

ALABAMA'S

TREASURED FORESTS

A Publication of the Alabama Forestry Commission

Volume XLI No. 2 - 2022



ALABAMA
FOREST

Alabama TREASURE Forest Association

I'D RATHER BE IN THE WOODS

TIMBER, RECREATION, ENVIRONMENT, AESTHETICS, SUSTAINABLE, USABLE, RESOURCE

The Alabama TREASURE Forest Association is dedicated to promoting good forest stewardship, educating others about responsible forest management and improving the forests of our state and nation. These lands are managed for many resources, including wildlife habitat, pine and hardwood timber, clean water, recreation opportunities and beautiful scenery. When utilizing a multiple-use management strategy, all of the benefits a forest provides are enhanced.

We are passionate about making our land better for the next generation. In a very real way, the future of Alabama's forests rests in the hands of landowners and like-minded individuals who support good forest stewardship. You can be a part of that effort. Purchase an "I'd rather be in the woods!" tag and support education and outreach efforts to raise awareness about the wonderful possibilities of sustainable land management.

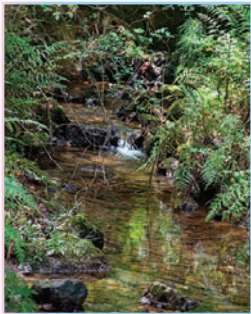


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ALABAMA'S
**TREASURED
FORESTS**

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- 4 Message from the State Forester
- 8 New TREASURE Forest Certifications
- 18 When Beauty Is The Beast
by Dale Dickens & Katie Wiswall
- 19 Invasive Tree Exchange - City of Auburn
by Anne Randle
- 24 Changes in Alabama's Wild Turkey Season 2022
by Steven Mitchell
- 26 Partnering in Wildfire Mitigation
by Cole Sikes
- 27 Map of Alabama Forestry Commission Work Units
- 28 Directory of AFC Employees
- 32 TREES OF ALABAMA: Yellow-poplar
by Bonnie Coleman



On the Cover:

The crystal clear water of the creek at Hawk Hill Farm in Calhoun County provides enjoyment for the family. See story page 5.

Photo by Elishia Ballentine

Editorial Note: The telephone number for the **Alabama Chapter** contact for the **Association of Consulting Foresters of America** was listed incorrectly in the most recent issue of *Alabama's TREASURED Forests* magazine (Volume XLI No. 1). The correct number is **(334) 864-9542**. We apologize for any inconvenience this error may have caused.

This publication is provided at no charge to the forest landowners of Alabama, with a circulation of approximately 13,000. Published four times each year, the magazine is filled with forestry information and technical assistance designed to assist landowners in making informed decisions about the management practices they apply to their land. Articles and photographs are contributed by AFC employees and other forestry or natural resources professionals.

Alabama's *TREASURED Forests* magazine is also available on-line! www.forestry.alabama.gov



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table of CONTENTS

Vol. XLI No. 2 - 2022



◀ 5

Hawk Hill Farm
by Elishia Ballentine



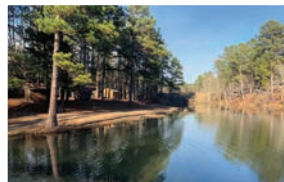
◀ 9

Brown Spot Needle Blight in Loblolly Pine Stands: Symptoms, Causes & Management Options
by Debit Datta & Dr. Lori G. Eckhardt



◀ 12

Alabama the Beautiful: Rivers Run Through It
by Coleen Vansant



◀ 16

Hidden TREASURE: Camp Horne, Where Adventure Awaits
by Samuel Boswell



◀ 21

A Species from the Underworld
by Rob Hurt & Jennifer Grunewald

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The publication of a story or article in this magazine does not constitute the Alabama Forestry Commission's endorsement of that particular practice, product, or company, but is an effort to provide forest landowners of Alabama with information and technical assistance to make informed decisions about the management practices they apply to their land.

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Message from the STATE FORESTER

On June 15, the Alabama Forestry Commission (AFC) celebrated the grand reopening of the 50-foot-tall observation tower at Flagg Mountain in Coosa County. For those of you who have never heard of Flagg Mountain, it is part of the 200-acre Weogufka State Forest. Flagg is the southernmost mountain in the Appalachian chain that reaches over 1,000 feet in height. The surrounding forest is unique in that it has many old longleaf pines, some of them are between 200 and 400 years old.

In 1933, the Civilian Conservation Corps (CCC) began construction on what was to be a state park in this remote section of the county. They built a stone tower, similar to the one at Cheaha State Park, a caretaker's residence, and several cabins. There was also a large camp for almost 200 CCC employees doing the construction. In addition to housing and feeding the men, the camp also offered educational classes in many subjects and trades to help them hone their job skills before returning home.

The AFC acquired this park after its completion. However, due to the remote location, it never became a popular destination. We used the tower as a fire tower until the 1980s when the agency switched over to aircraft as our primary means of spotting wildfires. Since then, the site fell into disrepair and was eventually closed. For the past five years we have been raising money to refurbish the stairs and cab of the tower so the public can climb up and take in the magnificent views from the top. I'm told you can see seven counties, including Garrett Coliseum in Montgomery when the weather is right!

Several partners, including the Alabama Trails Foundation, the Conservation Fund, the Alabama Hiking Trails Society, and the Alabama Legislature contributed more than \$500,000 toward the tower renovation, as well as construction of an accessible trail leading up to the tower. We could not have accomplished this feat without their support and contributions. I also want to thank the employees of the AFC who spent countless hours not only making the mountain more accessible but also preparing for the big event.

Other projects are underway, including an effort to get water from the town of Stewartville to the top of the mountain. Once this task is completed, we will construct a restroom and bathroom at the cabins to make it even more hospitable.

Another unique thing about this site is that it is the beginning of the Pinhoti Trail that winds through northeast Alabama to Georgia, eventually connecting to the Appalachian Trail at Springer Mountain. You can start at Flagg Mountain and hike all the way to Maine, if you're of a mind to walk that far.

When we reopened the tower on June 15, Governor Ivey came to help us celebrate the occasion. In her remarks she noted, "This tower is a symbol of Alabama's history, her rich natural resources, and her strength . . . This project will not only serve Alabama families today and tomorrow, it also serves as a tribute to the men who built it almost 100 years ago."

The AFC is excited to make this facility available to the public again, and we hope you will find a pretty day to make the trek to Coosa County to check out the tower and the beauty of Weogufka State Forest.



*Rick Oates,
State Forester*

A handwritten signature in black ink that reads "Rick Oates". The signature is written in a cursive, slightly slanted style.

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The Alabama Forestry Commission supports the Alabama Natural Resources Council's TREASURE Forest program. *Alabama's TREASURED Forests* magazine, published by the Alabama Forestry Commission, is intended to further encourage participation in and acceptance of this program by landowners in the state, offering valuable insight on forest management according to TREASURE Forest principles. TREASURE is an acronym that stands for **T**imber, **R**ecreation, **E**nvironment, and **A**esthetics for a **S**ustained **U**sable **R**esource.



Hawk Hill Farm

Worthy of A Lady

By Elishia Ballentine,
Editor

What began as a hobby for Kathy McCrimmon eventually became a passion. The Calhoun County farm that was purchased to keep a few cows became “Hawk Hill Farm” which is not only a certified TREASURE Forest, Stewardship Forest, and Tree Farm, but was also named a Helene Moseley Memorial TREASURE Forest Award winner in 2021.

Originally from Ohatchee, Alabama, she always loved the country life. While growing up, Kathy says she was happiest when outdoors. Crediting some of these feelings to her Native American (Cherokee) heritage, she recalls that as children she and her siblings didn’t spend much time indoors. They chose to stay in the woods – learning about nature and touching every bug. She also developed her love of wildflowers at a young age.

Even after she was married, Kathy still preferred to be outdoors. Her husband, Herb, would tell her they didn’t need a house, they should’ve just bought a tent! They initially purchased a small farm near the watershed in Choccolocco, but it did not completely satisfy her need for ‘green space.’ She still wanted more land. When a property became available only 15 minutes from their home in town, she said she kept begging him to buy it until he finally gave in. Before long, they both fell in love with the place they named Hawk Hill Farm. Even though Herb worked long hours as an orthopedic surgeon, they still enjoyed the farm on weekends, just spending time there, sometimes walking the whole place.

They also had a lot of cleaning up to do! When they first purchased the place, it was in a neglected condition with fences

down, scrap iron everywhere, fallen trees, weeds, and briars. While some game species were present, the density and quality were not what the family desired. Her first step was to establish a conservation plan that would increase the diversity of the site and build a foundation for a wildlife management plan.

Over time, she acquired other adjoining parcels, bringing the total size of her TREASURE Forest to 523 acres. Utilizing a forest management plan, Kathy eventually turned the once unmanaged tract of land into a showplace.

The primary TREASURE Forest management objective for the property is to improve the value and productivity of the timber, with the secondary goal of improving the quality of habitat for a variety of woodland wildlife species by increasing the diversity of cover and available food. Additional management practices include the utilization of silvopasture to integrate cattle grazing along with the forestland.

According to Kathy, these objectives go hand-in-hand with recreation. She loves taking her three grandsons on ATV rides through the forests and pastures, introducing them to the great outdoors, showing them various tree species and signs of wildlife. It’s also important for her and her family to share the land with close friends.

Today the forest is more open now than when they first obtained the farm. Sound timber management practices have helped establish a healthy productive forest. Trees look better and the forest floor is cleaner. Trees have been thinned; more trees have been planted. In an area that was once pasture, planted pines have done well despite the soil being rocky. In addition to mixed

(Continued on page 6)

Hawk Hill Farm

(Continued from page 5)

“Even some of the students from country schools . . . I’m always surprised to learn that they don’t know anything about forests and nature! It’s fun to point out trees, flowers, and bugs to them.”



Kathy McCrimmon enjoys teaching her grandsons by introducing them to the great outdoors and showing them various tree species.

hardwoods, there are approximately 40 acres of longleaf pines ranging in age from 12 to 15 years old.

There have also been improvements in the quality of wildlife. Not only has the deer population increased, but turkey, small game, and non-game species have also benefited from the forest management practices and are now abundant. Kathy enjoys bird watching and deer gazing, with a camera of course – not a gun. Although she doesn’t hunt, she doesn’t mind her son-in-law and grandsons doing so. They also fish on the property. She’s an animal lover and doesn’t want to kill anything; she just appreciates observing animals in the wild.

Understanding that forest education is a significant pillar of the TREASURE Forest philosophy, Kathy is committed to establishing outreach venues to help other landowners learn about forest stewardship. She demonstrates this commitment by hosting landowner tours and partnering with local agencies and organizations to facilitate natural resource seminars such as a ‘Woods, Wildlife, and Watersheds’ workshop/tour, a ‘Take a Hike’ program, and a ‘Landowner Conservation Planning Outreach’ workshop/tour. She was also instrumental in bringing a ‘Forestry and Estate Planning’ presentation to area landowners.

One of her favorite environmental education programs which she has hosted several times over the years has been ‘Classroom in the Forest.’ She says she loves to watch the little kids running around, especially those for whom it’s their first experience in the forest. She finds it hard to believe that children from rural schools have never been out in the woods. “Even some of the students from country schools such as White Plains and Dearmanville Elementary . . . I’m always surprised to learn that they don’t know anything about forests and nature! It’s fun to point out trees, flowers, and bugs to them.”

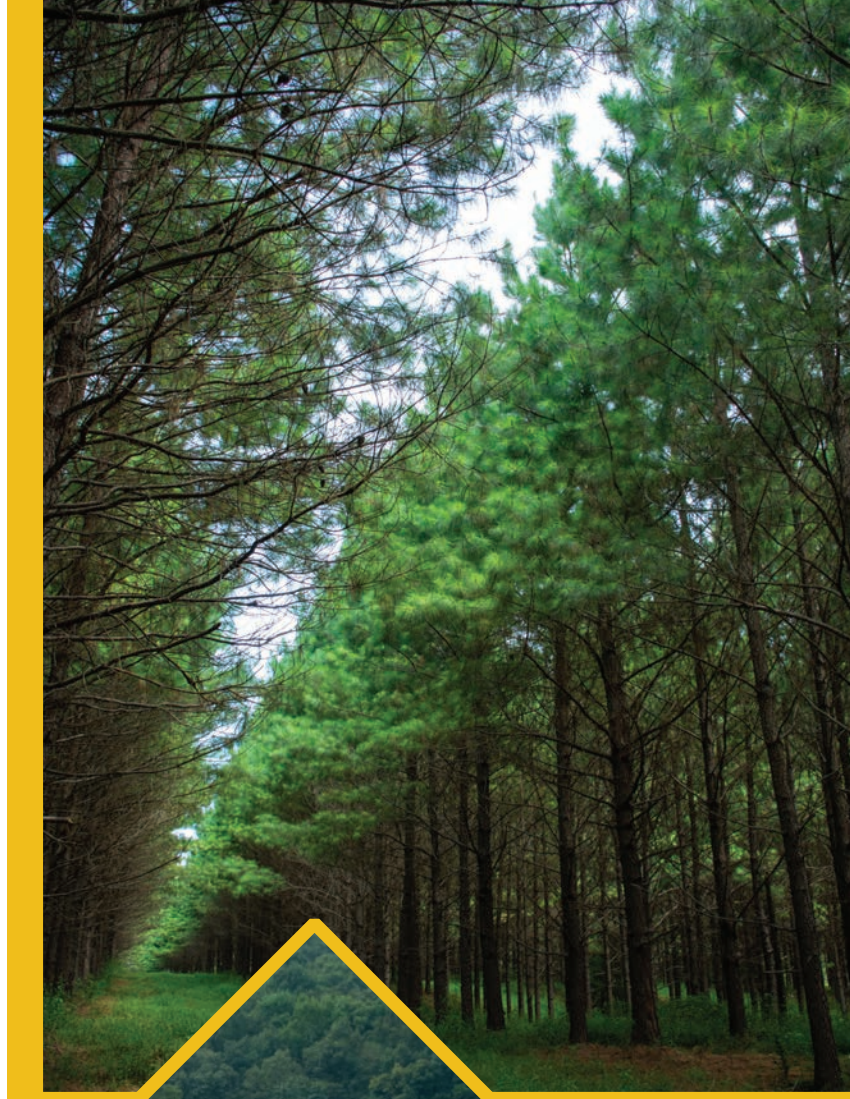
Given her passion for the great outdoors, it is not surprising that Kathy enjoys sharing her enthusiasm about sustainable forestry, wildlife, and conservation with like-minded people. Her dedication is made evident through active involvement in organizations such as the Calhoun County Soil & Water Conservation District, Alabama

TREASURE Forest Association, Calhoun County Forestry Planning Committee, Coosa Valley Resource Conservation & Development Council, Choccolocco Creek Watershed Conservancy District, Alabama Forest Owners Association, and the Calhoun County Cattleman's Association.

It seems that Kathy has been successful in instilling her values and love of nature with the next generation of the family. Her daughter and son-in-law, Kelly and Cale Cosby, have been assisting her in taking care of Hawk Hill Farm since Herb passed away about six years ago. Kelly says they plan to continue managing the place just as her mom is doing, with the exception of transitioning toward more regenerative agriculture. They would also like to see what opportunities would arise by adding more silvopasture. They have already been utilizing these practices on their own smaller farm for a couple years, and she said, "With regenerative agriculture, you're working *with* nature, not against it. The process has been amazing to watch, and we're teaching the boys at the same time."

Kelly's husband, Cale, commented that during his childhood he did not have access to a farm such as this, so he appreciates the importance of taking kids outdoors and exposing them to the truly amazing God-given environment of a place such as Hawk Hill Farm. He believes that their main goal is to be stewards of the land, preserving it not just for the family today, but for generations to come as well.

Looking toward the future, Kathy hopes her family will never sell Hawk Hill Farm. While they are only little boys now, she hopes that when her grandsons inherit it, they, and their children after them will continue to love and enjoy the farm as much as she does. She envisions the forest getting better and better under their care. 🏡



Kathy's special companion, Lady

Kathy McCrimmon and her family

New TREASURE Forest Certifications

Created in 1974 by the Alabama Forestry Commission under the vision of former State Forester Bill Moody, TREASURE Forest designation is earned by private forest landowners who affirm the principles of multiple-use forest management. It is this forest landowner recognition program that inspired the national Forest Stewardship Program which began in 1991. TREASURE is an acronym for Timber, Recreation, Environment, and Aesthetics for a Sustained Usable REsource.

Congratulations to these landowners who recently earned their TREASURE Forest certifications! 🌲



Landowner	County
Rob Colville	Washington
Patricia and Gillis Franklin	Lauderdale
Brad Butler	Escambia
Doug Isaacson	Bullock
Matthew Green	Russell
David Griffin	Pike
Glenda Lowry	Escambia
Hunter Hale	Monroe
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**Proceeds from silent auction to benefit the ATFA Scholarship Fund.*

Visit TREASUREForest.org for more information.

Brown Spot Needle Blight in Loblolly Pine Stands:

Symptoms, Causes, & Management Options

By Debit Datta, Masters in Forest Pathology, and Dr. Lori G. Eckhardt, Forest Pathologist/Entomologist, Forest Health Dynamics Laboratory, School of Forestry & Wildlife Sciences, Auburn University

Loblolly pine (*Pinus taeda*) is the most extensively planted species of commercial pine throughout the southeastern United States. Because of its ability to thrive in diverse sites and rapid growth, this species drew the attention of landowners and became the top choice of commercial tree species in the region. However, over the last several years stands planted with loblolly pine in Alabama have shown premature defoliation and tree mortality. **Brown spot needle blight** (*Lecanosticta acicula*) infections on mature loblolly pine is an emerging concern for landowners, forest managers, and forest health state cooperators, found in north, south, and southwestern counties of Alabama encompassing more than 2,400 acres of loblolly plantations.

Every stage of loblolly pine can be infected with brown spot needle blight (BSNB), a disease that causes needles to turn yellow and die, as well as causing premature defoliation of the afflicted tree. This disease results in stunted growth and tree mortality after three to four years of successive infection. Historically, BSNB has only been a major issue for grass-stage longleaf pine (*Pinus palustris*). Prescribed burning serves as a successful method of reducing the presence of the fungus; however, it is only effective in protecting longleaf pine seedlings from infection.

Disease symptoms

The first symptoms of brown spot needle blight appear as small yellow, reddish-brown, or grey-green irregular circular spots (Fig. 1, see page 10). These spots turn brown over time and are often surrounded by a yellow halo at the point of infection. Typically, the infection is more severe on the lower crown and moves upward as the disease progresses (Figs. 2 and 3). Depending on the host and fungal prevalence, infections can occur on several parts of the needles. This can result in severe defoliation which may lead to mortality of branches and whole trees (Fig. 4). Generally, second and third-year needles become infected leaving only the new growth needles at the tip of the branches as non-infected tissue. From the infected older needles, the fungus spreads and infects the needles of the current year. Development of disease symptoms and damage depend on the fungal strain and favorable climatic conditions.

BSNB fungus overwinters (becomes dormant during winter months) in the infected needles. When light, temperature, and humidity are favorable, it becomes active again and begins to spread.

Potential causes

Soil and site conditions can serve as indicators for the risk level of brown spot needle blight. Infected loblolly stands are predominantly found at sites with sandy-to-sandy loam and sandy clay loam soils with periods of long saturation. Waterlogged conditions in the stands and sites near the edge of a body of water are considered high risk locations for BSNB infection and disease success.

Genetics are another indicator. Some loblolly pine families are more susceptible than others for this disease. Selecting resistant seedlings of loblolly pine is an important consideration to prevent the BSNB infection and limit disease success in the stand.

Management options

Foliar and chemical treatments are available to aid in the prevention and management of brown spot needle blight. Few actions can be taken for mature stands which repeatedly experience defoliation and tree mortality; however, applying some basic management guidelines can potentially increase stand health and prevent or limit infections by BSNB.

Prevention on existing sites

Warm and humid conditions are conducive for fungal growth and reproduction. Increasing spacing between trees allows for air circulation which can minimize infection. Pruning of the lower branches can also be helpful in increasing the air circulation within the stand.

During the rainy or wet season at infected sites, pruning must be limited. Fungus spores can attach to pruning shears or cutting blades and become a potential source of infection to the healthy trees in the stand.

Weeds and grasses under the trees should be replaced with a layer of composted mulch to prevent competition, mower root damage and improve tree vigor. Mulch should be 3 to 4 inches deep and ideally extend to the tree's dripline.

Establishing new stands

It is advisable to plant disease-free seedlings of superior quality, as not all loblolly pine families are equally susceptible to the disease. Selecting loblolly seedlings resistant to brown spot infection will decrease the chance of infection after planting. Avoid establishing a new plantation near the old, infected stands which can serve as reservoirs of the fungus. Thinning treatments are an effective preventative measure to reduce infection of BSNB

(Continued on page 10)

Brown Spot Needle Blight in Loblolly Pine Stands

(Continued from page 9)

and pine needle pathogens. Monocultures of loblolly pines are at greatest risk. Consider planting a mixture of pines (such as shortleaf or longleaf pines) to prevent the spread of infection and potential mortality to all landscape trees.

Managing infected stands

In forest settings, tree crowns should be visually inspected to recognize brown spot needle blight infection severity. This can be achieved by visually rating the proportion of tree crown with yellowing, dead needles, and/or thin crown. Location (bottom, middle, or top) of the crown damage is another indicator of disease progression from lower branches to upper branches.

Selective removal of infected branches can be an effective management strategy when less than one-third of the tree crown is infected and disease is only detected at the lower branches. Although the timing must be carefully planned for the dry summer months and sanitary techniques such as disinfecting shearing tools between thinning branches should be taken to prevent pathogen spread and reduce disease severity over time.

Conversely, two-thirds or more of crown infection requires complete removal of infected trees from the forest. This should be completed by felling and burning infected trees along with all the litter beneath the trees. A stand with nearly 50 percent of trees sporadically infested and a combination of crown damage

(bottom and middle/middle and top/bottom and top) requires an immediate removal/clear cut of the stand.

Fungicide treatments are effective to protect pine seedlings from infection by BSNB. In nursery settings, Chlorothalonil, a broad-spectrum organochlorine fungicide (products include Bravo®, Daconil® and Maneb®) can be sprayed to provide successful control against brown spot infection. Another option is a Bordeaux mixture composed of copper sulfate and slaked lime, which offers a protective barrier on the plant surface inhibiting conidial germination. This product can be used for the protection of landscape seedlings, seed orchard trees, and Christmas tree plantations. It is best to initiate spraying in the spring when newly-emerging needles are 2 to 5 cm long, and usually four to six applications throughout the year are sufficient. However, it is only economically feasible to apply in landscape settings and high-value trees. Product rates and recommendations for the aforementioned fungicides are located on the labels of pesticide containers.

A study is underway to investigate and screen loblolly pine families which have resistance against brown spot needle blight. More research must be undertaken to better understand disease patterns, biology, and stress factors which cause this disease to successfully infect loblolly pines. 🌲

“ An easy way to identify the disease is if the pine needles look as if they have been scorched by fire, even though there has been no burn. ”



Fig. 1 Brown spot needle blight symptoms: (A) reddish-brown needles; (B) brown circular spots surrounded by a yellow halo at the point of infection; and (C) necrotic needles from the tip with irregular brown circular spots.



Fig. 2 Infected loblolly pine with brown spot needle blight: (A) infection on lower branches and (B) needles turning reddish-brown from the tip.



Fig. 3. Landscape tree infected by brown spot needle blight disease (note infection progressing in upper branches).



Fig. 4. A 2012 plantation stand infected by brown spot needle blight disease (note thinned canopies and mortality of branches and whole trees).

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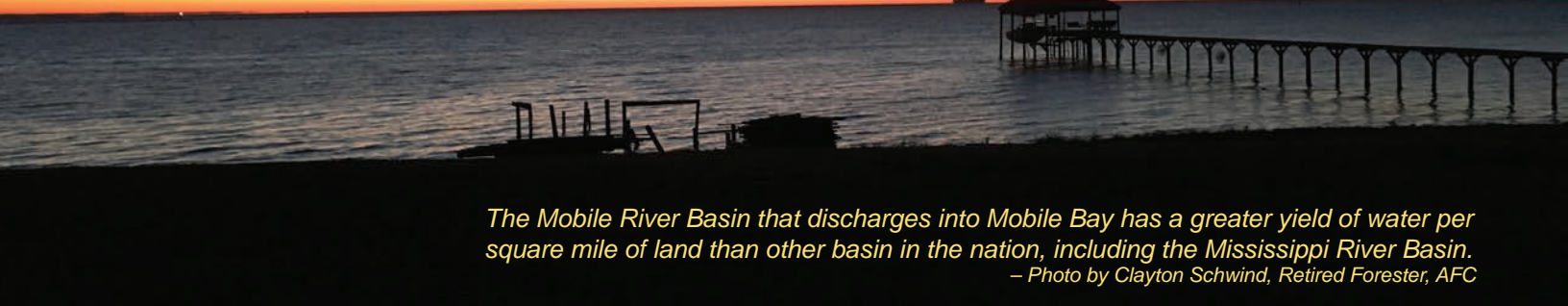


SCAN ME



Alabama the Beautiful: *Rivers Run Through It*

*By Coleen Vansant, Communications and Public Information Manager,
Alabama Forestry Commission*



*The Mobile River Basin that discharges into Mobile Bay has a greater yield of water per square mile of land than other basin in the nation, including the Mississippi River Basin.
– Photo by Clayton Schwind, Retired Forester, AFC*

Did you know one of the most biologically diverse states in the country is our very own beautiful state of Alabama? Referred to as the ‘Fort Knox of biodiversity’ by researchers at the University of Georgia, Alabama ranks fifth nationally in total species diversity behind four states at least double its size. California is number one, followed by Texas, Arizona, and New Mexico. They might be larger in size, but Alabama has twice the number of species per square mile than the larger states. “Alabama the Beautiful” comes in first as the most diverse state east of the Mississippi River.

To understand how Alabama became one of the most biologically diverse states in the nation you must look at several things: geology, geography, climate, and water resources. But to really understand how the state turned out so special you must travel back in time 2.5 million years.

The Glaciers, or lack of them

During the Pleistocene period (2.5 - 11,700 million years ago), most of the continental U.S. was covered in glaciers. Everything was frozen under ice – including plants and animals – except what is now the southeastern United States. Although it was much colder, Alabama was virtually ice-free. All the fauna and flora of this last Ice Age are still here – they just evolved and adapted to their new environment as everything around them changed.

The Climate

With Alabama’s latitude (between 30 and 35 degrees north), there are four seasons and a very long growing season – 200 days in the north and 300 in the south – which boosts its biological productivity. The state has a very warm semitropical climate and receives an abundance of sunlight which helps support a vast ar-

ray of plants and animals. Bordering the Gulf of Mexico, Alabama’s climate is in large part driven by the moisture that evaporates from these warm waters. We also have abundant rainfall, receiving around 54 inches of rain annually. The city of Mobile receives the largest amount of rain of any city in the nation, more than 65 inches per year! With the heat, sunshine, and rain, most of us would call it a miserable summer day. However, this climate creates the perfect greenhouse environment for Alabama’s plant and animal species to thrive.

The Geology

Alabama’s geology is one of the most diverse in north America. There are mountain ranges, deep valleys, and craggy hills through the Appalachian foothills; fertile soil in the Black Belt; wiregrass in the south; coastal plains, river deltas; inland wetlands, lakes, rivers, and creeks; springs; swamps; intricate cave systems; gulf and bay coastlines; and barrier islands – all providing a vast array of soil types across the state. This geological diversity helped create a buffet of different micro habitats and environments in which a menagerie of plant and animal species have thrived and evolved over time.

The rich dark soil of the ‘Black Belt’ that stretches across central Alabama from Georgia to Mississippi is unique because it was the coastline of an ancient sea that was created during the Cretaceous period, 145 to 66 million years ago. At that time, shallow seas covered much of the southern United States which supported tiny marine plankton with carbonate skeletons. Over time these skeletons accumulated into massive chalk formations in the shallow waters. Both porous and alkaline, this chalk became incredibly fertile soil well suited for growing crops, especially cotton.

The Water

Alabama's abundant water resources provide one of its greatest assets. Approximately 77,000 miles of perennial rivers and streams run through the state, ranking it seventh in the nation and providing more freshwater biodiversity than any other state. Combined with intermittent streams and channels, that number increases to 132,000 miles. According to the U.S. Geological Survey, around 10 percent of the freshwater that flows through the U.S. originates in or flows through Alabama.

Alabama's water resources are some of the most diverse in the world, helping rank the state **first** in the United States in the following categories:

- **Freshwater fishes – 332 kinds of fish**
– 27% of all fish species in North America
(20 species are endemic to Alabama)
- **Freshwater mussels – 180 kinds of mussels**
– 59% of all mussel species in North America
- **Freshwater snails – 202 kinds of snails**
– 28% of all snail species in North America
- **Crayfish – 97 kinds of Crayfish**
– 22% of all crayfish species in North America
- **Turtles – 27 kinds of freshwater turtles**
– 57% of all turtle species in North America

Alabama also ranks fourth in the combined diversity of amphibians and reptiles. The state's extensive cave system primarily located in the northeast corner of the state provides a treasure of creatures that are not common anywhere else. Because of the vastness of these cave systems, only a small portion has been explored and documented, but what has been found is enough to rank Alabama third in the temperate world as the most biodiverse when it comes to creatures and critters that love to live in the dark cool waters of a cave.

Ranking 14th in the nation with 563,000 acres of lakes, ponds, and reservoirs, Alabama also ranks 24th in the number of freshwater wetlands with 3.6 million acres. Additionally, there are 50 miles of shoreline and beaches, 390,000 acres of estuaries, and 271,000 acres of coastal wetlands. These unique areas provide critical habitat for many of our states plant and animal populations.

With 1,438 miles, Alabama leads the nation in navigable waterways and channels, with 16 lock-and-dam units on six river systems. There are 14 hydroelectric generating plants and an additional 20 or more impoundments on smaller rivers and streams. Approximately 56 percent of the state's population gets their drinking water from our rivers, streams, and reservoirs. About 33.5 trillion gallons of freshwater flow through Alabama's river and streams every year.

The Cahaba River

The Cahaba River is Alabama's last remaining free-flowing river and it's one of the most scenic. It begins just northeast of Birmingham, winds approximately 194 miles in and out of Alabama's largest metropolitan area and through the state's most rural communities where it empties into the Alabama River at Old Cahawba. It supplies the primary drinking water for one-fifth of the state's population. According to The Cahaba River Society, the river is a treasure of biological diversity of national and global importance.

There are more than 130 species of fish, 18 of which are not found anywhere else in the world. It has more species of fish in its waters than the entire state of California. One-sixth of all freshwater fish species known in the U.S. live in the Cahaba. It is home to 139 rare and imperiled species, including 10 fish and mussel species listed under the U.S. Endangered Species Act.

(Continued on page 14)



– Photo by Coleen Vansant

Murphy Creek, Blount County - Alabama ranks seventh in the nation with 77,000 miles of perennial rivers and streams running through it. Around 10 percent of all the fresh water that flows through the U.S. originates in or flows through Alabama.

Alabama the Beautiful

(Continued from page 13)

— Photo by Coleen Vansant

Alabama ranks 24th nationally in the number of freshwater wetlands such as this swamp.

The Mobile River Delta

The Mobile River Basin is one of the richest in the world in terms of the number of species and types of habitats. Referred to for decades as “Alabama’s Amazon,” the major rivers, creeks, and streams that feed the basin create the largest inland delta system in the U.S. Second only to the Mississippi Basin in how much water it dumps into the Gulf of Mexico, the Mobile River system is the fourth largest in the country in terms of water flow and drains parts of four states: Alabama, Tennessee, Georgia, and Mississippi.

The Mobile River Basin covers two-thirds of the state and has a greater yield of water per square mile of land than any other basin in the U.S., including the Mississippi River. Because of the Mobile River Basin, Alabama is home to more species of freshwater fish, mussels, snails, turtles, and crawfish than any other state. There are 18 turtle species in the Mobile Delta, more than any other delta system in the world.

The Forests

With 23 million acres of forests and 16.34 billion trees, the state of Alabama is home to the third largest timberland acreage in the 48 contiguous states, behind only Georgia and Oregon. The state’s timber base is larger than the states of Connecticut, Delaware, Massachusetts, New Jersey, and Rhode Island combined.

From the hardwood mountains of north Alabama to the cypress swamps of the Mobile River Delta, Alabama’s vast forests help sustain and protect species biodiversity. Two-thirds of the state is covered in forestland that not only provides shade and different habitats, but also

prevents pollution from runoff into the vast freshwater river and stream systems. These forests also assist in the recovery of species at risk, providing a diverse place for animals to live and breed.

At one time the Great Smokey Mountain National Park was thought to be the holy grail of oak tree diversity in the world. Fifteen species of oak had been identified within the boundaries of the park. Alabama has since displaced the champion, when a few years ago scientists working in the Red Hills area along the Alabama River discovered 20 species of oak trees on a single hillside.

With Plenty Comes Loss

When you are blessed with much, you also have much to lose. Sadly, Alabama ranks high in another category – the number of threatened and endangered species. While ranking at the top for the number of fish, snails, crawfish, and mussels, we also rank at the top of the list for the most aquatic extinctions. Since the 1800s, almost half of all extinctions in the continental U.S. have occurred to species that lived in the Mobile River Basin. Over the past 80 years, Alabama has lost approximately 67 species of fish, mussels, and snails to extinction and more than 84 species are listed as threatened or endangered, according to the U.S. Fish & Wildlife Service.

Alabama’s extinction dilemma is not limited to just aquatic species but extends to terrestrial species as well. The state ranks number two in the number of total extinctions, and number three for the number of animal species on the list of threatened and endangered species.

Part of the reason Alabama has so many threatened, endangered, or extinct

species of flora and fauna is so many rare species existed initially. The more you have, the more you have to lose. But other human activities have negatively impacted Alabama’s flora and fauna. Dams and alterations to the rivers and streams over the past two centuries have been instrumental in contributing to high extinction rates by blocking many aquatic species from freely moving up or down river. Other factors include industrialization and development, water pollution, and the introduction of non-native species.

Still More to Discover

In May of this year, researchers at George Washington University published a study identifying a new salamander, naming it *Desmognathus Pascagoula*, or the Pascagoula dusky salamander. This salamander has only been found in southwest Alabama and southeast Mississippi.

Scientists from the University of Alabama in Huntsville recently announced they had rediscovered a small, rare crayfish thought to be extinct for 30 years. The small Shelta Cave crayfish was found in Huntsville’s Shelta Cave, the crustacean’s only home. Between 1963 and 1975, only 115 Shelta Cave crayfish individuals were confirmed. In the last 47 years, only three have been sighted and confirmed.

For years Alabama’s rich biodiversity was overlooked but more recently has been a focus of many conservation biologists and researchers. Since we began attracting more scientific attention, more new species have been discovered and rediscovered, along with those we sadly have lost. 🌿

Not all classrooms have four walls



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HIDDEN TREASURE

Camp Horne
WHERE ADVENTURE AWAITS



By Samuel Boswell, Tuscaloosa County Forester, Alabama Forestry Commission

Nestled in the rolling hills of western Alabama and just a few miles east of the University of Alabama sits Camp Horne. The property is covered with a diverse number of native shrubs, wildflowers, and trees that include natural-growth hardwoods and planted longleaf pines. The camp serves as the main summer camping facility for hundreds of youths each year. Camp Horne is managed by the Black Warrior Council (a local council of the Boy Scouts of America) and is directed by Tim Patrick, who grew up spending time there as a scout.

The first summer camp was held here in 1924, when the property consisted of only 26 acres. Now in 2022, the camp has grown to nearly 500 acres. As the site is approaching its 100th year of involvement in the scouting program, it features several historical buildings that connect the past to the present while meeting the needs of today's Boy Scouts.

Camp Horne offers many amenities and activities for the scouts to utilize such as two lakes; a boating area; a rifle, archery, and shotgun range; an Olympic-size swimming pool; a climbing tower; numerous hiking trails; eight different campsites; a dining hall that includes an industrial-size kitchen; two barbecue grills; large and small pavilion areas that also serve as the camp store; a chapel; a medical hut; Hulsart Training Center; Project COPE course; and many other unique structures and sites.

The facilities are also available for public rental. Weddings, ROTC events, fraternity service days, family reunions, church

and corporate outings, fundraiser activities, and training events have all taken place at the camp. Any group can work with the scout office to plan the perfect adventure.

The camp first became a certified TREASURE Forest in 1992 and was recently recertified in 2020. Being a TREASURE Forest means that Camp Horne is dedicated to the education of scouts and young people about the importance of environmental stewardship and sustainability.

In 1995, the Boy Scouts and Camp Horne entered into a venture with the Tuscaloosa County Board of Education to establish an environmental education learning center. Camp Horne is also dedicated to education about wildlife and its management. The camp provides many young people with their first experience and impression of our natural world. This is an extremely important mission as technology tries to remove us from nature. Many scouts and young people gain interest and form a curiosity about the environment here that they will never forget.

Camp Horne is a wonderful and amazing place for outdoor learning and adventure. It provides something for everyone, whether it's a tour around the lake, the perfect nature walk, or a group activity on the skeet shooting trail. A visit to the site museum will teach you about the camp's history and how you can be a part of its future. Make a trip to Camp Horne today and create some lifelong memories while reconnecting with nature. 🏕️



A photograph of a large, mature tree with a thick trunk and many branches. One large branch has fallen and is lying on the ground in front of the tree. The background shows a grassy area, a paved path, and other trees under a clear blue sky. The title "When Beauty IS The Beast" is overlaid on the image. "When Beauty" is in a yellow, cursive font, "IS" is in a white, bold, sans-serif font, and "The Beast" is in a white, serif font.

When Beauty IS The Beast

Photo by Joseph LaForest, University of Georgia, Bugwood.org

*By Katie Wiswall, Urban & Community Forestry Partnership Coordinator,
and Dale Dickens, Urban Forestry Coordinator, Alabama Forestry Commission*

As you drive through Alabama in the early spring, do not assume all those beautiful, white-blossomed trees you see are dogwoods. Odds are that they are not dogwoods at all, but those noxious Callery pears or their highbrow cousin, the cultivar known as ‘Bradford’ pear. Regardless of the name, this is one beauty that may very well break your heart.

First, they stink. The flowers may look pretty, but many people find the smell of the flowers objectionable, like rotting fish.

Second, they can cause you injury. The smelly blooms attract flies and stinging wasps, and the purportedly sterile fruits produce ‘wild’ seedlings that develop large, sharp thorns. These thorns can easily penetrate your skin as well as large tractor tires.

Third, there is the effect they can have on your wallet. Cleaning up behind a Bradford or Callery pear can be far more expensive than most homeowners expect. The cultivar has been selected for more blooms, which has resulted in too many competing stems which press against one another. As these trees age, the weight and size of their branches increases, putting strain on the points at which they attach to the trunk. It is not unusual for Callery pear owners to find a significant portion of their tree suddenly on the ground, even without a storm event. Worse still, they may find major limbs have fallen on their vehicle, fence, barn, or home! Hopefully no one is under those falling stems.

Finally, as if all the above is not enough, this non-native invasive tree degrades the environment. Its many offspring form dense thickets, occupying all the available growing space and choking out native flora. This reduces the arthropods (think crickets and grasshoppers) on the ground. Caterpillars do not find the leaves of the Callery pear desirable, so they do not hang out in those areas either. This makes stands of Callery or Bradford pear virtual food deserts for the birds that depend on such creatures as food sources.

Nevertheless, there are some remedies to combat the beast that we have allowed to grow in our midst. First, if you have the opportunity to add trees to your life, DO NOT add any variety or cultivar of Bradford or Callery pear. Many are available, but do NOT believe the tag on the tree. Just say no.

Second, investigate on your own and spread the information to your friends and neighbors. You can find reliable information, as well as fiction, about the Callery pear online. Southern Living magazine’s site has numerous articles exposing the truth about this tree. Our own Alabama Cooperative Extension System has an excellent fact sheet found at <https://www.aces.edu/blog/topics/forestry-wildlife/Callery-pear-history-identification-and-control/>. Dr. Nancy Loewenstein at Auburn University or Dr. David Coyle at Clemson are both experts on the tree as well. Search for their articles if you need more convincing about the need to eradicate this beauty-turned-beast.

Third, you can REMOVE the ones that live on your property! Yes, it hurts to remove an apparently healthy tree from your landscape. But really, those Bradford pears are not ‘healthy.’ They are stealthy – waiting for the right moment to break your heart.

And fourth, you can advocate for aggressive measures that assist private citizens with removals and prevent the continued sale of the tree within our borders. Three states (Ohio, Delaware, and South Carolina) have instituted bans that prohibit the importation or sale of these trees. Many communities – including one in Alabama – have offered bounties or free replacement trees for each Bradford pear removed. Read the accompanying story by Anne Randle, the arborist for the city of Auburn, about a ‘bounty’ program they offered. Perhaps your town could offer a similar program. For now, avoid this ‘beastly’ tree in its beautiful blooms. You will be happier for it. 🍷

Blooming Mexican plum,
a Bradford pear alternative.

INVASIVE TREE EXCHANGE

• City of Auburn •

By Anne Randle, Arborist, City of Auburn

There is arguably no closer link between the urban forest and the vast acres of wild and managed forest in Alabama than invasive plants. Often originating in the home garden and spreading to native landscapes, invasive plants demand constant education for a diverse audience and control in various habitats. As the urban forester for the City of Auburn, I spend most of my time interacting with the public. It puts me in a unique position to both educate and directly improve our urban and native forests. In 2020, that opportunity led the City to pursue a grant from the Alabama Invasive Plant Council (ALIPC) to support Auburn's Invasive Tree Exchange Program. Although small in scale, the program generated significant interest and excitement and might be a great asset for other communities across the state.

The City of Auburn has a population of about 76,000 and is the home of Auburn University and a couple of famous oak trees. We have a long history of urban forestry within our municipal government, but that program has not included much public outreach in the past. Auburn has grown significantly in the last decade and is now facing a lot of the same issues as other cities: we have major losses in tree canopy, our remaining tree canopy is declining in health, and we have limited interaction with citizens. Invasive species are not a new phenomenon for us, so this project wasn't about addressing a new threat, but invasive species do provide a way to engage our community and build enthusiasm around this shared asset. The primary goal for this program was to start a conversation and get people to take pride in the City's tree canopy.

We also wanted to raise awareness of the Callery pear as an invasive species. The Callery pear, (*Pyrus calleryana*), is native to China and was widely planted for its white spring blossoms and red fall color. Several cultivars of Callery pear are popular, including Aristocrat, Autumn Blaze, Bradford (the commonly

planted Bradford pear), Capital, Cleveland, Chanticleer, Red-spire, and Whitehouse. While these trees aren't getting planted very much anymore, they are extremely common in our area and are becoming a nightmare in our forests. From a municipal perspective, they're also difficult to deal with in city rights-of-way because of their weak structure. A Callery pear will shatter on a sunny day and can be a significant hazard near roads and sidewalks. There are plenty of people who already hate these trees, but there are also a lot of folks who have no idea the impact they are having on our greater environment, so it's a good enemy to rally around.

***“Our goal was to remove 250 invasive trees in the city limits of Auburn...
...we exceeded that goal.”***

We modeled our work after similar projects in Fayetteville, Arkansas; Clemson, South Carolina; and Missouri. The exchange program functioned like a bounty system, where participants received up to five native trees to replace invasive trees they removed. The application was set up on the City's website and just required the applicant's name, address, and number of invasive trees they planned to remove. We accepted all trees listed as invasive by the Alabama Invasive Plant Council: Callery pear, Chinaberry (*Melia azedarach*), golden raintree (*Koelreuteria paniculata*), mimosa (*Albizia julibrissin*), popcorn tree (*Triadica sebifera*), princess tree (*Paulownia tomentosa*), privet (2" caliper or greater) (*Ligustrum spp.*), sawtooth oak (*Quercus acutissima*), tree of heaven (*Ailanthus altissima*), Chinese parasol tree (*Firmiana simplex*), and Chinese elm (*Ulmus parvifolia*).

(Continued on page 20)

INVASIVE TREE EXCHANGE



(Continued from page 19)

After citizens submitted their applications, they were reviewed to confirm property ownership. Then we asked the owners to submit pictures of the trees they wanted to remove, so I could verify that they were invasive. Once confirmed, they had to send another picture of themselves with the cut-down trees and arrange a time to pick up their native tree replacements. Needless to say, attempting this project during mandatory social distancing made the logistics more complicated.

We offered four replacement options and allowed applicants to choose while the supply lasted. Replacements were in three-gallon containers and about five feet tall, so trees were big enough for homeowners to feel as if they were getting a real tree, but small enough for them to transport and plant in a yard. Cherrybark oak (*Quercus pagoda*), southern sugar maple (*Acer floridanum*), blackgum (*Nyssa sylvatica*), and Mexican plum (*Prunus Mexicana*) were offered as replacement trees, providing the option of a large, midsize, or small tree, good fall color, and a flowering tree. The City did not provide any assistance with cutting down trees or debris removal, beyond our existing yard waste disposal program.

Our goal was to remove 250 invasive trees in the city limits of Auburn, and

with the help of Auburn University (AU) Facilities Management and AU Arborist Alex Hedgepath, we exceeded that goal. While we were not able to promote the program as we originally planned through volunteer invasive removal work days, Mr. Hedgepath and his crew removed an acre of invasive trees on campus and then coordinated a socially-distanced tree replanting day with university students and staff.

As a part of the program, we set up a page on the City's website about invasive species where we housed the program application. Over eight months, the page received 1,670 unique visitors. We also used the City's social media accounts to post facts and stories about Callery pears and the other invasive trees. These posts generated more than 3,500 interactions on social media through likes, shares, and comments. In addition, Dr. Nancy Loewenstein along with David Russell and Stephen Enloe authored "Callery Pear: History, Identification, and Control." This article was published by the Alabama Cooperative Extension System and serves as an excellent education piece beyond the scope of our project.

While Callery pear was the focus of the program, it represented just 18 percent of total removals. Privet was by far the most popular removal at 54 percent. The

favorite replacement tree was the Mexican plum. Many homeowners were hesitant to commit to the larger cherrybark oak. Most participants chose to remove the maximum five trees.

But the point of the project wasn't numbers alone, it was building that sense of ownership around Auburn's tree canopy, which is best illustrated by the partnerships we built. In addition to the work with Auburn University, two homeowners' associations (HOAs) reached out about the project. Both were maintaining several acres owned by the HOAs as a community greenspace and they wanted to use this program to expand what they were doing. By getting the HOAs involved, the City could provide the trees while they organized the work within their neighborhoods. Since this project ended, the City has been approached by three other HOAs about how they could organize in their own neighborhoods.

While I think the program would have benefitted by launching during a less stressful news cycle, it successfully encouraged citizens to remove invasive trees and take ownership of Auburn's urban forest. The time commitment was feasible for myself and volunteers over the year it was offered and it could easily be expanded. If you're interested in offering something similar in your community, I encourage you to reach out to me or the other organizations that have promoted this type of invasive outreach program: Clemson Extension, the Missouri Invasive Plant Task Force, and the City of Fayetteville, Arkansas. The City of Auburn continues to receive calls asking about the invasive exchange program, and I look forward to offering it again on a larger scale in the future. 🌱

Photo by John Ruter, University of Georgia, Bugwood.org



Southern Sugar Maple (Acer floridanum)

A Species from the Underworld

*By Rob Hurt and Jennifer Grunewald,
U.S. Fish & Wildlife Service,
Alabama Ecological Services Field Office*

Photo by Dante Fenolio

The Alabama cavefish (*Speoplatyrhinus poulsoni*), an extremely rare species from the underworld, is known only to exist at Key Cave. Located in north-west Alabama, Key Cave is in an area known by locals as the “Bend of the River.”

The cave underlies property owned by the U.S. Fish & Wildlife Service (USFWS) known as Key Cave National Wildlife Refuge (NWR or Refuge). The Refuge, one of seven refuges comprising the Wheeler National Wildlife Refuge Complex (Complex), was established on January 3, 1997, in Lauderdale County, Alabama, under the authority of the Fish and Wildlife Act of 1956; the National Wildlife Refuge Administration Act of 1966; and the Endangered Species Act of 1973. The purchase of this property was made to ensure that the biological integrity of Key Cave, Collier Cave, Collier Bone Cave, and their common aquifer remains intact.

Key Cave NWR consists of 1,060 acres along the northern shore of Pickwick Reservoir of the Tennessee River. Refuge property is underlain by Tuscomb limestone, whose weathering has produced many karst features including numerous springs, sinkholes, and several underground cave systems. There are very few exposures of bedrock except for locations along the bluff line overlooking the Tennessee River. The landscape of the Refuge has been described as flat to gently rolling upland terraces with slopes ranging from one to 15 percent. One hydrogeologic survey of the property noted the elevation of land surface ranges from approximately 500 to 580 feet above mean sea level (MSL).

Prior to 1992, the Monsanto Company owned the 1,060-acre tract, located in what became described in a late 1980s-early 1990s hydrogeologic survey report as the high hazard risk area of the Key Cave Aquifer. Concerned for the long-term health and protection of the Key Cave system and its biodiversity, and after considerable resources and time negotiating, Monsanto sold this

tract to The Conservation Fund in 1992. The Fund then held the land until the U.S. Fish & Wildlife Service acquired it some five years later to establish Key Cave NWR.

Key Cave’s entrances are located on Tennessee Valley Authority (TVA) lands on the northern shore of Pickwick Lake and adjacent to the refuge boundary. Several decades ago, TVA erected a chain-link perimeter fence around the entrances not only to restrict access into the cave due to human health and safety concerns, but also for the purposes of protecting sensitive, cave-dependent species such as the gray bat and Alabama cavefish and their habitats from human disturbance. More recently, TVA removed the chain-link fencing and replaced it with a new, more durable style fence. Since the Refuge’s acquisition of the property, Refuge staff have worked closely with TVA staff to protect, monitor, and survey these properties and the cave resources found there. The Refuge also provides habitat for a variety of migratory birds and resident wildlife species. Several priority bird species commonly occurring on the refuge include the dickcissel, grasshopper sparrow, field sparrow, northern bobwhite, northern harrier, and short-eared owl.

Growing on the Refuge’s gently rolling landscape are upland forests consisting of hardwood and conifer tree species, croplands, and grasslands. Currently, approximately 295 acres are in row crop production (corn, soybeans, wheat, and sunflowers) under a Cooperative Farm Agreement. As part of this agreement, the Refuge requires the farmer to leave 20 percent of cropland in non-harvested sunflowers, corn, and soybeans. Upon proper timing during the fall months, the Refuge staff will then manipulate those crops to benefit wildlife, providing a supplemental food source for wildlife while also promoting the use of the Refuge by game animals so that the public has another property available to enjoy the sport of hunting.

(Continued on page 22)

A Species from The Underworld

(Continued from page 21)



A field of sunflowers grows at Key Cave National Wildlife Refuge

Photo by USFWS

Approximately 327 acres are in early successional fields or native warm season grasses (big bluestem, little bluestem, Indian-grass, sideoats grama, switchgrass, and eastern gamagrass). A total of 122 acres of former cropland were planted to hardwoods and an additional 30 acres of drainageways are restored to either a grassland or hedgerow habitat. The remaining acreage consists of 16 acres managed as shallow water areas, 75 acres targeted to be converted to an oak/ hickory savanna, and the remaining 195 acres are upland forested land dominated by oaks and hickories.

The Refuge cooperater farmer plants and manages the crop fields, while the remaining non-crop acreage is managed by Refuge staff utilizing prescribed burning of the native warm season grass and fallow field areas to promote early successional habitat for a range of terrestrial game and non-game wildlife. Prescribed fire is also promoted in the forested areas on the refuge to control undesirable understory vegetation and to promote conversion to a more open, understory and oak/hickory savannah habitat component. These combined efforts of management allow for a diversity of habitat types and encourages use of the property by a multitude of neotropical migrant birds and resident game species such as deer, turkey, and quail.

To meet specific Refuge directives, the primary management objectives for Key Cave NWR include protecting habitat for

Key Cave is in the recharge area of the Mississippian-aged Tuscombium limestone aquifer and the cave has a mapped groundwater recharge area of approximately 16 square miles. Groundwater flowing through the cave is likely discharged into the Tennessee River via Collier Spring, which is submerged under Pickwick Reservoir, and Woodland Spring. Most of the surface water enters the Key Cave karst system through sinkholes or seeps.

The aquatic community at Key Cave includes, but is not limited to, the Alabama cavefish, southern cavefish, Alabama cave crayfish, phantom cave crayfish, and an undescribed cave shrimp (see page 23).

The food of the Alabama cavefish has not been determined but is expected to include copepods, isopods, amphipods, small crayfish, and shrimp. Flooding in caves brings changes in water level temperature, food availability, turbidity, and water chemistry. Cavefish are believed to rely on increased flow and small temperature changes associated with cave flood events during winter and spring to coordinate reproduction. Because most populations of cavefish are reportedly small, successful reproduction is very important.

Since little is known about this species, we must infer aspects of its biology from research of other related species. Cavefish adults quickly respond and move toward a water surface that is disturbed by falling water droplets or bat guano, but they also scavenge for food, perhaps relying on chemosensory organs that allow the fish to perceive chemicals in the water that are related to food sources. In contrast, relatively small, younger fish scavenge for food exclusively at the bottom, again possibly using chemosensation.

The species continues to face threats from groundwater degradation and lower groundwater levels, in addition to diminished organic input by bats. The Alabama cavefish is highly endemic with an extremely localized subterranean range that makes it vulnerable to extirpation from catastrophic events such as toxic spills, changes in flow regime, and changes in aquifer recharge due to pumping for public water supply or irrigation. These threats, coupled with the species' restricted range and small population size, increase its vulnerability. Monitoring of water quality and water elevation is ongoing.



Refuge staff utilize prescribed burning

Photo by: USFWS

Alabama cavefish



Photo by Dante Fenolio

Southern cavefish



Photo by Bernie Kuhajda

Alabama cave crayfish



Photo by Matthew L Niemiller

Phantom cave crayfish



Photo by Matthew L Niemiller

Cave shrimp



Photo by Bernie Kuhajda

Bats, particularly federally endangered gray bats, are important in the conservation and management of the Alabama cavefish. In Key Cave, the gray bat colony is likely the primary source of organic matter through the deposition of guano dropped by bats living at the cave ceiling. Studies have shown that additional nutrient sources for cavefish is the organic matter brought into the cave system through sink holes, sinking streams, and seasonal flooding. Diminished organic matter input adversely impacts the aquatic food base in caves.

Key Cave National Wildlife Refuge is home to the unique and extremely rare Alabama cavefish. The Refuge's management of the land protects the sensitive cave system and surrounding land for the species and is conducted for the benefit of the public.

If you are interested in learning more about the Refuge or its inhabitants, please visit the following link:
https://www.fws.gov/refuge/key_cave/ 🦇

In Key Cave, the gray bat colony living at the cave ceiling is the primary source of nutrition for the Alabama cavefish.





Changes in Alabama's Wild Turkey Season 2022

*By Steven Mitchell, Upland Game Bird Coordinator,
Alabama Division of Wildlife & Freshwater Fisheries*

Alabama has long been considered to have one of the best wild turkey populations in the country. From the brink of extirpation, restoration efforts by the Alabama Division of Wildlife & Freshwater Fisheries (ADWFF) started the recovery of the state wild turkey population. Phenomenal growth and expansion of the turkey population following restoration allowed liberal hunting seasons and bag limits that hunters have enjoyed for around half a century.

Things have a way of changing though, and unfortunately, wild turkey population trends have been declining in Alabama for the last decade. In 2013, due to growing concerns for the long-term sustainability of the turkey population, ADWFF initiated measures to identify solutions that could potentially stabilize or reverse declining trends. These actions included a comprehensive retrospective review of wild turkey research in Alabama, research in the southeast, and collaboration with Auburn University to develop a new research project. The outcome was a science-based recommendation to adjust hunting season framework for better protection of wild turkey productivity and promotion of sustainable population growth while maximizing hunting opportunity.

Background

Evidence supporting the decline in Alabama has been reflected in both harvest and reproductive surveys in Alabama over the last decade. Post-season gobble harvest estimates of over 45,000 that were common prior to the last ten years continue to decrease with the most current post-season estimate of 25,000 for spring 2021. During this same time frame, the number of hunters did not change significantly, averaging about 52,000 annually. Overall trend analyses of harvest data from the last decade indicates nearly a 30 percent decline in harvest numbers, but less than a 10 percent decline in number of turkey hunters. These comparisons lead to the conclusion that over 20 percent of harvest decline is likely not attributable to a loss in hunter numbers. Comparably, data from the statewide brood survey also reflect a declining trend in poul productivity. Productivity over the last ten years indicates an approximate 30 percent decline in poults per hen and brood size. Given our harvest index to population trends and productivity measurements are both indicating a ten-year decline in growth rates, this substantiates a warranted concern for the persistence of a sustainable wild turkey population under current season framework.

Declining wild turkey numbers haven't been limited to Alabama. State wildlife agencies across the Southeast have identi-

fied growing concerns with declining wild turkey populations. In 2016, the Southeastern Association of Fish & Wildlife Agencies (SEAFWA) adopted a white paper prepared by the Southeast Wild Turkey Working Group (SEWTWG 2016) entitled *Establishing Opening Dates for Spring Wild Turkey Hunting Seasons*. This report recommends that state wildlife agencies consider moving opening dates closer to peak nest initiation (most hens laying eggs) to maximize the potential for gobblers to breed with hens prior to harvest. Literature review of nesting phenology in Alabama indicates peak nest initiation is around the second week in April (statewide average). Most of Alabama's spring turkey hunting seasons have historically opened nearly a month prior to peak nest initiation.

Game Check data indicates more than 43 percent of our total season harvest occurs before April 1, well before peak nest initiation. Wild turkeys are the only game bird hunted almost exclusively during their spring breeding period. The removal of dominant males before peak nest initiation raises concerns of reduced breeding potential and ultimately decreased reproduction. Previous research in Alabama suggested that infertile clutches found during the study may have resulted from low density of adult gobblers available for breeding (*Exum 1985*). Infertile clutches may be a contributing factor to decreased population growth resulting from excessive adult gobbler harvest prior to peak nest initiation. In addition, more recent research facilitated by Auburn University examining impacts of hunting pressure on population metrics of wild turkeys in Alabama also indicated occupancy of poults was highest on areas with low hunting pressure compared to areas receiving high or medium hunting pressure (*Stewart 2019*).

Unfortunately, Alabama has previously experienced wild turkey populations that were too low to sustain. During wild turkey restoration, hunting pressure in some northwest Alabama counties resulted in season shifts in the 1950s and '60s. These counties initially opened on April 10 but then later changed to a March 20 opening date. During this timeframe, the observed hunting pressure with a March 20 opening resulted in turkey declines so great that seasons were closed for multiple years and then reopened back to an April start date with no bag limit reduction. Those season structure changes are currently still in place today.

Research

Out of growing concerns regarding declining survey trends and sustainability of wild turkey populations under our hunting sea-

son frameworks, WFF initiated a collaborative research project with Auburn University in 2015. A turkey population model was developed based on current conditions that predicts the effect of various harvest management alternatives on populations and hunter harvest. The project resulted in determining the current vital rates (*Zenas 2018*) of wild turkeys in Alabama and the development of a Decision Support Tool (DST) (*Grand et al. 2021*). The DST is functionally a turkey population model founded on local vital rates (i.e. survival, harvest, and recruitment) that is projected over a 30-year time horizon to compare impacts of different harvest management alternatives on the turkey population (i.e. density), harvest (i.e. density of adult male harvest), and stakeholder value of outcomes.

In general, the model evaluates different harvest management alternatives for spring turkey season including status quo (current season structure), highly restricted season (five-day) (Restricted), closed season (Closed); as well as five alternatives that include combinations of reduced bag limit, later opening date, and shortened season. This resulting DST provides a means for WFF to evaluate and compare impacts of different harvest management alternatives on turkey populations and harvest outcomes over time to make more scientifically informed management decisions regarding turkey populations in Alabama.

Results from the DST indicate the statewide wild turkey population will continue to decline under current (status quo) harvest management framework. The most optimal harvest management alternatives to increase the turkey population were a Closed or Restricted season. However, when comparing across all season frameworks, any harvest management alternative that includes a later opening date results in sustaining or stabilizing the population over time. Alternatives that do not impact productivity (i.e. reduced bag only and status quo) result in continued population declines. Stakeholders (i.e. Alabama avid turkey hunters, WFF biologists, AWF, and NWTFF partners) who attended statewide meetings placed twice as much value on outcomes with higher harvest than high gobbler density. Of all the combinations of season and bag limit alternatives when considering stakeholder value of high harvest, the alternative that frequently ranked as the best decision was determined to be the combination of Open Later, Reduced Bag, and Shorter Season.

Recommendation

Based on evaluation of state data, results from the research project and DST, ADWFF provided a recommendation to open turkey season later (April 1 – May 15 for most of Alabama) and maintain a bag limit of five gobblers but restrict the take of gobblers to one gobbler per hunter during the first 10 days of the season. Although a later opening date was not the highest ranked alternative by the DST, the research results also indicated our stakeholders place high value (preference) on high harvest and as identified in the DST any alternative that includes a later opening date results in sustaining or stabilizing the turkey population. Therefore, shifting our current spring turkey season to a later opening date that is closer to peak nest initiation should provide for a higher male density and survival during the early breeding period enhancing productivity and promoting sustainable population growth. Hunting opportunity would not be compromised since this recommendation results in no loss of spring hunting days. The density of males in a population during peak breeding periods affects productivity and ultimately population size since

male survival is influenced by harvest, which is partially additive mortality. Additionally, a significant percentage (26 percent on average per year) of total harvest in Alabama occurs during the first week of the regular season, which currently coincides with peak breeding dates for turkeys in Alabama. The proposed season change would merely delay the timing of harvest with minimal expected impact on overall harvest numbers while increasing male survival during peak breeding as an effort to increase reproduction.

Although the recommendation presented by ADWFF to the Conservation Advisory Board (CAB) was not adopted, changes were made for the 2022 spring season. Turkey season dates for private lands in most of Alabama ran March 25 to May 8 (Zones 1 and 3) and April 1 to May 8 in northwest counties (Zone 2). The bag limit was reduced to four gobblers, one per day, and no use of decoys during the first 10 days of season. Wildlife Management Area (WMA) and U.S. Forest Service National Forests (USFS) initiated April 1, excluding a small collection which began April 8, and harvest was restricted to one bird for the first 10 days of the season, with no more than two of the four-bird season limit coming from one particular WMA or USFS National Forest. Those statewide private lands changes, along with the ADWFF recommendation, were also implemented on WMAs and USFS lands for the spring 2022 season. Due to changes in season structures of surrounding states, ADWFF enacted the revised regulations on public lands to manage hunting pressure, increase hunt quality, and maintain sustainable populations across the public land system.

In conclusion, the recommendation to shift the turkey season towards a later opening date closer to peak nest initiation could afford the needed protection of turkey productivity in Alabama while still providing ample harvest opportunities for hunters. However, further changes to include an opening date even closer to peak nest initiation may be needed to prevent population level declines that necessitate more restrictive or closed seasons. The key to understanding impacts of our harvest management framework is to continue monitoring the turkey population. By design, structured, science-based decision making is an iterative process. As we monitor the turkey population to understand how these changes affect the population structure, other harvest management alternatives may be needed based on outcomes. The results and recommendations reflected by this adaptive management approach are aligned with other recommendations garnered from research in the Southeast and the SEWTWG white paper pertaining to spring season opening dates. 🦃

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Partnering in Wildfire Mitigation

*By Cole Sikes, former Communications
& Public Relations Specialist, Alabama Forestry Commission*

When AFC Franklin County Forestry Specialist Scott Daniel took a trip to visit his local grocery store, he returned with more than just the usual fruits and vegetables. While walking through the aisles he ran into his friend, Steve Archer, who works next door to the Franklin County Alabama Forestry Commission (AFC) office. Both Scott and Steve work in the forestry sector in northwest Alabama, and during their discussion, Steve informed Scott that he had a gift for his neighbors at the AFC.



Steve is a district manager for American Forest Management (AFM), an organization that is currently contracted to manage approximately 290,000 acres of forest land in Alabama. AFM's client, The Rohatyn Group (TRG), recently purchased property in Franklin County from International Paper and Champion Lumber Company. Included in their purchase were all the remaining assets (tools, equipment, etc.) that were left on the property by the former owners.

When AFM took inventory of these leftover assets, they encountered a hidden gem located in a storage facility. Still in its original shipping crate was a pristine 1999 model "Firecracker" water pump that was intended to be used for suppressing any flames that ignited from natural causes or while performing forest management work. Archer wasted no time deciding who would be the perfect new owners for this piece of machinery.

Scott Daniel and AFC Franklin County Forester Alex Horn had worked without a reliable water pumper unit for several years. Despite attempts to get their only existing unit running, it would not cooperate, making it an unreliable tool for wildfire suppression. In the past, the only first responders able to assist using water delivery in Franklin County were local fire departments and volunteer fire departments (VFDs). Scott and Alex had no form of water delivery system when they would be dispatched to wildfires . . . until now.

The Franklin County duo quickly obliged when Steve offered them this 'new' water pump as a donation. "We rely on the Ala-

bama Forestry Commission for wildfire protection," said Archer. "We never have to request their assistance; they just do it." Steve knew this piece of equipment would not only help him protect the land AFM manages, but also make a difference to others in need of wildfire protection.

Alex recalled that when he removed the water pump from its shipping crate, he was shocked at how good of a condition it was in, especially after sitting for more than two decades. "There have been many times I have been driving down the road and stumble upon a brush fire, with no efficient way to extinguish it without having to return to our office to bring our bulldozer," said Horn. "Now with this Firecracker, we can be better prepared for those quick responses." The Franklin County AFC noted that the new addition will help them assist local fire departments and VFDs, which are vitally important partners of the Commission.

This pump will also be used for educational purposes. The AFC often conducts Forest in the Classroom and Forestry Awareness Week Now (FAWN) programs where elementary students are taught about their local forests, wildfire prevention, and the wildland firefighters that respond to fires.

Some of the students' favorite experiences are trying on wildfire personal protective equipment (PPE), holding firefighter tools, and getting to spray water from one of the truck-mounted pumps.

This working relationship between the Franklin County Alabama Forestry Commission, American Forest Management, and The Rohatyn Group is a shining example of how we may all stand as a unified front with wildfire mitigation. It takes every one of us to ensure that Alabama's 23 million acres of forests remain protected and beautiful. Relationships such as this one in Franklin County is what makes our state a wonderful, safe place to explore, and an even better place to live. 🌲



Franklin pumper mounted on truck



Demonstration of water pump



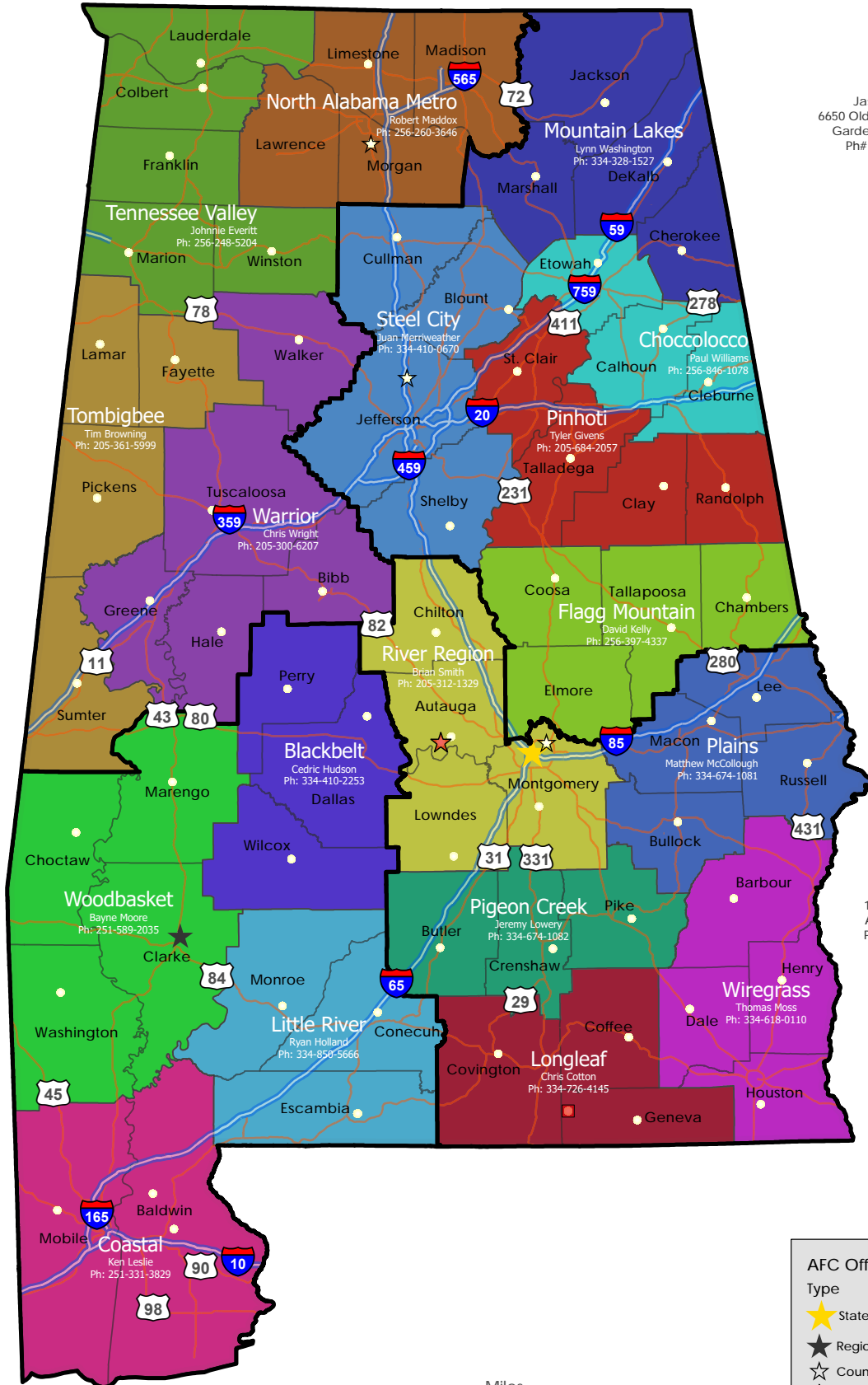
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- ★ Central Shop
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Date: 06/13/2022



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Yellow-poplar

(*Liriodendron tulipifera* L.)

By Bonnie Coleman, FIA Forester, Alabama Forestry Commission

There's just something about a yellow-poplar where the phrase "friendly giant" seems fitting. Also called tulip-poplar or tuliptree, the yellow-poplar (*Liriodendron tulipifera* L.) is part of the magnolia family.

It typically reaches heights of over 100 feet tall, making it one of the tallest trees in North America. The leaf shape, flowers, and fruit make it so unique that other species cannot be confused with it. It has deciduous leaves that are alternate, simple, typically 5-6 inches long, and generally have four lobes, resembling a tulip. Foliage is light green to green during the spring/summer months and turns to a bright yellow in autumn. The twigs are red-brown in color, moderately stout, and glabrous (smooth), with stipules scars that are large and encircle the twig. (A stipule on a plant is an outgrowth near the base of the leafstalk, serving different purposes on different plants. They are particularly noticeable in yellow-poplar as they serve to protect emerging leaves, dropping after the leaf unfolds.) The leaf scar is large and nearly circular, with numerous bundle scars. Terminal buds are typically 0.5-2 inches long, yellow-green to dark, glaucous (with a waxy coating), and flattened with two valvate (non-overlapping) scales, similar to a duck's bill.

The common name tulip-poplar also describes the tulip-shaped flower that blooms in the late spring to early summer after the leaves appear. The five-petaled flowers are 2-3 inches across and yellow-green with orange accents. Its fruit is a cone-like structure that is light brown in color, narrow, and upright, with numerous dry, winged samaras. Other common species, such as the maples, have samara fruits as well, as their flat construction and characteristic 'helicoptering' allow the wind to efficiently scatter these seeds over a great distance. Fruit matures in early autumn and can easily be seen in the treetops during the winter months after the leaves have shed.

The bark of the yellow-poplar changes with age. The younger trees have smooth, gray-green to ashy-gray bark with light vertical grooves, developing into gray, thick, deeply furrowed bark on older trees. The bark can be peeled off a mature yellow-poplar

tree and used as paneling for walls. The yellow-poplar displays light, soft, straight-grained wood that is light creamy white to yellow-brown in color with occasional streaks of green, gray, or black. Yellow-poplar wood can also exhibit mineral stained colors that include yellow, dark purple, and red, which when displayed is often referred to as rainbow poplar. There is speculation that the rainbow colors are due to a bacterial heart stain, and others claim the growing location is what makes the difference. Regardless of how it comes to be, the rainbow poplar wood displays a unique beauty. Its wood is economically important and used for pulpwood, veneer, paneling, furniture, cabinets, trim, pallets, boxes, and even musical instruments.

Yellow poplar can be found state-wide. It tends to prefer moist, fertile, well-drained sites commonly on lower upland slopes, along stream bottoms, and in coves and ravines. Its only request for growing power is to be shade free. When given full light, it can have rapid early growth and successful reproduction.

Want to see a majestic yellow-poplar in person? A well-known yellow-poplar, commonly referred to as the "Big Tree," has held the Alabama Champion Tree title for its species since 1974. Located in Bankhead National Forest within the Sipsey Wilderness, it was last measured in 2021 with a circumference of 263 inches and a height of 172 feet. If you are able to take the worthwhile 8.5-mile round-trip hike, you'll pass some beautiful streams and waterfalls along the way (depending on the season) and come up to a massive yellow-poplar that will leave all in awe! 🌲

