Forest Biodiversity at Fisher Farm:
Baseline Assessment Preceding Prescribed Fire

Summer 2025

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Executive Summary

In summer 2025, a group of Davidson College researchers continued their collaboration with Davidson Lands Conservancy, the Town of Davidson, Mecklenburg County, and the North Carolina Wildlife Resources Commission as part of the Wildlife Enhancement Collaborative focusing on Fisher Farm park in Davidson. As a follow-up to a 2023 report (Smith et al., 2023), which focused on biodiversity in a 20-acre forest ("Area E") at Fisher Farm, work in 2025 focused on more deeply understanding forest structure and tree regeneration forests at Fisher Farm.

Our 2025 surveys suggest that forests at Fisher Farm, including Areas E and F, are primarily hardwood forests with dry-mesic ridges and mesic washes and ravines. Many of the older and larger trees of the forests are oaks and hickories, suggesting previous dominance by these species, especially in the drier habitats associated with ridges. A relatively large number of post oaks, a dry site species, support the historical presence of oak-hickory forest at Fisher Farm. Oaks and hickories provide excellent resources for wildlife in the form of mast, browse, and habitat, and their inclusion in forests at Fisher Farm aligns with the goals of the Wildlife Enhancement Collaborative.

Oak-hickory forests are declining throughout the eastern United States, via two related processes, mesophication and oak regeneration failure (ORF), each of which is widespread in eastern forests. Mesophication and ORF result from a lack of disturbance, especially fire, combined with the spread of species that compete with oaks and change forest environments, leading to a positive feedback loop of conditions that suppress oak reproduction and regeneration.

We find strong evidence of mesophication in general and oak regeneration failure specifically at Fisher Farm. Younger tree life stages in Areas E and F are dominated by mesophytic species, including green ash, winged elm, and red maple in the understory and sweetgum, red cedar, and tulip poplar in the canopy. In the regenerative life stages of seedlings, saplings, and small trees, oaks trees are vanishingly rare.

Low-intensity prescribed fire, such as that scheduled for 2026, is likely to partially address mesophication at Fisher Farm. Future management interventions, including additional prescribed fires to be timed based on post-fire surveys, and crown-release canopy thinning around mature oaks and hickories, would further address mesophication and support oak regeneration. We recommend that the results of this report and the 2023 report be leveraged to assess the success of the 2026 prescribed fire and future management interventions.

Importantly, in alignment with the suggestions of the 2023 report, the planned prescribed fire and our recommendations for follow-up management would support plant and animal biodiversity broadly. These benefits to biodiversity and wildlife would be in addition to ensuring the continued presence of oak-hickory forest and the wildlife it supports. In short, addressing mesophication and oak regeneration failure at Fisher Farm would be a win-win for a declining forest type and for biodiversity and wildlife resources in general.

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Background

Under the stewardship of the Davidson Lands Conservancy (DLC), Town of Davidson, and Mecklenburg County, Fisher Farm (FF) is the focus of a collaborative wildlife enhancement project with the aim of restoring historic native habitats and supporting biodiversity. One focus of the project is a 20-acre hardwood forest at the center of Fisher Farm (Figure 1), designated as "Area E" in DLC documents. In 2023, a group of researchers at Davidson College assessed Area E, documenting tree, shrub, and herbaceous forest floor biodiversity. The 2023 report highlighted high species richness among herbaceous plants and tree species in Area E. However, the same report noted low species evenness of herbaceous plants, domination of the forest understory and forest floor by a few common species, and high shrub and tree density leading to shading and low understory productivity. **To address wildlife enhancement goals, the 2023 report recommended a low-intensity prescribed fire** to reduce dominance of fire-intolerant species and open the midstory, and to thin around trees with high wildlife value, such as canopy oaks and hickories (Harper, 2020; Smith et al., 2023).

Since 2023, management of Area E has focused on cut-and-spray of autumn olive and other invasive shrubs, and a dormant-season prescribed fire was scheduled to address management goals articulated in the 2023 report. Originally scheduled for late winter/spring 2025, the prescribed fire is now scheduled for 2026. This delay provides an opportunity to gather more extensive data in anticipation of the prescribed fire, establishing a thorough baseline against which management objectives can be assessed post-fire. While the 2023 report focused on overstory and midstory tree and understory herbaceous species biodiversity, detailed information on tree regeneration potential (seedlings and saplings) was lacking. **Because prescribed fire has the potential to significantly alter and potentially improve tree regeneration with benefits for biodiversity, wildlife, and forest sustainability, tree regenerative life stages are the focus of our surveys in summer 2025.**

Gathering seedling and sapling information in our 2025 surveys also allowed us to assess mesophication of forest habitats at Fisher Farm. **Mesophication is a transition toward shadier and moister forests and is caused by the domination of fast-growing, shade-tolerant, and fire-intolerant species, which are favored when beneficial disturbances such as fire are eliminated from forest habitats** (Nowacki & Abrams, 2008). Low-diversity forests with midstories dominated by species such as ashes, elms, and maples are now widespread throughout Eastern North America. Historically, many of these mixed hardwood forests were oak-hickory dominated, with oaks being among the most influential species (Abrams, 2003). **As a result of mesophication,oak-hickory forests and oak species in particular are now in decline**.

Assessing mesophication is important owing to its role in a phenomenon called **oak regeneration failure (ORF)**. ORF describes the inability of canopy oaks to successfully replace themselves in modern forests (Abrams, 2003). The transition to shadier and moister forest environments makes it challenging for oaks, many of which are fire-adapted, dry-site species, to compete at younger growth stages. The increased shading and lack of fire, along with deer browsing pressures, combine to limit oak regeneration. Without management, oaks may decline, and forests may lose the biodiverse plant and animal communities associated with resources provided by oaks.

Within this context, our 2025 data collection on tree diversity across life stages will provide baseline assessments of mesophication and ORF at Fisher Farm, therefore allowing for a formal evaluation of the management outcomes of the future prescribed fire.

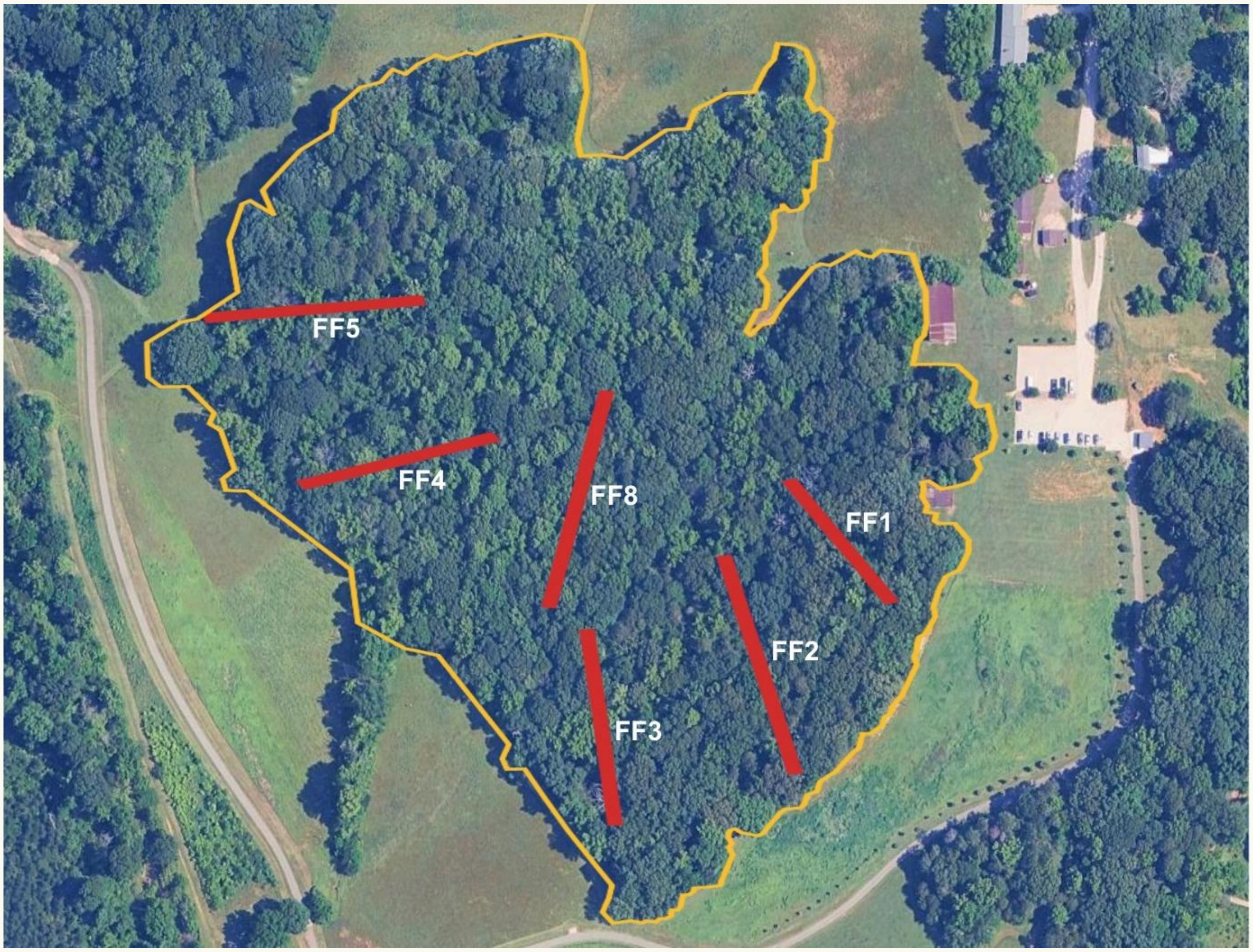

Figure 1. Map of Fisher Farm Area E, outlined in yellow, with labeled transect locations from 2025 surveys in red.

Goals of the study

In this report, we summarize surveys completed by Davidson College at Fisher Farm during the summer of 2025. Our goals for this work were to:

- Conduct surveys of tree seedlings and saplings to augment the 2023 surveys of this same area
- Assess mesophication and oak regeneration failure at Fisher Farm
- Determine the type and severity of oak regeneration failure, if present, and the potential causes behind this failure
- Provide extensive pre-burn baseline data for an evaluation of the success of the planned prescribed fire in achieving management goals

- Assess potential effects of the upcoming burn and provide additional post-fire management recommendations based on existing conditions
- Provide a preliminary assessment of a second forest area at Fisher Farm, Area F

Site Description

Fisher Farm is a public park and nature preserve located in Mecklenburg County, North Carolina. Comprising 200 acres, the park houses tracts of hardwood forest intertwined with fields. Our surveys focused on the central 20-acre patch of hardwood forest (Area E; Figure 1). The sites we surveyed were consistently characterized by large canopy trees, a dense midstory, low sunlight penetration, and heavy leaf litter typical of forests with little recent history of disturbance. Despite the midstory crowded by a small number of species (e.g., green ash and winged elm), oaks were consistently the largest species in the canopy (Table 1).

Historically, Area E of FF was likely a dry-mesic oak-hickory forest, though the terrain is quite varied, with mesic washes and ravines among drier ridges. The presence of post oaks (Table 1: FF1 and FF2) as common mature tree species is an important indicator of historic forest conditions. Post oak is a dry-site species, even more so than eastern white oak or southern red oak, and often relies on fire to maintain regeneration (Carey, 1992). Additionally, the largest trees in Area E, as determined by the largest average basal area, include southern red oaks, northern red oaks, and mockernut hickories (Table 1). The presence of large, mature oak trees and post oaks suggests that canopy trees in Area E established as an oak-hickory forest under dry-mesic to even xeric conditions.

Despite Area E having an apparent history as a dry-mesic oak-hickory forest, mesophytic tree species are common in several parts of the forest, with species such as eastern redcedar, sweetgum, tulip poplar, and winged elm as common mature trees (Table 1). The size of these fast-growing trees, which are not the largest and most dominant canopy species, suggests that mesophication in Area E likely began in the past 50 years or so.

Site Selection

We chose six sites for surveys in Area E. Five sites near the edge of the forest (FF1-5; Figure 1) were previously surveyed by Davidson College researchers, but these earlier surveys did not include tree saplings and seedlings (Smith et al., 2023). We also added a new site (FF8; Figure 1) located on the central ridge of the plot to ensure our surveys capture and assess the status of more clearly dry-mesic forest types. We excluded from these surveys two sites originally surveyed and reported on in the 2023 report (FF6 and FF7); these sites are within the mesic ravine network on the northern section of Area E and are therefore not likely to be affected by the planned prescribed fire.

Table 1. FF site descriptions, including frequent mature trees, canopy trees with the largest average size, the percent of canopy that is open, and relevant site descriptions. Oaks are **bolded** to highlight their importance at this site, especially among large trees.

Site Name	Most Frequent Mature Trees	Largest Average Basal Area	Average Open Canopy	Additional Information of Note
FF1	Eastern Redcedar **Post Oak** Sweetgum	**Southern Red Oak** Mockernut Hickory Sweetgum	8.5%	Dense green ash in understory (seedlings and saplings)
FF2	Eastern Redcedar **Post Oak** Shortleaf Pine/Winged Elm	**Willow Oak** **Southern Red Oak** Shortleaf Pine	19.2%	More open canopy, closed midstory dominated by green ash
FF3	Eastern Redcedar Winged Elm Shagbark Hickory	**Southern Red Oak** **Northern Red Oak** American Black Cherry	14.4%	Lots of leaf litter, mid-story dominated by green ash and winged elm
FF4	Sweetgum Tulip Poplar Mockernut/Shagbark Hickory	**Northern Red Oak** Eastern Redcedar Mockernut Hickory	15.6%	N/A
FF5	Sweetgum Eastern Redcedar Slippery Elm	Tulip Poplar **Southern Red Oak** Shortleaf Pine	14.0%	Crossed two ravines, the lowest point in Area E, possibly a more naturally mesic forest
FF8	**Northern Red Oak** Sweetgum Shortleaf Pine Shagbark Hickory Eastern Redcedar American Black Cherry	**Northern Red Oak** **Black Oak** **Southern Red Oak**	19.1%	Runs up the central ridge and therefore assesses the state of a more naturally dry-mesic community

Methods

Starting at an arbitrary tree (Tree 0), we established each 100-meter-long and 5-meter-wide transect using a reel tape. When setting up our transects, we chose a direction that would yield a representative sample of the habitat and avoided taking the "path of least resistance" to reduce bias in the sample. We conducted surveys within each transect that captured the woody species present at all life stages: seedlings, saplings, small trees, and mature trees.

- Seedlings were defined as woody species < 0.5 m tall, and we surveyed them by placing 1-by-1 square meter quadrats on either side of the transect every 5 m and counting all seedlings within them. These quadrats were alternately placed right against the reel tape and 2.5 m away from the reel tape to more accurately characterize the seedling distribution across the entire transect.
- Saplings were defined as woody species ≥ 0.5 m and < 2 cm in diameter. Every sapling in the transect was counted.
- Small trees were defined as woody species ≥ 2 cm in diameter but < 10 cm in diameter at 1.37 meters high (diameter at breast height or DBH). Every small tree in the transect was counted, and the DBH was recorded.
- Mature trees were defined as woody species ≥ 10 cm DBH. Every mature tree in the transect was counted, and the DBH was recorded

Every 10 meters, we also measured canopy cover using a spherical densiometer, following standardized practices.

Is Forest Mesophication Occurring at Fisher Farm?

In short, yes. **While the forest canopy in Area E has numerous mature oaks, suggesting historical dry-mesic site conditions, the presence of fast-growing mesophytic species among all tree growth stages indicates advanced mesophication** (Figure 2). Common mesophytic offenders include green ash and winged elm (Nowacki & Abrams, 2008), each of which we see in abundance at FF, along with other mesophying species (Figures B1-B4, Table C1). As a consequence of mesophication, all oak regeneration stages—seedlings, saplings, and small trees—are present in numbers well below the amount needed for successful regeneration. Below, we examine each tree life stage to better understand the impacts of mesophication.

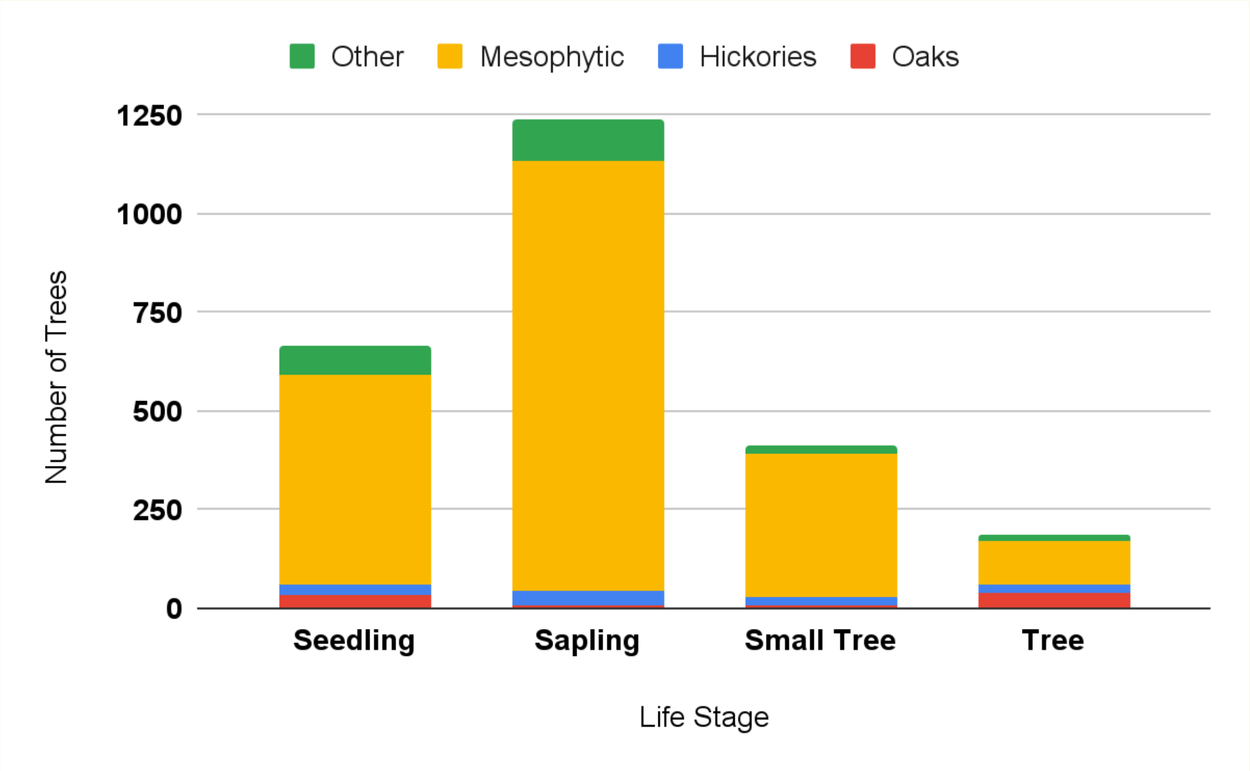

Figure 2. Absolute abundance by life stage (seedling, sapling, small tree, and tree) for oaks, hickories, mesophytic species, and other species from all Area E transects (Table B1).

Mature Trees/Canopy

While mesophytic species like eastern redcedar and sweetgum dominate the mature trees numerically, fire-adapted species like oaks and hickories contribute to a sizable proportion of mature canopy trees (Figure A1). Further, oaks, hickories, and other dry-mesic species disproportionately contribute the most to the forest's basal area, indicating that these slow-growing species are the largest and oldest trees (Table 1). Among FF's mature trees (DBH ≥ 10 cm)—which are pole-size and larger—oaks make up 21.4% (40 trees), which translates to 55 large oak trees per acre. Due to their abundance, larger size, and canopy exposure, indicating high seed production capabilities, **oaks at FF have the potential to produce large acorn crops and future oak trees under good conditions** (Rose et al., 2011).

Small Trees/Midstory

Despite the high proportion of mature oaks, there were very few small oaks (midstory trees between 2-10 cm DBH). Of this size category, only 1.2% (5 trees) were oaks, equaling 7 young oaks per acre. Instead, mesophytic species such as green ash and winged elm were widespread among the small trees (Figure A2). For comparison, analogous forest sites in other studies averaged around 325 small oaks per acre (Bölöni et al., 2021). **Given this, the density of young oak trees at FF is inadequate to support future replacement of canopy oaks**.

Saplings

Again, green ash and winged elms dominated the sapling life stage. Autumn olive, an invasive shrub species, also contributed to this life stage (Figure A3). Just 0.6% (8 saplings, or 11 saplings per acre) were oaks. **Based on some estimates, between 100 and 200 saplings per acre are needed for proper oak regeneration, which is an order of magnitude greater than what is found currently at FF, further suggesting extreme ORF** (Stringer, 2016).

Seedlings

We recorded a more even distribution of seedlings among species, with the exception being green ash, which overwhelmingly dominated the forest floor in many parts of Area E (Figure A4). Importantly, only 4.8% (32 seedlings) of the seedlings were oaks, amounting to 44 oak seedlings per acre. Other studies in similar habitats have found 3625 oak seedlings per acre, suggesting that **oak regeneration at FF is impaired in part by a relative absence of oak seedlings** (Lorimer et al., 1994).

Anticipated Effects of Proposed Prescribed Fire

The 2023 Fisher Farm report noted dense midstory, low light levels, and a lack of herbaceous cover in the forest floor (Smith et al., 2023). The species evenness of the forest was also low, with green ash and winged elm dominating in terms of abundance. The same was seen on the forest floor; vines such as Japanese honeysuckle, crossvine, and grape dominated coverage of the forest floor and most other herbaceous species were relatively rare. Our surveys this year (2025) found similar results with green ash and winged elm dominating the dense midstory (Figure A2). At the seedling level, green ash and other mesophytic species (tulip poplar, black cherry, and winged elm) were most abundant with a similar lack of evenness as noted in 2023. **Collectively, these results are consistent with the low light levels and mesophication of Area E, leading to low herbaceous biodiversity (2023 report), low potential for oak regeneration, and dominance by common mesophytic tree species (2025 surveys).**

How would the planned prescribed fire affect the current conditions? Because the terrain in Area E is so varied, we should expect that a low-intensity fire under typical late dormant season conditions would create a mosaic of fire effects on vegetation. The fire will be most intense, with the greatest fuel consumption and mortality of midstory species, along ridges and slopes, and least intense in lower, damper areas associated with ditches and ravines (Weir, 2009). These differing effects have the advantage of creating a mosaic of plant communities across which a greater diversity of species can exist (Parsons & DeBenedetti, 1979), while addressing mesophication in parts of the landscape that were historically drier.

Within Area E, ridgelines are the driest habitats, and were probably dry-mesic oak-hickory forests. These areas tend to receive the most sunlight and retain the least water, making them ideal habitats for oaks and hickories, many of which compete well under dry-mesic conditions. This is reflected in the canopy, where the majority of space is taken up by slow-growing, fire-adapted oaks and hickories. However, the abundance of winged elm, autumn olive, and musclewood in the shrub layer and small tree stage suggests that intermediate mesophication has occurred along the ridgelines. **A low-intensity burn will be most**

effective on these ridgelines and will consume the top layer of leaf litter, enhancing the germination and growth potential of fire-adapted tree seedlings and herbaceous species (Van Leer & Watt, 1992; Harper, 2020). Additionally, many of the small fire-intolerant, mesophytic trees and shrubs will be top-killed. Although many top-killed species, including mesophytic species, will resprout after fire (Harper, 2020), the "setting back" of mesophication by a fire will provide an opportunity for oak seedlings and herbaceous species to regenerate, leading to increased diversity of herbaceous cover compared to the 2025 and 2023 surveys, respectively (Benz et al., 2025). Top-kill of the dense understory would achieve one management objective of improved light penetration to the forest floor in areas where small trees were creating the most shading. Other than fire-intolerant species, we expect that the majority of mature trees would survive a low-intensity prescribed fire, especially if care is taken to clear their bases of large debris beforehand, helping to ensure their survival during the burn (Harper, 2020).

Despite the above possible benefits of a prescribed fire, changes initiated by a fire will not persist without regular maintenance. Given the density of mature mesophytic species, resprouts and seedlings will quickly outcompete slow-growing oak seedlings. Thus, **if this prescribed burn is successful, future prescribed fires or other interventions should be considered.**

Depending on the goals for Area E, there are several options for the fire return interval after a first prescribed fire. As examples, to maintain a more open forest, dominated by herbaceous species and ideal for bird and deer forage, frequent fires (every 1-2 years) are needed (Harper, 2020). In contrast, fire every 3-5 years allows for a mix of herbaceous and woody species in the understory and provides time for a midstory to develop (Harper, 2020). Sporadic fire every 5-8 years keeps the understory dominated by woody species and keeps the midstory quite dense, making it ideal bedding and nesting habitat (Harper, 2020). Given that the Wildlife Enhancement Collaborative aims to increase biodiversity and wildlife value in FF, a return interval of 2-5 years may be preferred. To best promote oaks within Area E, regular fires should continue until surveys show that a significant portion of understory mesophytic regrowth has been killed, then should cease for a longer period (~10 years) so that oak seedlings have a chance to grow undisturbed until they are large enough to withstand fire (Van Leer & Watt, 1992; Blankenship et al., 2023). **Most importantly, however, fire return intervals and prescriptions and future interventions should be flexible and adjusted based on observed conditions ("treat it as you see it").**

Burn Follow-Up

The prescribed burn is the first step in what is likely a longer journey of management at Area E. The burn will likely clear out much of the dense midstory, but many sections of Area E will still have closed canopies owing to the density of mature trees. Additionally, after just one burn, many of the top-killed mesophytic species will resprout, necessitating more attention in the future if not addressed with additional prescribed fires or other management interventions.

Forest Stand Improvement

In the first few growing seasons after the spring 2026 burn, surveys should be conducted to reassess canopy closure. Currently, **the majority of Area E is classified as an almost**

entirely closed canopy with an average canopy closure of 84.78%, meaning only around 2 to 5% of available sunlight reaches the forest floor (Harper, 2020). However, herbaceous plants and oak seedlings generally require at least 15% sunlight and prefer more than 40% sunlight for proper growth (Wang & Bauerle, 2005). In FF, canopy closure is determined primarily by two forest layers: the midstory and the canopy. If successful, the prescribed burn will reduce midstory closure by top-killing the dense layer of green ash and winged elm, but it will not strongly affect overstory canopy closure, assuming a low-intensity fire. Post-burn canopy closure surveys can assess the impact of the reduced midstory on light levels and will help to determine what further action is needed.

In locations that still have high levels of canopy closure, canopy thinning should be considered. Thinning can be implemented using girdling, hack-and-squirt, hinge-cutting, or felling, though the lower-intensity girdling and hack-and-squirt methods are likely the better option in Area E. Girdling and hack-and-squirt both use a chainsaw or hatchet to shallowly cut the inner bark layer (fully around the tree for girdling and every few inches for hack-and-squirt), followed by application of an herbicide into the wound so that the tree dies, usually within one growing season (Smith, 1986). These methods have the dual benefits of increasing sunlight in the stand and creating snag (standing dead wood) habitat for a variety of birds, mammals, reptiles, and arthropods (Harper, 2020). **To simultaneously provide benefits to oaks, thinning can be focused around mature oak trees in a technique called crown release.** This method involves killing competing trees surrounding mature oaks to create more growing space (Harper, 2020). The canopy gaps left by these competing trees allow oaks to spread their crowns by as much as 25 percent within one growing season, enabling them to produce larger acorn crops. Within five years, crown-released eastern white oaks can increase acorn production by 65%, benefitting wildlife and improving oak regeneration (Brooke et al., 2019).

Proposed Timeline (Should be Adjusted Based on Observed Future Conditions)

- During the first growing season following the prescribed burn, resurveying Area E is crucial to document what species are sprouting and which have died from the fire (Harper & Keyser, 2016).
- At the same time, canopy closure should be documented to determine the need for other forest stand improvements (i.e., thinning and canopy release).
- In 2-5 years, plan and execute another prescribed burn to further open the understory.
- Repeat until mesophytic growth is stunted. Four burns have been shown to reduce mesophytic growth and promote oak growth in the midstory, though the ideal number of burns for Area E will depend on the tenacity of mesophytic sprouts (Blankenship et al., 2023).
- Allow eight to ten years for oak to grow large enough to withstand fire.

Preliminary Survey of Area F

Area F is a 45-acre mixed hardwood forest adjacent to Area E. In summer 20205, we conducted a preliminary survey of a single 100 by 5 transect along a ridge in Area F, using the same methods described above.

Unsurprisingly given its close proximity and presumably shared land use history, the forest in Area F shows similar patterns to the forest of Area E, including evidence of mesophication and ORF. The younger growth stages of trees (seedlings, saplings, small trees) are dominated by mesophytic species despite an oak-hickory dominant canopy (Figures 3 and A5-A8). ORF is also clearly documented as multiple mature oaks are present with nearly a complete lack of younger oaks at any growth stage more advanced than seedlings (Figure 3). Although additional data is needed in this location, future research will likely denote Area F as a suitable candidate for a future burn. As we learn from the outcome of the scheduled 2026 burn, these lessons can be used to better prepare for future burns at FF.

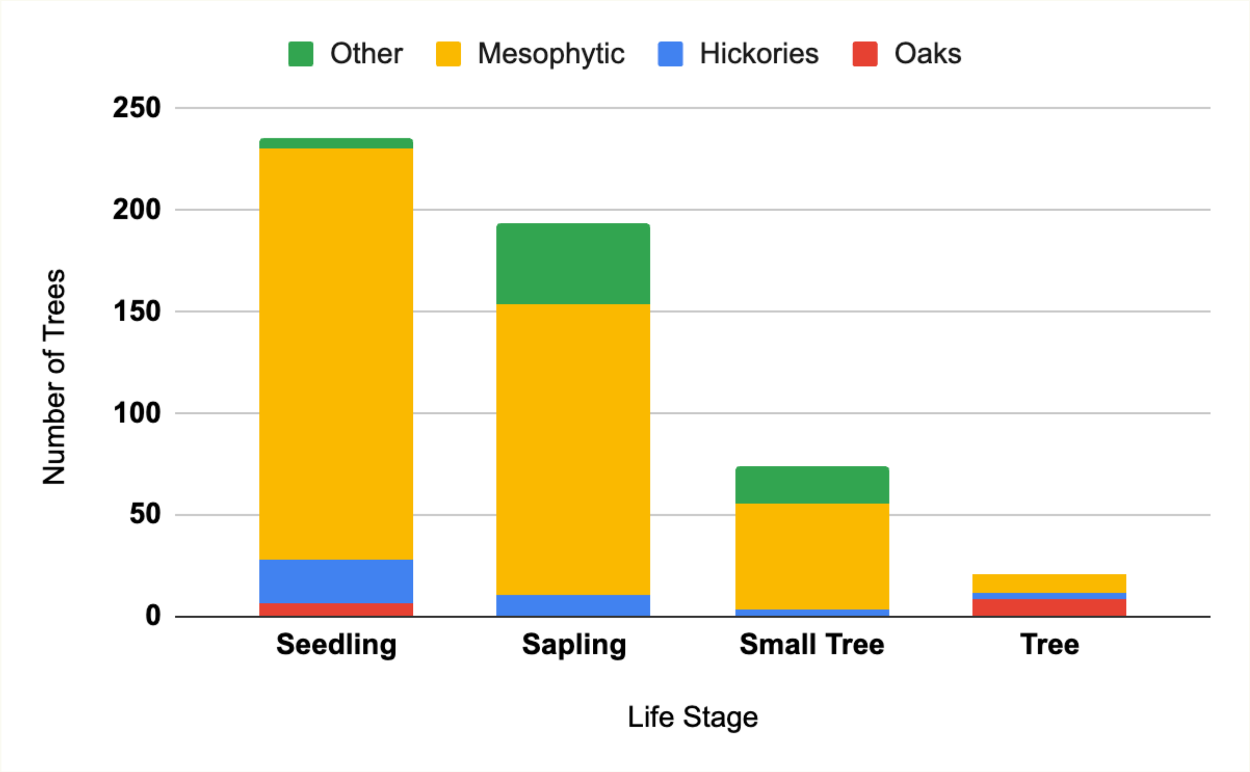

Figure 3. Absolute abundance by life stage (seedling, sapling, small tree, and tree) for oaks, hickories, mesophytic species, and other species from the Area F transect (Table B1).

Conclusion

Forest habitats at Fisher Farm are what one would expect for North Carolina Piedmont forests. Among the largest trees, the forests show the history of the previous dominance of oak-hickory dry-mesic forests. In contrast, younger parts of the forest, i.e., small trees, saplings, and seedlings, show changes associated with the lack of fire, canopy closure, and deer overabundance that typify modern forests in this region. In the eastern United States, mesophytic hardwood forests are common, and the oak-hickory forests and the ecosystem services they are replacing are becoming rare.

There are the large oaks and hickories in the canopy at Fisher Farm, and management interventions could ensure the survival of some oak-hickory forest at FF. **Given the widespread decline of oaks, the decline of oak-hickory forests more broadly, and**

the wildlife value of dry-mesic oak-hickory forests with herbaceous understories, management of FF forests to reduce mesophication and support oak regeneration would align with many of the goals of the DLC's Wildlife Enhancement Collaborative. The required management interventions are well-known and studied, but restoration of this type is not "one and done" and will require follow-up and future commitment.

Appendix

A. Figures

Area E:

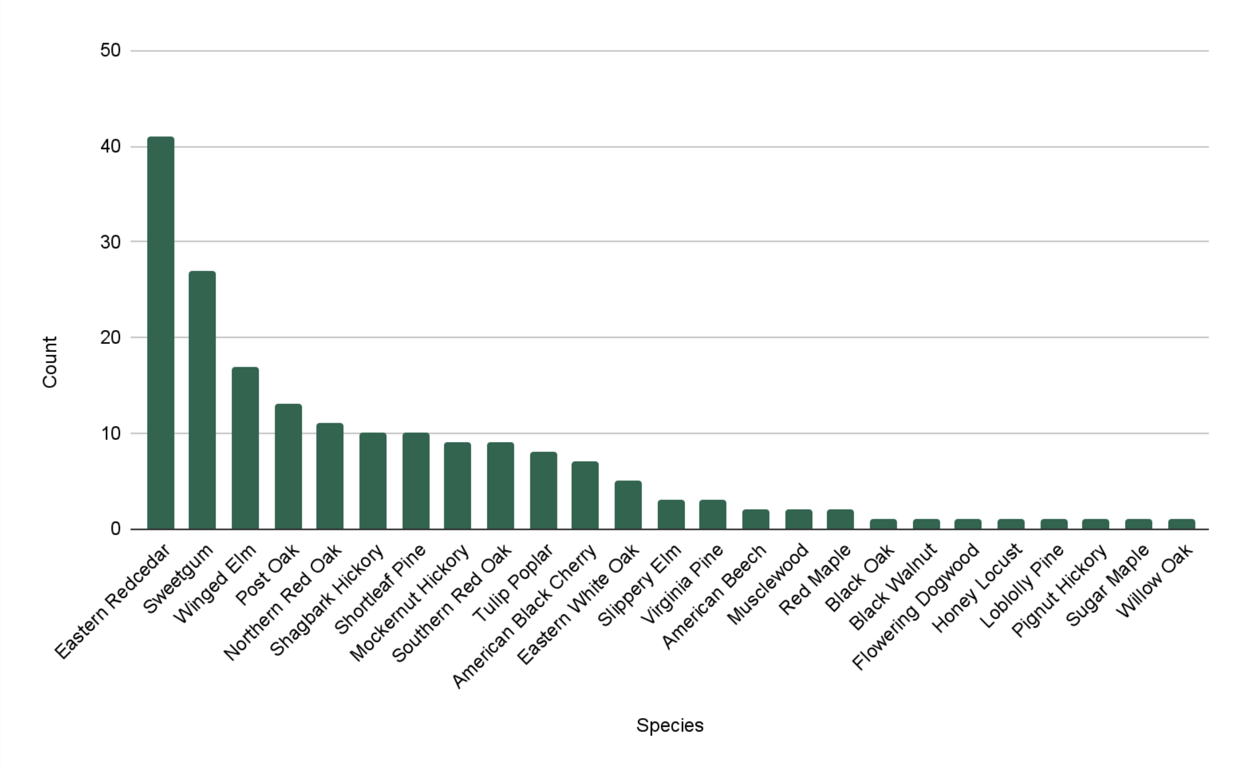

Figure A1. Tree (DBH ≥ 10 cm) species abundance across all Area E transects; High proportions of eastern redcedar and sweetgum, while oaks and hickories make up a substantial portion.

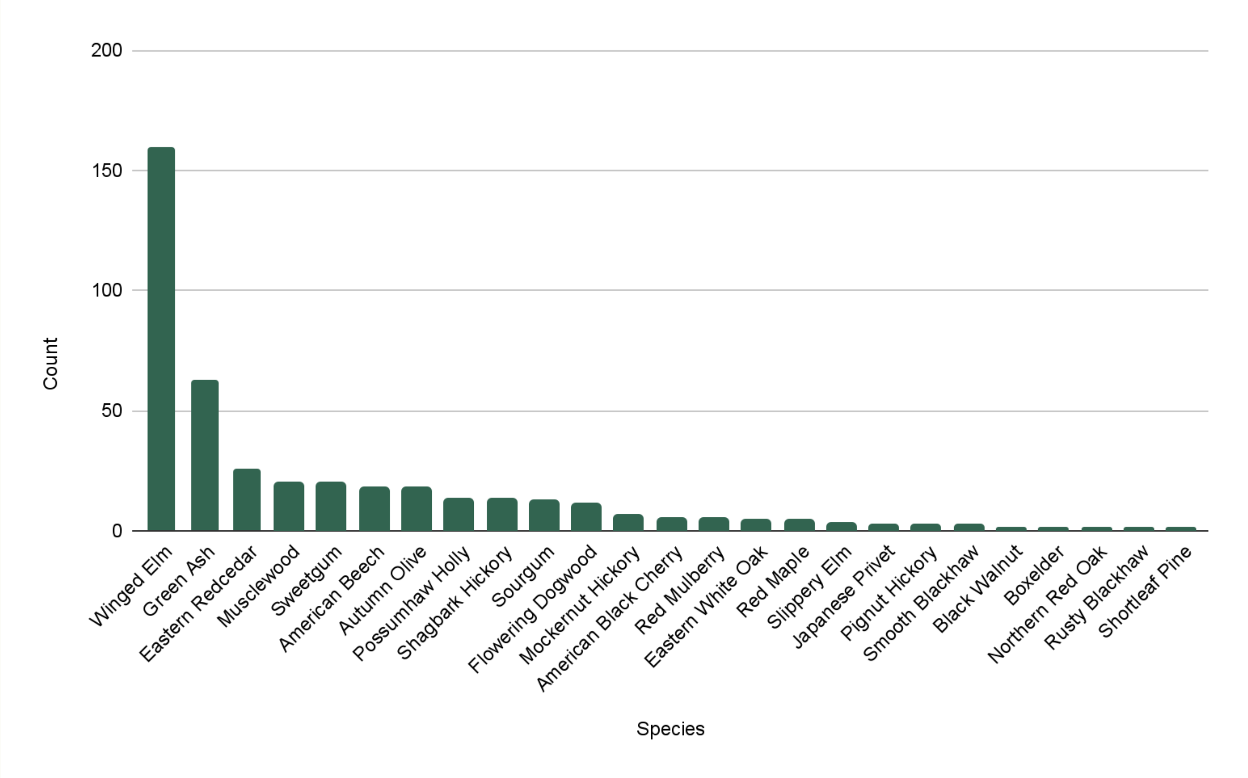

Figure A2. Small tree (2 cm ≤ DBH < 10 cm) species abundance across all Area E transects; the majority is winged elm and green ash, and there are almost no small oak trees.

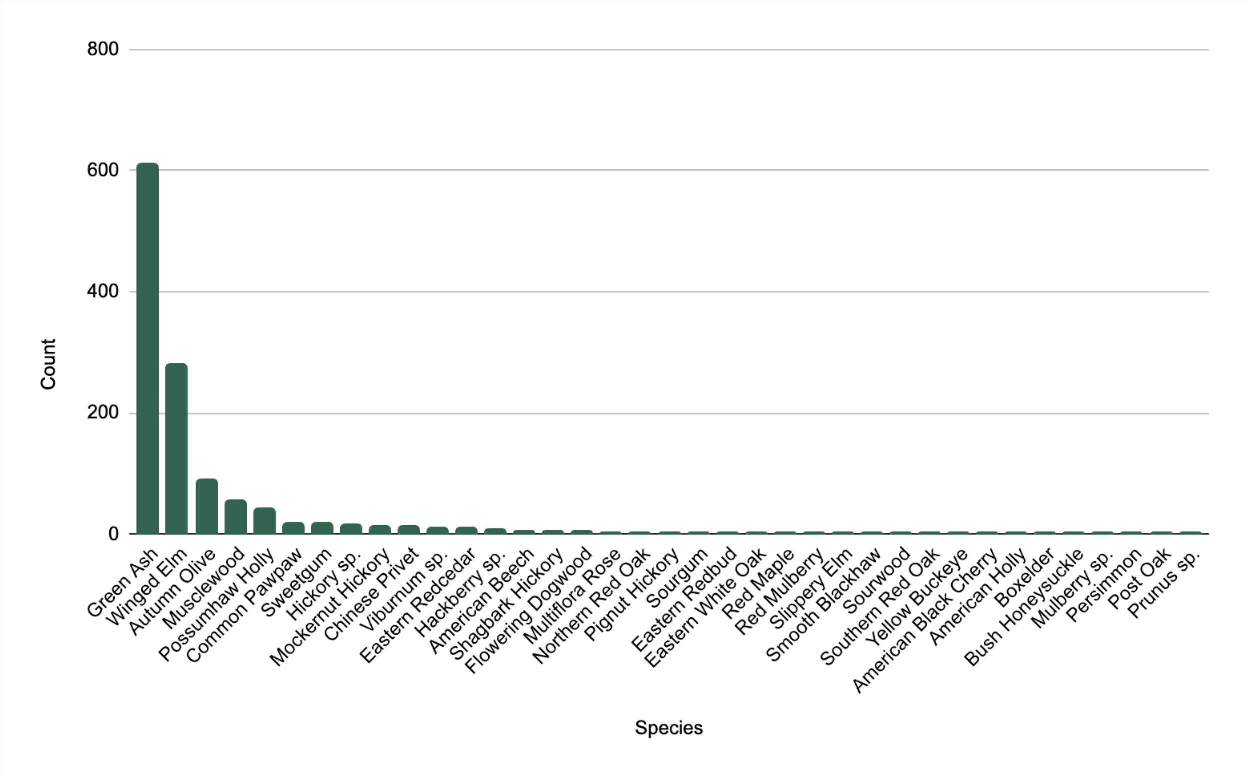

Figure A3. Sapling (DBH < 2 cm, height ≥ 0.5 m) species abundance across all Area E transects; the majority is green ash and winged elm and there are almost no oak saplings.

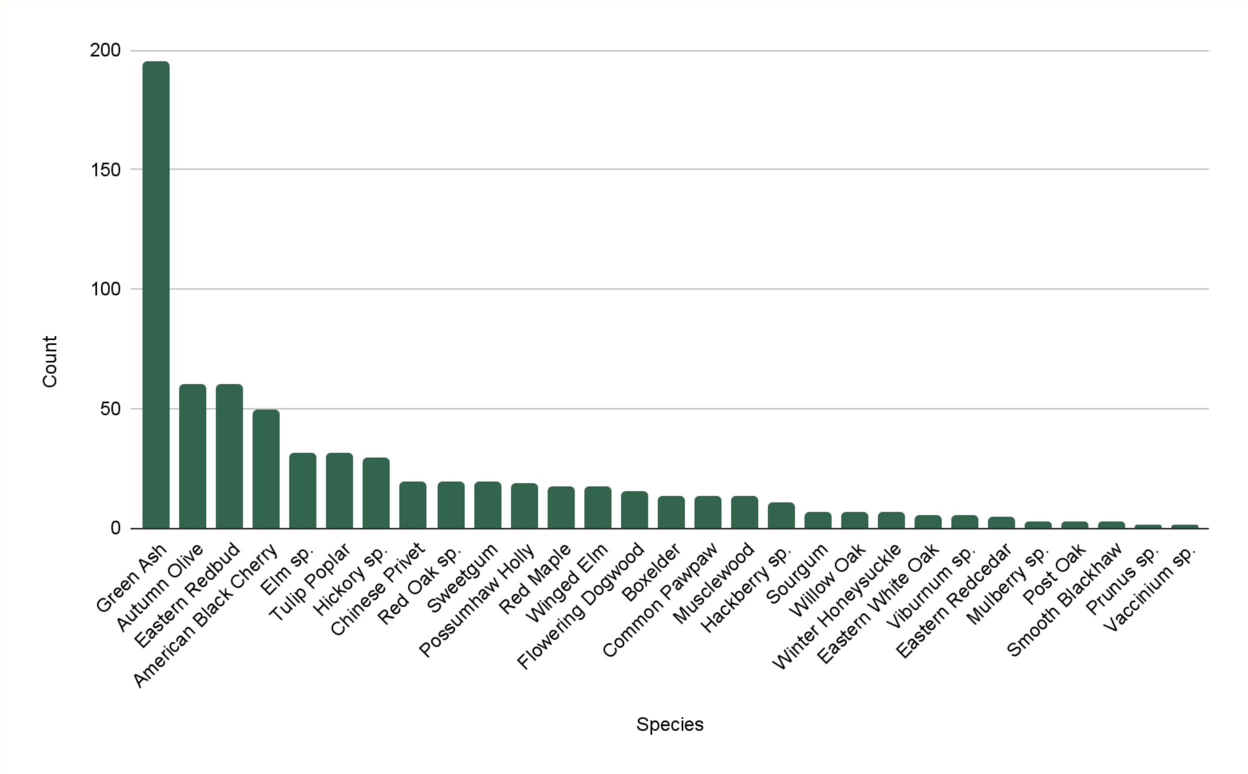

Figure A4. Seedling (height < 0.5 m) species abundance across all Area E transects; very high proportions of green ash and low amounts of oak seedlings.

Area F:

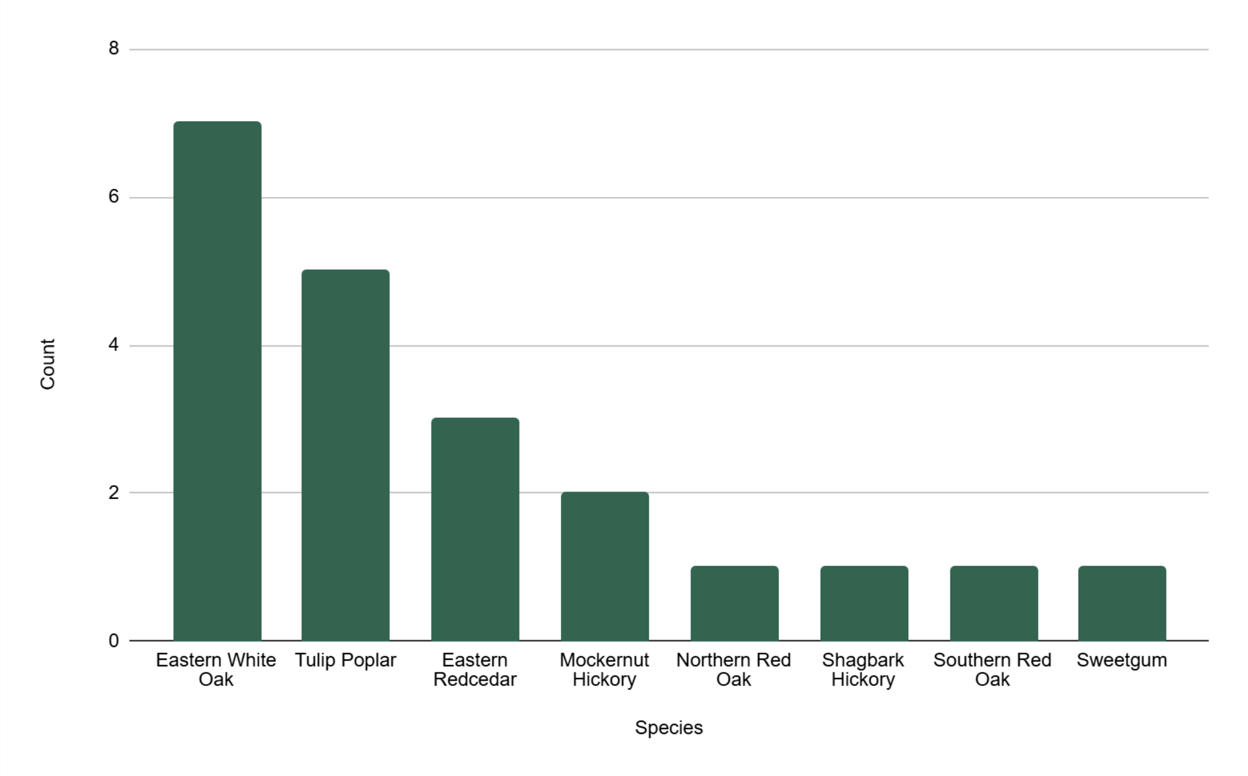

Figure A5. Tree (DBH ≥ 10 cm) species abundance from Area F transect; mainly oaks and hickories.

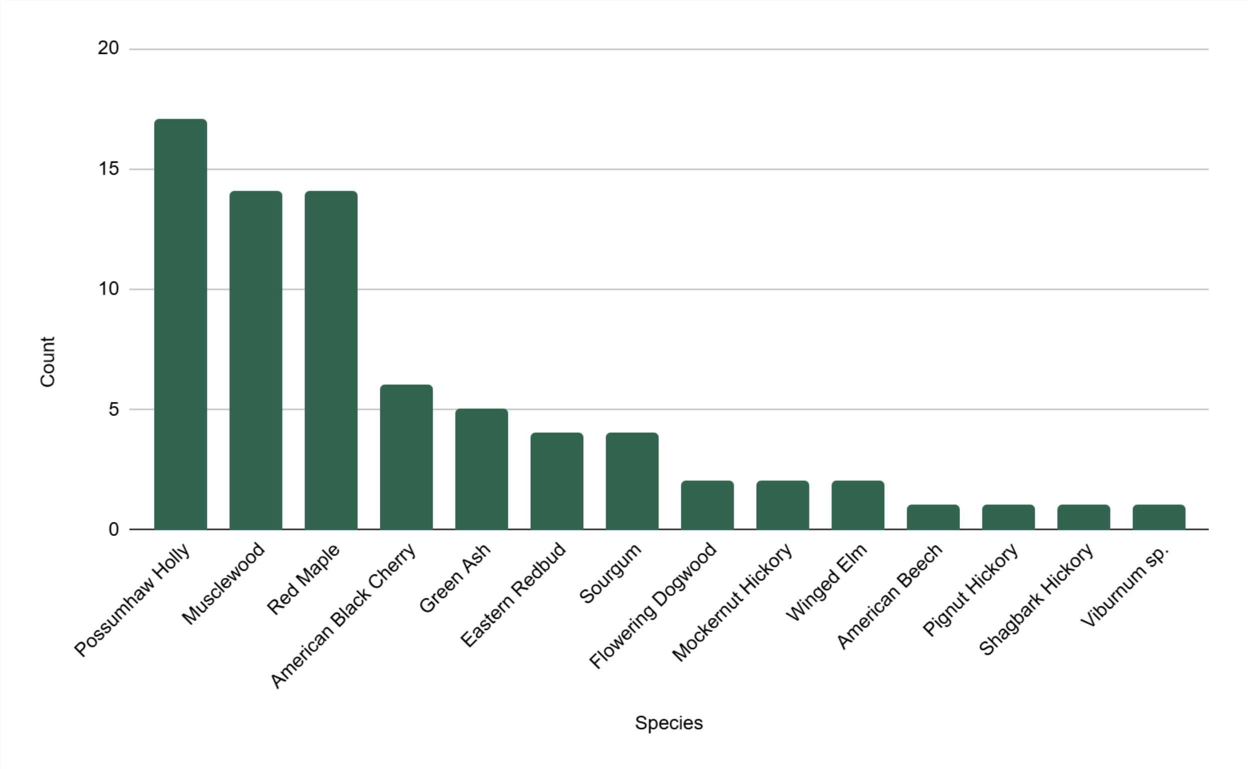

Figure A6. Small tree (2 cm ≤ DBH < 10 cm) species abundance from Area F transect; nearly every species observed was mesophytic and there is not a single small oak tree.

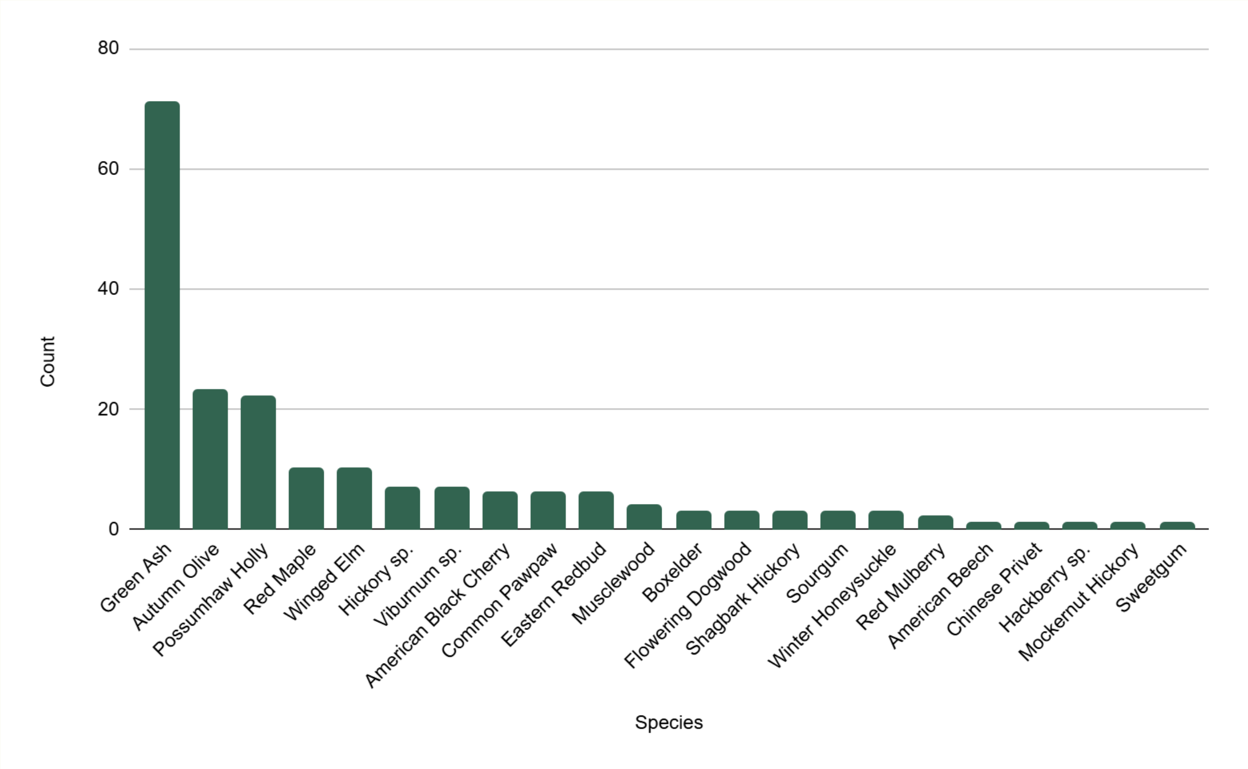

Figure A7. Sapling (DBH < 2 cm, height ≥ 0.5 m) species abundance from Area F transect; very high proportions of green ash, and there is not a single oak sapling

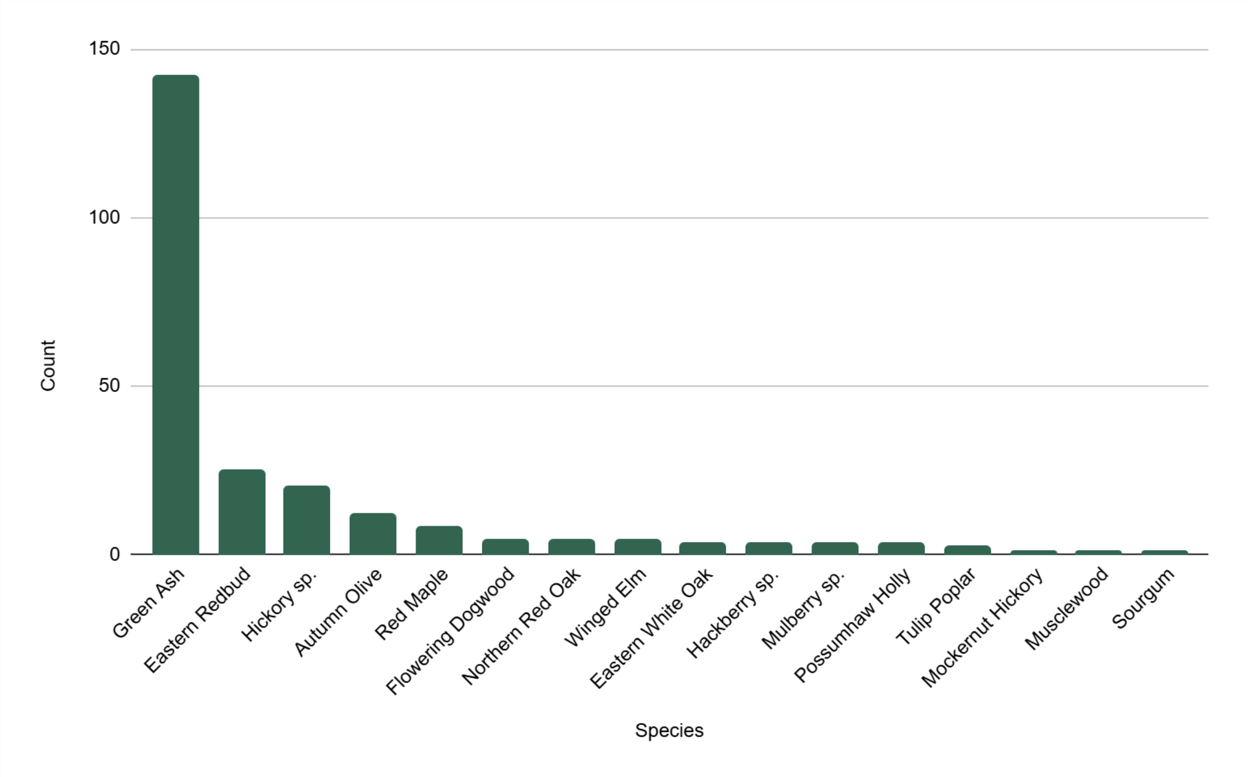

Figure A8. Seedling (height < 0.5 m) species abundance from Area F transect; very high proportions of green ash and very few oak seedlings.

B. Tables

Table B1. Woody species surveyed at FF are sorted by category: oak, hickory, mesophytic, or other (adapted from Arthur et al., 2021; Hale & Peterson, 2024).

Oaks	**Hickories**	**Mesophytic**	**Other**
Black Oak Eastern White Oak Northern Red Oak Post Oak Southern Red Oak Willow Oak	Black Walnut Mockernut Hickory Pignut Hickory Shagbark Hickory	American Beech American Black Cherry American Holly Autumn Olive Boxelder Eastern Redbud Eastern Redcedar Flowering Dogwood Green Ash Musclewood Red Maple Red Mulberry Slippery Elm Sourgum Sugar Maple Sweetgum Tulip Poplar Winged Elm	Chinese Privet Common Pawpaw Hackberry sp. Honey Locust Japanese Privet Loblolly Pine Multiflora Rose Persimmon Possumhaw Holly Rusty Blackhaw Shortleaf Pine Smooth Blackhaw Sourwood Vaccinium sp. Viburnum sp. Virginia Pine Winter Honeysuckle Yellow Buckeye

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