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LEADER

BRANCHING OUT

VOLUME XV — ISSUE 2

SUMMER 2022

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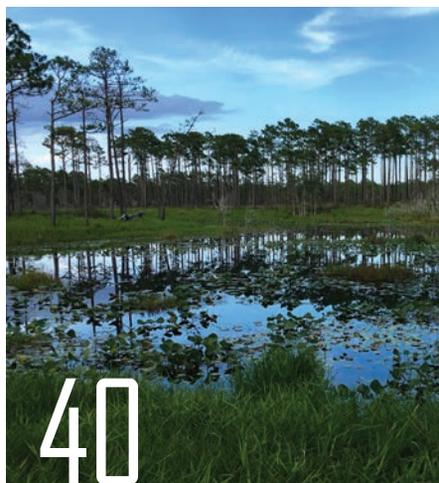
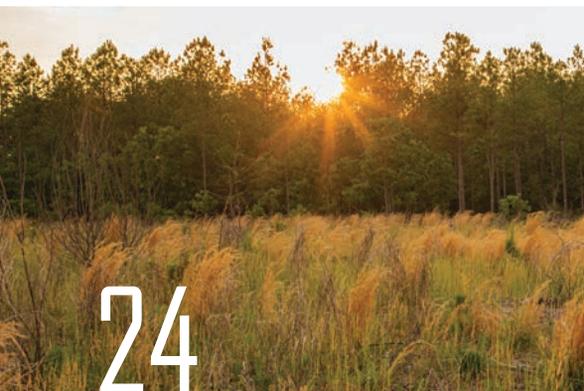
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TABLE OF CONTENTS



PRESIDENT'S MESSAGE2
 Management Checklist.....3
 Letters from the Inbox.....6
 Plant Spotlight.....8
 Window into Wildlife10
 GREEN SIDE UP12
 Elements Contributing To Successful
 Application of Prescribed Fire16
 RESEARCH NOTES20

LANDOWNER CORNER24
 TECHNOLOGY CORNER28
 REGIONAL UPDATES32
 ARTS & LITERATURE38
 Longleaf Destinations40
 PEOPLE44
 SUPPORT THE ALLIANCE46
 Heartpine48

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 COVER Longleaf pine canopy against the blue sky of summer. Photo by Lisa Lord.

The Longleaf Leader is an official publication of The Longleaf Alliance, 12130 Dixon Center Road, Andalusia, Alabama 36420 and is published quarterly. The Longleaf Alliance reserves the exclusive right to accept or reject advertising or editorial material submitted for publication. Advertising rates quoted upon request. Postmaster: Send address changes to The Longleaf Alliance, 12130 Dixon Center Road, Andalusia, Alabama 36420. Periodicals Postage Paid at Montgomery, Alabama.

The Longleaf Alliance PRESIDENT'S MESSAGE



CAROL DENHOF

Branching Out

Many of us will immediately picture our favorite tree — the longleaf pine — when hearing the word ‘branching.’ Longleaf pines certainly have distinctive, stout branches that serve as one of the identifying characteristics we look for when distinguishing it from other southern pines. These branches hold the tufted clusters of long needles and large cones aloft by reaching up and away from the tree's trunk. This arrangement allows ample light to filter through to the forest floor, encouraging the abundance of plant and animal species that support the overall diversity for which this system is known. And the structure of the canopy and branches of a longleaf pine adds to this species' resilience to high wind events like hurricanes and tornadoes.

In terms of our longleaf efforts, though, we want to think of “branching out” in the context of how it relates to initiating different activities and opportunities. These new activities must be aimed at keeping our existing partners engaged and reaching new audiences. We are a stronger collaborative when we incorporate a variety of perspectives, experiences, and skills into our strategies for getting more and better work done on the ground. Building out this community of thinkers and doers is instrumental to pushing forward the shared goals and objectives of The Longleaf Alliance and our partners within America's Longleaf. These lines from Suzy Kassem's poem *Forked Branches* bring to mind the beginnings of the longleaf effort, the growth and expansion of our partnerships over the years, and the

different roles that we all play in our similar dream of bringing back longleaf:

*And though our roots belong to
The same tree,
Our branches have grown
In different directions.
Our tree,
Now resembles a thousand
Other trees
In a sea of a trillion
Other trees
With parallel destinies
And similar dreams.*

“Branching Out” to increase the amount of longleaf restoration and conservation occurring in the Southeast is an important topic and one that we will focus on at the upcoming Biennial Longleaf Conference in Wilmington this October. We will examine ways to increase awareness of the longleaf ecosystem and widen the longleaf restoration community tent by bringing non-traditional partners into our efforts. Reaching outside of the traditional longleaf box allows us to expand our reach and make meaningful long-term advances in longleaf restoration.

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MANAGEMENT CHECKLIST | SUMMER

EVALUATE YOUNG STANDS

- + **Inspect recent longleaf plantings** and plan future treatments if problems are noted.
- + **Mow or spray problematic species** such as crabgrass, coffee weed, partridge pea, hairy indigo, and other emergent weeds. Old fields seldom burn well until grasses become major components.

PREPARE FOR PLANTING LONGLEAF

- + **Secure soil samples** for selected longleaf restoration sites.
- + **Subsoil (rip) sites with hardpans** when very dry; do so early enough to allow time for the furrow to settle before planting season.
- + **Order longleaf seedlings** for upcoming plantings as nurseries may sell out of their entire inventories early. Find a list of preferred nurseries at longleafalliance.org.
- + Secure contractors for any **chemical site-prep treatments**. For maximum efficacy, foliar-active herbicides such as glyphosate (Roundup®/Accord®) should be applied to actively growing pasture grasses at their most receptive stage. If targeting waxy species, triclopyr (Garlon®) may be applied now or delayed until after the first frost to minimize impact to herbaceous groundcover.

TACKLE INVASIVE SPECIES PROBLEMS

- + **Repeated herbicide applications** will likely be necessary to combat problematic species such as kudzu, cogongrass, bermudagrass, climbing fern, bicolor lespedeza, bahiagrass, and fescue.

PRIORITIZE PRESCRIBED FIRE

- + **Growing-season burns** may continue into the summer if the weather allows.
- + Not good burning weather? **Conduct post-burn evaluations** to determine if previous burns achieved objectives, including woody control.
- + Prepare for future burning by **creating firebreaks**.

NATURAL REGENERATION

- + If natural regeneration is part of your plan, **conduct longleaf pine cone counts** to estimate cone crop for Fall 2022.
- + **Perform a seedbed preparation burn** on mature longleaf stands with good cone crops before seed fall (October-November). The goal is to increase the likelihood that longleaf seed falls on bare mineral soil but not so clean that predators can easily find and destroy most of the new seed.

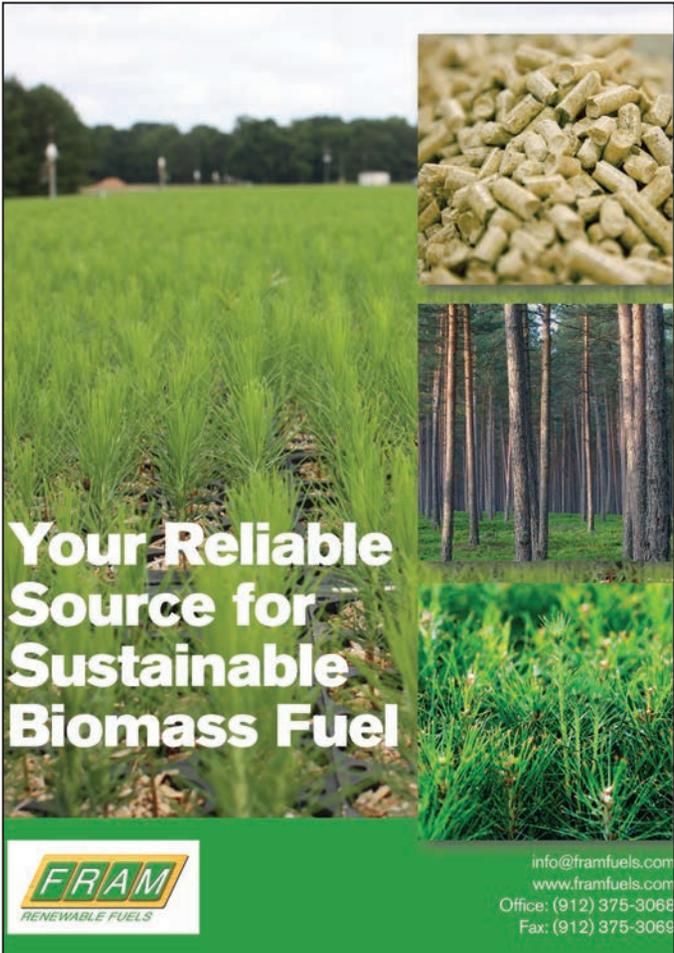
GROUNDCOVER RESTORATION

- + **Order native seed for understory restoration**. Although some landowners have the time and expertise to collect their own, most projects will use purchased seed.
- + A few companies sell southeastern sourced seed, but seeds from local ecotypes and endemic species are limited and expensive.

PLAN FOR COOLER WEATHER

- + Too hot to go out? Now is a great time to **review, update, or create a management plan**. Numerous partner organizations are willing to help, and often there are incentives to assist.

Reach out to The Longleaf Alliance with any questions you have about establishing and managing longleaf stands at longleafalliance.org/contact.



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Q&A

Well-established wiregrass site with regular prescribed fire. Photo by Jacob Barrett.

Q. Dear Longleaf Alliance,
My husband and I have just recently made a move to Florida's panhandle, and we are looking to restore our five acres of land to the native longleaf ecosystem. Our home site is a former peanut field. We are especially interested in providing a diversity of plants, much like we would see in a restored system. What steps should we take to prepare the site for planting, and what species should we plant? We are also trying to decide if we should plant the longleaf seedlings first or the groundcover? Is there financial assistance available?

- New to the Sunshine State

A. Dear Sunshine State,
We are excited that y'all have such a great interest in reclaiming an old agricultural site for a home and restoration area! The first step to take would be to evaluate what species you have on the site. Being a former ag field, it is unlikely that there is anything botanically important to save. Still, there may be some problem species that would hinder or adversely impact your efforts. Bermuda grass, bahiagrass, or cogongrass are all possible – so be on the lookout. If you happen to have any of these species present, it could take as long as two years of treatment to eradicate these problem species. Proper identification and field preparation upfront will save you headaches down the road.

As for the question about species, your efforts may be best spent on establishing grass species. Species selection would vary based on the specific site conditions, but assuming that you have a sandy upland site, the bulk component would likely be comprised of wiregrass (*Aristida beyrichiana*) with honorable mentions to dropseeds (*Sporobolus* spp.), indiagrass (*Sorghastrum* spp.), and

bluestems (*Andropogon* spp., *Schizachryium* spp.). When you order your seed mix, you may add in additional species like forbs and pollinator species. If you happen to miss out on some species in the initial planting, fear not – you can always supplement your initial planting with additional species for years to come. It is also worth noting that when buying your seed, make sure that the vendor is selling local ecotype seed. This is important because we want to ensure a somewhat “foreign” seed stock will not outcompete the rest of our mix.

There are compelling reasons to establish the groundcover before placing trees on the site. Once longleaf seedlings are in the ground, any invasive species problems are complicated as herbicide options narrow drastically, so as not to adversely affect the trees. However, if you plant the groundcover first and wait to plant longleaf, the groundcover should be growing by year two or three, and any residual invasive species will have been treated. From there, a prescribed fire on the acreage will prepare the area for planting longleaf. Fire will top kill encroaching hardwoods and loblolly pines, which if left alone, will quickly shade out the planting area. Fire will also clear the thatch layer creating a receptive seedbed for any additional groundcover species that you may want to supplement.

As for financial assistance and incentives, your local USDA-NRCS may have programs that apply to your management plan. When the time comes, The Longleaf Alliance is a dependable source for help with locating longleaf seedlings.

Keep us updated on the project!

Sincerely,
The Longleaf Alliance

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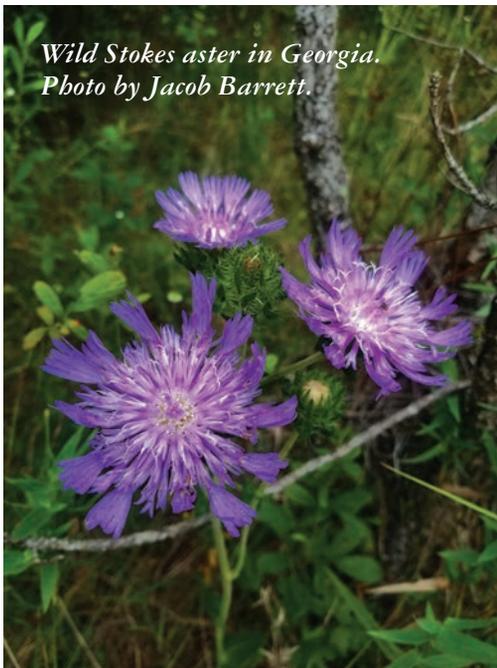
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By Sarah Crate, The Longleaf Alliance

PLANT SPOTLIGHT

Stokesia laevis (Hill) Greene
Stokes Aster
Asteraceae (Aster Family)



*Wild Stokes aster in Georgia.
Photo by Jacob Barrett.*



*Cultivated plant from
a Florida garden. Photo
by Margaret Platt.*

DESCRIPTION

Stokes aster is a low-growing perennial, 1-2 feet tall, with a basal cluster of dark-green, lance-shaped leaves. Its numerous violet-blue flower heads appear in the summer, with an outer whorl of lobed flowers surrounding a central disc of small, tubular florets in the center. Cultivars vary in flower size and color, including white, yellow, and pink.

Stokesia is a monotypic genus containing the single species *Stokesia laevis*.

DISTRIBUTION & HABITAT

Stokes aster is a Coastal Plain native found in wetlands and moist pinelands from South Carolina to Louisiana. Wild populations range from relatively common in its Gulf Coast range to rare in its eastern range. It is state-listed as critically imperiled in Georgia due to the small number of wild populations.

WILDLIFE VALUE & AVAILABILITY

A number of Stokes aster cultivars are available in the horticulture trade. It is a great choice for perennial beds with other natives to attract insects, including butterflies.

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*Top Left: Ellis Martin and Roy O. Martin, Sr.
Bottom: Brittany Ray - Harvest Technician, Employee since 2015*

WINDOW into WILDLIFE

Northern Long-eared Bat *Myotis septentrionalis*

By Lisa Lord, *The Longleaf Alliance*



Northern long-eared bat. Photo by Al Hicks, NYDEC.

Maternal roost in a longleaf pine tree marked with orange flagging. Photo courtesy of South Carolina Department of Natural Resources.

DESCRIPTION, DIET, & BEHAVIOR

The northern long-eared bat (*Myotis septentrionalis*) is a medium-size bat, most easily identified by its long ears. Adults are approximately 3-3.7 inches in length and have a total wingspan of 9 inches. The females are slightly larger than the males. Their fur color is medium to dark brown with tawny, pale-brown undersides. Maximum northern long-eared bat lifespan is estimated to be up to 18.5 years.

HABITAT & DIET

Northern long-eared bats overwinter in cracks and crevices of caves and spend the spring, summer, and fall months in forested habitats. They are most often found in mature trees roosting under bark in live or dead trees, either singly or in colonies. Occasionally they will roost in caves or structures.

Not only do these bats use forests for roosting, but as insectivores, they also use forests for foraging, consuming a wide variety of insects including, moths, beetles, and flies. Like other bat species, the northern long-eared bat uses echolocation to find and eat insects from the air, but they also eat prey from leaves and branches.

CONSERVATION STATUS

The northern long-eared bat is a federally threatened species. In March 2022, the USFWS released a proposal to reclassify the northern long-eared bat as endangered. The primary threat to their survival comes from white-nose syndrome, a fungal disease which has impacted cave-dwelling species throughout much of the continent. Hibernacula counts estimate that northern long-eared bats have declined 97-100% across their range. Other threats include both summer and winter habitat loss and climate change.

IN LONGLEAF

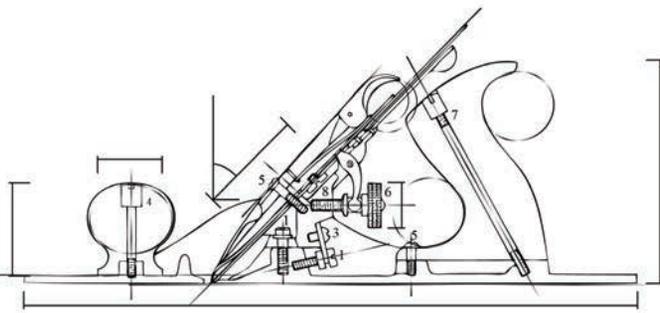
Northern long-eared bats can be found in 37 states, primarily in the eastern and northcentral U.S., and throughout Canada. Once thought to be restricted to mountainous regions in the Southeast, northern long-eared bats were discovered in the Coastal Plain of North Carolina in 2007 and South Carolina in 2016.

Several years later, for the first time, pregnant bats were found just north of Charleston, SC in longleaf habitat. They were found roosting in open, frequently burned pine stands under the bark of 85-year-old longleaf pines. Wildlife biologists with the South Carolina Department of Natural Resources observed that the female bats change roosts from night to night but generally stayed in the same location at the Santee Coastal Reserve and Wildlife Management Area. They also found that the average female roost tree had a 14-inch diameter at breast height and was approximately 58 feet tall, with only low-growing shrubs in the understory, which was an indicator of the habitat conditions this bat prefers.

Maternal roosts in longleaf pine have also been documented in North Carolina.

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- U.S. Fish and Wildlife Service. 2022. Species Status Assessment Report for the Northern Long-eared Bat (*Myotis septentrionalis*), Version 1.1. March 22, 2022. Bloomington, MN.



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PLAN NOW FOR PLANTING SEASON

By Jennie Haskell, The Longleaf Alliance

Once you decide to establish longleaf pine, more decisions await. Luckily, being armed with information on quality seedlings and planting techniques will make some choices easier. Planting season may be several months away (December to March), but securing seedlings and contractors early will significantly benefit your establishment project.

Choosing Seedlings

A landowner must decide what type of seedling to plant and which planting method to use — planting with bareroot or containerized seedlings and to machine or hand plant? Because of easier handling and the longer planting window, most of the longleaf pine seedlings sold are containerized seedlings. However, machine planting bareroot seedlings can be very successful with proper seedling handling and an experienced planter.

Site preparation, planting method, and cost may influence the choice of seedling type. Typically, containerized seedlings (\$0.20) are twice the cost of bareroot seedlings (\$0.10). Containerized seedlings can tolerate longer storage times and are easy to hand plant. However, bareroot seedlings are often the preferred seedling type when machine planting due to cost efficiency and limited need for personnel.

Tree nurseries sell longleaf pine seedlings grown from natural seed sources and sometimes genetically improved selections. Ask about the seedlings' seed source and their suitability for your location. Since most landowners only get

a few chances in life to start a new forest, The Alliance encourages choosing the best seedlings available for your location. Investing in improved seedlings may pay off with improved form. Remember to order seedlings as early as possible - many nurseries have sold out of longleaf pine seedlings the last few years.

Preparing to Plant

Seedling survival is dependent on the quality of the site preparation. Chemical application to control undesirable competing vegetation is typically done the summer before planting, sometimes followed by site-preparation burns. If using a machine planter such as a dozer, mechanical site preparation may not be necessary as a dozer with a v-blade on the front can remove debris and competing vegetation. On old field or pastures sites, subsoiling may be necessary to break up a hardpan or compacted soil, but it should be conducted in a dry summer period. Be sure to complete this at least three months before planting season to allow the soil to settle. When converting improved pastures or ag fields previously in leguminous crops, scalping can be an essential aid to successful restoration.

If the site-prep isn't sufficient to adequately control competition, waiting another year to get it right may be cheaper and easier than addressing problems while the young longleaf pine are growing.



A



B



C

A) Young longleaf stand in South Carolina. Photo by Robert Franklin.

B) Bareroot longleaf seedlings are grown in nursery beds and lifted when time to plant. Photo by Jennie Haskell.

C) "Plugs" are grown in container or cavity trays, creating well-formed plugs of soil with many roots. Photo courtesy of North Carolina Forest Service.

When investing in your new forest, hire a forester familiar with longleaf pine or consult with The Longleaf Alliance for additional information about site preparation and seedling selection. When choosing foresters and contractors, always check references.

Stay tuned for planting tips in the fall issue of *The Longleaf Leader*. In the meantime, more information on longleaf seedlings, site preparation, and planting tips is available in "Keys to Successfully Planting and Establishing Longleaf Pine" on our website at bit.ly/EstablishLongleaf.



The Longleaf Alliance is accepting applications for seedling reimbursement for the 2022/2023 planting season until July 31st. Details and request form found at longleafalliance.org/longleaf-planting-funds.



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*Photo by Dr. Robert Mitchell,
Jones Ecological Research Center*

*By Dr. Dale G. Brockway, Emeritus Scientist,
Southern Research Station, USDA Forest Service,
Auburn, Alabama*

ELEMENTS CONTRIBUTING TO SUCCESSFUL APPLICATION OF PRESCRIBED FIRE

Creating societal conditions, where prescribed fire (i.e., controlled burning) can be effectively implemented in forest ecosystems to achieve the multiple goals of long-term social, economic, and ecological sustainability, requires attention to the major elements of (1) support from scientific research and development, (2) public understanding, acceptance and cooperation, (3) enabling legislation, and (4) coordination among organizations.

Although scientific studies and the insights and tools that result serve as the fundamental basis of our knowledge about fire and its behavior across these landscapes, management experiences with fire operations during past and present environmental conditions (i.e., dynamic changes through time) are also very informative. All groups are crucial partners for program success.

SCIENCE

The ecological process of fire as a regulator of ecosystem function through periodic disturbance that transforms energy, alters structure, and recycles nutrients, is fundamental to the long-term sustainability of landscapes across our planet. Although most humans may consider fire to be only destructive, it is in reality also a violent force of renewal. Following prescribed fire, surface vegetation is reduced, mineral seedbeds are exposed, and plant species are given opportunity for rebirth through natural regeneration.

The key to living successfully with fire is to discover all that we can and then use that knowledge to facilitate its action in ways that sustain ecosystems while minimizing damage to the lives, structures, and resources that we value. Hazardous fuel reduction, altering forest structure through thinning to

inhibit wildfire spread through tree crowns, and applying prescribed fire are often noted as measures needed to develop sustainable ecosystem conditions and abate our current wildfire crisis. Although these will be helpful, it must be recognized that their application is not universal across all landscapes. For example, some forest types have longer fire-return intervals that naturally renew themselves through catastrophic fire. Prescribed fire use in such forests is problematic and likely, not appropriate.

New knowledge about fire is being discovered through ongoing studies, and a great deal is already known. This scientific knowledge must be effectively communicated to the public, management decision-makers, and administrative policymakers so that scientifically-based on-the-ground efforts to protect people and sustain ecosystems will be supported in the future.

PUBLIC

The current wildfire crisis in America should be a “wake-up call” that action is needed to address the role of fire in ecosystems. However, **public interest in wildland fire ebbs and flows in proportion to the personal risk individuals perceive, usually sparked by media reports of wildfire activity.** The optimism so prevalent in American culture typically dissuades most members of the public from dwelling on the negative and fretting about the catastrophic.

People living in or near forests have at times been victimized by their lack of knowledge, when choosing to live in an environment that periodically becomes hazardous from the accumulation of excessive fuels, compounded by drought or other adverse weather factors.

Hence, fire safety communication programs like Firewise USA® must help individuals better understand the risks involved and how they can locally mitigate these risks by their decisions and actions.

The public must understand the dynamic role of fire in ecosystems and how altering forest structure, through thinning dense stands of trees and periodically applying prescribed fire, can help diminish wildfire risk. Part of the difficulty in communication is that fire dynamics in the wide span of forest types present in the United States are complex, with varying fire-return intervals, stand structures, landscape mosaics, tree growth rates, fuel accumulation rates, topography, and local weather conditions, now compounded by broader climate change. **Translating the complexity of wildland fire into a digestible number of basic principles, which can be easily transmitted, understood, accepted, and acted upon, is a challenge that cannot be neglected.** Persuasion through fact-sharing is the principal way of encouraging people to make a substantive change that will benefit them.

Public understanding and support are essential to restoring fire as an ecological process that regulates ecosystem function. Absent these, the use of prescribed fire and other forest restoration tools is unlikely, thereby leading to more catastrophic wildfires in the future until fuels are exhausted through environmental degradation.

LEGISLATION

Right-to-Burn laws enacted in several states have empowered burning practitioners and are essential for implementing prescribed fire programs in the field. Such laws are based on an understanding of the fundamental relationship between naturally-occurring fires that historically swept across the land and the continuing need for periodic application of prescribed fire, especially in fire-dependent

ecosystems. These laws recognize the many benefits derived from periodic surface fire, such as (a) reducing the level of potentially-hazardous fuels, (b) controlling competing vegetation, including nonnative invasive species, (c) decreasing the prevalence of pest species and those which may spread disease, and (d) site preparation that facilitates the germination and establishment of desirable species through natural regeneration.

These laws also limit the financial liability of prescribed fire practitioners, as long as burning is conducted in accordance with all conditions set forth in the prescription described in their approved prescribed burning plan.

Without such liability protection, it is unlikely that many private landowners would be willing to continue this management practice.

ORGANIZATIONS

Because an active fire may cross property lines or administrative boundaries, **fire management requires an integrative approach** (a) throughout the planning phase, (b) from the time of ignition to when it is extinguished, and (c) during the post-fire assessment.

Fire professionals in federal, state and local agencies must have excellent communication and coordination to safely conduct a prescribed fire program. On any given day

during the prescribed burning season, each of them should have knowledge about (a) who is burning, (b) where they are burning, (c) what type of vegetation is being burned and (d) when the burning is scheduled to begin and end. Although burning may take place on a single ownership, it is helpful for those from other agencies and jurisdictions to participate jointly on fire crews or serve as backup and support members. Fortunately, very good cooperation currently exists among fire professionals, with many of them being equally adept at prescribed burning as well as fire suppression.

Training professionals is crucial to maintaining a knowledgeable, field-ready cadre of prescribed burning teams. Training centers should be available to provide classroom and field training for future prescribed burners and those wishing to update their knowledge and skills. Such centers may also open their curriculum to private individuals to build such a cadre in the private sector, thus fostering further development of private consultants who provide prescribed burning services to private landowners (i.e., economic development for small businesses).

In the long-term, ecosystems and their resources and society and its people will lose without enhanced understanding, support, acceptance, and collaboration to restore fire.

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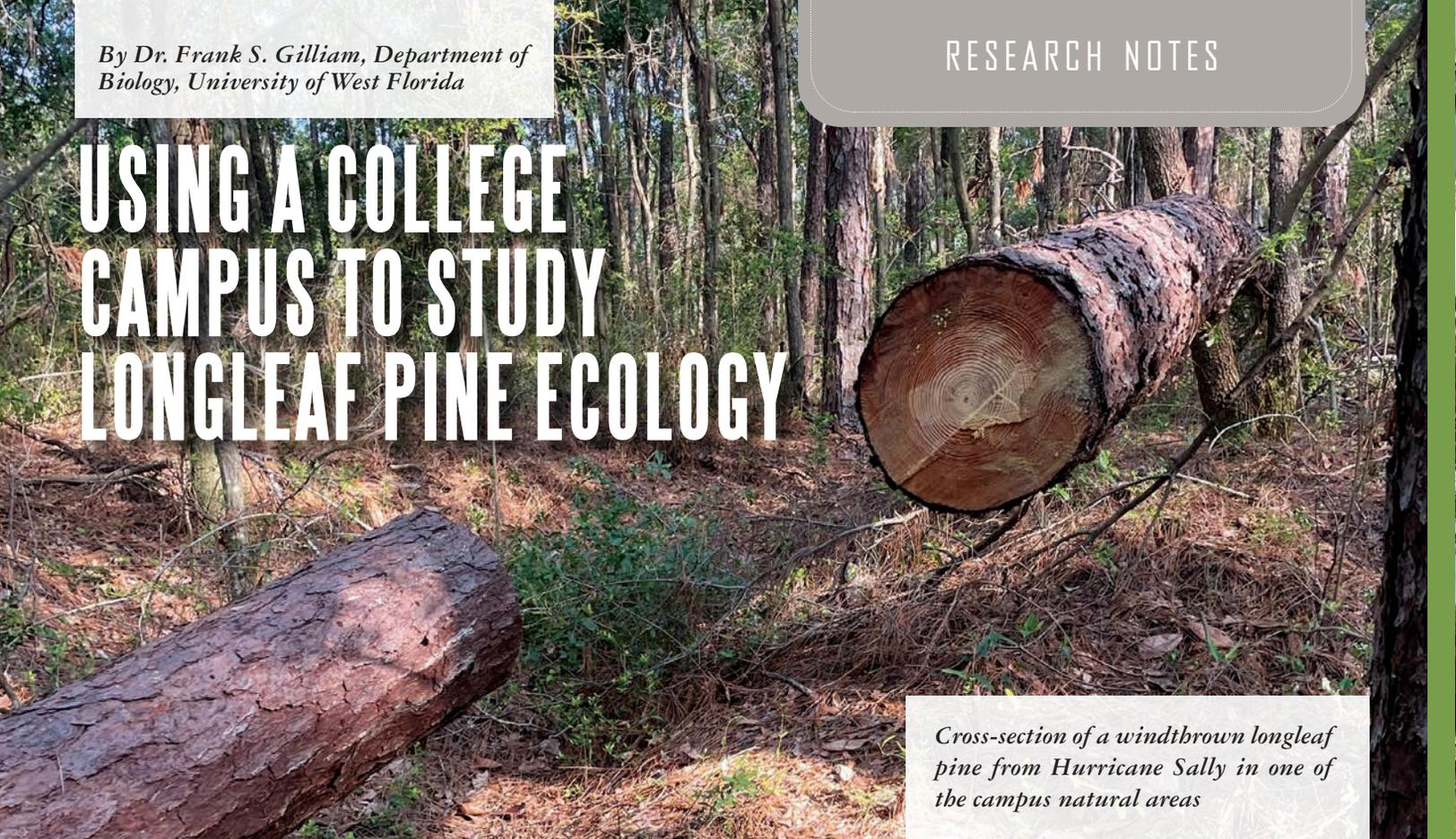
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USING A COLLEGE CAMPUS TO STUDY LONGLEAF PINE ECOLOGY



Cross-section of a windthrown longleaf pine from Hurricane Sally in one of the campus natural areas

Collegiate Urban Interface Provides Research Opportunities

Although humans have created an indelible imprint on virtually all landscapes of the biosphere (Gilliam 2016), urban interfaces represent a unique juxtaposition of human populations and the natural systems that sustain them (Barrington-Leigh and Millard-Ball 2015; Francos et al. 2019). College and university campuses comprise a distinctive urban interface, with their spatial patterns of permanent construction—dormitories, administrative buildings, classrooms, academic departments—combined with parking lots and green spaces, such as quadrangles, gardens, and arboreta.

The University of West Florida in Pensacola extends ~1000 ha, most of which remains undeveloped. It comprises the largest flora of any college/university campus in the eastern United States with nearly 900 vascular plant species (with specimens in the UWF Michael I. Cousens Herbarium).

Contemporaneous with construction was the establishment of natural areas with non-paved, low-impact hiking trails. The two most prominent were the Edward Ball Nature Trails (hereafter, Trails) and the Baars-Firestone Nature Trail (now called Baars-Firestone Wildlife Sanctuary, hereafter Sanctuary).

The campus provides a unique opportunity to study the ecology of longleaf pine in an urban interface. Such an awareness led to the initiation of the UWF Campus Ecosystem Study (CES). The CES was conceived as an interconnected series of summer research investigations funded by the Office of Undergraduate Research through its Summer Undergraduate Research Program. To date, there have been three of these, all resulting in publications in the peer-reviewed literature. In all, this research comprises the efforts of seven UWF undergraduates, with four students funded for additional work this summer of 2022.

Initial construction of the University of West Florida campus in Pensacola began in 1963 on a 405-ha area with diverse ecological features, including wetlands, hummocks, and a bayou. The most prominent of these were second-growth longleaf pine stands recovering from extensive logging of the Florida Panhandle (Knight et al. 2011). John E. Jarvis, Jr., campus designer, was influenced by the architectural philosophy of the Scottish landscape architect Ian L. McHarg, using a “design with nature” approach. Thus, campus design protected the ecological features to the extent possible, with minimal tree removal and largely maintaining original contours (Marse 2007; Jarvis 2008).



A



B



C

A. *The most obvious asset of Jarvis' vision for the UWF campus is the simple beauty one experiences by walking around the main campus and especially when hiking the nature trails. These pines were part of the second- and third-growth forest landscape within which the UWF campus was constructed.*

B. *Gopher tortoise in its burrow on the UWF campus.*

C. *Longleaf pine canopies in a UWF natural area. Note the wide spacing of the pines, typical for longleaf stands, but also the hardwoods (principally *Quercus virginiana* here) filling in an otherwise wide canopy opening.*

Main campus longleaf pines and effects of gopher tortoise burrowing

Initial work of the CES was prompted by two fundamental questions, both related to different facets of the longleaf pine ecosystem. The first was, what is the size structure (based on diameter at breast height—DBH) of the seemingly countless longleaf pine stems on the main campus. The second was, what is the effect of burrowing by gopher tortoises on soils and plant communities?

All longleaf stems ≥ 2.5 cm DBH on the main campus were measured for DBH. These data, based on >2,100 stems measured, confirmed the absence of fire (Gilliam et al. 2020), with fewer than 10% of stems being estimated to be <50 yr old.

Because of chronic fire exclusion, gopher tortoise populations at UWF are confined to power line rights-of-way. Vegetation and soil sampling were conducted in three discrete areas (types) for each gopher tortoise burrow: apron (redistributed soil outside burrow), burrow (soil above burrowed cavity), and matrix (unaltered surrounding area). For each of 16 burrows, density was determined for all vascular species; mineral soil was taken to a 5-cm depth. Air-dried soil was analyzed for pH, organic matter (OM), and extractable nutrients.

Plant density was reduced by burrowing seven-fold on apron versus burrow and matrix sites, which did not vary between each other. Soil variables did not vary between burrow and matrix samples, but apron soils were significantly lower in pH, organic matter, cation exchange capacity, and cations. Soil NO_3^- was ~3-fold higher in apron soils.

Composition and structure of chronically unburned longleaf stands

Longleaf stands of the Trails and Sanctuary sites were studied to quantify the effects of chronic fire exclusion on longleaf pine stands. We addressed these questions: (1) how does forest species composition and stand structure vary between these two sites; (2) how do soil characteristics vary between areas and change under fire exclusion? Fifteen 0.04 ha circular plots were established in each area to assess composition and structure and sample mineral soil. All live stems ≥ 2.5 cm DBH in each plot were identified to species and measured for DBH. Mineral soil samples (taken to a 5-cm depth) were analyzed for pH, organic matter, cation exchange capacity, extractable macro- and micronutrients, and extractable aluminum.

Basal area and density were similar between the natural areas, as was canopy dominance (live oak and longleaf pine) but with contrasting sub-dominant species (more *Magnolia grandiflora* and *M. virginiana* in Sanctuary stands versus *Quercus nigra* in Trails). Soil analyses revealed no significant differences between natural areas but suggested decreased soil organic matter and fertility compared to open, grass and forb-dominated sites. Diameter structure of longleaf pine contrasted sharply between natural areas, suggesting different land-use history (Gilliam et al. 2021).

Using hurricane-windthrown longleaf stems to study diameter/age relationships

Previous studies (e.g., Gilliam et al. 2020) attempted to estimate age of longleaf pine stems on the main UWF campus

Figure 1

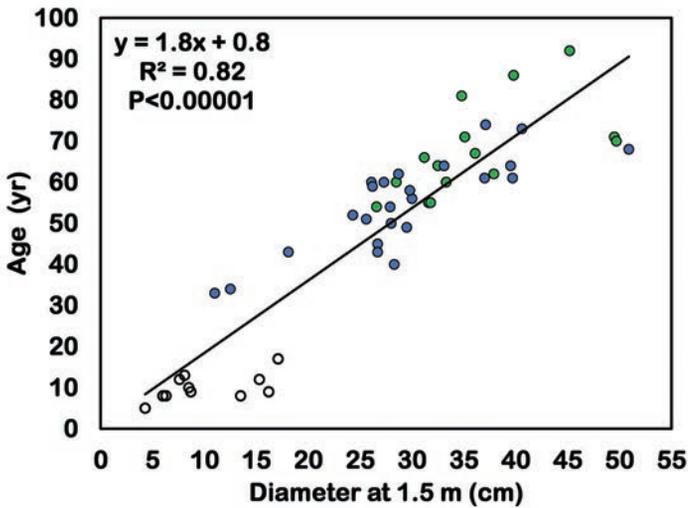


Figure 1. Longleaf age (yr) versus diameter (cm) at 1.5 m from base for 50 samples from Trails (blue circles), Sanctuary (green circles), and harvested stems (white circles).

Figure 2. Age-class distributions of longleaf stems at UWF based on the age/DBH model generated in this study, including the main campus (black bars, from Gilliam et al. 2020) and each of the two natural areas (blue and green bars, from Gilliam et al. 2021).

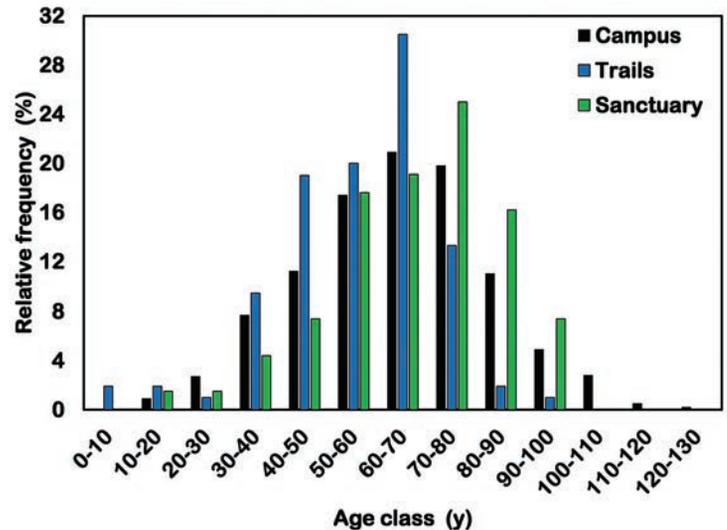


Figure 2

based on a model from old-growth longleaf in southern Georgia, concluding that oldest stems were just under 200 yr old and that >80% of stems on the main UWF are between 50 and 125 years old. More accurate age data can be obtained from disks collected locally from recently fallen trees. On 16 September 2020, Hurricane Sally impacted UWF as a Category 2 storm, with winds reaching 49 m/sec (~110 miles per hour). Our study took advantage of longleaf pine blowdowns by Sally to obtain cross-sections for age determinations, sampled primarily in the Trails and Sanctuary areas. For each sampled section, DBH and number and width of annual rings were recorded.

Based on a total of 50 sampled trees, linear regression revealed a highly significant relationship between DBH and age (Figure 1). Applying this to DBH measurements of 2,165 stems on the main campus, as measured in the summer of 2019 (Gilliam et al. 2020), indicated that the oldest longleaf pines are ~130 years old (mean age = 63.9 ± 0.4 yr), consistent with cessation of historically widespread harvesting in the region. Mean age for the Trails site (55.7 ± 1.6 yr) was significantly lower than that of the Sanctuary (66.7 ± 2.0 yr), again suggesting that they represent sites of contrasting land-

use history (Figure 2). Annual growth rates of older pines were mostly negatively correlated with temperature, a finding with implications for the future of longleaf pine ecosystems under anthropogenic climate change. This study confirms that college/university campuses can be used as units of ecological study, and can do so in a way that takes advantage of stochastic events such as tropical cyclones (Gilliam et al. 2022).

Conclusions

The UWF CES comprises a series of connected studies on the remnant longleaf stands from which the campus was originally constructed, with each of these sequentially building on the previous one. These studies have gone far in providing further understanding of the ecology of the longleaf pine ecosystem and its dynamics in the uniqueness of the urban interface of a university campus. With the current work of this summer 2022 investigating variation in soil microbiomes between longleaf- versus hardwood-dominated stands, the research opportunities provided by the campus natural areas seem almost limitless.

Acknowledgements

I would like to acknowledge the dedication and hard work of my undergraduate students/co-authors: Emily E. Harmon, Skylar C. Boyles, Selina J. Detzel, Katy D. Bray, Emily A. Major, Heather N. Patten, and Sarah K. Rabinowitz. I also thank the UWF Office of Undergraduate Research (Dr. Allison Schwartz, Director) and the Hal Marcus College of Science and Engineering for funding.

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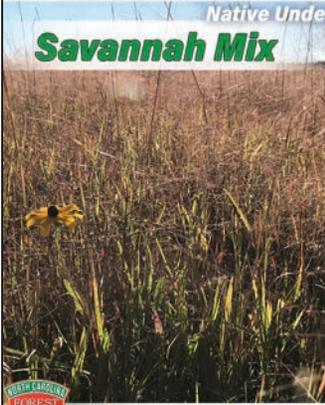
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UTILIZING LONGLEAF RESTORATION TOOLS

in the North Carolina Sandhills

By Carol Denhof, The Longleaf Alliance

The once abundant longleaf pine forests of North Carolina are much depleted due to the long-term effects of resin collection, overharvesting of trees, and lack of management with prescribed fire. Fortunately, there are landowners across the state who are bringing back this ecosystem.

As they begin their longleaf restoration journey, landowners often face overgrown properties with a long history of fire exclusion and an abundance of woody plants in the understory instead of desirable native groundcover. To reach their full potential as working forests with longleaf's characteristic open and park-like structure, timber harvests and prescribed fire are essential management tools for restoring stands and ensuring forest health.

On some sites, one harvesting strategy available is fuel chipping – a tool to remove undesirable hardwoods and pines to kickstart longleaf restoration while also providing income to the landowner. This income helps the landowner to push forward with management practices, bringing them closer to achieving their restoration goals.

What is Fuel Chipping?

Fuel chipping is when low-quality wood is chipped and processed to form pellets for energy. Companies like our partner Enviva, a global renewable energy company specializing in sustainably sourced biomass, begin their process by sourcing the most sustainable raw materials, including fiber from low-value wood, tops and limbs, thinnings, and mill residues. These materials typically would

be left behind or burned in the field to make way for the next generation of lumber-grade timber.

“Being able to sell low-grade hardwood for pellets has helped my clients manage their property. When the chip market came along, we had a by-product to generate income to help the restoration process plus clean up a lot of the mid-story, remove loblolly, and leave the longleaf in place. Some projects would not have happened without being able to get rid of that by-product,” said David Halley, consulting forester with True North Management Services.

First-hand restoration examples are important learning tools for those working to restore longleaf pine forests. Meet two North Carolina landowners, Ann Rogers and Hand Me Down Farms, who share their experiences restoring longleaf and how fuel-chipping helped.

Ann Rogers

Ann Rogers is a landowner in Montgomery County, North Carolina. Her unique property is located on the fall-line between the Coastal Plain and Piedmont regions of the state and has been in Ann's family for multiple generations. After inheriting the property, she is working to restore the longleaf pine ecosystem by thinning, planting, and burning with the goal of permanently protecting the land through a conservation easement. Fuel chipping has been utilized in the thinning process and provides some income that helps fund other work on the property.

*Ann Rogers, Montgomery County,
North Carolina*



Originally, I didn't have a goal for the property until I learned about longleaf. I was thrilled to know that something good could come from this, and these 200 acres would never have concrete on them. - Ann Rogers



Family members meet with their forester and others to discuss management options at Hand Me Down Farms.



A ~200-year-old pine stump shows evidence of turpentine at Hand Me Down Farms.

Photos courtesy of Eniva

Hand Me Down Farms

Hand Me Down Farms in the Sandhills of North Carolina is collectively owned by siblings Christina Williams Smith, Teresa Williams Byers, and Tracy Williams Overton-Pritchard as an LLC. Because of his farming experience, George Byers (husband to Teresa) has taken on the farm and land manager role. The family has learned about the benefits of longleaf and its history on their land and actively manages the forested areas with prescribed fire to enhance the ecosystem. Hand Me Down Farms is an active member of the Sandhills Prescribed Burn Association that engages

landowners to work together to return fire to the landscape.

Additionally, they are in the process of restoring 50 acres of longleaf pine habitat on their property. A combination of canopy, understory thinning, and fuel chipping has reduced competition for the trees and native groundcover, promoting a healthy ecosystem. By working closely with a network of foresters, loggers, and other partners, they can convert what was once land that was difficult to manage into a healthy forest system that supports the many plant and animal species that call the longleaf ecosystem their home.

The three girls lived here all their lives, and they saw the property grow up over time. When we started talking about thinning, they weren't sure that's what they wanted to see. Once it happened, it was very clear to them that things looked much better. Now you can sit in the center of the farm with a 360-degree view. They are proud we were able to do that while preserving what their grandparents and parents worked so hard to do. – George Byers



The Longleaf Alliance is working in partnership with Enviva to bring these additional tools to landowners focused on longleaf restoration. If you think this process could help you on your land and are interested in learning more about this longleaf restoration opportunity, please send a message to sustainability@envivabiomass.com.

Stand prior to treatment with a dense scrub oak midstory. This overly thick growth inhibits healthy herbaceous groundcover and regeneration of longleaf pine. By resetting the midstory, the site will open up, and sunlight will hit the ground and encourage a diverse groundcover release.

Maximizing restoration potential

When managing working forests, like many privately owned properties where longleaf pine occurs in the southeastern United States, it is important to look at all available tools to maximize restoration outcomes. If these strategies also bring some income to help with the process,

that is even better for the landowner. In the long run, by using harvesting tools like fuel chipping and other management activities to improve forest health, landowners will see their land as an asset that provides value on many levels and is worth keeping intact for the next generation.

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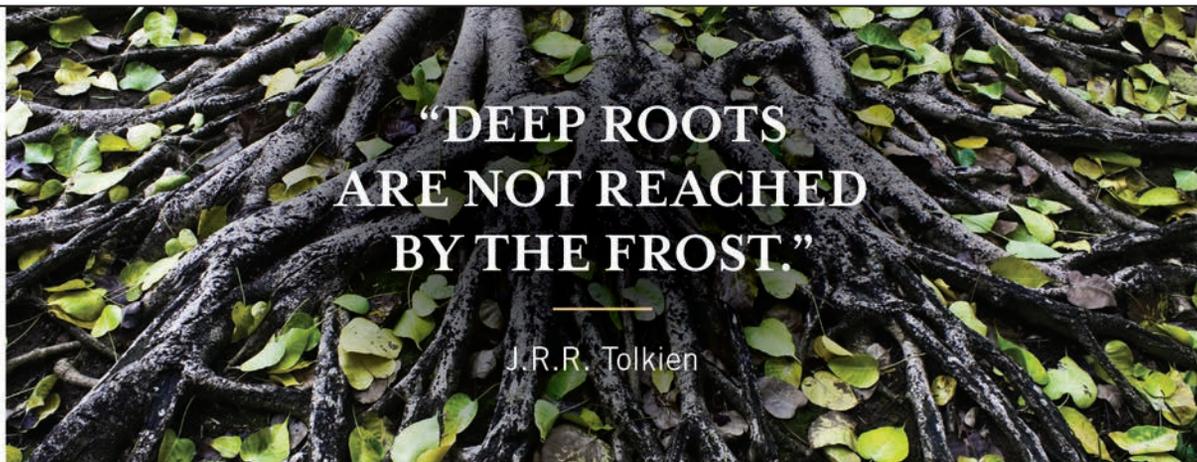
ACRES

67M

FOREST OFFSETS ISSUED

\$750M

TOTAL PROJECT REVENUE



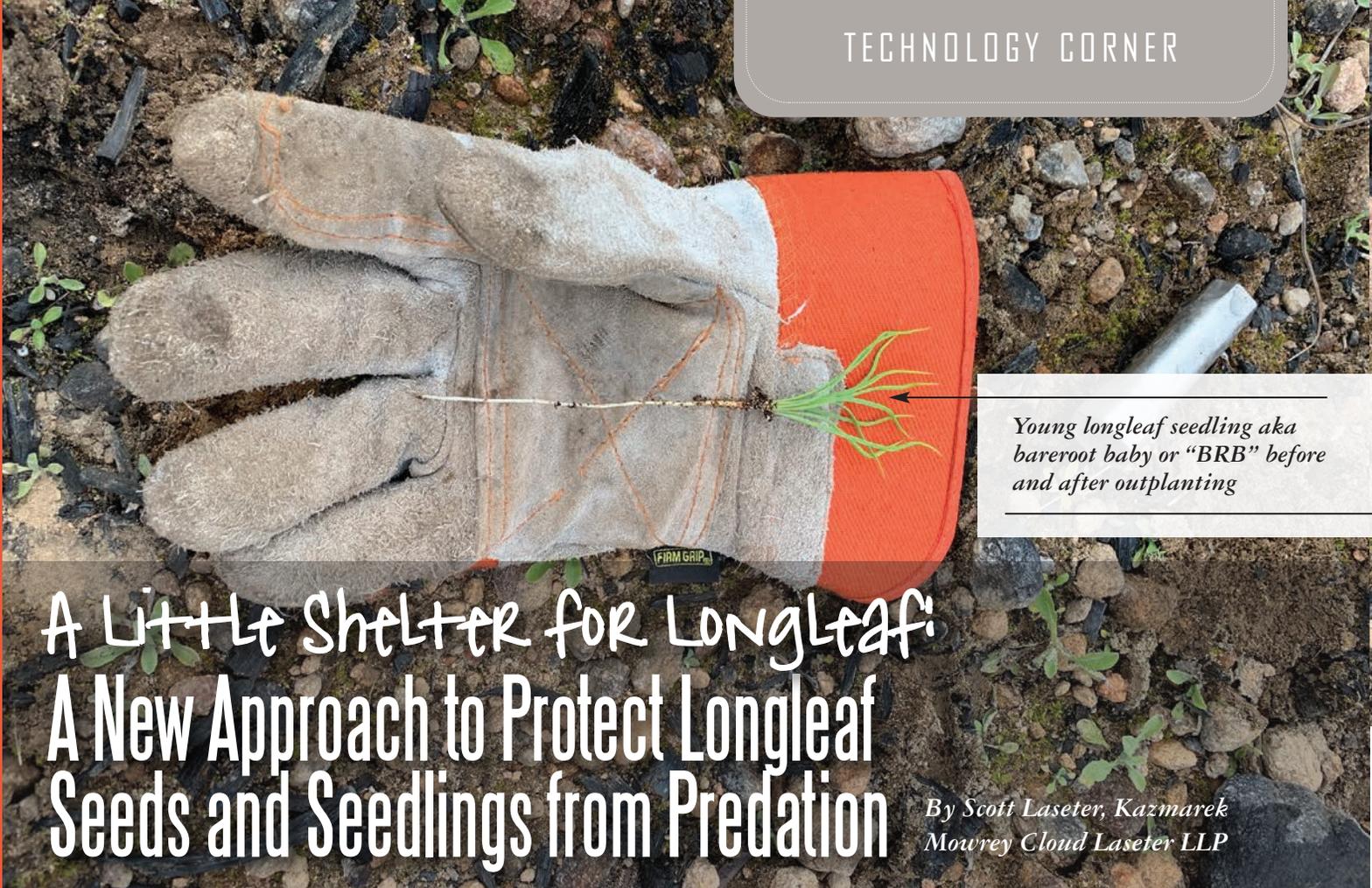
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J.R.R. Tolkien

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Young longleaf seedling aka bareroot baby or “BRB” before and after outplanting

A Little Shelter for Longleaf: A New Approach to Protect Longleaf Seeds and Seedlings from Predation

*By Scott Laseter, Kazmarek
Mowrey Cloud Laseter LLP*

In the last century, longleaf luminaries like James P. Barnett labored mightily to develop direct seeding techniques for regenerating the iconic tree, including the use of aircraft and various ground operations. However, heavy predation losses from birds, rodents, and insects overtaxed the seed sources and made direct seeding unreliable. Canadian foresters during the same period tried biodegradable seed shelters for regenerating conifer species in the boreal forests but vegetative fouling, the price of plastics, and labor requirements caused abandonment of those efforts. Direct seeding has mostly vanished.

Today, longleaf is regenerated almost exclusively with container or bareroot seedlings raised in nurseries. The expense and site preparation requirements of these methods make longleaf impractical for some reforestation projects.

I am one of those landowners for whom nursery seedlings are not a great fit. My property sits in the comparatively isolated montane longleaf region of Georgia. The ground is rocky and sloping, making site preparation for planting seedlings challenging at best. In addition, one of my hopes is to preserve whatever genetic adaptations might exist among the 100-year-old+ remnant longleaf on the property. Sources for nursery-grown seedlings are limited and their ancestry uncertain.

What if regenerating longleaf could be as easy as sticking seeds in the ground and watching them grow?

I have spent much time trying to find easier ways to get from cones in the trees to seedlings on the forest floor. My plodding path of discovery started with just picking up cones off the ground. To my surprise, I found that extracting hundreds or

even thousands of viable seeds from cones fumbled by fox squirrels or dislodged by other random forces was not at all difficult. After learning to cull seeds based on the clear sound they make when dropped on plastic, I began with sowing the good ones in flats and then transplanting to containers. Seeing how easily the seedlings shrugged off transplanting just days after germination, I tried putting a few in the woods. They tolerated relocation to the forest surprisingly well.

Bareroot Babies

Planting what I came to call bare root babies (or “BRBs”) in my rocky soils is a lot easier than planting containerized seedlings. Transplanting BRBs merely requires poking a hole with a spare chainsaw tool or screwdriver, inserting the seedling, and giving the spot a couple extra pokes to secure the taproot.

If left unmolested, BRBs transplanted to the woods appear to have survival rates comparable to natural seedlings at the same age and, in the best microsites, will begin height growth in the second year. Unfortunately, almost nothing newly introduced in the woods remains unmolested for long. Deer seem especially curious, and a plucked seedling laying on the ground at the tip of a fresh hoof print was a distressingly common sight.

Direct Seeding

I finally thought to skip the transplanting operation altogether and sow seeds in the woods with the same care I used sowing flats. It worked! A longleaf seed stuck in the ground wing end up is about as likely to germinate in the forest as one



Prototype shelter (homemade from compostable plastic cup) on a 1.5-year-old seedling, immediately before and after test fire

similarly planted in a greenhouse. I call this method precision direct seeding (“PDS”).

Of course, countless creatures love a longleaf seed. I found, however, that predation rates taper quickly, with losses becoming rare after three months. By covering a precision-planted seed with something as simple as an upside-down strawberry basket, I achieved germination and three-month survival rates exceeding 50%, and one-year survival rates better than 20%.

It takes little experience or imagination to recognize that sticking a seed in the ground and covering it with a little basket compares favorably in terms of total system inputs to starting a seedling in a nursery and then transplanting it to the forest. Further, if “success” is defined as having a seedling thriving in the desired spot after one year, and a method achieves a single-seed survival rate of 20% after one year, simple statistics means planting two seeds per spot should produce a success rate surpassing 35%, and three would near 50%.

Keeping Away Predators

I experimented with a variety of temporary shelters to overcome the animal vandalism, which greatly reduced early losses. Further, the removal of the shelter a couple of months later did not produce the same uptick in predation or other mayhem that accompanied planting. A problem with an

enclosed shelter, however, is that it quickly clogs with other vegetation, and even if it remained free of competition, the basket itself would eventually impede the desired seedling. Therefore, enclosed baskets need to be retrieved, rendering deployment at scale impractical.



Direct seeding germinant protected by an upside-down strawberry basket

After much trial and even more error, I got the idea to cut the bottom from a drink cup made of compostable cornstarch plastic (polyactic acid or “PLA”) in a palisade pattern. Turned upside down, the solid sides thwart small animals, and the palisade points deter larger animals like deer and rabbits. The open top allows other vegetation to grow alongside the longleaf seedling without clogging the shelter.

A second discovery was that the palisade points could be heat-formed to curve inward, thereby helping deflect leaf litter falling in the forest while retaining enough flexibility to allow plant growth. Further, shortening every other palisade seemed to allow more rain to reach the seedling and reduce the greenhouse warming effect of the plastic.

In the process of bending palisades with various kitchen appliances, I stumbled upon a third revelation — PLA begins to melt at around 200° F. While PLA might eventually biodegrade on its own, this low melting point means it quickly vanishes when exposed to prescribed fire, the essential forest management tool for longleaf pine, and does not appear to increase heat around the seedling materially.



Patent-pending Seed Crown™ with peg (left); prototype in the field on a 1.5-year-old longleaf seedling (right)

Photos by Scott Laseter

Seed Crown™

The result of these citizen scientist experiments is a patent-pending concept trademarked as a Seed Crown™. The idea can be embodied in a variety of sizes, configurations, and materials. Key features include an open bottom, a solid base wall, and long primary palisades that bend inward, alternating with shorter palisades. The length of the primary palisades lends flexibility both from above and below. When depressed from above by a predator’s snout, the palisades bend to shield the seed or seedling and provide a prickly encounter with the opposing points. When pressed from below by a growing plant, the palisades can yield to avoid fouling. The shorter palisades add pointed tips and side barriers, and the gaps allow needles to protrude, sunlight to enter, and rain to infiltrate.

PLA becomes more brittle when exposed to elements, leading to some desirable degradation even before a prescribed burn,

with any residual material melting away when exposed to fire. While Seed Crowns™ can be made from many materials, PLA has another advantage beyond its non-toxicity and low melting point - it is the least expensive of the plant-based plastics in today’s market. If interest were ever to take off, it should be possible to produce Seed Crowns™ from PLA at the scale necessary for large reforestation projects for just pennies per unit.

I hope bona fide longleaf experts will attempt to replicate my results using more rigorous methods, sharing insights and refinements along the way. Planting a seed in the woods may yet prove to be a viable method for regenerating longleaf in select settings, and maybe even for other fire adapted species, as well.

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THE POWER OF A PLAN

By Colette DeGarady, Longleaf Partnership Council Chair

It's been 13 years since the original 15-year Conservation Plan was completed and released for use by America's Longleaf Restoration Initiative (ALRI). It set an overarching ambitious goal to reach eight million acres of longleaf pine forests by 2025, while improving the condition of existing longleaf ecosystems.

This Conservation Plan has been a unifying document and guide for partners. It was written for resource professionals representing organizations whose active participation was essential for further refining and ultimately delivering the recommendations of the Conservation Plan.

Subsequently, a variety of partners have utilized the Conservation Plan to inform their business plans within their agencies and organizations. You can find the current plan on the ALRI website here: americaslongleaf.org/resources/conservation-plan

Guiding Principles of the Conservation Plan include:

- 1) Strategic, Science-based Approach
- 2) Site-based Conservation Efforts in the Context of Sustainable Landscapes
- 3) Involvement by Public and Private Sectors
- 4) Partnerships and Collaboration
- 5) Conservation Plan as a Framework and Catalyst

The strategies identify objectives and key actions to address issues, opportunities, and challenges for:

- Public Lands
- Private Lands
- Economic and Market-based Financial
- Fire Management
- Understory and Overstory Regeneration
- Climate Change

As we get close to completing the first 15 years of ALRI, the Longleaf Partnership Council (LPC) leadership is assembling a team to update the plan for the next 15 years.

We are mindful to consider these factors as we are planning:

- Current science, knowledge of the resource, and experience gained during the first 15 years
- Guiding Principles framework
- Regional priorities and updated spatial tools
- Diverse and collaborative partner input

Since we have transitioned from our original "Initiative" to an ongoing partnership, the LPC leadership team decided to adjust the name of ALRI from America's Longleaf Restoration Initiative to America's Longleaf. We look forward to the next 15 years of longleaf restoration work together and celebrating those successes!



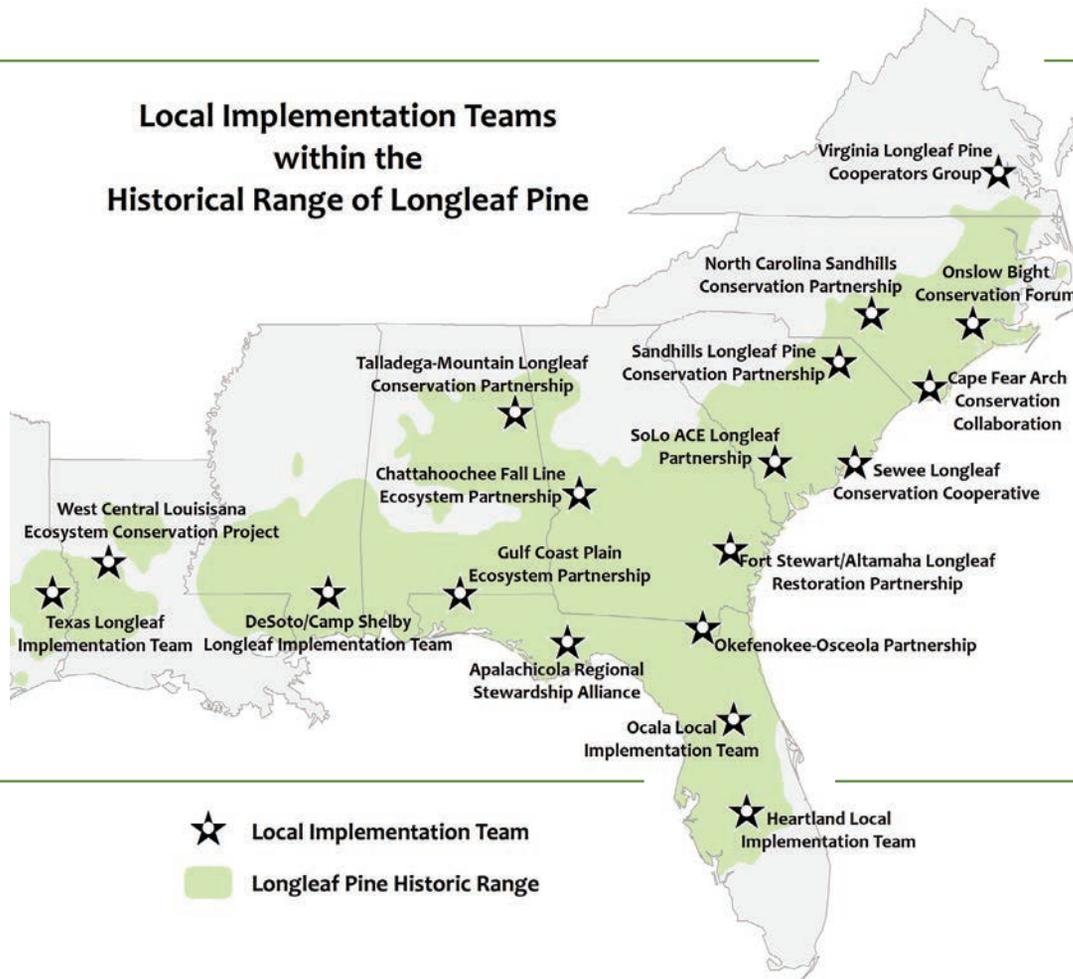
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Local Implementation Teams within the Historical Range of Longleaf Pine



And Many Happy Returns to Liberty County Sandhills

By Brian Pelc, Apalachicola Regional Stewardship Alliance (ARSA) Coordinator



Brian Pelc holds an eastern indigo snake just before release into a flagged gopher tortoise burrow. Photo by Michelle Hoffman.

Twenty-six eastern indigo snakes (*Drymarchon couperi*) made new homes in the restored sandhills of the Apalachicola Bluffs and Ravines Preserve (ABRP) in Florida’s eastern panhandle in late April 2022. About as many partners assisted in releasing these snakes, bred two years ago by the Orianne Center for Indigo Conservation (OCIC) and the Central Florida Zoo. This was the largest number of snakes released yet and the 6th consecutive repatriation of the predator, restoring some ecosystem balance by controlling other snake populations and a variety of small mammals and other reptiles. The goal of the program is a total of 300 snakes, and partners estimate it could take upwards of a decade to get there.

A technical committee selected ABRP for the release because of its healthy population of gopher tortoises, the sandhill “engineer” whose deep burrows offer the tropical snakes a way to survive the cold panhandle winters. Between the abundant burrows and the relatively rural setting (fewer roads means fewer hits by cars), the team expects this reestablished indigo snake population in northern Florida to begin reproducing on its own and spread from ABRP to nearby state and federal conservation lands.

Partners from OCIC, Central Florida Zoo, Florida Fish and Wildlife Conservation Commission, Florida State Parks, and U.S. Fish and Wildlife Service participated in the release.

TREX Firefighters from Spain Visit the Chattahoochee Fall Line

By Mike Thompson and LuAnn Craighton, The Nature Conservancy



The TREX team from Spain and Chattahoochee Fall Line partners completed a successful prescribed burn using a drone. Photo by Mike Thompson.

and even meteorologists from the Peachtree City Office of the National Weather Service. Their experiences during their two-week visit were wide-ranging. Several firefighters participated in a burn utilizing the IGNIS drone for prescribed fire ignition, while others used the handheld Pyroshot for ignition. The TREX participants provided a great capacity boost for the local fire teams and supported 10 operations totaling over 2,300 treated acres on the Fall Line. During their time in Georgia, they also developed a keen appreciation for southern BBQ and the longleaf pine ecosystem!

This past spring, a total of twelve firefighters from the Andalucía region of Spain, which includes the cities of Seville, Cordoba, and Granada, traveled to Georgia and worked alongside prescribed fire practitioners in the Chattahoochee Fall Line and at Moody Forest to execute prescribed burns. This Prescribed Fire Training Exchange (TRES) program was facilitated by The Nature Conservancy and is designed to foster learning and information exchange between prescribed fire colleagues. The visiting firefighters were very knowledgeable, and all had 10+ years of fire experience – primarily in wildfire suppression. They participated in the TRES program to learn more about prescribed fire operations as they are still developing a controlled burn program at home. Currently, they burn during the winter and spring seasons and are focused on small units.

During their stay, they had the opportunity to interact with diverse partners, including staff from the Georgia Forestry Commission, Georgia Department of Natural Resources, The Nature Conservancy,

Restoration Burning at Canoochee Sandhills Wildlife Management Area, Georgia

By Shan Cammack, Georgia Department of Natural Resources



Burning lupine at Canoochee Sandhills. Photo by Maria Lougbran.

new technician Mike Moore, is carefully preparing and rehabbing firebreaks. In March, restoration burning was applied to 629 acres in six different units.

Another goal at Canoochee Sandhills is to engage with Ogeechee Technical College which is only 30 miles away. Students will be able to use this WMA as an outdoor lab. Mike is also starting an eco-volunteer program, where the DNR will train students in fire management, and allow them to get hands on experience in ecological burning.

Seasonal fire crews have been busy across the state. It has been a productive burn season for many of the Interagency Burn Team partners. The Wildlife Resources Division of the Georgia Department of Natural Resources (DNR) hopes to have another big year, burning over 65,000 acres in the state so far. In the Ft. Stewart/Altamaha LIT, DNR has led burns on over 3,579 acres this season, with more growing season burns planned.

One highlight is initiating crucial restoration burning on a recent addition to the protected properties of the LIT – the Canoochee Sandhills Wildlife Management Area. This 6,324-acre property is located in Bryan and Bulloch counties. The goals at Canoochee are to restore the uplands to native longleaf pine savanna habitat in drier areas and longleaf/slash pine-flatwoods habitat in the lower, seasonally wet areas. This will support and expand the resident gopher tortoises and eastern indigo snakes and will benefit the myriad other native species found there. DNR's

Trail Volunteers Make a Difference on Public Lands in the GCPEP Landscape

By Vernon Compton, *The Longleaf Alliance*



Juniper Creek Canoe Trail at the Blackwater River State Forest. Photo by Vernon Compton.

Volunteers play an especially significant role in creating, maintaining, and improving access to public lands in the Gulf Coastal Plain Ecosystem Partnership (GCPEP) landscape. A core part of volunteer efforts has centered on developing a vast land and water-based trail system that allows the public to enjoy and learn more about the longleaf ecosystem. The benefits of trails are abundant, and they often open the door to natural areas and those interested in wildlife, plants, trees, and the diversity of natural communities. Trail volunteerism leads to champions of public and private lands restoration and management, many becoming our strongest supporters, and helping to ensure those actions can continue.

GCPEP partners appreciate those that give back by volunteering. The service volunteers provide in caring for the land and water trails is an amazing gift to everyone. Our deepest thanks and gratitude go out to these groups, including the Florida Trail Association, Alabama Hiking Trail Society, Pensacola Off-Road Cyclists, West Florida Wheelman, South Alabama Mountain Bike Association, Happy Hoofers, Five Flags Arabian Horse Association, Florida Quarter Horse Association, Escambia & Santa Rosa County Sheriff's Posses, the Blackwater Heritage Trail, Inc., and the West Florida Canoe & Kayak Club. If you are interested in exploring more of the longleaf ecosystem while at the same time assisting with the development and care of trails, consider these groups if not already involved.

Sandhills Longleaf Pine Conservation Partnership — Native Understory Restoration

By Charles Babb, *SLPCP Coordinator*



Charles Babb establishes native understory plants in a logging deck to enhance habitat for quail and pollinators. Photo by Tony Graham.

The SC Sandhills Longleaf Pine Conservation Partnership (SLPCP) assisted three landowners with understory restoration efforts using native ecotype seed collected from local landowners and the Carolinas Sandhills National Wildlife Refuge. “We are very fortunate to be able to collect seed from the Refuge and a couple of landowners that manage their land with prescribed fire,” said Charles Babb, SLPCP LIT Coordinator. Wiregrass and various bluestem species comprised the collected seed. Native pollinator and quail habitat mixtures were purchased to supplement the collected seed to improve plant diversity.

Babb and Tony Graham, LIT Outreach Coordinator, planted sites using the Partnership’s Grasslander Seeder™. Logging decks, forest gaps, and areas between rows where native grass is sparse were targeted with the goal of establishing patches of native cover that can expand through seed dispersal. “Landowners need to exercise

patience during these projects,” said Babb. “Typically, we don’t see any signs of success the first year. The second year normally produces enough visible plants, and then all of a sudden, you will have a stand in year three.”

“We talk to people who want to manage their forests for a wide variety of reasons,” said Graham. “No matter what species landowners plan to manage for, be it quail, honey bees, or butterflies, plant diversity is always a key element to providing year-round food and cover.”

Landowners interested in native ground cover should talk to their herbicide applicators prior to chemical site prep for planting longleaf. Specific herbicide prescriptions can lead to faster recovery of native plants and the earlier introduction of prescribed fire to young stands of longleaf.

Back Together Again

By Jennie Haskell, *The Longleaf Alliance*, and Patrick Ma, *The Nature Conservancy*



Field tour at Black River Cypress Preserve. Photo by Jennie Haskell.

Within the South Carolina Sewee LIT, the Williamsburg County Forest Landowner Association gathered in person for the first time in two years at the Black River Cypress Preserve (BRCP). Dan Sheffing led a tour of the BRCP uplands, highlighting the restoration and conservation efforts of the Butler Conservation Fund along the Black River. On the BRCP tour, Dan discussed the upland longleaf restoration, where they thinned a dense loblolly overstory, under-planted longleaf pine, and burned to encourage native understory vegetation.

After the field tour, SC Forestry Commission's Scott Danskin presented on state and local timber markets, sharing a timber supply analysis tool available for the Southeast. David Lynch of American Forest Management presented on state and local real estate trends and potential outlooks. Attendees enjoyed networking in person again and learning about conservation and market trends.

The BRCP is part of the Black River Water Trail & Park Network, a growing chain of public and privately held kayak landings to provide recreational access for paddlers about every 15 miles. This network includes roughly seventy miles of recently protected bottomland hardwoods that will be designated as a SC State Park.

Pollinator Meadow Established within SoLoACE

By April Atkinson, *South Carolina Department of Natural Resources*



Planting various seeds to promote pollinator habitat with USFWS seed drill. Photo by April Atkinson.

South Carolina Department of Natural Resources (SCDNR) partnered with The Longleaf Alliance to create a four-acre pollinator meadow on Hamilton Ridge Wildlife Management Area (WMA), located in the Lower Coastal Plain in Hampton County, South Carolina. The WMA is comprised of 13,281 acres and has 8.5 miles of river frontage along the Savannah River. A portion of the upland habitat is designated as a National Bobwhite Conservation Initiative Focal Area and is managed long-term for Northern Bobwhite Quail (*Colinus virginianus*).

As part of the overall management objectives for the property, the WMA is promoting native pollinator habitat to maintain the ecological integrity of native plant communities and benefit a critical ecosystem service. Creating a pollinator meadow also benefits other wildlife species, including game birds like quail, by providing nesting and brood-rearing habitat. A collaborative effort began last year to prepare the planting site, including:

- Mechanical site prep,
- Multiple herbicide treatments,
- Seed mix,
- Expertise from different professionals and a borrowed seed drill.

The pollinator meadow was planted on March 22, 2022. Thanks to partnership with The Longleaf Alliance, the future of pollinator meadows in wildlife management areas will continue to grow as professionals learn about the value of planting native plant communities for pollinators and its benefits to other wildlife populations across the state.

Longleaf Savanna Restoration at Sam Houston Jones State Park

By Will DeGravelles, *The Nature Conservancy, Louisiana*



Left: Laney Brager, a Louisiana GulfCorps crew member, plants a longleaf pine seedling in an area of heavy hurricane damage at Sam Houston Jones State Park near Lake Charles, LA. Right: Longleaf recently planted during a volunteer planting event at Sam Houston Jones State Park near Lake Charles, LA. Photos courtesy of TNC Louisiana.

In 2020, Hurricane Laura severely impacted Sam Houston Jones State Park, a much-beloved 1,087-acre park at the confluence of the Calcasieu and Houston Rivers near Lake Charles, Louisiana. The hurricane caused the loss of a significant portion of park canopy trees, including mature longleaf and loblolly, as well as severe damage to infrastructure. Recovery efforts created an opportunity to build on previous longleaf savanna restoration work at the park started in 2017 by The Coastal Plain Conservancy.

The Nature Conservancy (TNC) recently began working with the Louisiana Office of State Parks to further longleaf restoration in areas that lost significant canopy and historically supported savanna. TNC oversaw the planting of over 10,000 longleaf using professional contractors as well as two volunteer planting events and the aid of two hardworking GulfCorps crews. The most recent volunteer planting saw more than 300 locals come out to plant 4,000+ loblolly seedlings and 450+ large containerized longleaf, white oak, and native shrubs. Moving forward, this longleaf restoration requires a shift

toward a prescribed fire regime, including more regular burning. To help facilitate this, TNC is working with State Parks officials to re-construct a biking trail system that will also serve as protective fire lines and carve the park into sensible burn units.

The West Central Louisiana Ecosystem Conservation Project (WLEP) is a coalition of stakeholders, including the U.S. Forest Service and U.S. Department of Defense, Natural Resource Conservation Service, state and federal wildlife agencies, conservation NGOs and others, overseeing longleaf and other ecosystem restoration efforts within the Fort Polk/Kisatchie National Forest Significant Geographic Area (SGA).

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2022. Oil on canvas on panels, 21 x 28 inches. Courtesy of Kristin Leachman.



Longleaf pine bark



Yellow-bellied Sapsucker sap wells

Kristin Leachman – *Longleaf Lines*

Kristin Leachman began the *Fifty Forests* project in 2010, documenting the self-organizing patterns in trees through paintings. By transcribing the unspoken language of trees' structural integrity and biological resilience, she explores the intersection of painting and the natural world. *Fifty Forests* also reflects upon the relationship between humans and trees. Leachman's paintings ask what is at stake as our country continually struggles to reconcile its connection to nature with its extractive use of natural resources?

With plans to visit all 50 U.S. states, Leachman traveled to an old-growth longleaf pine forest in southwest Georgia in 2020 as part of the project. The results, *Longleaf Lines* (part two of the *Fifty Forests* project), will be on display at the Georgia Museum of Art at the University of Georgia from July 23, 2022, through February 5, 2023. More at georgiamuseum.org.

About the Art

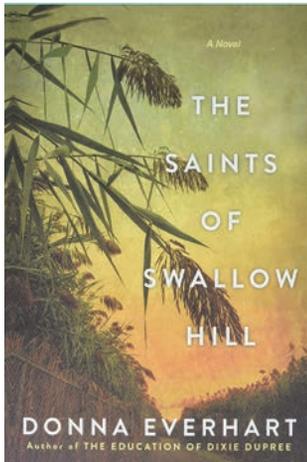
Leachman says that because the majority of longleaf forests are in private hands, many may never have access to these hidden spaces. She uses art to offer people a physically immersive experience, bringing the sacred old-growth landscape into the museum, both for contemplation of and reflection on the natural history of Georgia. The paintings take a "zoomed in" perspective, enlarging the longleaf bark into monumentally scaled biomorphic abstractions. This project also examines the complex cultural issues around climate change,

colonialism, the local economy, and animism, the ancient belief that objects, places, and creatures all possess a distinct spiritual essence.

Leachman's pictures appear singed with fire, capturing the tree's marvelously scaly and fire-resistant surface. This effect points to the destructive histories of these landscapes and the decline of longleaf pine forests. The scorched surfaces of Leachman's pictures also correspond with the practice of regular burn cycles that prescribed burners now use to maintain the longleaf ecosystem. As both a ravaging and refining force, fire is a fitting metaphor for the revitalized forests of longleaf pine, which today rise phoenix-like from the ashes.

About the Artist

Born in Washington, D.C., Kristin Leachman spent her early years in Virginia and now lives in California. She earned a Bachelor of Fine Arts in painting from the Rhode Island School of Design and a Master of Fine Arts in production design from the American Film Institute in Los Angeles. Her paintings have been presented in solo exhibitions at the National Museum of Women in the Arts (2008) and Laguna Art Museum (2016). Leachman's work is in the collection at the National Gallery of Art, and an oral history interview with her is in the Smithsonian Archives of American Art. More at kristinleachman.com.



The Saints of Swallow Hill

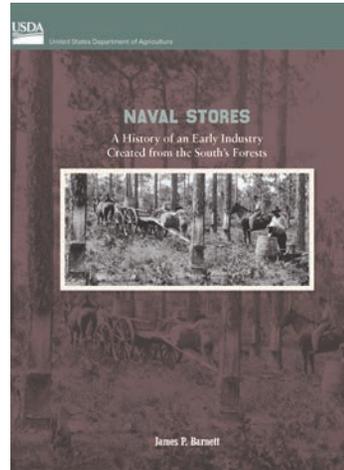
By Donna Everhart
Published by Kensington,
2022

'Where the Crawdads Sing' meets 'The Four Winds' as award-winning author Donna Everhart's latest novel immerses readers in its unique setting—the turpentine camps and pine forests of the American South during the Great Depression.

By setting *The Saints of Swallow Hill* in the pine woods of Georgia and North Carolina, Donna Everhart exposes her readership to an unfamiliar piece of Southern history, sharing the story of longleaf pine with a whole new audience. With each chapter, Everhart alternates between the two main characters, Del Reese and Rae Lynn Cobb, who separately find themselves navigating the hardships of a turpentine camp in Georgia called Swallow Hill but for very different reasons. Though the book is slow to reveal the destination devoting several chapters to developing the character's journeys to Swallow Hill, readers will be rewarded with an engaging tale of friendship and survival as it intersects with the decline of longleaf, the experience of turpentiners, and hardships of camp life.

About the Author

North Carolina resident Donna Everhart writes Southern fiction, including *The Education of Dixie Dupree*, *The Forgiving Kind*, *The Moonshiner's Daughter*, and *The Road to Bittersweet*. DonnaEverhart.com



NAVAL STORES: A History of an Early Industry Created from the South's Forests

By James P. Barnett
Published by U.S.
Department of Agriculture
Forest Service, Southern
Research Station, 2019

Naval stores are a nearly forgotten legacy in the South, but throughout history, nations have depended on them, sought them out, and fought wars over these coniferous products. These products—tar, pitch, turpentine, and rosin—long kept the wooden navies of the world afloat and found many other uses prior to petrochemical dominance. This is the story of a remarkable, but messy, industry that helped support much of the South's economy for nearly 400 years.

The social implications of the naval store industry are as much the story of longleaf as its ecological impacts. Large turpentine operations were rooted in slavery and relied on laborers from marginalized groups, including people of color, convicts, and debt peons, creating a workforce disproportionality of Black Americans. *Naval Stores: A History of an Early Industry Created from the South's Forests* provides a detailed look into production techniques and the industry's social implications. Find the report online at www.srs.fs.usda.gov/pubs/58160.

About the Author

Dr. James Barnett is an Emeritus Scientist with the U.S. Department of Agriculture Forest Service at the Southern Research Station in Pineville, Louisiana.

LEARN MORE ABOUT LONGLEAF
See what educational opportunities are available at longleafalliance.org/upcoming-events.

The Richard and Rita Porterfield Educational Trust assists those who would not otherwise have the means to attend Longleaf Alliance educational events, including the Biennial Longleaf Conference and Longleaf Academies. Historically underserved landowners, students, and professionals, and those with limited financial resources or restricted budgets are eligible, and encouraged, to request a registration waiver.



Limesink pond, seen from Patsy Pond Trail, Croatan National Forest. Photo by Andrew Walker.

Longleaf Destinations

By Andrew Walker, USDA Forest Service

LONGLEAF ON NATIONAL FORESTS IN NORTH CAROLINA

Two of the four National Forests in North Carolina fall within the range of longleaf pine. When planning your upcoming visit to Wilmington for the 14th Biennial Longleaf Conference this October, consider a detour (or two) to explore the unique longleaf of the Uwharries and Croatan.

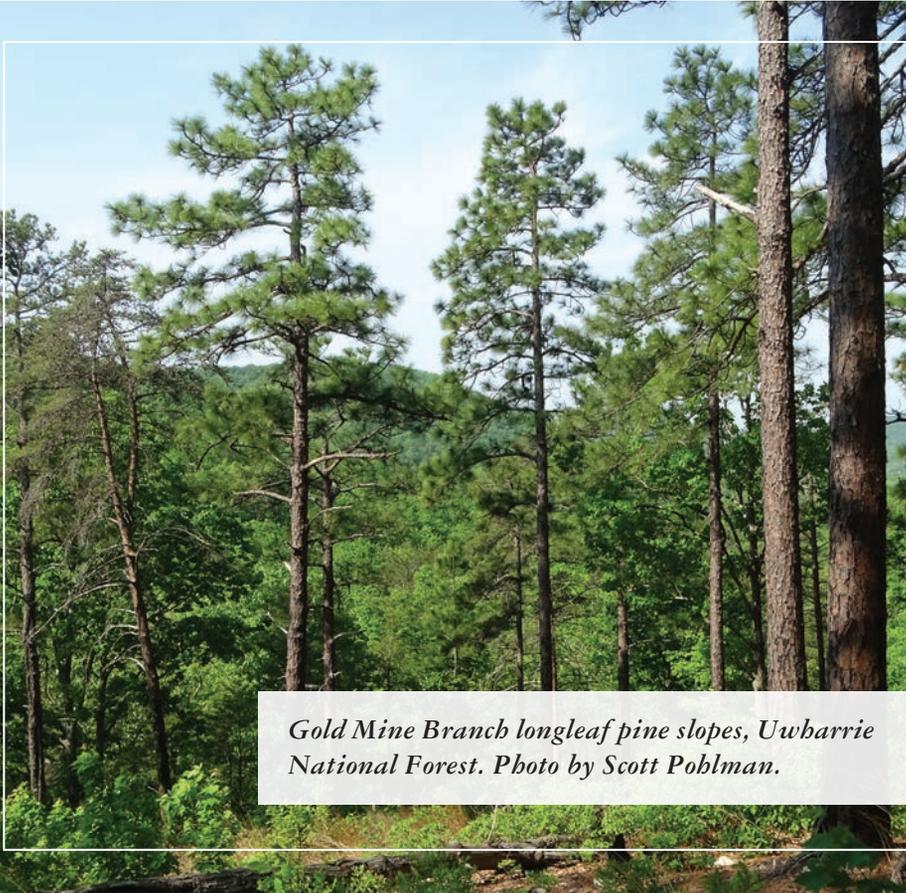
Uwharrie National Forest

Historically, longleaf was abundant in the Uwharrie Mountains of Montgomery County. An 1883 forest inventory reported an estimated 80,000 acres of longleaf forest in the county (Hale), and in 1894, William Willard Ashe reported that this longleaf was “the finest body of pine for lumber now in the State, having been worked for turpentine for only four or five years.” This did not last long. Railroads made it to the area shortly after 1890, and a subsequent inventory of the forest resources of the county from 1918 reports, “Most of the timber, which was recently abundant..., has been cut within the past fifteen years.” (Pratt).

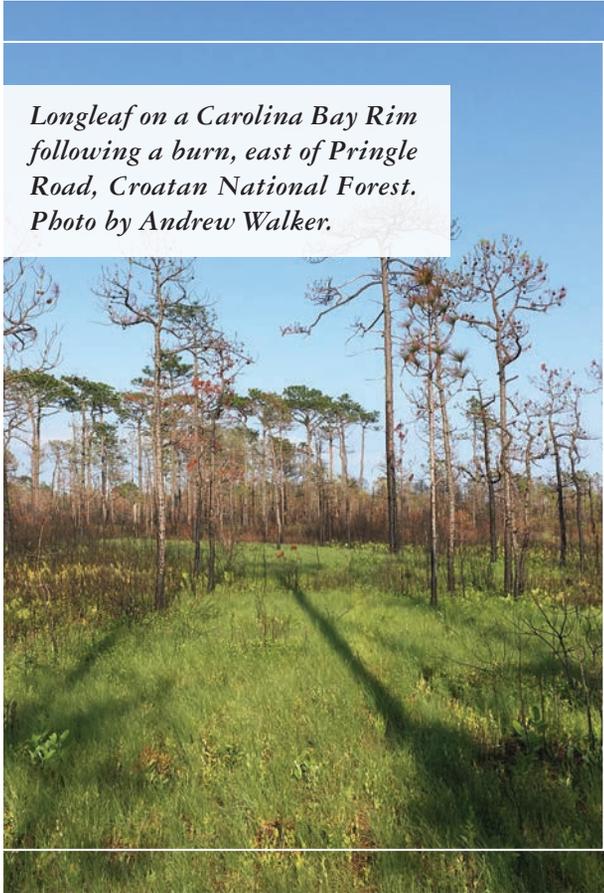
With the majority of the seed trees cut, coupled with decades of fire suppression, longleaf declined dramatically in

the North Carolina Piedmont, to the point where all longleaf communities in the Piedmont are now considered rare. The majority are on the Uwharrie National Forest in Montgomery County, where we estimate 2,300 acres of longleaf habitat remain. Most of this habitat is found on silty soils in rolling terrain, and the longleaf is often mixed with other pines and oaks. In addition to the existing habitat, a potential natural vegetation model for the Uwharrie has identified a total of 7,560 acres of potential longleaf habitat on the Uwharrie NF, so there is much potential for restoration work.

The U.S. Forest Service has managed the Forest with prescribed fire for decades and first conducted a growing-



Gold Mine Branch longleaf pine slopes, Uwharrie National Forest. Photo by Scott Poblman.



Longleaf on a Carolina Bay Rim following a burn, east of Pringle Road, Croatan National Forest. Photo by Andrew Walker.

season burn in the longleaf habitat in 1992. Since 2000, the Uwharrie fire staff has been burning longleaf habitat on a two to three-year rotation, alternating dormant- and growing-season burns. Overall, Uwharrie staff burns an average of 6,000 acres a year, including 2,000 acres in the growing season. The Uwharrie timber staff has also been carrying out restoration thinnings in longleaf habit, which have focused on removing loblolly and undesirable hardwoods.

The best place to see the results of these efforts may be the Pleasant Grove pine savanna, which is located four miles south of downtown Troy on the west side of SR1005 (Pekin Road). This is considered the best example of a Piedmont longleaf savanna, with a canopy of mixed longleaf and shortleaf pine and a diverse mix of grasses and forbs in the ground layer, many of which are more associated with the Coastal Plain. There are no official trails or parking in this area, but you are welcome to park on the road shoulder and freely explore the open savanna.

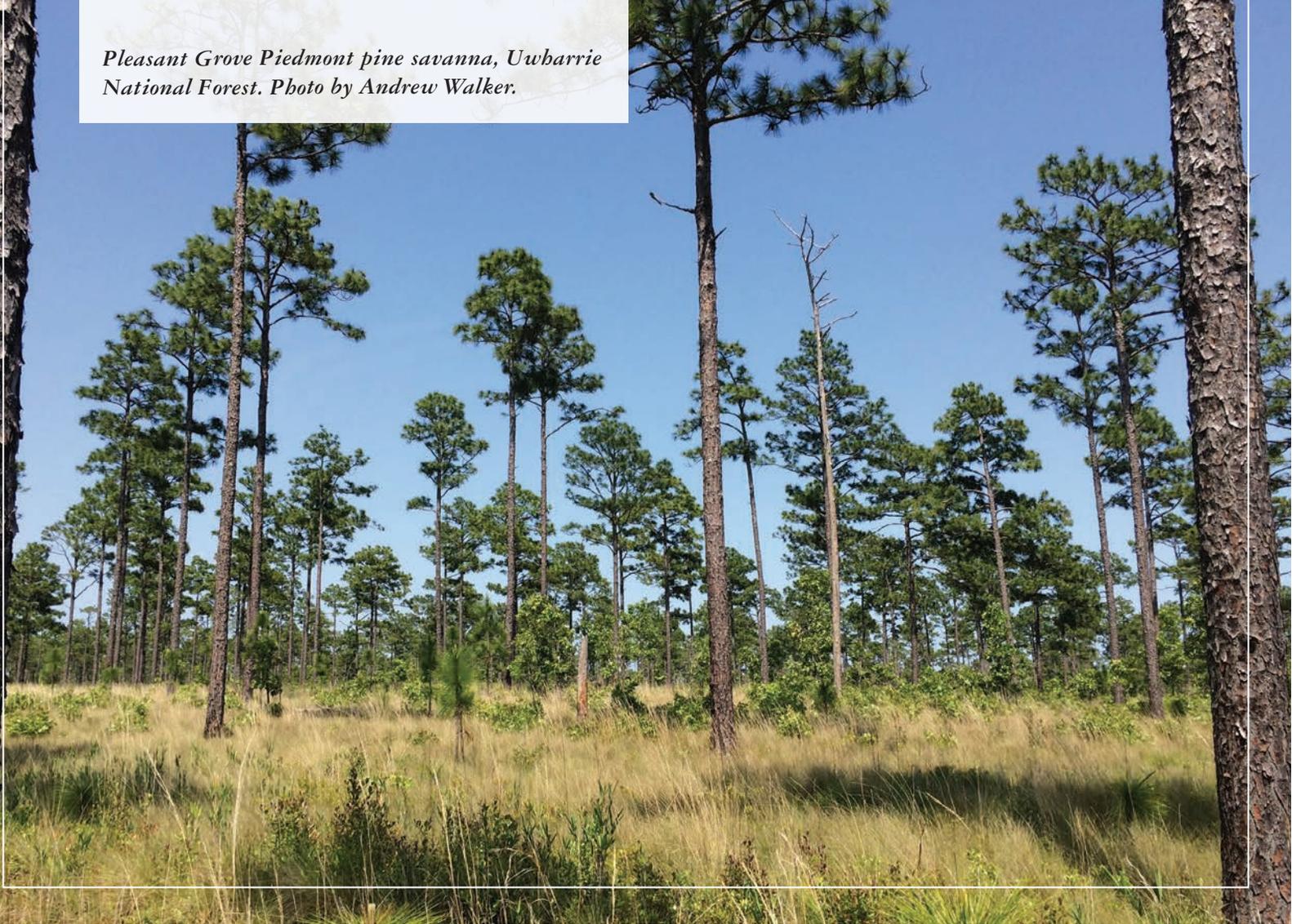
Another type of longleaf pine habitat in the Uwharrie is found at higher elevations on steep rocky slopes, where there are old longleaf that survived the era of rampant logging. These habitats are primarily small but notable for having younger trees and seedlings and a handful of large old trees. Presumably, due to the lack of competition on these rocky, infertile soils, these longleaf have managed to maintain and regenerate without fire. These trees and habitats have been studied by the Carolina Tree Ring Science Lab at University of North Carolina Greensboro. Dr. Paul Knapp and his

students found living longleaf on the Uwharrie that date to 1731 and documented several “new” locations for this montane longleaf habitat.

None of this montane longleaf habitat is easy to access, but the Goldmine Branch Longleaf Pine Slope affords the best opportunity for those determined to see it. This longleaf area begins approximately 0.5 miles west of the Cotton Place trailhead parking area for off-highway vehicles. There is no trail directly to the site, but you may follow along Gold Mine Branch Creek at the foot of the slope and ascend the steep slope after some distance. In recent years, this area has been managed with several prescribed fires, so the landscape is fairly open, and the longleaf will be easy to find. More information about this area can be found in the article “Observations on a rare old-growth montane longleaf pine forest in central North Carolina, USA,” included in the references.

The Uwharries to Sandhills Landscape Collaborative, a new Joint Chiefs Landscape Restoration Partnership, will further showcase these special longleaf places. The collaboration between USDA Forest Service, NRCS, The Nature Conservancy, NC Wildlife Resource Commission, Sandhills Prescribed Burn Association, NC Forest Service, and The Ember Alliance will improve forest health by restoring privately and publicly owned pine forests to open-canopy conditions in and around Uwharrie National Forest, and in a habitat corridor between the Uwharries and the NC Sandhills ecoregion.

Pleasant Grove Piedmont pine savanna, Uwharrie National Forest. Photo by Andrew Walker.



Croatan National Forest

The Croatan National Forest is located along the coast, between the Neuse and White Oak Rivers, and is on the northern periphery of the longleaf/wiregrass range. The Croatan has approximately 27,000 acres of longleaf habitat, including dry pine/scrub oak sandhill, mesic savanna, wet pine flatwoods, and wet pine savannas. Much of the longleaf habitat is in excellent condition due to the fine work of the Croatan fire staff, who typically conducts between 15,000 and 20,000 acres of prescribed burning every year. Longleaf habitat on the Croatan supports many rare animal and plant species, including the Red-cockaded Woodpecker, gopher frogs, northern long-eared bats, rough-leaved loosestrife, and Venus flytraps.

Although there are no designated trails, Pringle Road (FR123) follows a narrow sand ridge that runs between NC 24 and Millis Road, from which there is easy access to a variety of excellent longleaf habitats, some of which were burned in 2022. Park along the side of the road anywhere you like and explore the ecotones — where the longleaf/wiregrass habitat meets the shrubs of the wet pond pine woodland. You may find a variety of carnivorous plants, orchids, and showy wildflowers. Pringle Road runs northwest from NC 24, approximately 5.3 miles north of the intersection with NC 58 in Cape Carteret.

The Patsy Pond area is a popular place to see longleaf habitat on the Croatan and has a parking area and designated trails. This easy 2.2-mile trail system passes through dry pine and scrub oak sandhill habitat and runs along the edge of several limesink ponds. There are over 20 of these ponds, varying in size, shape, and vegetation. These ponds are critical habitats for many rare plant and animal species. The Patsy Pond trailhead and parking lot are also on NC 24, across from the NC Coastal Federation building, roughly 6.3 miles north of the intersection with NC 58 in Cape Carteret.

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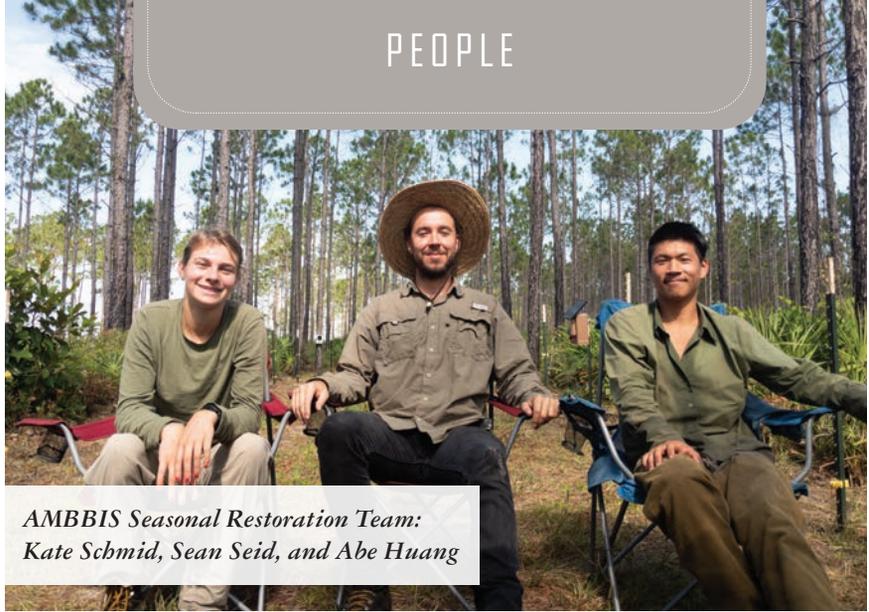
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Sarah Brazil, Natural Resource Technician with the EST



PEOPLE



*AMBBIS Seasonal Restoration Team:
Kate Schmid, Sean Seid, and Abe Huang*



*WEST Members: Shanovia Croom,
Kameron Burgess, and Ethan Dickey*

By Vernon Compton, The Longleaf Alliance

GCPEP STAFF UPDATE

Several staff changes occurred within The Longleaf Alliance (TLA) working in the Gulf Coastal Plain Ecosystem Partnership (GCPEP) landscape.

Bob Wilken, TLA's Fire Specialist, hung up his line gear and retired after 47 years in fire and restoration. Bob was instrumental in implementing prescribed fire and training fire practitioners that now work not only in the longleaf range, but all over the United States. He is enjoying retirement with his family in Olympia, Washington.

Brian Schumann, a long-time member of the Ecosystem Support Team (EST), has a new position with the Northwest Florida Water Management District as a Land Manager I assisting with the management of lands within the Western Division.

Nicole Barys, the Wetland Ecosystem Support Team (WEST) Leader, accepted a job as a Restoration Technician 2 with the Ecostudies Institute based in Olympia, Washington, where implementing prescribed fire is a core part of her duties. **Miles Threadgill** and **Camille Broxson**, both also with WEST, began new paths in their careers. Miles joined NRCS, and Camille is continuing her education in Natural Resources at the University of Florida.

Ed O'Daniels, the first Cogongrass Coordinator for GCPEP, joined the Florida Fish and Wildlife Conservation Commission as a Private Lands Biologist.

Elizabeth Shadle, former AMBBIS (reticulated flatwoods salamander) Wildlife Technician, began a new role with the

National Park Service at Gulf Islands National Seashore Wildlife, working as Biological Science Technician focusing on the Perdido Key area and the Perdido Key beach mouse. **Wynn Hoskins** completed his seasonal period with the AMBBISS Seasonal Restoration Team and returned to a Western Seasonal Firefighting Engine Crew. **Haley Welshoff** also completed her time with the AMBBISS Seasonal Restoration Team and began a thru-hike of the Appalachian Trail before starting the next chapter in her career.

As a result, several new natural resources staff joined TLA in the GCPEP landscape. **Shanovia Croom** and **Ethan Dickey** joined WEST as Wetland Resource Technicians, and **Sarah Brazil** started with the EST as a Natural Resource Technician I. **Sean Seid** and **Kate Schmid** joined the AMBBIS Seasonal Restoration Team.

Emma McKee, previously with WEST, returned to the GCPEP landscape and joined TLA as the Invasive Species Coordinator. Two TLA staff members moved up in the organization with new team responsibilities. **Alexis Feysa** was promoted from Wetland Resource Technician with WEST to a Natural Resource Technician I position with the EST. **Kameron Burgess** was also promoted from an AMBBIS Seasonal Restoration Team Member position to the WEST Crew Lead.

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By Lynnsey Basala, The Longleaf Alliance

INDIVIDUALS AND BUSINESSES SUPPORT The Biennial Longleaf Conference

Words cannot adequately express our excitement to host this year’s regional in-person Biennial Longleaf Conference in Wilmington, North Carolina. The conference theme is appropriately titled *Rekindling Our Connections*, and we will be exploring these sessions.

- **Branching Out** by exchanging strategies and resources to reach new audiences;
- **Strong Roots** That Bind highlights work that addresses groundcover and communities;
- **Pyrodiversity Enkindles Biodiversity™** as we explore the intersection of fire and ecosystem diversity such as research, implementation, and social considerations;
- **Tomorrow’s Forest** will touch on innovative solutions, management opportunities, and economic considerations to conserve working longleaf forests and support climate resiliency.

Couple these concurrent session topics with a field tour in the literal “Land of the Longleaf Pine,” along with socials, networking, silent auction, poster presentations, exhibit hall, and much more – you have yourself a glorious week of fun to look forward to in the coming months!

There is still plenty of time to sponsor the conference as an individual or business. Because of the conference’s educational and fellowship opportunities, folks from across the range and businesses of all shapes and sizes contribute directly to this, the country’s largest and longest-running longleaf gathering. Conference Sponsorship revenue helps offset conference expenses, making conference registration costs manageable for participants.

We could not host this event without the generosity of others. Please help us reach our \$90,000 sponsorship goal!

14 th BIENNIAL LONGLEAF CONFERENCE SPONSORSHIP OPPORTUNITIES						
GIVING LEVELS & INCENTIVES		\$10,000	\$5,000	\$2,500	\$1,000	\$500
The Longleaf Leader	Quarterly Magazine Issues	✓	✓	✓	✓	✓
	Complimentary Advertisement	Full Page (4)	½ Page (4)	¼ Page (4)	¼ Page (4)	
	Electronic Delivery (for Internal Use)	✓	✓			
	Recognition in Winter Issue - Annual Report	✓	✓	✓	✓	✓
Membership - Media - Gifts	Individual Annual Memberships	5				
	Press Release Acknowledging Contribution	✓				
	Quote for Company Use	✓	✓	✓		
	Company Logo on TLA Website	✓	✓	✓		
	Recognition at TLA Academies & Workshops	✓	✓	✓		
Biennial Conference	Complimentary Aluminum Property Sign(s)	3	1	1	1	
	The Palustris Society & TLA Board Social (invitation only event)	4	2			
	Official Sponsor of Conference Social Event	Evening Celebration	Meal or Field Tour	Break	Hospitality Room	
	Complimentary Exhibit Space	✓	✓	✓		
	Company Logo on Printed Conference Materials	Prominent Placement	Prominent Placement	✓	✓	✓
	Company Logo & Link on Conference Website	Prominent Placement	Prominent Placement	✓	✓	
Complimentary Registration(s)	4	2	1			

longleafconference.com



Ready to join us? Review the incentives and agreed-upon terms in the table above and contact Lynnsey Basala, Vice President for Development, at (314) 288-5654 or Lynnsey@longleafalliance.org.

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By Ad Platt, *The Longleaf Alliance*

A WELL-TRAVELED TREE

Cross-section on display at the T.R. Miller Mill Company office in Brewton, Alabama, of a tree born in 1658 where it lived and grew until harvested in 1958. Its square timber was exported to Holland and manufactured into moulding and paneling for railroad dining cars.

Our inherent busyness slows when we encounter ancient things, at least for a moment. Big old trees reach through the veil and rekindle our sense of wonder, and we react with awe and reflection. We ponder, if these trees could talk, what has this silent sentinel borne witness to over the centuries?

In the lobby of the T.R. Miller Mill Company office in Brewton, Alabama, is a display of a cross-section of a virgin longleaf, displayed to honor and tell the story of a very well-traveled tree. While this tree never moved, history swirled all around it. During its 300-year lifespan, not terribly old for a

longleaf, it was resident in the territory of at least six nations (Muscogee Creek, Spain, France, England, U.S.A., C.S.A. (the Confederacy), and then again U.S.A.), shifting between four states (Florida, Georgia, Mississippi, and Alabama), and three counties (Washington in Mississippi, Monroe and Conecuh in Alabama). After it was felled in 1958, the resulting timber traveled to Amsterdam, Holland and was manufactured into moulding and paneling for railway dining cars. Knowing the durability of heart pine, it was most likely remanufactured and put to other uses – perhaps traveling still, though the trail is lost beyond this point.

This “journey” of a single tree is a glimpse into our cultural

connections to longleaf, where we often begin to build an appreciation for this iconic tree. By recalling what we inherited, what happened to it, and how we nearly lost it all, we find ourselves working to bring it back. Along the way, we learn how we might be better off when we do.

We are often asked, “If longleaf was once the king of the forest, dominating the southern landscape, why is it harder to grow now?” This gets to the heart of the restoration challenge, an understanding of how all the many uses have changed a particular site over the centuries.

On site, we try to read the land and ask many questions, to fully understand what changes have occurred due to the choices and actions of previous owners and managers. We may observe old foundations or trash middens, fragments of turpentine pots in what is now entirely a hardwood stand, or beautiful non-native flowers, a lingering remnant of someone who once lived here. Or, more hopefully, we may note bits of native understory still hanging on. The better we understand how conditions have been altered, the better we can prescribe appropriate treatments to improve longleaf restoration success.

It is a gamble to guess which parts of our restoration might persist for the long-term in what is expected to become an

even more rapidly changing world. Still, as Rhett Johnson reminds us, “better is better.” Those of us working in restoration are not only busy folk; we are also fixers, people who leave things better than we found them and find satisfaction in the doing.



Old home-place flowers with nary a brick remaining on-site in Mississippi. These gladioli are the last traces of someone who once, long ago, beautified that place.

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