGH MALES ARE SLIGHTLY LARGER.

LIVES IN FRESH AND SALTWATER HABITATS.

EATS AMPHIBIANS, FISH, INSECTS, SMALL REPTILES, OTHER BIRDS, AQUATIC INVERTS.



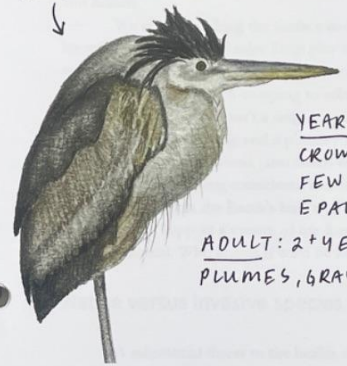
HAVE SPECIAL POWDER DOWN ON CHEST USED FOR CLEANING OFF FISH OIL AND DIRT.

NEST IN HERONRIES OF 5-500 NESTS. IN NC, LAY CLUTCH OF 3-5 EGGS IN MARCH/APRIL. BOTH PARENTS CARE FOR YOUNG TO FULFILL THEIR TREMENDOUS FOOD REQUIREMENTS. YOUNG LEAVE NEST AFTER 60 DAYS. ONLY 10-30% OF EGGS LIVE TO ADULTHOOD.

FLEDGLING: FIRST FEW WEEKS OUT OF NEST. SLATE-BLUE, DOWNY CROWN.

JUVENILE: REMAINDER OF FIRST YEAR. GRAY CROWN, CHESTNUT EDGING ON WING COVERTS, LACKING BLACK EPAULETS AND LONG BODY PLUMES.





YEARLING: 12-24 MONTHS OLD. SMALL CROWN STRIPE, SHORT BODY PLUMES, A FEW CHESTNUT-EDGED COVERTS, SMALL EPAULETS.

ADULT: 2+ YEARS. WHITE CROWN, LONG BODY PLUMES, GRAY-BLUE COVERTS, BLACK EPAULETS.

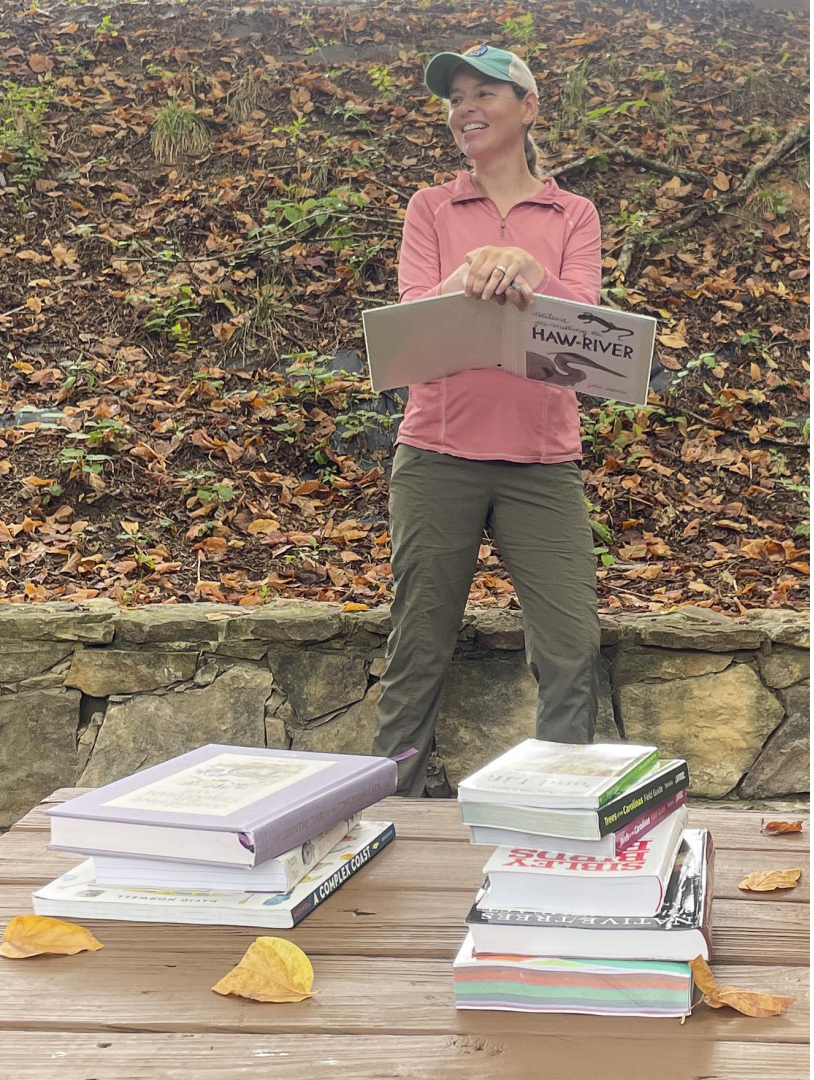
YEAR-ROUND NC RESIDENTS.



PAIRS ARE MONOGAMOUS DURING BREEDING SEASON BUT FIND A NEW MATE EACH YEAR.

THE ORIGINAL MYTH OF THE PHOENIX WAS LIKELY INSPIRED BY A LARGE HERON IN EGYPT.

BALD EAGLES SOMETIMES KILL HERONS!



NC COOPERATIVE EXTENSION

N.C. A&T STATE UNIVERSITY

NC STATE UNIVERSITY

Email me for a PDF of
Nature Journaling the Haw River:

julia.soplop@gmail.com

Toni Sweetland

Master Naturalist Impact Project
Bumble Bee Atlas

October, 2026

Xerces Society Bumble Bee Atlas

Bumble bees are native to NA and are essential pollinators

There are nearly 50 species of bumble bees in NA, 15 species in NC

1/4 of NA's bumble bees are at risk of extinction



What is the Bumble Bee Atlas?

The Atlas is a community science project aimed at gathering the data needed to track and conserve bumble bees



What Do You Need to Participate?

Training

Adoption of a “grid” area with documented permissions

Equipment

Willingness to complete at least two 45 minute surveys during the season



My Experience

A grid was adopted that included much of the southeastern quadrant of Wake County

10 surveys were completed as well as some chance observations

Two Wake County Parks and numerous private properties were surveyed



My Experience

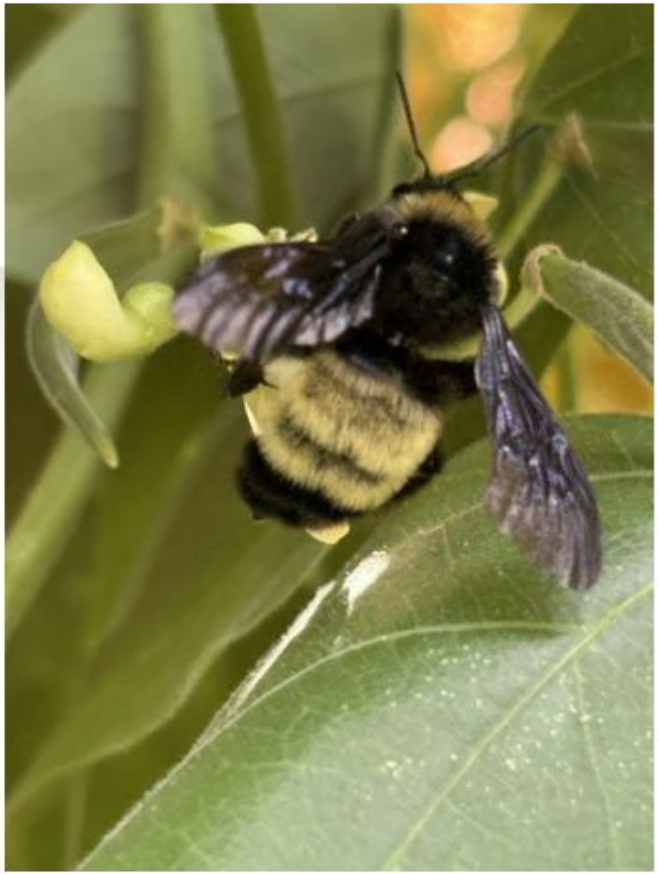
67 individual bumble bees were reported

29 American, Bombus pensylvanicus

Considered to be in "in decline" status by Xerces Society

38 Common Eastern, Bombus impatiens

Our most common NC bumble bee



2026 Atlas Results Are In!

3345 individual bumble bees were reported

13 species were observed

140 volunteers completed 256 samples across 4 states

Trifolium (clover) was the most commonly observed forage plant





Personal Surprises and Take Aways

Experienced numerous spontaneous educational opportunities with the public

Friends, acquaintances, even strangers asked me to survey their properties



Personal Surprises and Take Aways

Each survey was a personal learning experience

Once I started looking for bumbles I saw them everywhere

Can’t wait to do it again next year!

The Bluebird Valentine* Trail

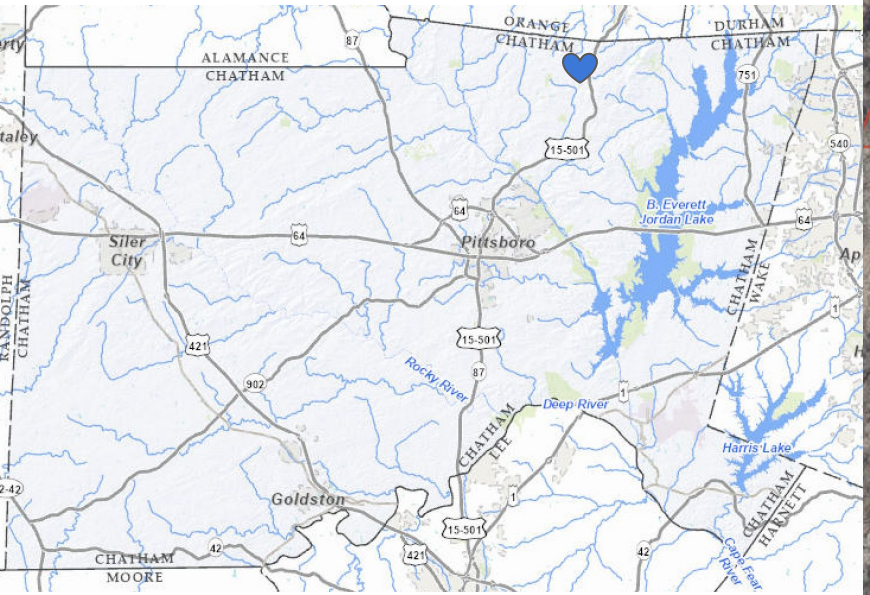
Gary Oakley, MNV 2026 in cooperation with the North Carolina Bluebird Society



*The Bluebird houses were put in place on 2/14 (Valentine's Day) 2026

Bluebird Valentine* Trail

Location & Map





Used Chatham County GIS to space boxes 100 yds apart





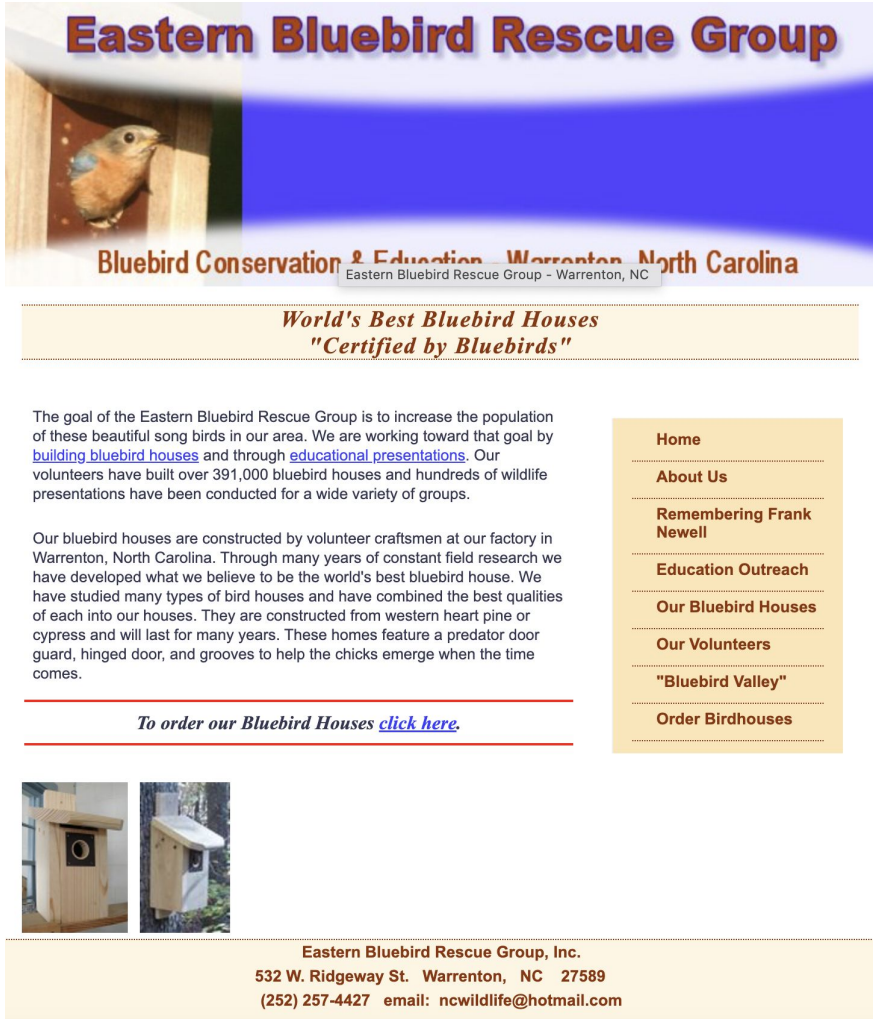
Best Practices

Material	solid, ***untreated*** wood, ¾ - 1 in thick
Box Height	5 feet above ground (for protection with observational ease)
Hole Diameter	1.5 in (“reducer” for some species) & ***kerfed*** **inside** under hole
Dimensions	Floor interior: 4” x 4 “ Ht (floor to base of hole): 4 - 6.5 in
Access	Hinged side or front to observe & clean… remove old nests!
Perch	**NONE** on house, but branch 10+ ft from opening for fledglings
Drainage/Venting	holes in floor corners; 2+ vent holes/side near top
Support	only *smooth* metal posts (rebar + EMT conduit)
Color	white top, sides optional (opinions vary), interior NEVER
Location	edge of grassy open space (avoid overhanging branches)
Protection	8 in stovepipe predator guard, avoid overhanging branches)
Direction	opening facing SE (early light + avoids prevailing weather)

For detailed recommendations regarding construction, placement, and maintenance of nest boxes, visit the North American Bluebird Society (NABS) website!



Unless you want to build nest boxes, and if using several for a trail, I recommend visiting the Eastern Bluebird Rescue Group website and consider ordering from them. It is a long drive to Warrenton, but this organization produces high quality nest boxes that meet all NABS specifications for a price *barely* above their cost! *A materials list and construction guide for (10) nest boxes with predator guards is* ***HERE***.



It wasn't just about bluebirds!

Other common cavity nesting birds that might build in your nest box in NC →

*Document modified from information provided by Bill Zitek, NCBS past president. There is a shared link to a document that includes the information shown **HERE**.

NC Cavity Nesting Birds - Average Incubation & Nestling Periods

ID	Species: Code, Common & Scientific Names	Incubation*	Nestling*
	EABL: Eastern Bluebird (*Sialis sialis*)	12 - 14 Days	16 - 20 Days
	BRHE: Brown-Headed Nuthatch (*Sitta pusilla*)	13 - 15 Days	18 - 19 Days
	CACH: Carolina Chickadee (*Poecile carolinensis*)	12 - 15 Days	16 - 19 Days
	HOWR: House Wren (*Troglodytes aedon*)	12 - 15 Days	15 - 17 Days
	TRSW: Tree Swallow (*Tachycineta bicolor*)	14 - 15 Days	18 - 22 Days
	TUTI: Tufted Titmouse (*Baeolophus bicolor*)	12 - 14 Days	15 - 16 Days
	WHBR: White-Breasted Nuthatch (*Sitta carolinensis*)	12 - 14 Days	14 - 26 Days

Nest Box Management:

1. Fledge Date: Projected time when nestlings leave the nest. **[*Can vary *outside* ranges listed!]**
   a. **DO NOT OPEN THE NEST BOX** during the 5-day period preceding the Fledge Date.
   b. This avoids premature fledging (a failed flying attempt) that may result in death.
2. *After* Fledge Date:
   a. Observe nest box for evidence of viable nestlings still in the box.
   b. If no evidence is observed, open the box and record these observations:
      i. # of successfully fledged birds
      ii. # of unhatched eggs, if any
      iii. # of dead nestlings, if any
      iv. evidence of parasites (ex: blowfly larvae)
      v. evidence of ant or wasp infestations
      vi. other observations

Data Collection... Each Box, Each Visit

CornellLab | NestWatch

Nest Visit

Switch to single entry mode

Date			Host Species			Status & Activity Codes				Cowbird Activity			More Information	
Month	Day	Year	Eggs	Live Young	Dead Young	Nest Status	Adult Status	Young Status	Management Activity	Eggs	Live Young	Dead Young	Observer Initials	Notes

Nest Status
- no nest
- incomplete nest
- completed nest
- damaged nest
- flattened nest with fecal matter
- new avian nest found
- non-avian nest found
- nest removed, remover unknown

Adult Status
- no adults seen
- building nest or carrying material
- remained on the nest
- at/on, then flushed from nest
- in vicinity of nest
- feeding young at nest
- dead adult(s)

Young Status
- no young
- hatching young
- naked young
- partially feathered
- fully feathered
- vocal young, heard only

Management Activity
- no management activity
- avian competitor nest/eggs/young removed
- banded adults or young at nest
- unhatched eggs removed
- nest box management
- pest management (e.g., wasps, ants, mice, etc.)

End and Summarize Nesting Attempt

1. Nest Fate (* required)

What was the outcome of this nesting attempt?

2. Important Dates

More About Estimated and Observed

First Egg Laid Date — Estimated / Observed

Hatch Date — Estimated / Observed

Fledge Date — Estimated / Observed

Nest was visited during the egg-laying period: yes / no

3. Host Species Totals

Visits to Nest | Clutch Size | Unhatched Eggs

Live Young | Fledglings

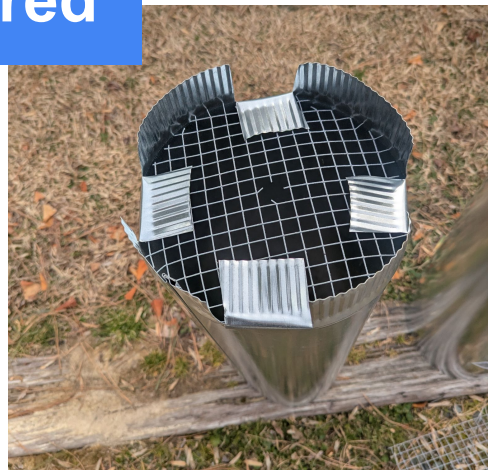
4. Your Thoughts

Please provide any additional details about this nesting attempt:

Some assembly required



















Carolina Chickadees

(Poecile carolinensis)













Eastern Bluebirds

(Sialia sialis)









2026 Quick Summary

10	17	66	59	52
Total Nest Sites	Total Nesting Attempts	Total Eggs	Total Young	Total Fledglings

-7

-5

-2

+6 CC &
+46 BB
fledged!

4 CC & 3 BB eggs did not hatch



5 BB nestlings lost to unknown predator



2 CC nestlings failed to fledge





I want to thank the NCBS for their generous grant which helped fund this project, and to the various NCBS representatives for their advice and guidance.

North Carolina Bluebird Society



Special thanks to **Dr. Bill Zitek**, past president of the NCBS and current coordinator of nest boxes in Chatham County, for his cavity nesting birds flyer, site evaluation, and article about this project in the 2026 summer issue of the NCBS newsletter ***BLUEBIRD N0TES***.

NC Bluebird Society Hall of Fame

2026 Inductees



Dr. Bill Zitek, a retired veterinarian, was a past president of the North Carolina Bluebird Society.

During his leadership, he helped guide the Society in a new direction and organized the statewide County Coordinator program. He brought new energy to the Society's membership.

Since his term expired in 2023, Dr. Zitek has continued to be chair of the County Coordinators program. He currently serves as Chatham County Coordinator.

Dr. Bill Zitek is well deserving of induction into the North Carolina Bluebird Society Hall of Fame.

Summer 2026

BLUEBIRD NOTES

North Carolina BLUEBIRD SOCIETY

Established 1986 to promote a resurgence of Eastern Bluebirds and other cavity nesters in NC

A Visit with one of the North Carolina Bluebird Societies Grantees Promoting Good Bluebird Conservation



When Gary Oakley, a retired science teacher in Chatham County, submitted his request for a NCBS Grant to place nest boxes around his 33-acre property, he went ahead (before even receiving the grant money) and started laying out his "trail". The large open meadow accommodates 10 nest boxes one hundred yards apart and some extend over to an adjacent neighbor and family property. All have stovepipe predator guards, and he monitors them at least once weekly.

I visited Gary's lovely farm and nest box trail on April 22, 2026, and walked the entire nest box layout with him. That included a beautiful walk-through the adjacent woods where many woodland plants were beginning their season's growth.

All bluebirds should have as nice of an area and well-constructed nest box trail to establish their nesting sites!



White vinyl sheeting protects this nest box and its contents from the sun's heat.

On April 30th, Gary visited our trail here at Carolina Meadows, a continuing-care retirement community (CCRC), where we have 64 nest boxes scattered among parks and the villas which several volunteers monitor weekly. We exchanged thoughts and discussed nest box trails and then moved over to visit the house and gourds which house purple martins on the property. Purple Martins are another cavity nester which depends on us for its nesting sites.

There are a number of people or organizations who receive grants through the NCBS Grants program each year. Each request is vetted to see that proper materials, construction and monitoring will be carried out by the recipient. In other words, there is important education that goes along with the process. We want to be sure the bluebirds are the recipients of the best efforts on their behalf and my visit with Gary confirmed his commitment.



Bill Zitek-Chatham County Coordinator
5/9/2026

And a BIG BLUEBIRD HUG to fellow 2026 MNV classmate, provider of today's fashion statement, and my soul sister Cari Votava, who began texting and emailing me advice even before we met! 💙





I finally know what it feels like to be an "empty nester".

For me, it feels ***good!***



Evaluating and Enhancing FLOHA's Pollinator Garden

Emily Behr, Becca Beechhold, Linda Bell

Friends of
LOWER HAW RIVER
State Natural Area



Friends of the Lower Haw River State Natural Area (FLOHA)



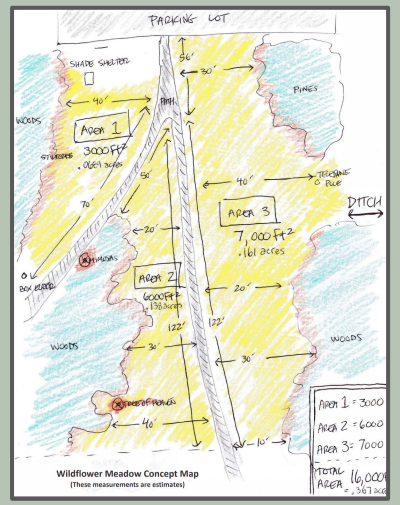
Mission:

The Lower Haw is a special place that we're committed to conserving and enhancing for current enjoyment while creating a legacy for future generations.

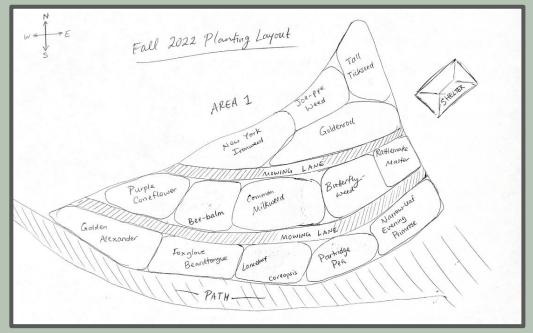
Friends of
LOWER HAW RIVER
State Natural Area

Background

2019 – FLOHA partnered with an Eagle Scout to install a pollinator garden at the US 15-501 access point



2020 to 2021 – Continued invasive removal and volunteer workdays



2022 – FLOHA volunteers assessed success of the garden and installed additional native perennials

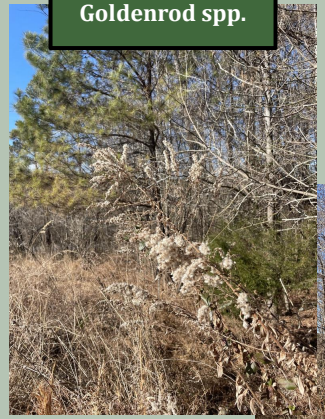
2023 to 2025 – High invasive pressure led to continuation of invasive removal workdays

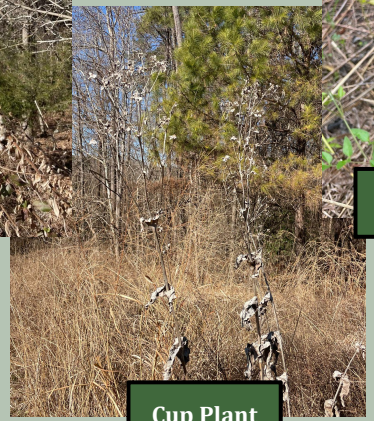
Project Goals

1. **Assess** current plant species (native and invasive)
2. **Conduct volunteer workdays** to remove invasive plants and plant native species
3. **Establish ongoing maintenance** schedule for the garden
4. **Lead educational programming** about sustainable garden management, native plants, and pollinators/wildlife that visit the garden

(1) Assessment

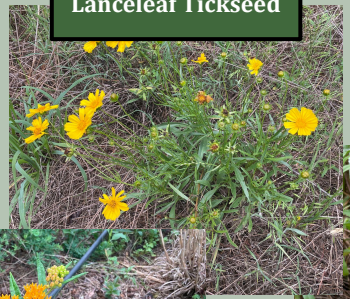
In the early spring, we cut back old growth and began identifying the native species present:


Goldenrod spp.


Cup Plant


Foxglove Beardtongue


Butterfly Milkweed


Lanceleaf Tickseed


Aster spp.


Switchgrass + Cup Plant


Purple Passionflower

February

May

August

(1) Assessment (cont.)

We also logged the <u>invasive</u> species that had moved in:



Sweet Autumn Clematis

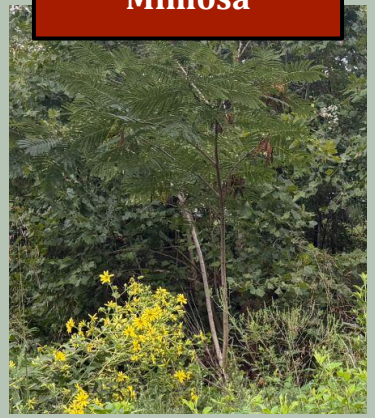






Blackberry/Bramble

Mimosa





Chinese Bush Clover (Lespedeza)

(2) Volunteer Workdays

We then began hosting workdays to remove the invasive species and to mulch the garden!



Our Progress Thus Far



What's Next?

Sunday, November 22nd (2-4 PM): Fall planting workday

Next Year:

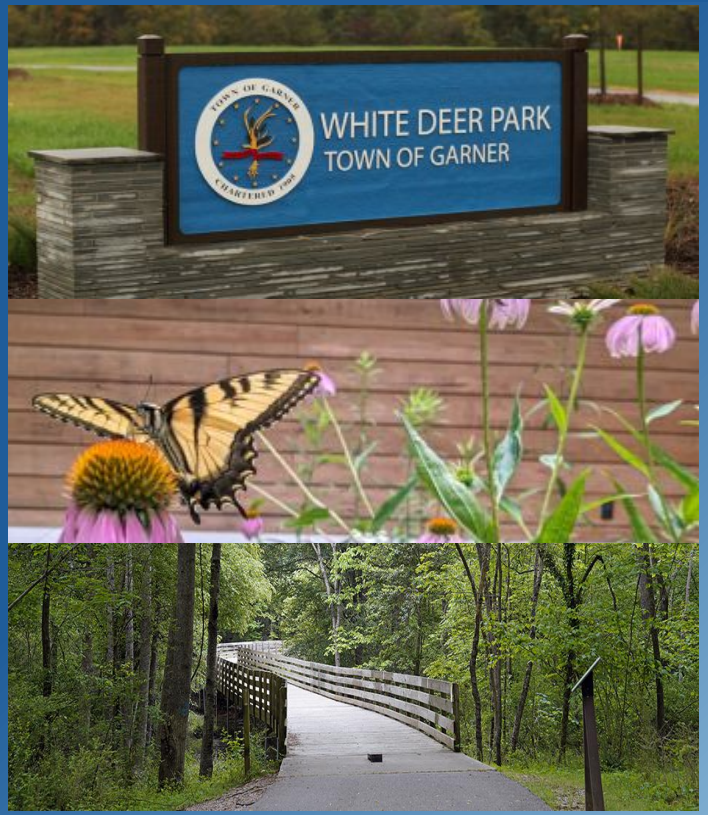
- **Host more volunteer workdays!**
- **Fundraise for tools, plants, signage**
- **Install educational signage**
- **Host educational events onsite**

Want to get involved?

LowerHaw.org/volunteer

Create White Deer Park Firefly Sanctuary

Mary Abrams



Partners:

- White Deer Park (WDP)
- Wake Audubon
- Subject Matter Expert, Dr. Clyde Sorenson, NCSU

Project Goals:

- Protect fireflies
- Improve park habitat
- Engage & educate community
- Encourage stewardship

Firefly Graphic/Xerces

Create White Deer Park Firefly Sanctuary

Mary Abrams



Results:

- Conducted 5 surveys
- Identified ~6 species
- Identified best initial sanctuary
  - Low light pollution
  - Leaf layer
  - Low/no foot traffic
  - Low/no pesticide use
  - Native plants

Firefly Graphic/Xerces

Create White Deer Park Firefly Sanctuary

Mary Abrams



Next Steps:

- Remove invasive plants
  - Nov 14, 2 - 4 pm
  - Nov 20, 1:30 - 3:30 pm
- Plan 2027 surveys
- Develop signage
- Develop programming

Firefly Graphic/Xerces

Invasive Plant Removal & Re-Wilding Impact Project

Keep Durham Beautiful

- Invasive Plant Removal Team Leader
  - Lead or co-lead for 30+ IPR events
- Assistance in KDB IPR program standardization
  - IPR site prescription
  - KDB IPR manual standards
  - KDB IPR web site content
  - Standards for IPR with Durham Parks & Recreation sites
- Re-wilding study
  - Study to determine how to re-wild areas that have received extensive IPR work
  - Development of “Contract growing” model for IPR rehabilitation
- Community engagement in raising level of Invasive knowledge

NC MASTER Naturalist Volunteer

Greg Van Stekelenburg
2026 Master Naturalist
Impact project



What are and Why remove Invasive plants?



Native Plants- Species that has evolved naturally in a region and supports native insects and wildlife

Non-Native plants- Evolved in another region and has minimal ecological benefit to the local environment

Invasive plants – Non-native plants that cause environmental and ecological harm while out competing native plants

- Do not support local insect populations
- Have few, if any natural enemies to control them
- Crowd out and overtake native plants
- Are a poor food source for birds and native wildlife
- Tend to be huge seed spreaders

Many native insects can only survive on native plants. When invasive species take over the entire food web is compromised.

Invasive Plant Removal







- 30+ KDB IPR Events
- KDB IPR: Durham Parks, Museum of Life Sciences, Paper Street project, Briggs Community Garden
- Additional IPR: Rewild NC events, SeeCut brigade



KDB Invasive Plant Removal Prescription

Keep Durham Beautiful Invasive / Restoration Prescription

Location name:	**Forest Hills Park - East side of University Dr**
Location GPS:	

Park Section	Removal area (Map ID)	Scheduled Invasive date	Completed	Treatment applied?	Revisit to treat site?	Restoration Candidate?	Re-visit cycle	Estimated re-visit date	KDB IPR Leader(s)
Section 1	Jan IPR	1/17/2026	Yes	Yes	No	Yes	1 year	March-27	Julie, Pete, Greg, Megan
Section 1	Jan IPR	1/18/2026	Yes	Yes	No	Yes	1 year	March-27	Steven, Julie, Greg
Section 1		3/18/2026	Yes	Yes	No	Yes	N/A	NA	Dawn, Greg, Julie
Section 2	Apr IPR	4/21/2026	Yes	Yes					
Section 3	May/Jun IPR	5/22/2026	Yes	Yes					
Section 4		5/23/2026	No	-					
Section 3	May/Jun IPR	6/26/2026	Yes	Yes					
Section 4	June IPR	6/27/2026	Yes	Yes					



Keep Durham Beautiful Invasive / Restoration Prescription

Location name:	Forest Hills Park - East side of University Dr
Location GPS:	
Address:	1639 University Drive
Date of review:	3/14/2026
KDB Leader evaluating:	Greg VS

Site evaluation

Invasive Type	Invasive Rank	Type	Invasive level	Treatment method recommended	Material Disposition
Chinese Privet (Ligustrum sinense)	1	Shrub	Significant infestation	Cut & Paint	Pull to site for pickup
Glossy Privet (Ligustrum lucidum)	1	Shrub	Significant infestation	Cut & Paint	Pull to site for pickup
Chinese Wisteria (Wisteria sinensis)	1	Vine	Minimal level	Cut & Paint- Canopy cut	Cut and leave in place
Leatherleaf Mahonia (Mahonia bealei)	2	Shrub	Minimal level	Cut & Paint	Pull to site for pickup
Mimosa (Albizia julibrissin)	1	Tree	Scattered in area	Cut & Paint	Pull to site for pickup
Oriental Bittersweet (Celastrus orbiculatus)	1	Vine	Minimal level	Cut & Paint	Cut and leave in place
Multiflora Rose (Rosa multiflora)	1	Shrub	Scattered in area	Cut & Paint	Pull to site for pickup
Autumn Olive (Elaeagnus umbellata)	1	Shrub	Scattered in area	Cut & Paint	Pull to site for pickup
Bradford Pear (Pyrus calleryana)	1	Tree	Scattered in area	Cut & Paint, Hack & Squirt	Pull to site for pickup
Wintercreeper (Euonymus fortunei)	2	Vine	Scattered in area	Cut & Paint Vines	Cut and leave in place
Amur Honeysuckle (Lonicera maackii)	2	Shrub	Scattered in area	Cut & Paint	Cut and leave in place
	N/A	#N/A	-	#N/A	N/A

- Template for each IPR site
- Initially Developed to meet DP&R requirements
- Provides consistent trackable & Repeatable process

Rewilding of KDB IPR Locations







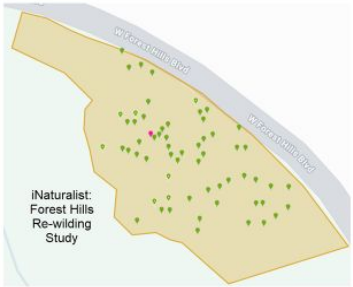
- 60 trees/shrubs planted for study
  (Provided by Project Pando & Panther Creek Forest Farm)
- Determine best Plants/Trees to Rewild extensive IPR locations

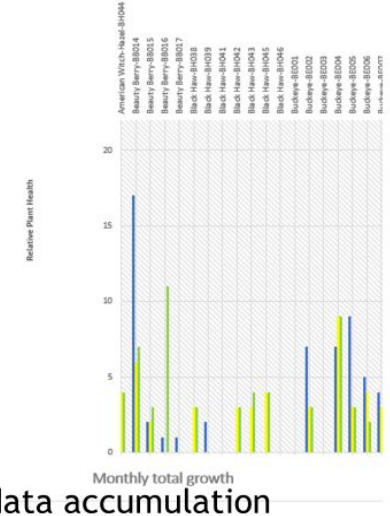
IPR Rewilding Study Metrics

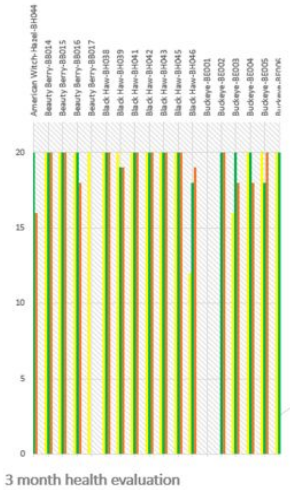
Forest Hills Re-Wilding IPR Study

Site GPS: 35.982352, -78.917015

Plant Data						Location Data					Planting Data		
Plant ID	Common Name	Scientific	Type	Source	Planting Style	Exposure %	Canopy density	Planting Terrain	Ground type	Drainage	Date Planted	Planting Height	Planting condition
BH040	Rusty Black Haw	*Viburnum rufidulum*	Shrub	PP	Bare root	60%	Light	Flat	Soil/Duff mix	Average	3/18/2026	16	Leafing
BH041	Black Haw	*Viburnum prunifoium*	Shrub	PP	Bare root	20%	Heavy	Flat	Soil	Exellent	3/18/2026	16	Leafing
BH042	Black Haw	*Viburnum prunifoium*	Shrub	PP	Bare root	40%	Medium	Gentile slope	Soil/Duff mix	Exellent	3/18/2026	16	Leafing
BH043	Black Haw	*Viburnum prunifoium*	Shrub	PP	Bare root	40%	Medium	Flat	Soil/Clay mix	Exellent	3/18/2026	14	Leafing
BH044	American Witch-Hazel	*Americanis virginiana*	Shrub	PP	Bare root	40%	Medium	Flat	Soil	Exellent	3/18/2026	16	Leafing
BH045	Black Haw	*Viburnum prunifoium*	Shrub	PP	Bare root	40%	Light	Flat	Soil/Clay mix	Exellent	3/18/2026	13	Leafing
BH046	Black Haw	*Viburnum prunifoium*	Shrub	PP	Bare root	40%	Heavy	Flat	Soil/Clay mix	Exellent	3/18/2026	12	Leafing
DW056	Dogwood	*Cornus florida*	Tree	PCFF	Divided into grow bag	40%	Light	Flat	Soil/Clay mix	Exellent	3/18/2026	19	Dormant
DW057	Dogwood	*Cornus florida*	Tree	PCFF	Divided into grow bag			Gentile slope	Clay/Duff mix	Average	3/18/2026	18	Dormant
DW058	Dogwood	*Cornus florida*	Tree	PCFF	Divided into grow bag	20%	Heavy	Steep slope	Soil/Duff mix	Exellent	3/18/2026	20	Dormant







- Metrics to be tracked for 1 year
- iNaturalist Project for additional data accumulation
- Potential “Contract” future supply by Pather Creek Forest Farms

More Invasive information

- Keep Durham Beautiful - https://www.keepdurhambeautiful.org
  To sign up for Durham IPR Events

- Rewild NC - https://rewildearth.net
  Invasive information, IPR events, Dauber exchange

- Invasive Podcast-
  https://open.spotify.com/show/7gmL4mQfTdRMUYbZ6SHDjv
  Informative Invasive Podcast series with expert guests by fellow invasive plant slayer Megan Brame



Expanding Environmental Education Efforts in the Peak of Good Living!

Nora Skinner
Master Naturalist 2026

APEX
NORTH CAROLINA


Background

Apex Environmental Programs

- Environmental Programs Coordinator hired in February 2025
  - External outreach opportunities
  - Create new environmental programs / initiatives
  - Staff liaison for EAB
  - Interdepartmental staff coordination

- Master Nat project focused on expanding the programming facet of my role using the knowledge gained and connections made from this course!


Environmental
Programming

Pollinators in the Peak

- Bee City USA
- Mayors' Monarch Pledge
- Pollinator garden at Apex Nature Park
  - Volunteer Workdays
- Evening in the Garden event
- Dedicated website

www.apexnc.org/2032/Pollinators-in-the-Peak





Habitat Certification Program

- Must have native pollinator trees, shrubs, and vines, water source, and nesting habitat (check out the application here)
- Pollinator Pit Stop Virtual Tour







Invasive Removal Workdays

- Partnering with SWANEC to remove invasive species from our parks!
- Currently working with them on replanting plans.



SOUTH WAKE AREA NATIVE ECOSYSTEM CONSERVATION



Since June 2025...

- 921 lbs Japanese stiltgrass
- 930 lbs English Ivy
- 100 lbs Japanese honeysuckle
- 1360 lbs Chinese wisteria

...have been removed from Apex Community Park and Kelly Road Park





❖ SWANEC had a write-up in Cary magazine a few months ago!

Creek Week 2026

- March 14-21
- Regional week-long event celebrating our streams and rivers and engaging residents to connect with nearby waterways and the critters that depend on them.
- Apex's first year formally participating!
- 3 events held during the week

- For 2027, would love to expand this programming and incorporate a Creek Critter Discovery event with Haw River Assembly!

Clean Water Education Partnership

CWEP REGIONAL CREEK WEEK

Creek Week 2026

Big Sweep Stream Cleanup



2,500 lbs litter removed



Youth Trackout Camp



25 youth engaged with



Invasive Removal Workday



230 lbs English Ivy removed



Creek Critter Discovery

- Sandra Villasenor with Haw River Assembly
- 2 events so far…looking to include more in PRCR program guide!







Great Backyard Bird Count 2026

- February at Apex Nature Park

Would love to have…

- Wake Audubon
- Close to Nature
- New Hope Bird Alliance
- Master Naturalists

…and others table!



Science Across NC

North Carolina bird count

Evening in the Garden / Moth Night

- July at Apex Nature Park
- 170+ attendees and local vendors!

HUGE shoutout to

- Mary Abrams with Wake Audubon
- Kara Foley with Master Nat







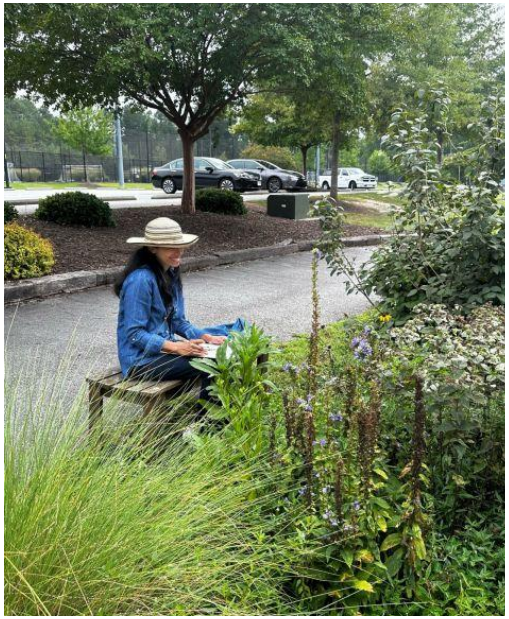


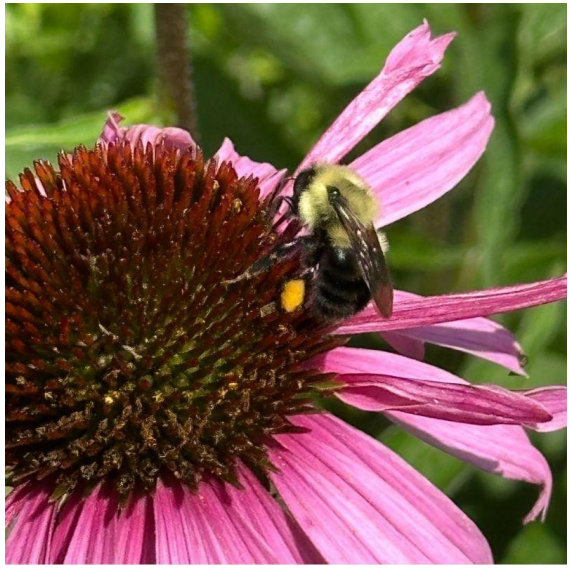

NC STATE EXTENSION


Nest Boxes - $20

Great Southeast Pollinator Census

- August at Apex Nature Park







Triangle Environmental Symposium

- August-September with Trees for the Triangle







Arbor Day

- October with We Plant it Forward and Leaf&Limb



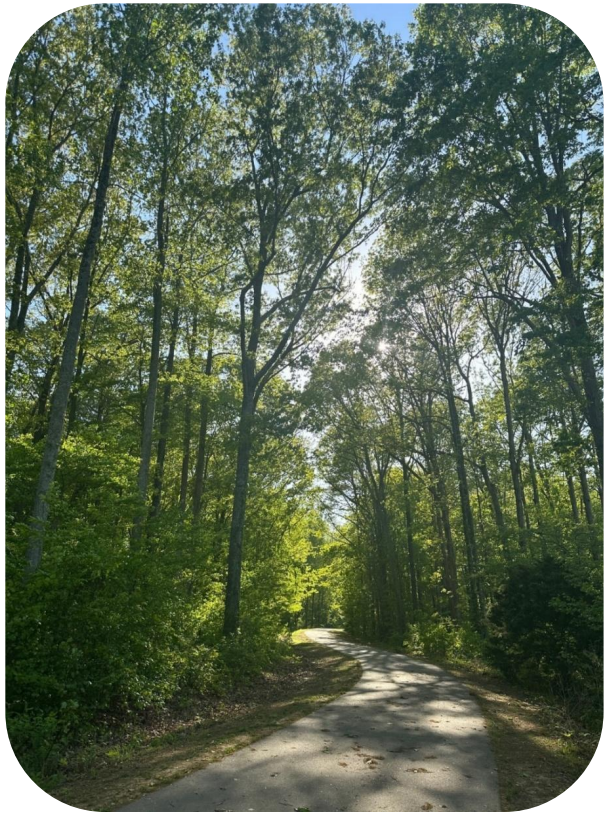




Connections…

- Master Naturalists
- Master Gardeners
- NC Native Plant Society
- Wake Audubon
- Trees for the Triangle
- We Plant it Forward
- Leaf&Limb
- Close to Nature Wildlife Rehabilitation
- Green Waste Company NC
- SWANEC
- Science Across NC
- Nurtured by Nature Growers
- Rachel's Native Plants
- Apex Seed Swap group

and more! Join in on the fun!

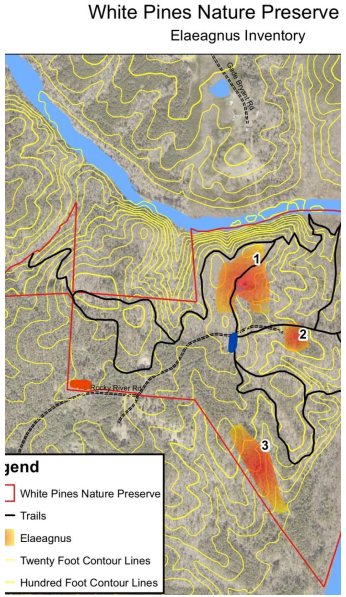


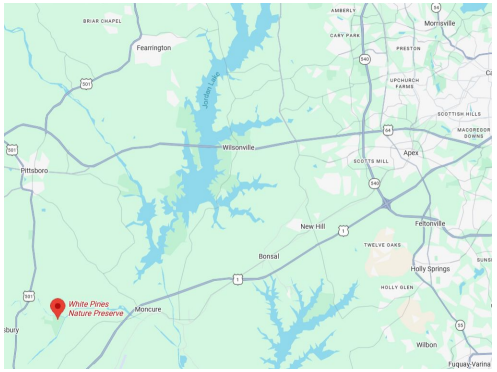
White Pines Nature Preserve - Autumn Olive Removal

MN Volunteers: Paul Swenson and Gary Oakley

Triangle Land Conservancy: Hannah Royal and Nick Adams





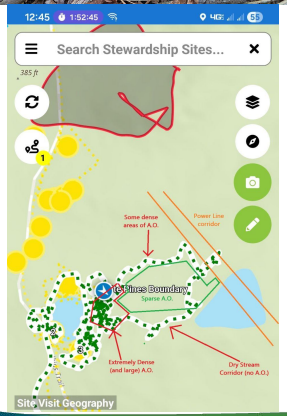


White Pines Nature Preserve - Autumn Olive Removal

Targeted Removal









White Pines Nature Preserve - Autumn Olive Removal

Accomplishments…

Before & After



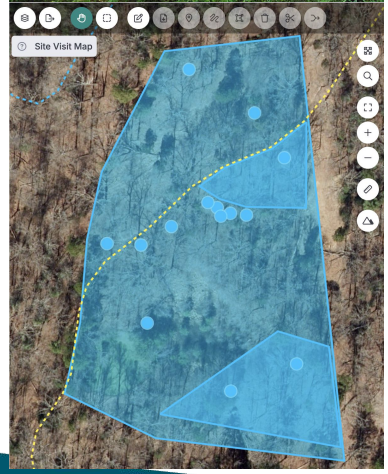


White Pines Nature Preserve - Autumn Olive Removal

Challenges











Saving Halloween Pumpkin Seeds for Bird Food

James M. Samet

2026 North Carolina Master Naturalist Program

The Resource

- Approximately 100 million pumpkins are grown in the US each year for Halloween. Approximately 80 % of them end up in landfills.
- The average mass of a Halloween carving pumpkin is approximately 7 Kg.
- The seed content of an average pumpkin is between 1 and 3 % by mass, which is approximately 100 g per pumpkin.
- Assuming 100 g per pumpkin, this converts to 10 million Kg of pumpkin seeds available each Halloween.
- Pumpkin seeds contain approximately 6 kcal per gram, therefore 600 kcal per 100 g of pumpkin seeds.
- For 100 million pumpkins, this translates to a potential 60 billion kcal worth of pumpkin seeds available each Halloween.

The Need

- For illustration purposes, a White-throated sparrow needs approximately 30 kcal/day.
- Sixty billion kcal can meet the caloric requirements of approximately 2 billion White-throated sparrows for a day.
- The population of White-throated sparrow in North America is 160 million birds.
- Therefore, the pumpkin seeds discarded each Halloween could feed the entire population of White-throated sparrows in North America for over 12 days.
- A bird can consume up to 30 % of its fat reserves surviving a single cold night.
- The availability of pumpkins seeds at the end of October coincides with the time of year when birds need fat reserves for migration and winter survival.

Challenges to Utilizing the Resource to Meet the Need

- Most pumpkin seeds are discarded during the carving of the pumpkin for Halloween decoration.

- To be effective, an intervention to persuade consumers to save the seeds from their Halloween pumpkins should:

    a. Be communicated at the point of sale of the pumpkin.
    b. Include simple instructions for processing the pumpkin seeds at home.

Project Objective

The objective of the project is to

1. Educate consumers about the value of pumpkin seeds as a food resource for birds,
2. Appeal to them to save the seeds from pumpkins that they purchase for use as bird food,
3. Provide instructions on how to remove and process the seeds to use as bird food.

Approach

The project objective will be pursued through the following aims.

Aim 1. To develop a graphic-based informational handout that

a. Informs consumers of the potential of pumpkin seeds as a significant food resource for birds in their backyard
b. Provides a simple set of instructions to process the pumpkins seeds removed during pumpkin carving.

Aim 2. To distribute printed and digital versions of the handout through:

a. Pumkin patch operators
b. Day care centers
c. Schools
d. Halloween social events
e. Appropriate social media portals

Outreach

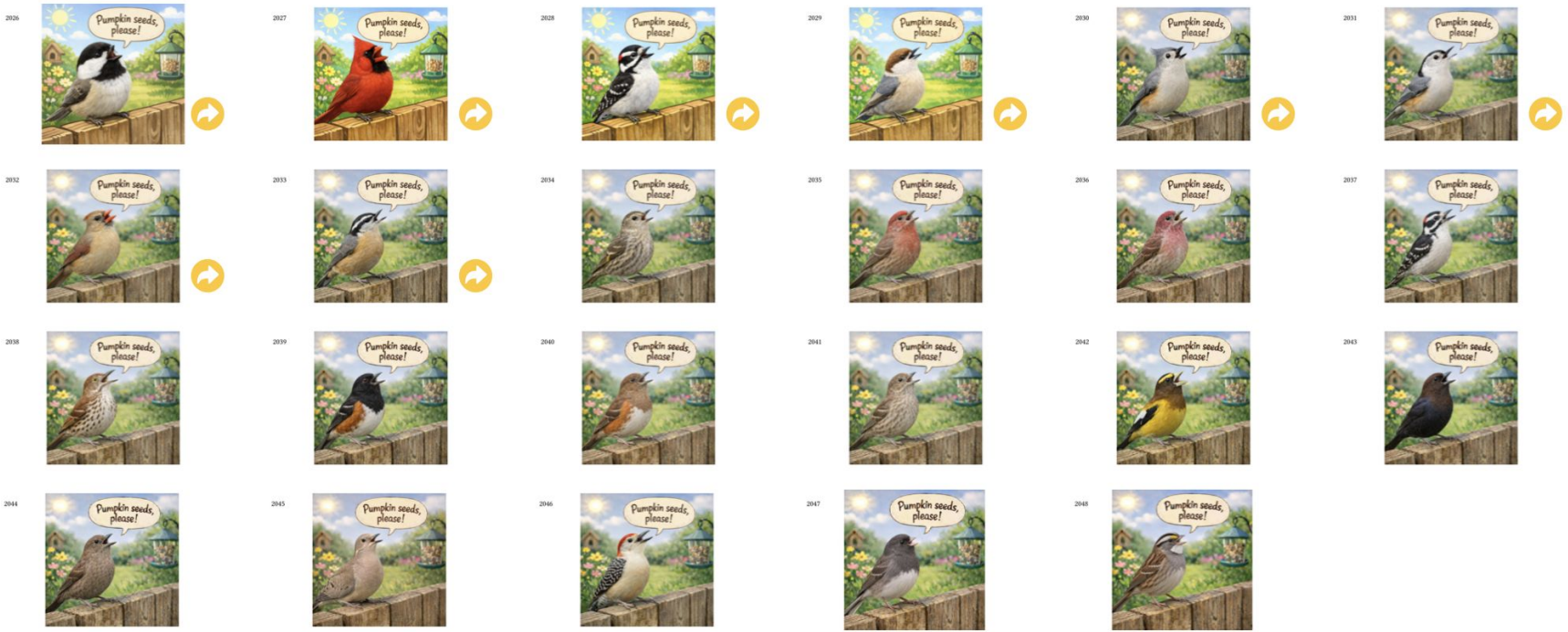
Information sheets and stickers were distributed to retail pumpkin sellers, schools and a pediatric clinic in the Triangle area:

- Jean’s Neighborhood Market/Ragan and Holly’s Pumpkin Patch
- Binkley’s Baptist Church pumpkin patch
- Perkin’s Orchard
-
- Whole Foods on Elliot Road
- Harris Teeter Meadowmont
- The Fresh Market (Hwy 54)
- Trader Joe’s Eastgate location
- Lowe’s Home Improvement (Fordham Blvd)
- Home Depot (15-501 location)
-
- Durham Academy
- Cary Pediatric Center, PA
- The Museum of Life and Science

https://youtu.be/TQP4dKtzEnIhttps://youtu.be/TQP4dKtzEnI


Pumpkin seeds, please!

Birds that may visit your backyard feeder for pumpkin seeds



Restoring Native Habitats

Invasive Species Education and Volunteer Removal Program

Angela & Josh DiPaolo
NC Master Naturalist Project 2026

Program Mission 🍂

To foster community involvement in invasive plant removal and promote education about native plants and wildlife habitat restoration.



Program Details 🍂

- Participants can sign up for an invasive plant removal day on their property
- Participants must also commit to volunteering at another property and/or a small monetary donation to Wake Forest Conservation Foundation

Foundational Concepts 🍂

- PARTNER with NC Native Plant Society
- INCORPORATE the pillars of Homegrown National Park
- TEACH participants to use Seek by iNaturalist
- EDUCATE about wildlife Habitat – beneficial insects, getting rid of the lawn, stopping pesticides/herbicides
- Share on WFCF website, social media

Program Participants

Norma



Carol



Program Participants

Joncie



Our House (TBD)



Moorefields Piedmont Prairie: Plan, Timeline & Costs

Master Naturalist 2026

Jim Barrick, David Ennist, Arleen Eppinger, John Wisdom

November 9, 2026



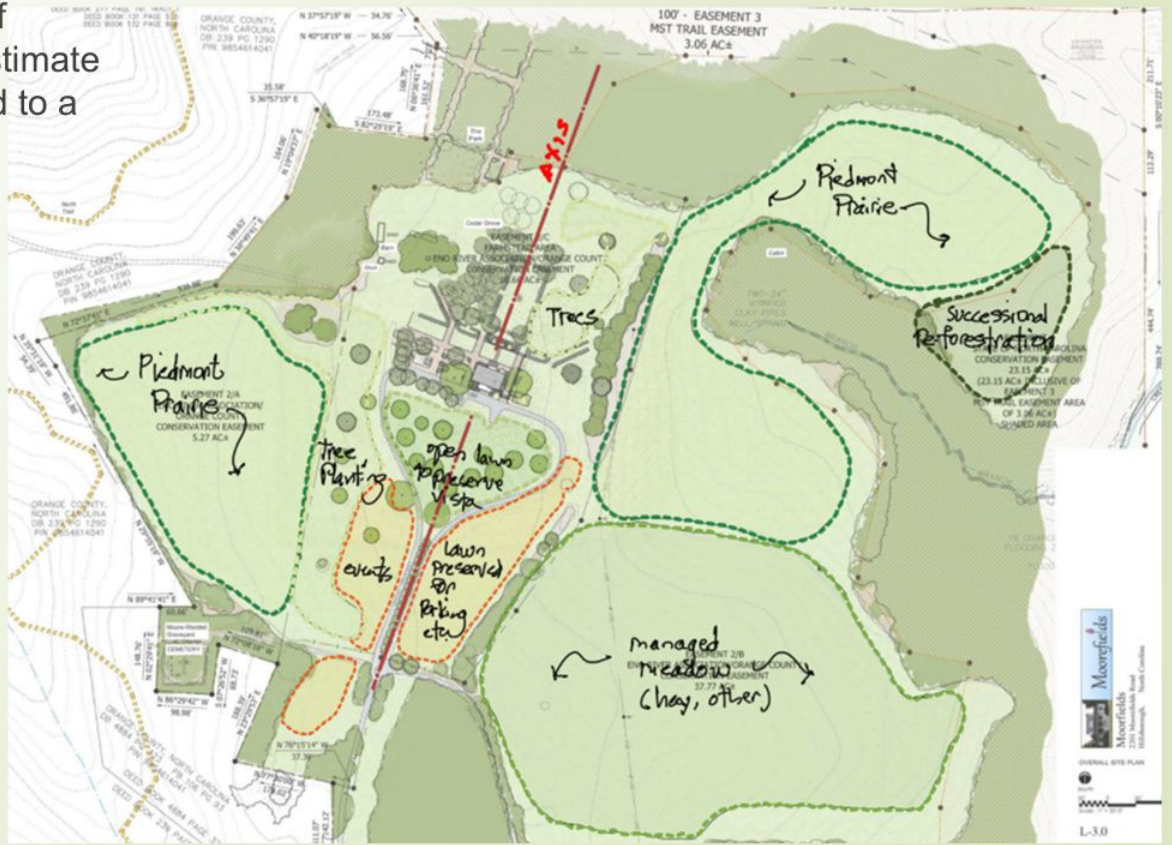
Project Overview

Provide the Moorefields Board of Directors with a plan and cost estimate for converting 3.8-acre open field to a Piedmont Prairie.

What is a Piedmont Prairie?
Historically occurring grassland communities of southeastern piedmont dominated by native warm-season grasses and herbaceous wildflowers maintained by fire.

Approach:

- Reviewed scientific literature
- Interviewed 12 SMEs & visited 6 prairie restoration sites
- Performed site assessment
- Identified research-based restoration approaches
- Identified potential contractors and costs



Moorefields “Before” Photos

Sept 10, 2026

The challenge:



The promise:



Other native grasses identified in field: little bluestem, open-flower witchgrass, beaked panicum, purpletop, bottle brush



Mixture of invasive plants and native grasses and forbs presents a difficult choice for site preparation.

Site prep goal: Remove invasives, prep field for native grasses & forbs; retain existing native plants.

Project Structure



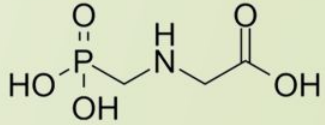
Phases carried out as part of this MN project:

- **Phase 1**: Research & Preliminary Plan, year 0
  - Interview SMEs, visit prairie conversion sites, literature
- **Phase 2**: Site Assessment, years 0 to 1
  - geology, human history
  - current vegetation, insects & animals



Implementation phases to be carried out by Moorefields Board

- **Phase 3**: Site preparation, year 1 **(decision needed)**
  - Most crucial step in the project
  - Options:
    - Herbicide, prescribed burn, or soil inversion
    - Others of note: Solarization, annual burn without seeding, experimental plots
- **Phase 4**: Plantings, year 1
- **Phase 5**: Maintenance, transition to long-term stewardship, years 2 to 3
- **Long-term Stewardship**: Periodic disturbance-based management, years 4, 5 & beyond



glyphosate

Plantings:

- "Don't fight the site" - no fertilizer, no lime,
- Medium-dry to mesic native seed mix
  - Limited number of deer-resistant plants
  - 50/50 to 40/60 grasses to forbs
- Consider the following :
  - Bloom time
  - Existing plants
  - Hemiparasitic plants
  - Including some annuals

Costs:

4-Year Cost Summary & Financial Allocation (Gemini)

Year 1: 60%	$8,550 - $15,450
Year 2: 20%	$2,900 - $5,400
Year 3: 11%	$2,300 - $4,700
Year 4: 9%	$2,200 - $4,800
Estimated Total Investment (3.8 Acres):	$15,950 - $30,350

Possible Contractors:

- Wildland Forestry & Environmental, Inc.
- Leaf and Limb

Comparison Table: Site Prep Options 1-3

	Pros	Cons
Herbicide (glyphosate)	▪ Cost-effective ▪ Quick ▪ Efficient - kills to roots & rhizomes	▪ Health risks humans, pollinators, wildlife ▪ Negative perception ▪ Kills existing native plants ▪ Stunt growth of future native plants
Prescribed Burn	▪ Ecological advantages; recycles plant material and exposes bare soil ▪ Black surface absorbs sunlight, warms soil, boosts early native seed germination	▪ Only top-kills invasives; roots and rhizomes remain ▪ Requires precise operational window ▪ Heavy smoke or wind shift can cause health risks, friction & road hazards
Soil Inversion	▪ Buries invasive plants and seed bed, ▪ Exposes rhizomes to the elements. ▪ May be able to reestablish natural pH of the GeB soil	▪ Drastic approach, can't be undone ▪ May require cold winter to fully destroy invasive rhizomes ▪ Requires specialized equipment & experienced operator

Optimal time a consideration: Herbicide, June to Sept; Rx Burn & soil inversion, dormant season.

Completed Milestones

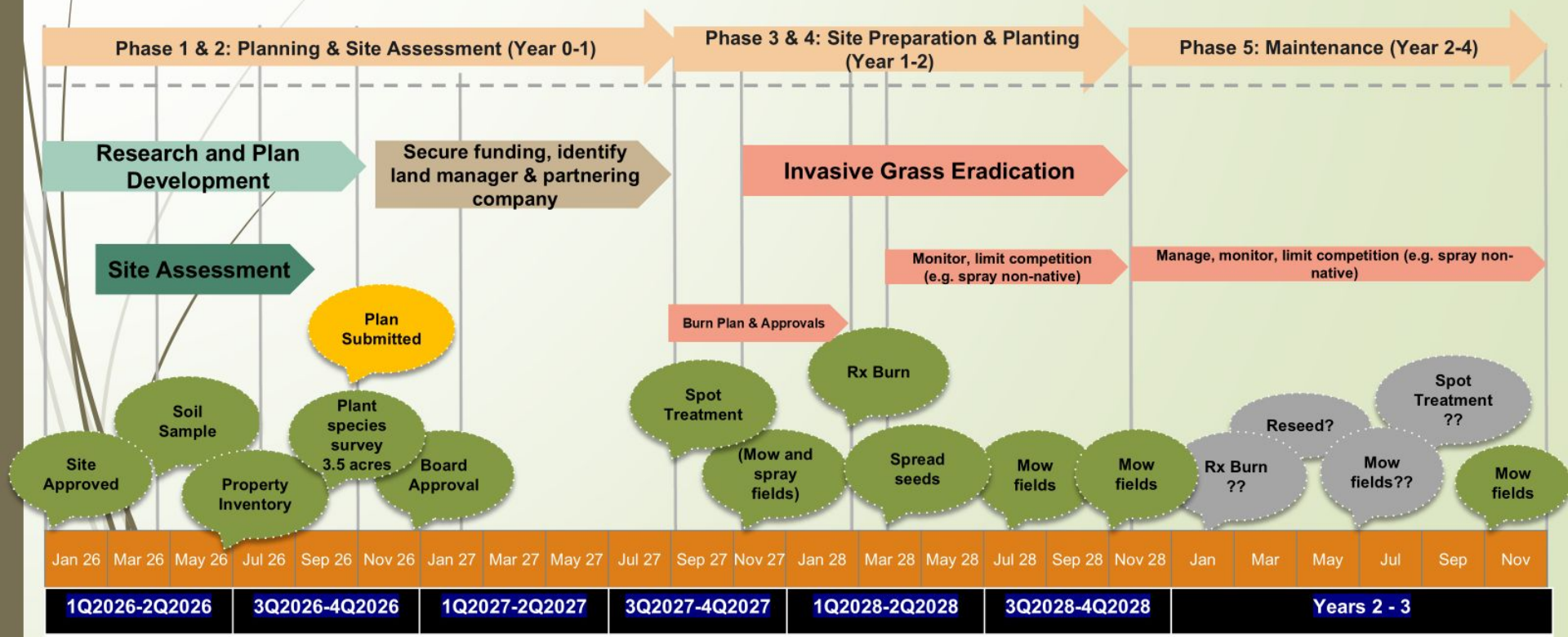
Date	Milestone
09-Feb-2026	Decision on prairie location
07-Mar-2026	Meeting with Board – Master Naturalist begin proposal
14-Mar-2026	Soil Sample Obtained
Apr to Sept-2026	Meetings with SMEs
Apr to Nov-2026	Site visits
May to Sept-2026	Plant Species Inventory - 3.8 acres designated for prairie
30-Oct-2026	Report and Appendices delivered to Moorefields Board
09-Nov-2026	Presentation to Moorefields Board

Completed Milestones



Moorefields Piedmont Prairie Plan and Timeline

Transition Long-Term Stewardship (Year 4-5)
Prairie functions as self-sustaining grass land with ongoing monitoring, management and yearly mowing



Benefits

Land Management

- Restore native ecosystem and connect to ecological heritage
- Create resilient landscape: enhance soil stability, improve rainwater infiltration, and increase carbon storage
- Reduce costs compared to conventional groundskeeping
- Enhance site's beauty and expands community opportunities

Community Engagement

- Develop paths with signage and points of interest through the meadow
- Informational and educational programs for groups including homeowners on importance of native landscapes
- Citizen science programs focused on (e.g. insect counts, fireflies, birds)
- Daytime retreat for yoga, Tai Chi, artists and similar groups

Wildlife

- Continuous native food sources for wildlife
- Pollinator support
- Insect diversity
- Bird habitat, nesting, foraging, cover
- Improved native habitat connectivity
- Increased biodiversity



Duke Gardens Piedmont Prairie and Bluestem Conservation Cemetery

Summary

Restoring the land to an “original state” will:

- Be a challenging long-term commitment
- Require significant funding
- Necessitate ongoing management
- Deliver a healthier, resilient, and more biodiverse landscape

Now:



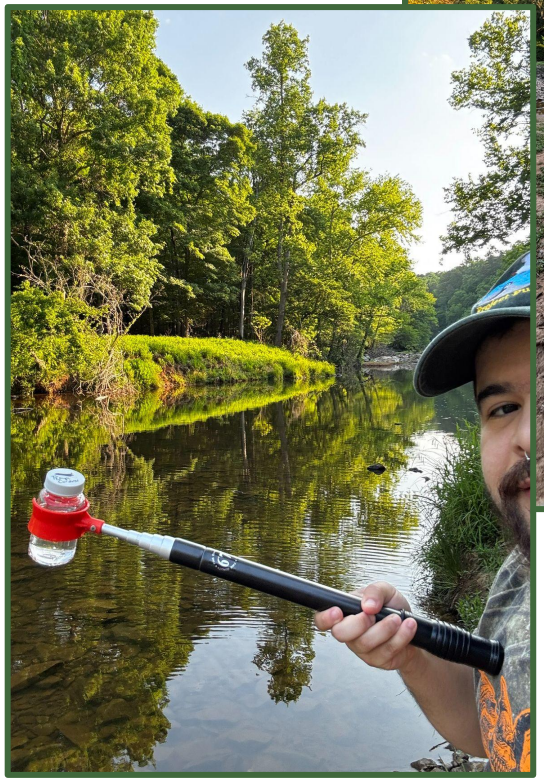
Now + five years:




Sound Rivers /
Eno River Association
Alex Garcia, Alex Riehm

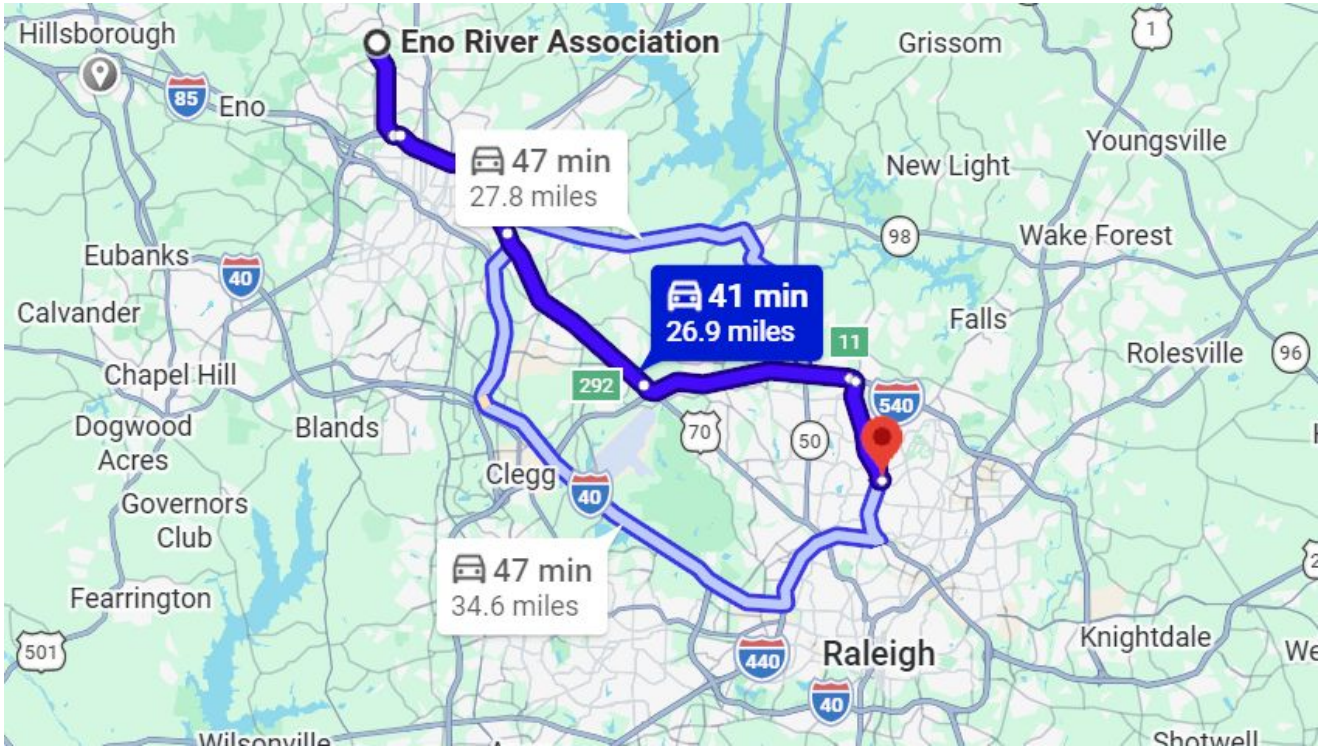
Water Sampling Methods

- Kits provided by Sound Rivers Project and kept by Eno River Association
- Video instructions provided, simple process and paperwork entry
- Volunteers needed for next year!








Hillsborough
Eno River Association
Grissom
Eno
85
47 min
27.8 miles
Youngsville
New Light
98
Wake Forest
Eubanks
40
41 min
26.9 miles
Falls
Calvander
11
Rolesville
96
Chapel Hill
292
540
Dogwood
Acres
Blands
70
50
Clegg
40
Governors
Club
47 min
34.6 miles
Fearrington
501
440
Raleigh
Knightdale
40
Wilsonville
Shotwell


6060
6060-B



Water Quality | About | Weather | Source Info

Historical Water Quality

See Source Info tab to understand what these results mean

Passed water quality tests 60-95% of the time

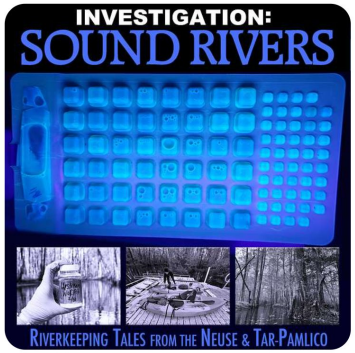
This status is based on the latest sample, taken on September 3rd, 2026 Sound Rivers updates the status of this beach as soon as test results become available. These results were posted to Swim Guide on September 4th, 2026 at 14:07.

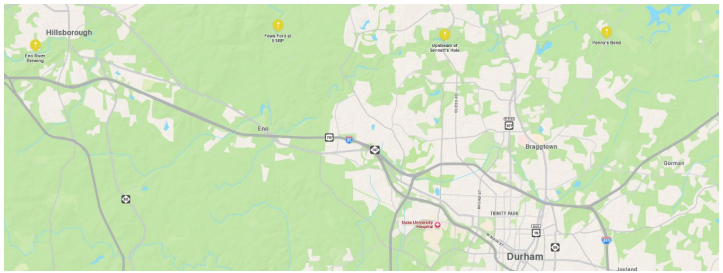
Monitoring Frequency: Fews Ford at ESRP is sampled Weekly from May 22nd to September 3rd.

Water Quality Graph: Pie Chart | Bar Chart



Interval: Monthly







Eno River Association:

https://www.enoriver.org/

Sound Rivers Project:

https://soundrivers.org/

FIREFLY SANCTUARY in CHATHAM COUNTY

A park built for people, next to forest full of life

- Northwest District Park: 118 acres of pond, ballfield, pool and camps
- Ringed by unmanaged pine and hardwood forest
- Goal: a sanctuary that works alongside recreation

Gini Bell & Barbara Fisher · Chatham County Parks · Xerces Society







First we learned to count fireflies

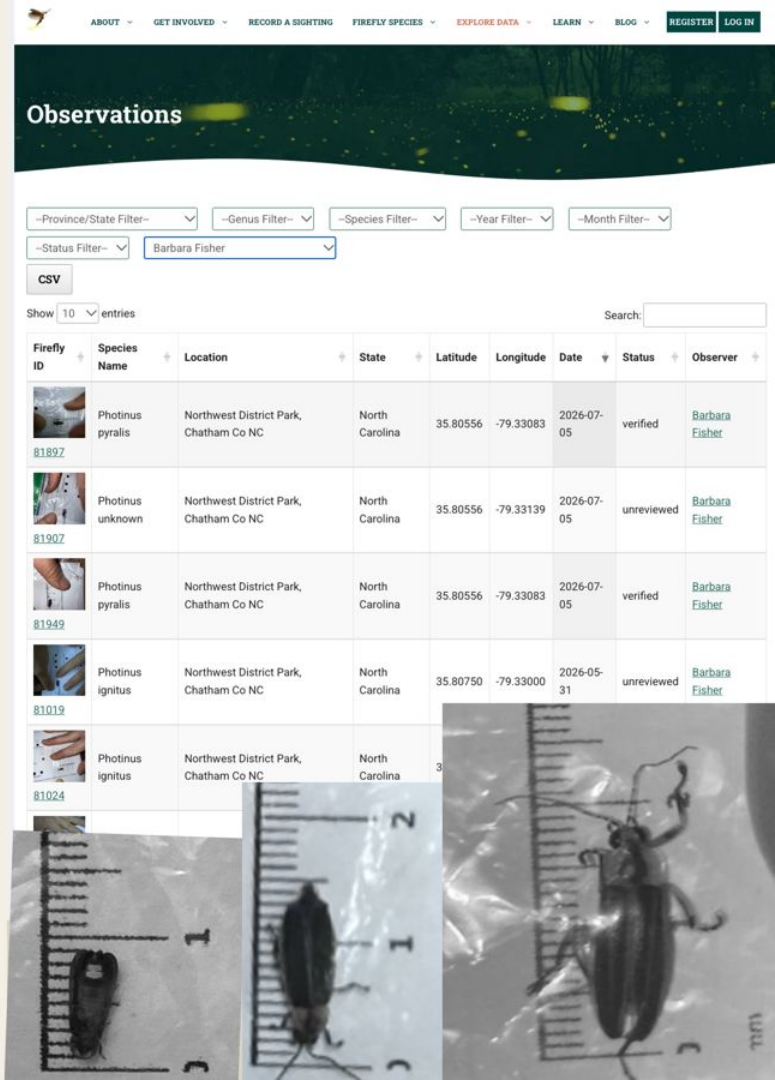
A severe drought year, so this is a baseline. We'll keep surveying.

10 surveys uploaded to the national Firefly Atlas with 30+ observations

3 peak-season surveys at the park, many more at home and while traveling

4–5 firefly species found at the Park April to June





What the county agreed to

- Interpretive firefly signage, made with Xerces
- A prairie in an unused field
- A small trial pollinator garden
- Invasive-removal workdays
- Public firefly walks and a summer-camp curriculum

The county pays for signs and materials. We volunteer time and expertise.

The biggest win is a working relationship with county staff. Parks staff want more volunteer-led projects, so this model can repeat across Chatham County. Kids already at the park become the next stewards.



HAW RIVER ASSEMBLY

Hidden Gems & River Stewards

- 5 Hidden Gem sites written up, 3–5 more this winter
- Website audit: 20+ broken links fixed
- Clean-Up-A-Thon crew, ages 1 to 71, with my daughters' Girl Scout troop
- Learning Celebration support in Bynum and Saxapahaw
- Joining a Riverwatch Crew in Dec.











TRIANGLE PRESCRIBED BURN ASSOCIATION

Becoming a certified burn boss

Fire is medicine for Piedmont landscapes, but we need more trained burn leaders.

- Volunteered on 2 prescribed burns
- Passed the burn boss course and exam
- Planning my certifying burn at Luna Blues Blueberry Farm this winter
- A Forest Service plan for my family's land, aiming for Piedmont prairie







COMMUNITY SCIENCE INITIATIVES

Ranita Dawkins



Community Science

A collaborative approach to research where everyday people work with scientists to collect data, answer questions, and solve local or global problems

- Xerces Society



Herpetofauna

Duke Forest

Butterfly Monitoring

Carolinas Butterfly Monitoring Program (CarBMP)









Similarities

- Electronic Data Entry
- Standardization
- Collection of universal environmental and demographic data
- Use of scientific names

Differences

Rationale – climate change impact

Rigidity and system





Rationale – monitor habitat loss

Flexibility





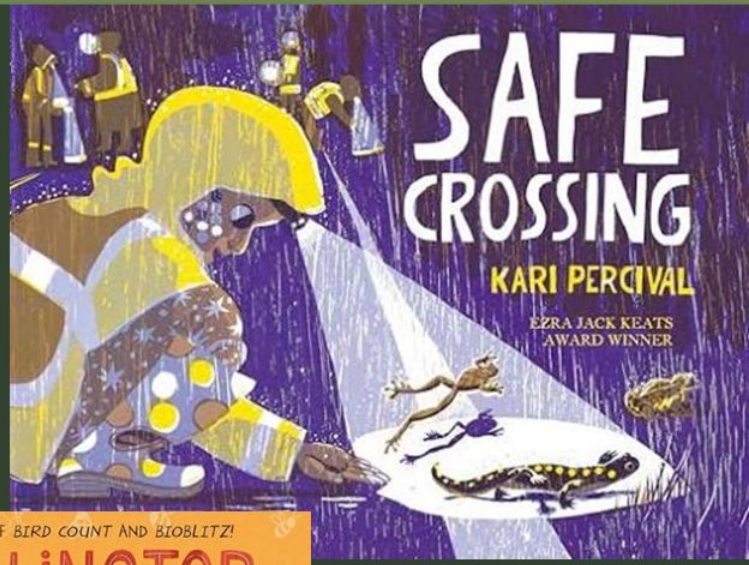
Organic Learning & Inquiry

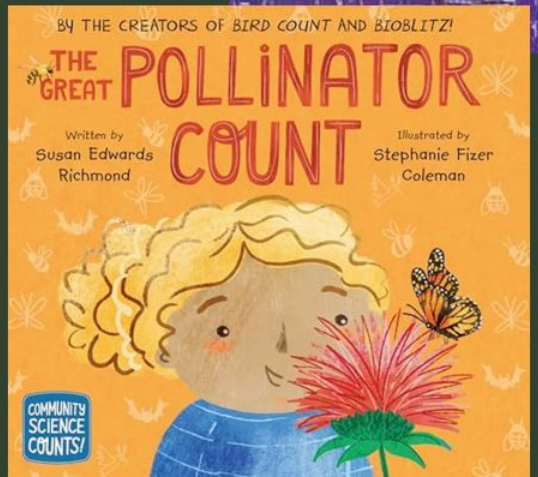
- Scientific names
- Habitat changes (seasonal)
- Other organisms

Translation to Schools

Finding ways to simulate formal community science projects

Developing internal community science programs for students





NC MASTER Naturalist Volunteer

NC COOPERATIVE EXTENSION
WARREN COUNTY CENTER

Inaugural Class 2027

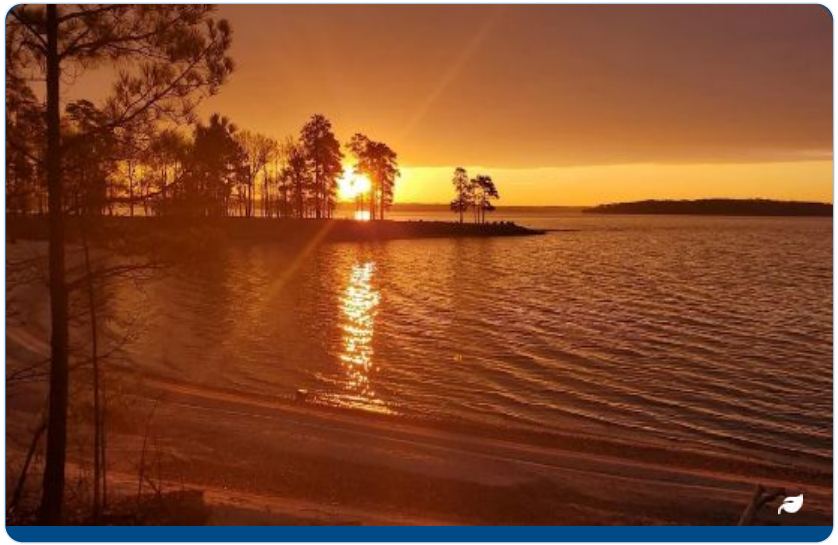
NC COOPERATIVE EXTENSION
N.C. A&T STATE UNIVERSITY
NC STATE UNIVERSITY

NC EXTENSION VOLUNTEER INITIATIVE

Warren County Master Naturalist Program

Connecting residents with research-based environmental education from NC State and N.C. A&T to preserve local ecosystems and natural habitats.

APPLICATIONS	COURSE LAUNCH	CENTER BASE
Fall 2026	Spring 2027	Warrenton, NC



Warrenton, NC • N.C. Cooperative Extension Warren County Center

NC COOPERATIVE EXTENSION

Certification Requirements & Pillars

PILLAR 1

9 Instructional Classes

In-depth classroom and field education on native flora, wildlife management, and Warren County Natural Resources.

PILLAR 2

Community Impact Projects

Active community service projects supporting habitat conservation and public outreach in Warren County.

PILLAR 3

Fieldwork Opportunities

Partnership opportunities with local and regional environmental groups and state agencies.

Open to all Warren County & North Carolina residents (18+).

N.C. Cooperative Extension is an equal opportunity provider operating through NC State and N.C. A&T Universities.

New Hope Bird Alliance
Susie Crate



Since 1991 I have worked as an anthropologist in Northeastern Siberia, Russia



"Winters are not as cold and it snows all winter now . . . not like before"

-Marusa Semenova, Tumul, Sakha, Russia


Bird Friendly Habitat
Under Construction
This property is being transformed
by using native plants and
by removing invasive plants.
New Hope Bird Alliance Certified
Bird Friendly Habitat
NEW HOPE
BIRD ALLIANCE
Together For Nature
newhopebirdalliance.org

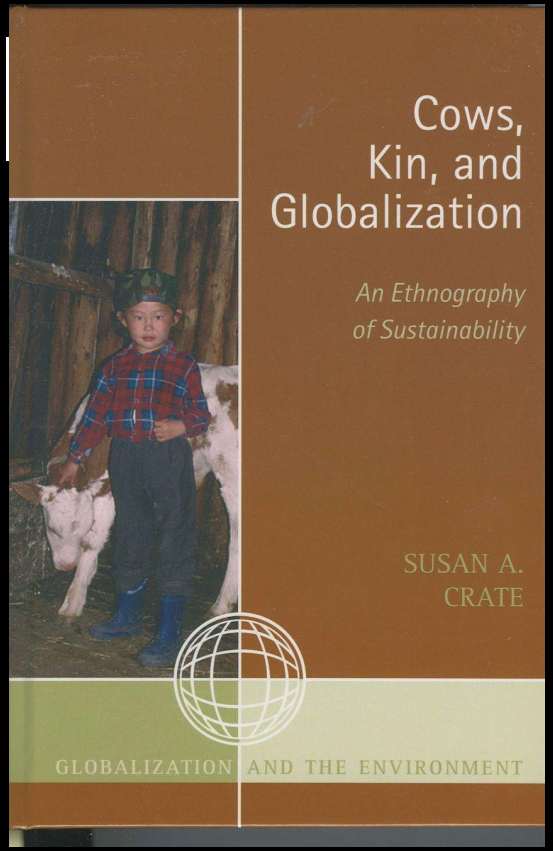

CERTIFIED
BIRD FRIENDLY HABITAT

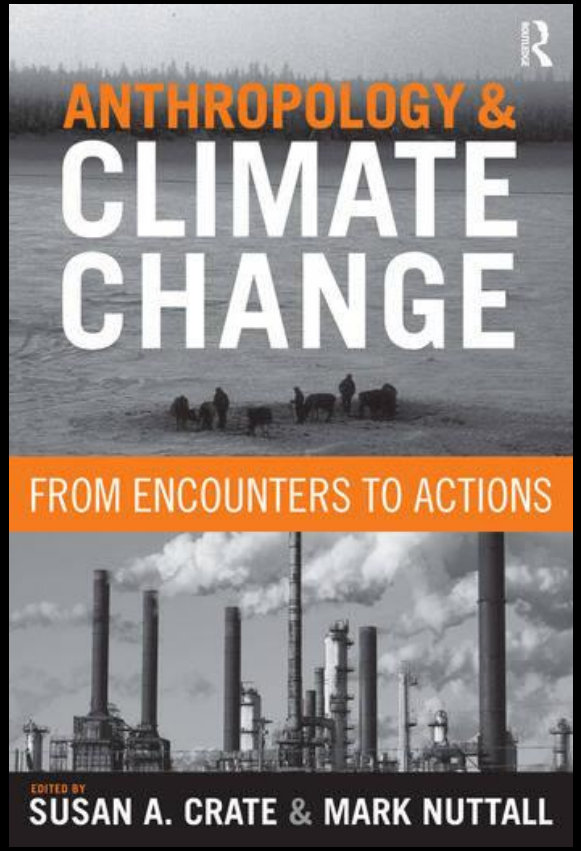

Bird Friendly Habitat
Under Construction
This property is being transformed
by using native plants and
by removing invasive plants.
New Hope Bird Alliance Certified
Bird Friendly Habitat
NEW HOPE
BIRD ALLIANCE
Together For Nature
newhopebirdalliance.org

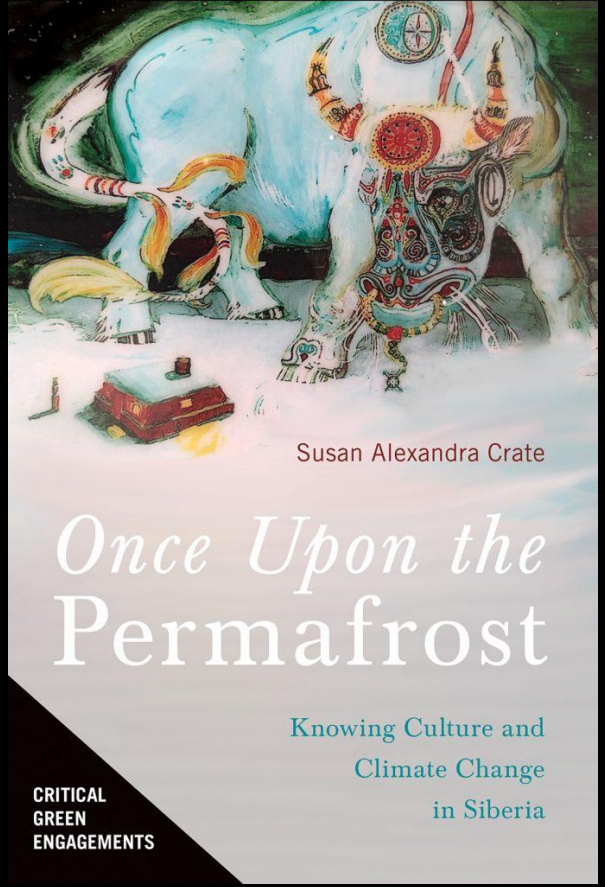



CERTIFIED
BIRD FRIENDLY HABITAT







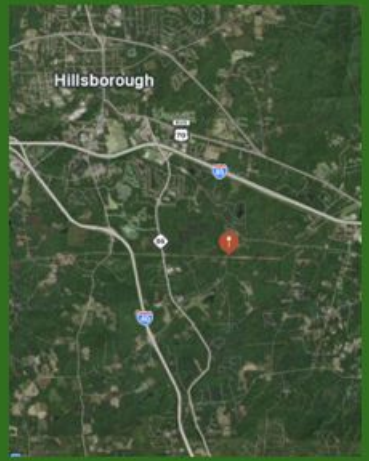


Help yourself to these two books

This book available OPEN ACCESS

A Tale of Two Oases: Losing and Recovering Hope and Habitat

I completed the NC Wildlife Federation Wildlife Habitat Stewards Certification, helping create and maintain "Oases" in the Brumley South Preserve of the Triangle Land Conservancy.





I also experimented with small habitats: tree frog tubes, rock piles, brush piles and track traps at a school, experimenting with plants for a back patio pollinator garden and the adoption of a utility-cleared waste area to restore bird, insect and reptile habitat.





finding hope… healing from eco-grief

UNITED NATIONS DECADE ON ECOSYSTEM RESTORATION 2021-2030

Eco-medicine

What the Land Witnessed: Lecture by Michelle Lanie



Artwork: 'Harvesting Hope' by Sahasra Kalakonda (Johannesburg, South Africa).

caring
connection
encounter
respect

zooming in
sense of place
soil people life land

Plant Baby Plant is a new grassroots movement led by Robin Wall Kimmerer that invites people to reimagine our shared future through acts of care for the living world.







stepping back
seeing connections and
context global restoration



Connecting Amphibians and Reptiles: An Ecology + Rights Approach (2026-2027)



looking up
eco and resistance art
eco-spirituality

tion

NC Native Plant Habitat Certification Program

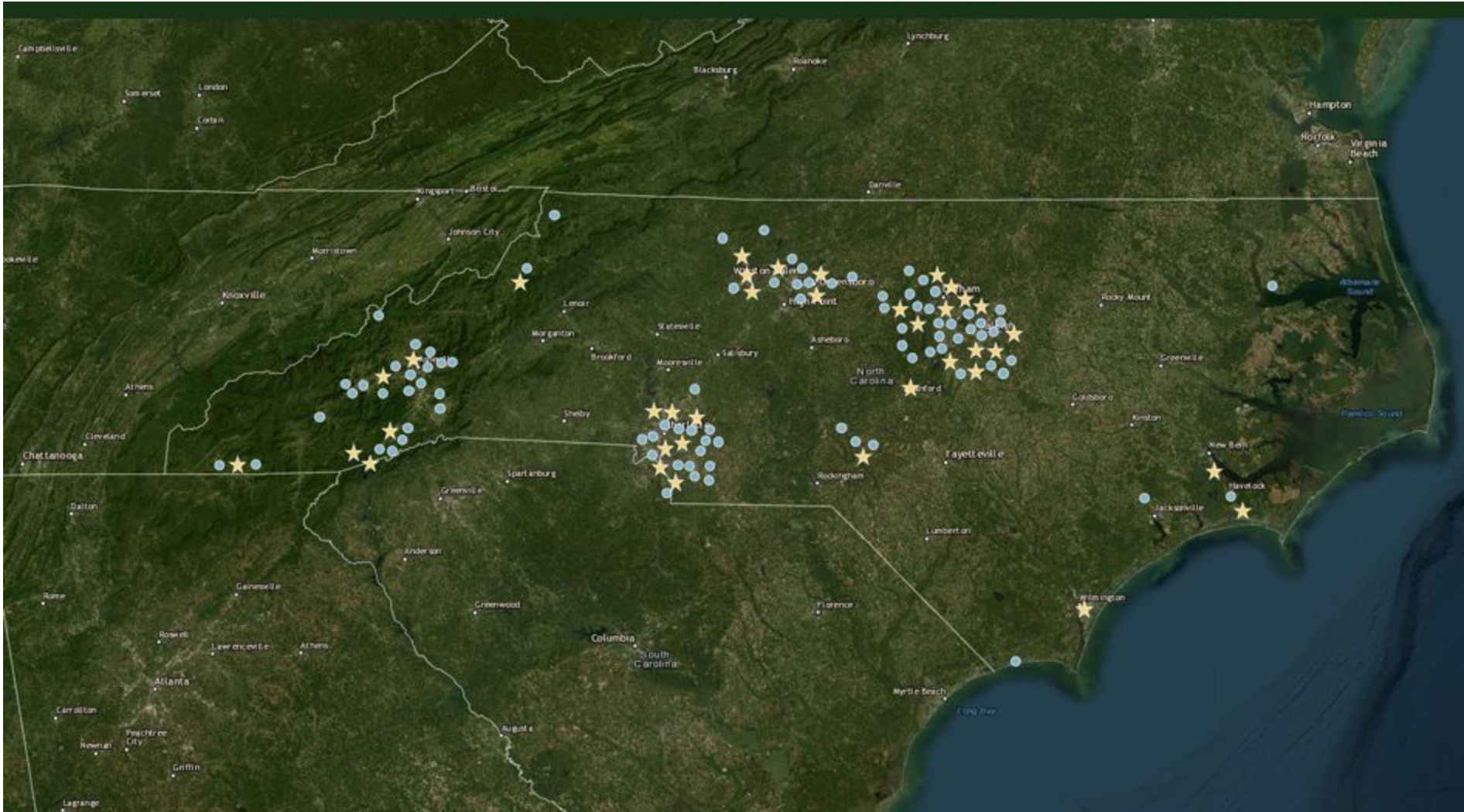
Dean Di Lillo
November 14, 2026





One of the top reasons to have your yard certified is to learn and Implement following

Plant native plants
Create biodiversity
Remove non-native invasive plants
Provide habitat for wildlife: food, water source, cover or shelter such as a brush pile, places for wildlife to raise their young,
Avoid using chemicals including herbicides and pesticides
Attend to drainage and runoff management on property
Minimize lawn area
Leave the leaves
Leave dried plants and seedheads throughout the winter
Reduce use of power equipment, particularly gas-powered leaf blowers


Campbellsville
Somerset
London
Corbin
Lynchburg
Blacksburg
Roanoke
Hampton
Norfolk
Virginia Beach
Kingsport
Bristol
Danville
Johnson City
Morristown
Knoxville
Lenoir
Morganton
Statesville
Asheboro
Brookford
Salisbury
Mooresville
Rocky Mount
Albemarle Sound
Greenville
North Carolina
Goldsboro
Kinston
Pamlico Sound
Athens
Cleveland
Chattanooga
Shelby
Spartanburg
Greenville
Rockingham
Fayetteville
New Bern
Havelock
Jacksonville
Dalton
Lumberton
Anderson
Gainesville
Rome
Greenwood
Florence
Roswell
Lawrenceville
Athens
Columbia
South Carolina
Atlanta
Carrollton
Peachtree City
Newnan
Griffin
Augusta
Myrtle Beach
Lagrange

A small sampling of existing Certified Gardens


Ken Quilty
Charlotte, NC 28269


Nathan Golan
Waxhaw, NC 28173


Nancy Anderson
Sapphire, NC 28774


Susan Lampert & Sandra Fournies
Alexander, NC 28701


Katie Hamm-Robinson
Charlotte, NC 28209

Brumley South Preserve Restoration
Laura Kiefer & Steven Feuerstein
(Plus A LOT of other volunteers)

Partner Organization: North Carolina Wildlife Federation
Collaboration between the Tri-County Conservationists Chapter of NCWF and Rewild NC. On TLC land.

Addressed the scourge of invasive plants by planting 556 native trees and shrubs in 8 cleared and fenced "oases" Dec 2025 - Feb 2026. Watered and weeded them over the summer.

Project Pando gave us some of the trees and we ordered others from **Mellow Marsh Farm**.



So Many Volunteers Came Out to Help!

20+ Species: Southern red oak, Sugar maple, White oak, Black cherry, Black gum, Am Hornbeam, Am hazelnut, Spicebush, Silky dogwood, Witch hazel, Paw paw, Blackhaw viburnum, Serviceberry, Elderberry, Possumhaw holly, New Jersey tea, Red chokeberry, swamp rose, Eastern red cedar, and buttonbush





Results

556 planted; 446 ID'ed as alive, likely alive, or dead (Nov 2026)**; 301 alive = 54% survival**

Did well:
- Oaks
- Witch hazel
- Sugar maple
- Silky dogwood
- Witch hazel
- Blackhaw viburnum
- Serviceberry
- Elderberry
- Swamp rose
- Eastern red cedar



Did poorly:
- Possumhaw holly
- New Jersey tea
- Am hornbeam
- Red chokeberry
- Spicebush

IN PURSUIT OF POLLINATORS

2026 MASTER NATURALIST PROJECT



BY

ROGER HANNAH



PARTNER ORGANIZATIONS

XERCES SOCIETY

UNIVERSITY OF GEORGIA

ORANGE COUNTY MASTER GARDENERS

ORANGE COUNTY GIS STAFF

NC MASTER Naturalist Volunteer

NC COOPERATIVE EXTENSION

N.C. A&T STATE UNIVERSITY

NC STATE UNIVERSITY



- EDUCATION
- EXPERIENCE
- SHARING
- PLANNING

PLAN



EDUCATION



Xerces Society
UGA GSEPC Training
NC Master Gardener Training
Books, Articles, and Websites



"The great aim of education is not knowledge but action."
Herbert Spencer

NC MASTER Naturalist Volunteer

NC COOPERATIVE EXTENSION

N.C. A&T STATE UNIVERSITY

NC STATE UNIVERSITY



EXPERIENCE

Bumblebee Atlas
Habitat Observations including GSEPC
Orange County Pollinator Corridor Project

"You can observe a lot just by watching."
Yogi Berra



NC MASTER Naturalist Volunteer

NC COOPERATIVE EXTENSION

N.C. A&T STATE UNIVERSITY

NC STATE UNIVERSITY



SHARING

Friends, Family, Community

GSEPC

Orange County Pollinator Corridor Project

Future Master Gardener Efforts

"People learn as they teach."

Seneca





PLANNING

2027 Bumblebee Atlas

2027 GSEPC Expansion

Orange County Pollinator Corridor Project

"Plan for the future because that's where you're going to spend the rest of your life."
Mark Twain



BLUESTEM PLAY DAY

Intergenerational Ecopoetry Workshop

CHELSEA KRIEG



NC MASTER Naturalist Volunteer

AUDIENCE

“Efland-Cheeks is a diverse, working-class community in rural Orange County, due west of the Town of Hillsborough. The community roots are rural farms owned by several generations of experienced agriculturalists. The community is home to many families and embraces diversity and inclusion. UVEC is intentional in engaging and acknowledging each person and their value through community outreach projects and events.”



SCHEDULE

12:00 PM – Lunch

12:45 PM – Welcome, introductions, pass out notebooks

1:00 PM – Sensory Walk* around the Pond Trail

1:20 PM – Sharing & Gratitude List*

1:30 PM – Plant Buddy*

1:45 PM – Discuss

2:00 PM – What is a Poem?*

2:15 PM – Letter Poem*

2:30 PM – Depart



ACTIVITIES

Gratitude List: Warm-up activity; write or draw five things that you are grateful for about nature or the world around you.

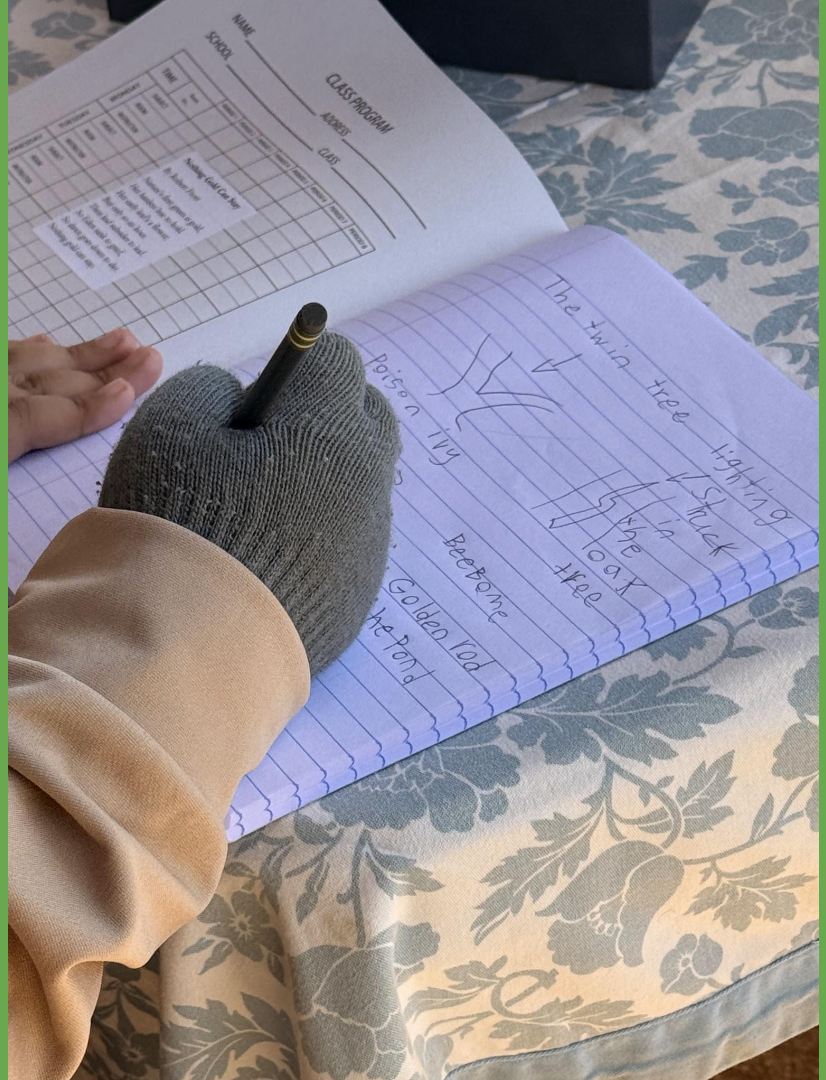
Sensory Walk: Students will focus on sights, sounds, smells, touch, etc. of nature and jot them down in their notebooks

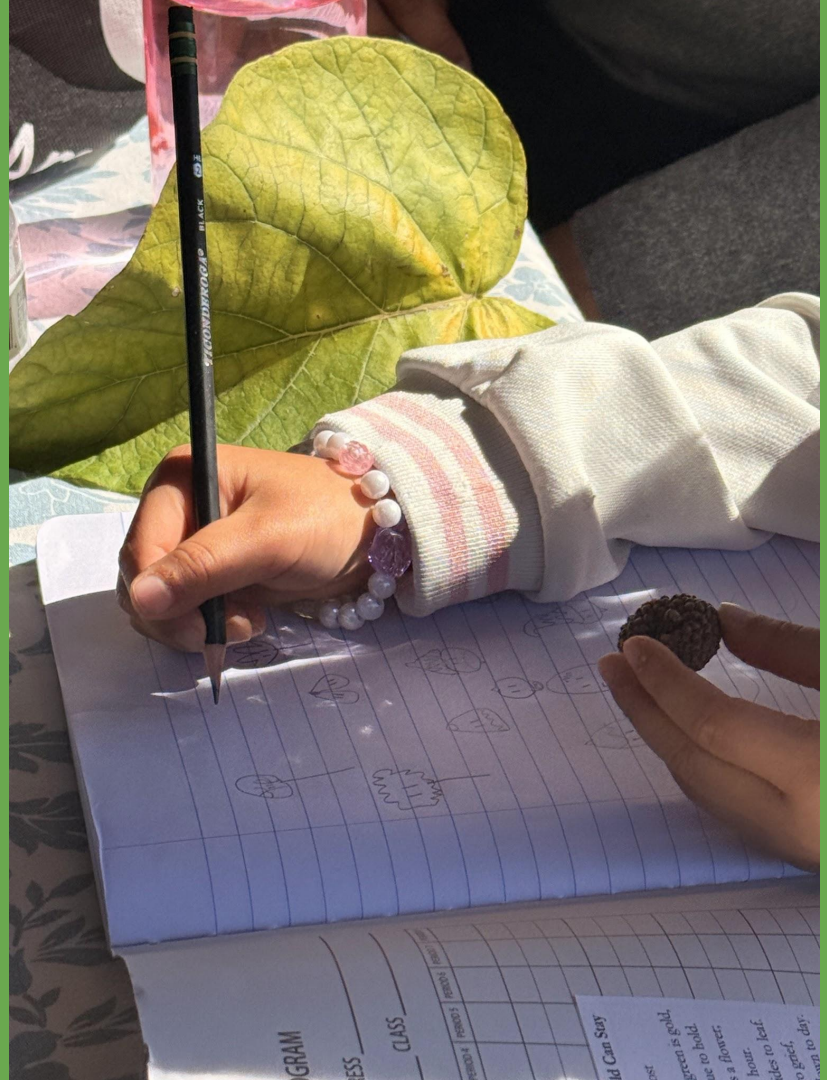
Plant Buddy: Find a plant and sit with it for 5 minutes. Write down everything you can about that plant. What do you notice? What does it look like? Draw it? How is it interacting with the world around it? With you? Does it have a smell?



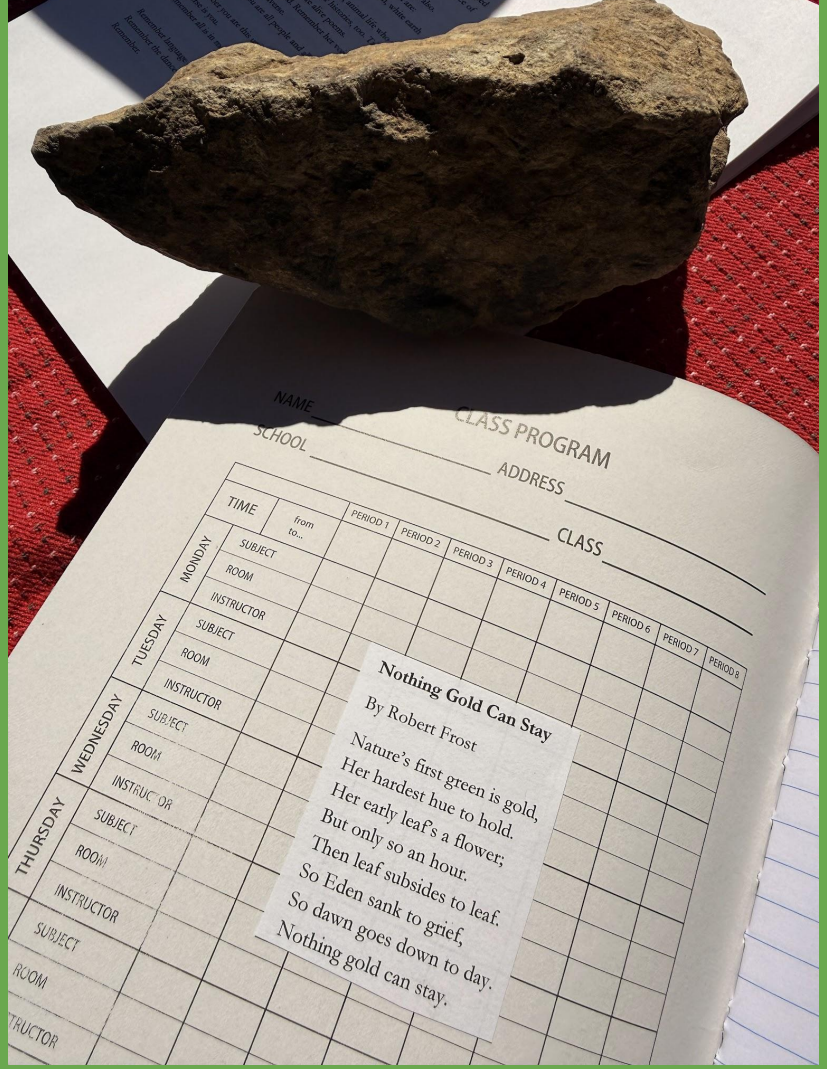




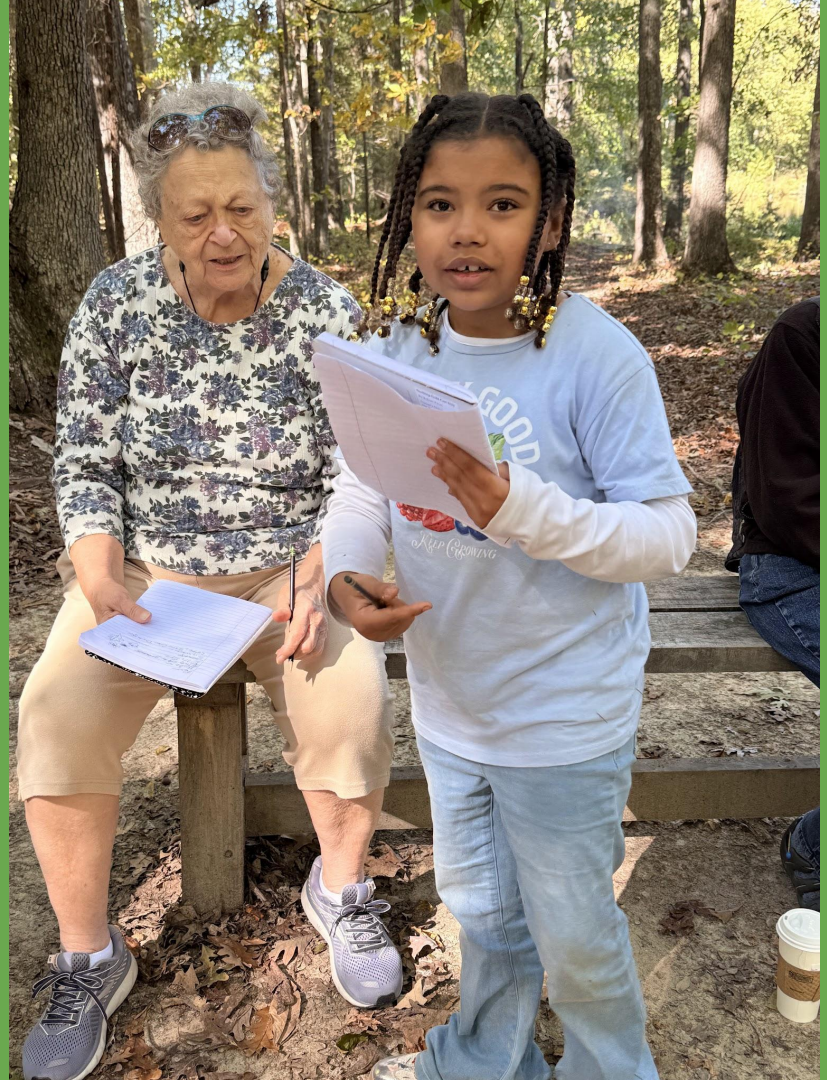

NAME
SCHOOL
CLASS PROGRAM
ADDRESS
CLASS
The twin tree lighting
struck
the oak tree
Poison ivy
Beehive
Golden rod
the Pond


BLACK




NAME
SCHOOL
CLASS PROGRAM
ADDRESS
CLASS
TIME
from
to...
PERIOD 1
PERIOD 2
PERIOD 3
PERIOD 4
PERIOD 5
PERIOD 6
PERIOD 7
PERIOD 8
MONDAY
TUESDAY
WEDNESDAY
THURSDAY
SUBJECT
ROOM
INSTRUCTOR
Nothing Gold Can Stay
By Robert Frost
Nature's first green is gold,
Her hardest hue to hold.
Her early leaf's a flower;
But only so an hour.
Then leaf subsides to leaf.
So Eden sank to grief,
So dawn goes down to day.
Nothing gold can stay.













Working with the Eno River Association

Marilyn Mayer



- Education – Stream Invertebrates & Water Quality
- Site Steward – Effect of Construction on Black Meadow Creek

Education – Stream Invertebrates

Splash Quality

Who do we find?

Nifty traits

Assessing Water














Key To Common Macroinvertebrates
Found at Fews Ford, Eno River State Park





Created Handouts - Adaptations

Adaptations for Respiration

- Extensions to increase surface area for O2 uptake from water

Damselflies



Dobson fly

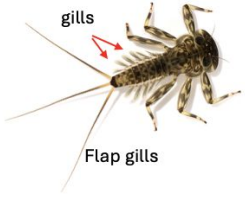


Netspinning caddisfly

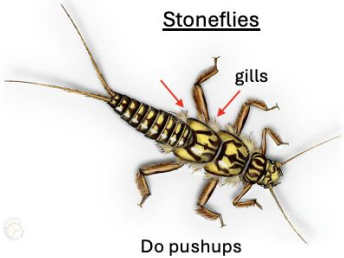


- Increase water movement to increase O2 uptake

Mayflies



Stoneflies



Do pushups

Dragonflies



Pump water in and out of rearend
O2 exchange inside abdomen.

Live in fast flowing water

- Get O2 from air above the water's surface

"Snorkle Method" reach above water surface for air

Water scorpion (bug)



Mosquito larva



"Scuba Method" collect and carry air supply in bubble

Diving beetles



Feeding Methods & Adaptations

- Herbivores. - algae & fungi & bacteria

- <u>Scrapers</u>

Mayflies (some)



Water penny – larval beetle



- <u>Capture particles from water</u>

Black flies - head fans to capture particles

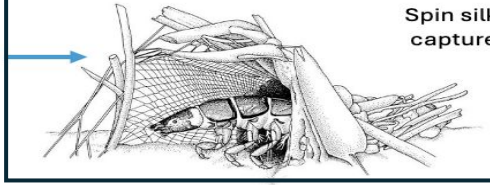


water

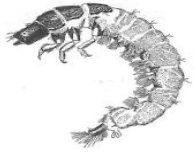


Attach to rocks with sticky silk & hooks

Net spinning caddisflies



Spin silk net & pluck captured particles

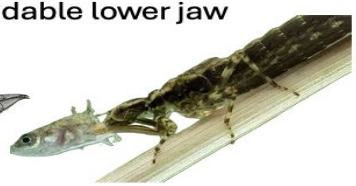


- Predators

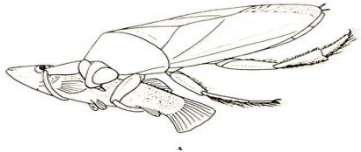
Dragonflies & Damselflies - Extendable lower jaw







Water bugs
Piercing venomous beak

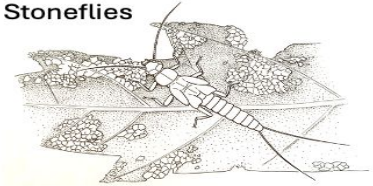


Water beetles: larvae & adults



- Detritivores – eat decaying leaves etc.

Stoneflies



Craneflies



Especially unusual species sensitive to pollution

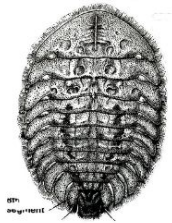
Case-building Caddisflies

Cases protect fleshy abdomen and can provide ballast & camouflage



Water Penny: beetle larva

Live on top of rocks. Are extremely flattened for hydrodynamics



top



underside

Can stay on top of rocks despite fast current



Side view

Determining Water Quality from Benthic Invertebrate Community - Pollution Tolerances

Group 1 = Sensitive

Common Name	Pollution Tolerance	Number	Abundance	Common Name	Pollution Tolerance	Number	Abundance
Case-building caddisfly	1	4	R	Riffle Beetle	1	0	R
Dobsonfly, Hellgramite	1	8	R	Stonefly	1	2	R
Gilled snail	1	9	R	Water Penny	1	0	R
Mayfly	1	87	C				

calculations	
#R x 5.0	6 x 5.0
#C x 5.6	1 x 5.6
#D x 5.3	0
Sum	35.6

Group 2 = Moderately Tolerant

Alderfly	2	2	R	Fishfly	2	4	R
Cranefly larvae	2	7	R	Midge	3	3	R
Crayfish	2	12	C	Mussels, clams	2	31	C
Damselfly	2	3	R	Net spinning caddi	2	39	C
Dragonfly	2	3	R				

#R x 3.2	6 x 3.2
#C x 3.4	3 x 3.4
#D x 3.0	0
sum	29.4

Group 3 = Tolerant

midge	3	3	R				

#R x 1.2	1 x 1.2
#C x 1.1	0
#D x 1.0	0
sum	1.2

Abundance scores: Rare = 1-9, Common = 10-99, Dominant = 100 plus

Alternative Index	group score	
# taxa group 1 x3	7 x 3	21
# taxa group 2 x2	9 x 2	18
# taxa group 3 x1	1 x 1	1
Total		40

overall total	66.2

Excellent Water Quality (highest rating)

Good Water Quality (Highest Rating)

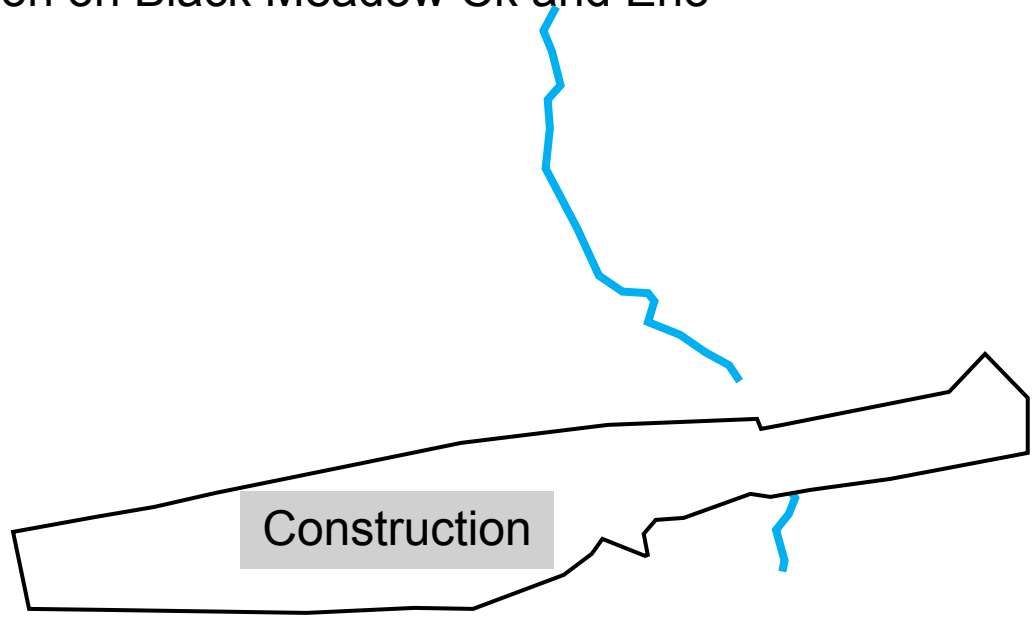
Goal : Monitoring construction for impacts on Black Meadow Ck & Eno River

- Flagged and geo-referenced mesh openings & problem locations
- Photographed problems & sources
- Reported problems to Eno River Assoc.
- Submitted online reports - City of Durham Stormwater Pollution Office





Effect of Construction on Black Meadow Ck and Eno River



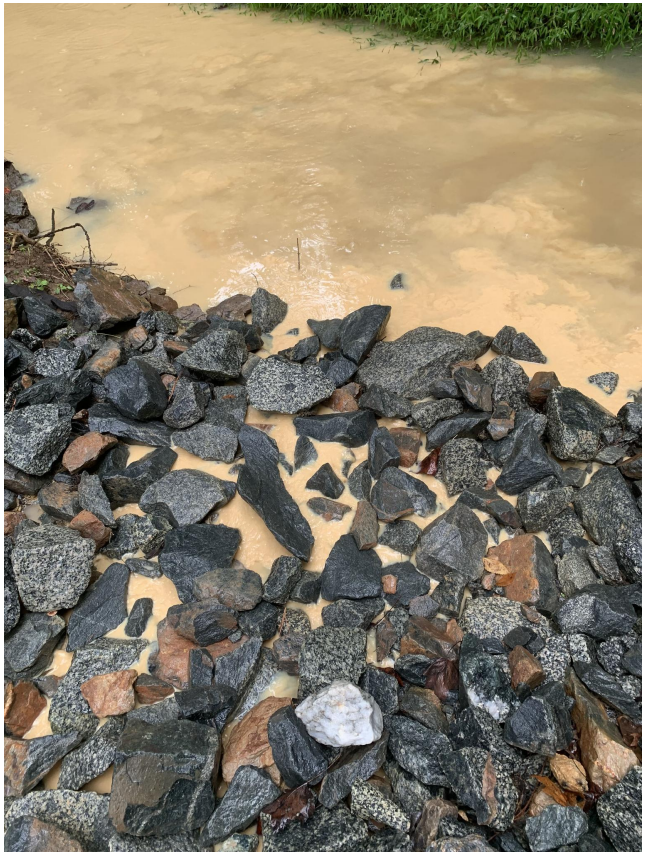
Main stormwater control measure ✔





Large Drainage Pipe - Major problem






36.06639 N, 78.90846 W


36.06772 N, 78.90988 W







Old Mill Wheel – close to mouth of Ck



Black Meadow Ck Entering Eno





Become a Haw River Assembly Member Today! Click here.

HAW RIVER ASSEMBLY

About Support Programs Events Calendar Data Swim Report River Issues Blog/Español REPORT POLLUTION

Muddy Water Watch



Virtual Muddy Water Watch Training

Thursday, November 5, 2026, from 6:30-7:30 PM

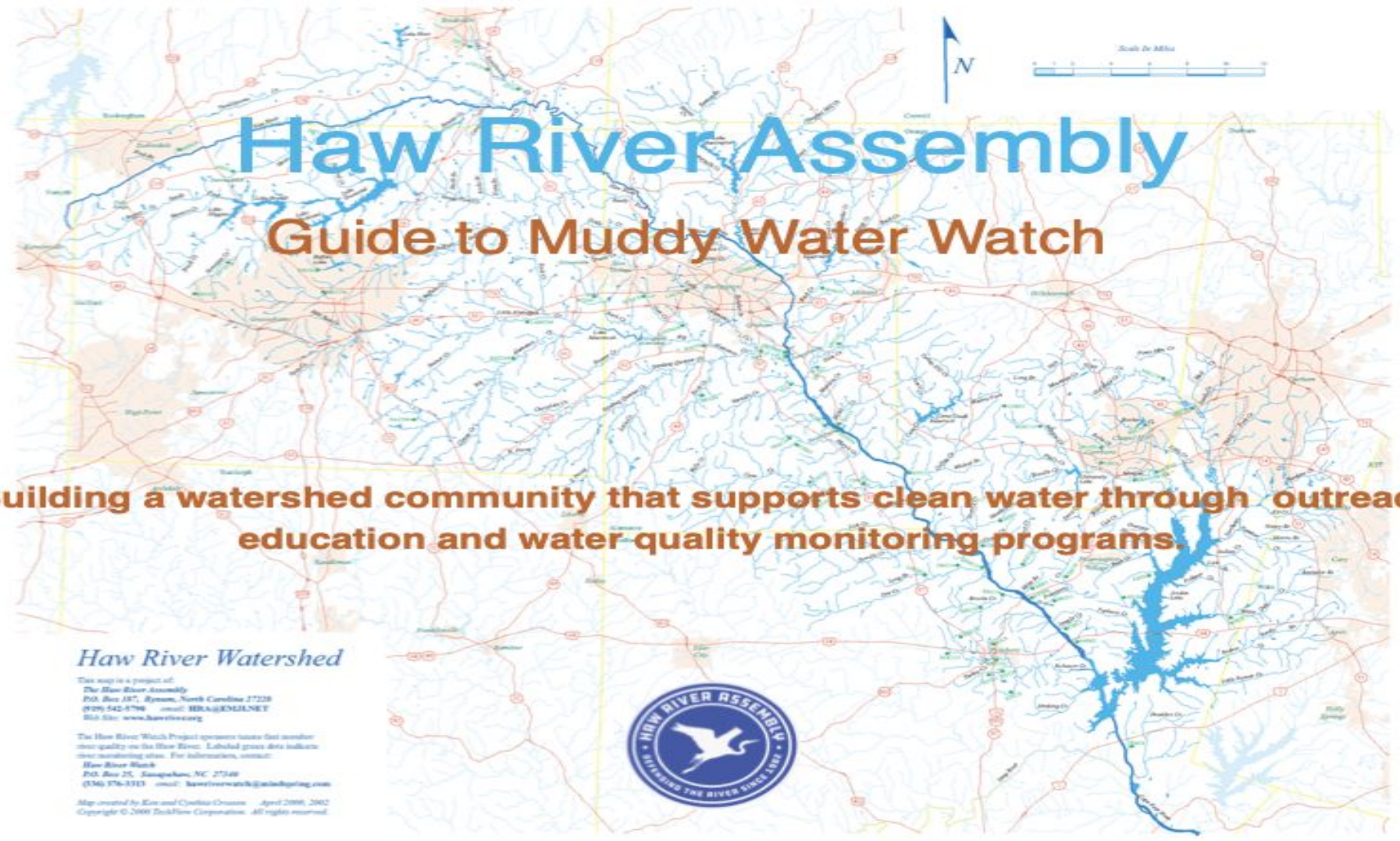
Construction stormwater runoff carries sediment, debris, chemicals, and bacteria which are harmful to humans and aquatic habitat. Join Haw River Assembly for a Muddy Water Watch virtual training to receive the knowledge and tools necessary for volunteers to properly identify and report sediment and erosion control violations. For specific questions about the muddy water watch training, please email kaitlyn@hawriver.org. An email with a ZOOM link for the virtual training will be sent out 2-3 days ahead of time.

RESERVE YOUR SPOT HERE!

Haw River Assembly

Guide to Muddy Water Watch

Building a watershed community that supports clean water through outreach, education and water quality monitoring programs.



Success Stories

“

Another great example of community members taking action! A notice of violation and a permit hold was issued at this Storage Shed construction site in Pittsboro. This location had sediment leaving the job site. A report was made that included a lack of silt fencing, no stabilization measures, and no ground cover which resulted in offsite sediment. Chatham County Sediment and Erosion control have been busy this week!

Our watershed is being developed at an alarming rate, and sediment has potential to suffocate sensitive macroinvertebrates living in our streams.

”



The Muddy Water Watch program focuses on reducing sediment pollution in the Haw Rivers Watershed.

"The sedimentation of streams, lakes and other waters of this State constitutes a major pollution problem. Sedimentation occurs from the erosion or depositing of soil and other materials into the waters, principally from construction sites and road maintenance."
Sedimentation Pollution Control Act of 1973, North Carolina (https://www.ncleg.gov/enactedlegislation/statutes/html/byarticle/chapter_113a/article_4.html)

Why is Sediment Pollution a Problem for Our Streams and Rivers?

- In North Carolina, sediment pollution is the number one pollutant by volume.
- Sediment pollutions enters our waterways from construction sites, logging operations, agricultural lands, and from stream bank erosion. North Carolina is experiences.
- Sediment in excess can negatively impact feeding, respiration, and reproduction of aquatic life. It can block sunlight and kill plants which can limit food availability as well as settle out of the water column and smother fish eggs.
- Sediment can also bind with other substances that can be harmful like heavy metals and pesticides and carry them into the water system.
- When land is disturbed and ground cover is removed, decreasing water filtration, runoff velocity (the speed of runoff) increases.
- As much as four truckloads of soil can leave a single building block during a storm event.
- Losing valuable topsoil decreases land productivity and property values. It takes up to 100 years to form 1 inch of topsoil.



MUDDY WATER WATCH

FIELD GUIDE





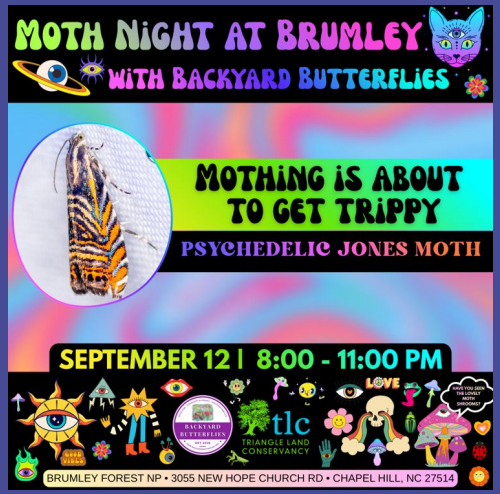


Article About Master Naturalist Program

Rebecca Jones
rejone25@ncsu.edu

Lior Carlson







Transition to PowerPoint

NC MASTER Naturalist Volunteer

One person can change the world. So… maybe a group of us can save it.