

ALABAMA'S

# TREASURED

FORESTS

*A Publication of the Alabama Forestry Commission*

**FALL 2003**

- **Site Preparation - the Key to Success**
- **Smart Herbicides**
- **Tree Seedlings**
- **Coyotes vs. Alabama Landowners**
- **Topo Maps & Contour Lines**



## A MESSAGE FROM . . .



**BOB RILEY**  
Governor, State of Alabama



**TIMOTHY C. BOYCE**  
State Forester

**W**ith the cool crisp days of fall here, many things occur in Alabama . . . among them football, fall color, and hunting season.

Of the 347 thousand people that hunt in Alabama every year, 73 percent of them are Alabama residents. The remaining 27 percent live out of state, traveling from all over the country and even other countries to hunt the abundant wildlife in Alabama. Each year, hunting brings in over \$610 million dollars to our state's economy. On the average, hunters spend over \$1,700 per person each hunting season. Aside from food and lodging, they spend their money on equipment, fuel, licenses, tags, permits, land leasing, membership dues, and even hunting magazines and books.

Hunting is a big industry in Alabama. The reason that it is so big is the abundant and healthy forests we have that can support some of the finest wildlife in the nation. Approximately 78 percent of Alabama's 23 million acres of forest land is owned by private non-industrial landowners, many of whom manage their land under a responsible stewardship ethic like TREASURE Forest.

By continuing to manage our natural resources and protect our environment, we will attract even more hunters and other sportsmen to Alabama and profit from their investments. ♣

**A**s you travel around the state visiting TREASURE Forest landowners and talking to them about their accomplishments and goals, it becomes vividly apparent how important our conservation programs are. So many landowners continue to show me stewardship practices they have conducted on their land through programs like the Stewardship Incentive Program, the Forestry Incentives Program, the state conservation program, and the Conservation Reserve Program.

The 2002 Farm Bill provided a new program that will also benefit landowners.

The Forest Land Enhancement Program (FLEP) will allow our agency to provide additional education programs and professional technical assistance for landowners. This will further augment the TREASURE Forest Program, through which our foresters and wildlife biologists work directly with each landowner. By preparing management plans for each landowner's specific goals and objectives and helping them implement accomplishments, Alabama's forests remain healthy and productive for all to enjoy and utilize. ♣

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COVER: Scarlett Oak, just one example of the glorious fall foliage our state offers in the autumn months. *Photo by Mark Burkett*

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Whether on the job or at the farm, it's "all in the family." Pictured at a job site a few years ago are (left to right): Don Jordan, Jr., the late H.C. "Hack" Jordan, and D.R. Jordan.

# Building Bridges to Success

By *Elishia Johnson*, Editor

**\$**347.12. That's the amount of money H. C. "Hack" Jordan had saved when he started his own bridge construction business in 1946 at the end of World War II. He had finished high school in Choctaw County and begun working with a railroad "bridge gang." When the war broke out, his eyesight kept him out of the military service so he worked at Alabama Dry Dock and Shipbuilding Company in Mobile. A few years later when he ventured out on his own, all he knew was how to drive piling and build railroad

bridges. His very first job took him to Dale County. And as his son Donald Ray stated, "The rest is history."

In 1948, Mr. Jordan was given the opportunity to purchase 400 acres just outside of Ozark in Dale County. He had always heard that land was a good investment, so he bought the property which was mostly farmland at the time. Over the next few years he was much too busy running his now successful construction company to give the farm much attention. Consequently the property lay idle for many years. He made a few

unsuccessful attempts at raising cattle, and would later comment on that particular endeavor, "the cow business is tougher than the bridge-building business!"

Growing up in Ozark, Alabama was delightful according to Donald Ray ("D.R.") Jordan, an only child, "Everybody knew everybody else . . . and even their dog's name!" Some of his fondest childhood memories involve camping and fishing on the property as a young Cub Scout and Boy Scout. Because his father held such a strong belief in the



ideals of the Boy Scouts of America, their farm became a primary facility for hosting scouts and “camporees” in the Dale County area. The support and encouragement of Mr. Hack, as well as the time spent on the property, actually helped D.R. earn his Eagle Scout Badge and God and Country Award.

In 1967, after his son finished college and a stint in the military, Mr. Hack started taking a little time off to escape to the farm to do the things he had always wanted to do there. He began developing the property and roads. One of his good friends, Jack Monk, had advised him that timber production would be a wise investment for his land. Finally in 1982, he got serious about it. He hired a forestry consultant, Norm Kinney, to help manage his land and timber. Over twenty years later, Norm is still there.

While the family bridge-construction business grew and was eventually moved to Mobile, the family farm also grew. The size of the Jordan property has now increased to almost 600 acres. Approximately 408 acres are covered in woodlands, with two-thirds planted in loblolly and longleaf pines, and one-third made up of hardwoods. Timber is the Jordan’s primary TREASURE Forest objective.

Photo by Elishia Johnson



The family continues to follow Mr. Hack Jordan’s management principles, including good thin and burn programs that benefit both timber and wildlife.

Managing wildlife is their secondary objective. There is an abundance of deer and turkey on the property, which D.R. stated is a source of happiness to both his son and son-in-law who are hunters. Although hunting is reserved for family and employees, they maintain about ten food plots of oats, corn, field peas, and chufas for summer and winter forage.

There are also plentiful quail, squirrels, and bobcats on the farm.

Education is another important goal for the Jordan’s TREASURE Forest. For the last five or six years, hundreds of fifth graders from Ozark and other Dale County schools have taken field trips out to the farm. Additionally, they have also hosted several landowner tours.

Mr. Hack passed away in 1997 at 87 years of age. His wife, Mrs. Alma Jordan, just recently passed away. At the 2002 TREASURE Forest and

Landowner Conference, their property was recognized with the Helene Mosley Award for the Southeast Region, which D.R. and his children proudly accepted.

In the last years of his father’s life and since his death, D.R. has taken a more active role in the operations of the farm. In addition to following the professional guidance and recommendations of Norm Kinney, D.R. also relies on another family member. His cousin, Ben Johnson, who retired from the bridge building company after 40 years, now assists with the day-to-day management

(Continued on page 6)

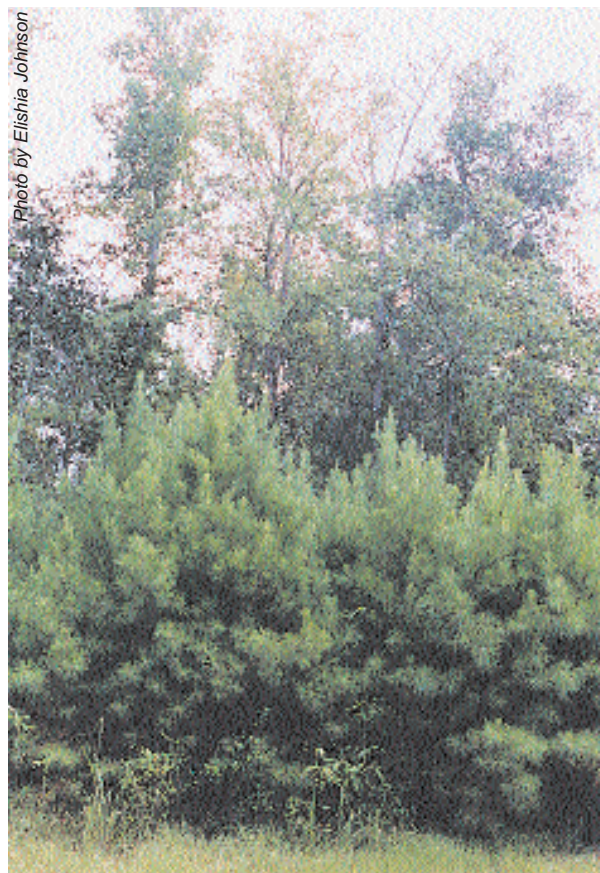


Photo by Elishia Johnson

Left: A mixed stand of pine and hardwoods illustrate the diversity of the property.

Right: Both the foliage and berries of the American beautyberry provide food for wildlife.



Photo by Elishia Johnson





Photography by Elishia Johnson



*The Florida maple (right) provides one example of the abundant hardwoods found on the Jordan farm.*

of the property. Built on trust and sound principals, the three men have developed a strong working relationship. They continue to follow the management practices Mr. Hack established such as his thinning and clear cutting/replanting programs. He also believed that prescribed burning on a three-year rotation was beneficial to both timber and wildlife.

D.R. describes his father as a real "visionary." He always foresaw the potential for his land. The fact that he owned a heavy construction business allowed him access to bulldozers, back-

hoes, and cranes for building roads and ponds to promote good conservation practices.

Maintaining such a large parcel of land involves hard work in any situation, much less when managing it from a distance and running a large company at the same time. But D. R. Jordan doesn't

have any ideas of ever letting it go. He is pleased that the next generation is already showing a love and genuine interest in the land as well, and he believes they will carry on the family operations in the coming years. He also knows his dad is "upstairs" looking down, and he would never consider disappointing him. 🙏







# New TREASURE Forest Certifications

Congratulations to the 36 landowners who were awarded TREASURE Forest certification at the July 2003 meeting of the TREASURE Forest sub-committee. With these landowners, 13,999 acres were added to the TREASURE Forest program in Alabama. At this same meeting, 177 landowners received re-certification.

This brings Alabama to 1,899 certified TREASURE Forests with a total of 1,807,150 acres of forestland being managed under the guidelines of the TREASURE Forest program.

Landowner	Location of Property	Region	Landowner	Location of Property	Region
Jack Agricola	Etowah	NE	Louis Martin	Colbert	NW
<i>"Swampfield Plantation"</i>			Gregory McCain	Henry	SE
Steve Albritton	Elmore	SE	<i>"Flat Eight Farm"</i>		
Reed Alexander	Talladega	NE	Ryan McKenzie	Geneva	SE
Tod Ayers	Elmore	SE	Bobby Messer	Henry	SE
<i>"DAB's Plantation"</i>			Roger Mickelson	Covington	SE
Kerry Baskins	Marion	NW	Carolyn C. Morris	Covington	SE
Johnnie Beeson	Dale	SE	<i>"Bear Creek Treasure Forest"</i>		
George Cole	Bullock	SE	J. Murphy	Marion, Franklin	NW
Scotty Collins	Marengo	SW	James Murphy	Coffee	SE
Carl Cotton	Elmore	SE	Jerry Paul Owen	Cleburne	NE
David L. Ezell	Escambia	SW	Greg Wittendorfer	Washington	SW
<i>"Lake Manor"</i>			Marvin Payne	Hale	SW
J. W. Fuqua	Escambia	SW	<i>"HKR Longleaf Farm"</i>		
Theodore Fikes	Mobile	SW	Charles Rutherford	Mobile	SW
James T. Grimes	Coffee	SE	George F. Seier	Autauga	SW
<i>"Bell Rattle Farms"</i>			<i>"Full Quiver Plantation"</i>		
Jean Holman	Coosa	NE	John Simmons	Geneva	SE
Larry Jeffreys	Marion, Lamar	NW	<i>Lucile P. Swift Trust</i>		
Darrell Kimberl	Monroe	SW	Buddy Swift	Dallas	SW
<i>"Kyser Farms"</i>			Tommy Vansandt	Coosa, Talladega	NE
W. T. Kyser	Hale	SW	<i>"Yeilding Lake Property"</i>		
<i>"Boone's Branch"</i>			Manly Yeilding	Shelby	NW
Victor H. Lott	Escambia	SW	Taylor Wilkins, III	Baldwin	SW

# SITE PREPARATION:

## The Key to a Successful Crop



By *Mac Prince*

Management Specialist, Alabama Forestry Commission

Some of the most important money spent during the rotation of a tree crop is in site preparation; whether it is spent during the last several years of the previous rotation on fire to make sure a clean harvest can be accomplished, or whether it is spent on equipment or chemicals to clean up the site post-harvest. Despite new high intensity technologies in forest stand management, site preparation is the key to having a productive stand of trees.

If the previous stand has been well managed, the site preparation may be as simple as a fire to remove litter and slash to prepare the site for the next stand. At the other end of the spectrum may be a stand that was harvested several years previously and needs to have the standing trees physically removed before the seedlings can be successfully planted.

How do you accomplish good site preparation? If you have not yet harvested your timber, now is the time to begin planning for site preparation and regeneration of the next stand. Good, clean stand management over the last six to nine years of a rotation will allow you to use a lower cost and more successful site preparation alternative for the next stand. However, whether you use fire or chemicals to suppress the under-story vegetation, a clean site, post-harvest, will benefit you, the landowner.

There are two classes of site preparation: mechanical and chemical. Mechanical site preparation uses heavy equipment to physically remove the material that is impeding the planting and growth of the chosen crop. Just as a farmer plows and discs his fields, mechanical site preparation gets the area ready for planting.

Chemical site preparation suppresses the growth of competing vegetation, and (usually) uses fire to remove vegetative residues to prepare for planting. It is similar to no-till farming, as special tools are needed to plant in the chemically prepared area if machine planting is used. Most often hand planting is used in conjunction with chemical site preparation.

### Mechanical Site Preparation

The most often used type of mechanical site preparation is shear and pile. In this method a tractor is used to cut down the residual stand, using a shear blade or K-G blade. The shearing operation is followed by a tractor using a root rake to move the residue into piles or windrows (see photo above). This technique is most useful if a high percentage of the residual stand is stems above 6 inches in diameter. If the land is somewhat sloping, windrows should be placed along the contour to help control erosion which

can result from areas of exposed soil. The piles or windrows may either be burned or left for erosion control and wildlife cover. If this method is used, do not use a regular bulldozer blade for piling as too much soil will be moved into the piles.

This mechanical method has some very positive points associated with it:

The site will be clean enough to use a machine planter, which usually leads to a 10 – 15 percent higher survival versus hand planting.

This method has a larger window of opportunity for use than some other types, which may be limited to late summer/early fall use.

On the negative side:

- This method is the most expensive, at \$150-\$190 per acre.
- This and all mechanical methods do not suppress re-sprouts, and competition may be a problem for the new stand.

Another mechanical site preparation type that has fallen a bit out of favor is drum chopping. This method requires a tractor to pull a drum chopper over the residual stand, chopping it up and reducing it to a burnable mass. It is practical on somewhat steeper land than shearing, because of less exposed soil area. To use this type of site preparation, most of the



residual stand should be less than 3 inches in diameter.

While drum chopping is less expensive than shearing and piling, it needs to be used in conjunction with fire for best results. This method also has a larger window of use than some others, and can be successful if used in the correct situation. Some foresters shy away from this technique due to the fact that it seems to encourage re-sprouting. Drum chopping used with a suppressant chemical can be a good strategy for situations where there are more stems than can be planted through.

The last mechanical type discussed will be wild-land disking. Disking is a good method if the terrain will allow the large areas of exposed soil without eroding. It is very effective at suppressing re-sprouting due to the multiple cutting of the stems. It works best where most of the stand is less than 2 inches in diameter. It is usually the least expensive mechanical method, as well as the most restrictive in its use.

## Chemical Site Preparation

The use of chemicals to kill or suppress competition is not new, and it is currently the method of choice for many site preparation situations. There are two main reasons for this:

- Chemicals tend to give a longer competition-free time than mechanical processes.



*Disking is a good method if the terrain will allow the large areas of exposed soil without eroding.*



Photography by John Pirtle

*Drum chopping requires a tractor to pull a drum chopper over the residual stand, chopping it up and reducing it to a burnable mass.*

- Chemicals are usually somewhat less expensive than mechanical methods.

Chemical site preparation tends to be more effective when used in conjunction with fire. Fire also helps to remove excess vegetation that may hinder planting, whether by machine or hand planting.

For chemical site preparation to be most effective, it must be timed correctly for both the chemical used and for the species being suppressed. To get the best results, it is recommended to use a professional who is familiar with chemical site preparation.

## Methods of Application

Aerial application is currently the most common method used to apply chemicals. However, the downside is that in small acreage it is hard to get chemicals applied to, unless several people coordinate to hire an applicator to come in and spray.

Ground application may be an answer for those small acreage situations, but certain chemicals are better applied from the ground, particularly granular types. A good ground application can be just as effective and somewhat less expensive than aerial application, but not always.

The proper chemical to use is a frequently asked question. Often there are several chemicals that may fit an application need. When this is the case, it is best to use the chemical your applicator is most familiar with, instead of the cheapest chemical available. This is because the application will be better, therefore the chemical may be more effective.

How much does chemical site preparation cost? Depending on rates and application methods, costs can run from \$85 to \$125 per acre, sometimes a bit higher or lower.

Chemical site preparation is usually the “most bang for the buck” method to prepare your site for planting, but hiring a professional to help with this phase of stand regeneration is probably the wisest money you will spend. 🏠



# Smart Herbicides

By *Michelle Isenberg*  
BASF Professional Vegetation Management

**T**he key to growing a healthy and profitable pine stand starts before the first seedling is planted. The beginning stage in the process is called site preparation. This practice is vital to create conditions that allow new forests to thrive. Effective site preparation removes competitive weed species, thereby assuring higher pine survival rates and faster growth.

Aside from combating competitive species, site preparation is also necessary to alleviate site limiting factors such as a high water table or hard compacted layers in the soil that will inhibit root development. Successful site preparation helps landowners avoid problems and unanticipated costs later in the reforestation cycle.

For example, sweetgum is a pesky hardwood, adaptable to many different soil and site conditions. Following a prescribed burn or cutting, it actually sprouts vigorously from roots, stumps or limbs in the soil, growing multiple sprouts where only one occurred before the treatment.

Today, landowners and timber producers who plan for the long term have turned to site preparation using smart herbicides as a way to accomplish competition control. Smart herbicides provide a cost-effective method that's more controllable and effective than relying solely on mechanical treatments or prescribed burning alone. Designed to target specific plant species, smart herbicides penetrate and move all the way through undesirable plants, such as sweetgum, killing them at their roots. With hardwood brush out of the way, sunlight reaches the forest floor and pines do not have to compete for nutrients and water.

Smart herbicide site preparation can lead to an optimal rotation age six years sooner than mechanically prepared sites and fifteen years earlier than natural stands. Even with a shorter rotation, her-

bicide site preparation produces more pulpwood and saw timber than either mechanical site preparation by itself or natural regeneration. In addition, smart herbicide site preparation minimizes impact on soil and wildlife habitat quality versus mechanical treatments.

Alabama forest landowner and former Auburn University football coach Pat Dye agrees. "Some of the areas on my property where I established pine trees had to fight thick pasture grasses in order to survive," Dye said. "Looking back, if I could have controlled the grasses early

on, my pines could be even bigger than they are now. Since that opportunity was missed, I've been going back into those same areas and using herbicides to control the grasses. I know this will give my trees the fighting chance they need."

## Where to Begin

Before beginning any site preparation, seek the advice of a certified forester or product specialist. Planning a smart herbicide treatment requires a professional evaluation of your specific needs and a prescription to ensure the correct herbi-



*Site preparation treatment with smart herbicides eliminates the hardwood competition and accelerates pine stand growth, which allows landowners to start thinning sooner and get a faster return on investment.*



cides are applied at rates that will provide long-term control of the competing vegetation.

Site preparation usually occurs during the months of June – October when hardwoods are actively growing. Actively growing hardwoods will absorb the herbicide better, making the treatment more effective. On coastal plain sites dominated by evergreen shrubs, a longer season is possible.

### Application Methods

The site prep method a landowner selects depends on the specific needs of a forest. Factors ranging from the slope of the land, plant species dominance, and proximity to residential areas must be considered.

Smart herbicides may be applied by air or ground – both are effective. Smart herbicides may also be used along with bedding and sub-soiling or ripping. For example, coastal plain states often have a high water table, requiring landowners to create raised beds to allow the newly planted pines to grow on unsaturated soil. The use of bedding with herbicides is successful when the aim is to combat competing vegetation as well as avoid soil-limiting factors.

The total cost of herbicide site preparation depends on a number of factors such as:

- volume of water required for coverage of tract.
- number of acres being treated.
- location of tract.
- access to tract with equipment.

Good site preparation with smart herbicides can greatly increase the chance of a pine's survival during the first critical years of its life. As Coach Dye testifies, "The smart thing to do is to control the competition right from the start."

If performed properly, site preparation with smart herbicides also features a number of other benefits beyond timber growth:

- provides better access for planting.
- facilitates burning by browning vegetation.
- minimizes erosion and soil disturbance.

In addition, landowners who use smart herbicides for site preparation find that



*Good site preparation with smart herbicides can greatly increase the chance of a pine's survival during the first critical years of its life.*

they use less herbicide over a period of time and achieve improved control of the undesirable understory in older stands. After implementing an ongoing program of proper herbicide application, most landowners achieve a consistent decrease in the presence of unwanted vegetation.

### Smart Herbicide Considerations

Herbicide site preparation success depends on several factors. The density and composition of weeds, combination of herbicides used, and timing of application are vital to successful results.

Smart herbicides must be chosen carefully. The length of time the herbicide will provide brush control is just as important as the types of vegetation it will eliminate. Long-term control is critical because hardwoods and brush that recover will compete with a new stand of pine trees.

In addition, landowners should avoid choosing "discount" herbicides. The cheapest herbicide may prove to be the most expensive in the long run — if

landowners have to waste time and money re-treating hardwood re-sprouts or if they lose pine volume to hardwood or herbaceous competition. Landowners should seek out well-established herbicide brands to ensure consistent results.

### Getting the Most from Your Land

Proper land management is essential to continually improving the value of your forest. It begins with site preparation. Smart herbicides can provide the most effective method of site preparation by providing long-term control of the weeds and brush that compete with desirable timber for needed nutrients, sunlight, and water. And they can do it at about 40 percent of the price tag for intensive mechanical site preparation, according to the *Forest Landowner Manual*.<sup>1</sup>

Pine reforestation represents a substantial investment of time and money. Today's progressive landowners know that it makes sense to get the most out of it from the very beginning. 🌲

<sup>1</sup>Dubois, M.R., Straka, T.J., Crim, S.D., and Robinson, L.J. "Costs and cost trends for forestry practices in the South." *Forest Landowner*, Volume 62 Number 2, 34th Manual Edition. 2003.

*Michelle Isenberg is a forestry products specialist & associate wildlife biologist for BASF Professional Vegetation Management and is based at Lake Martin, Alabama. She works with landowners to help establish pine stands and meet their overall forest-land management objectives. For more information on how smart herbicides can be used for your site preparation needs, visit [www.forestryfacts.com](http://www.forestryfacts.com) or call (800) 545-9525.*

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# Farm Tractor Safety

By *Charles R. Rawls*

Chief, Fleet Equipment Section, Alabama Forestry Commission

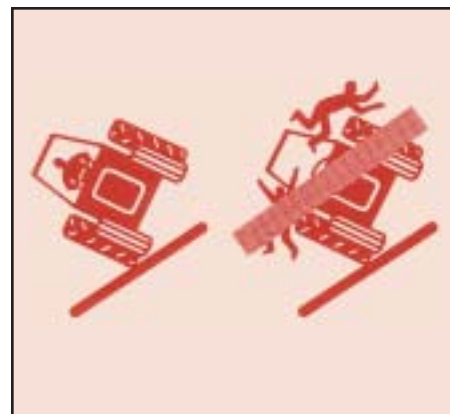
**A**utumn is fast approaching and like me, many of you are anticipating the upcoming hunting season. This means preparing and planting food plots, maintaining access roads, and mowing fields and trails. The use of a farm tractor is essential for many of these tasks and regardless of your skill level or experience we should always take the necessary time to ensure it is used safely. Here are a few safety rules that will help you prevent accidents and injuries.

**Know your tractor, its implements, their limits, and how they work.** Read and understand the operator's manual(s)

for your tractor and its implements before you operate them. Keep your equipment clean and in good working order.

**Use Roll Over Protective Structure (ROPS) and seat belt whenever and wherever applicable.** Most tractor fatalities are caused by overturns (*see Figure 1*). If your tractor is equipped with a ROPS, always wear the seatbelt. If your tractor does not have a ROPS, it is recommended to have one installed.

**Start the engine from the operator's seat only.** Never attempt to start the engine by shorting across the starter terminals. The machine will start in gear



*Figure 1 - As most tractor fatalities are caused by overturns, always wear a seatbelt.*





Figure 2 - Never attempt to start the engine by shorting across the starter terminals.

and cause serious injury or death to anyone in the vicinity of the tractor (see Figure 2).

**Be familiar with your work area and terrain.** Walk the area first to check for hidden obstacles and drive safely. Use special caution on slopes, slow down for all turns, and stay off the highway whenever possible.

**Never get off of a moving tractor or leave its engine running.** Shut it down

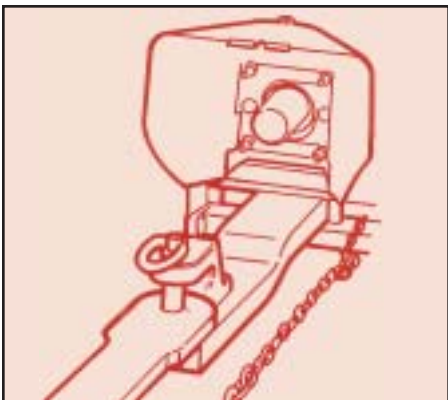


Figure 4 - Keep hitches low and always on the drawbar.

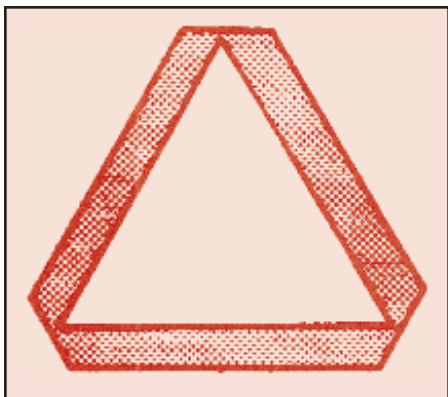


Figure 5 - Make sure your tractor is equipped with "slow-moving vehicle" signs before operating on a public road.

Fall 2003

before leaving the seat and engage the parking brake. A runaway tractor can be extremely dangerous.

**Always keep your Power Take-Off (PTO) properly shielded.** Never stand or allow anyone else to stand between the tractor and the implement unless the engine is turned off, the PTO shaft has stopped turning, and the parking brake is engaged. Make a habit of walking around your tractor and PTO-driven implement — never over, through, or between the tractor and implement. The PTO rotates with enough speed and strength to kill you. (See Figure 3.)

**Keep hitches low and always on the drawbar.** Otherwise, your tractor might flip over backwards. (See Figure 4.)

**Never refuel while the engine is running or hot.** The possibility of a fuel spill resulting in fire is high. Additionally, do not add coolant to the radiator while the engine is hot; hot coolant can erupt and cause a scalding injury.

**Before operating your tractor on a public road:** Familiarize yourself with

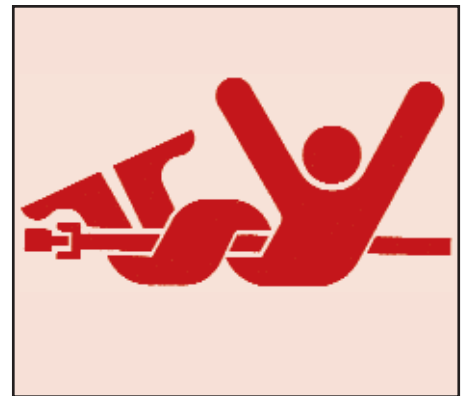


Figure 3 - Never stand or allow anyone else to stand between the tractor and the implement unless the engine is turned off.

local laws that might apply to your tractor. Make sure it is equipped with "slow-moving vehicle" signs (see Figure 5), and lock the brake pedals together to ensure proper braking.

**Never be in a hurry or take chances about anything you do with your tractor.** Think safety first, then take your time and do it right. 🛑



Landowner Neil Martin performs a safety check before working on his wildlife food plots.



# Hanging an Axe



Inevitably, the wooden handle to your trusty axe will break one day. You'll be merrily swinging your axe – either splitting stove wood for the approaching winter or mercy-killing that old storm-damaged red maple in the corner field – and “crack!” . . . the handle lets go.

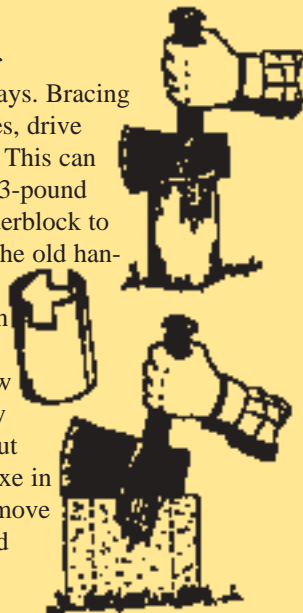
To the uninitiated, a broken axe handle signals that it's time to buy a new axe; but to the resourceful woodsman or woods-woman, it's simply time to hang a new handle.

Here's how:

## Remove the old handle.

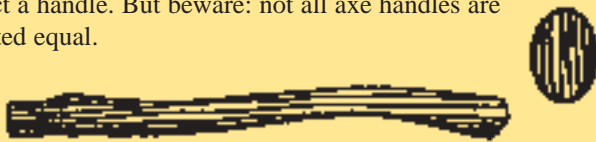
This can be done one of two ways. Bracing the axe head on two opposing sides, drive the handle out from the top down. This can be done with a wood chisel and a 3-pound hammer, using a steel pipe or cinderblock to brace the axe head while tapping the old handle with the chisel.

If you're not in a hurry, you can place the entire axe head and handle stub in the woodstove for a few minutes. The wood will burn away and any remnants can be tapped out easily. (Caution: Don't leave the axe in any longer than is necessary to remove the wood from the axe – you could affect the temper of the steel.)



## Select a new handle.

Bring your clean axe head to your local hardware store and select a handle. But beware: not all axe handles are created equal.

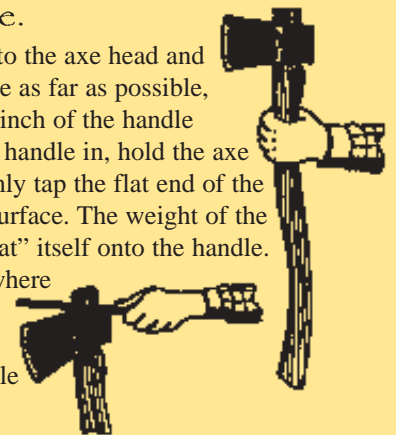


- Species: Most handles are made of hickory though some are white ash. Stick with the hickory; it's considered the better species for impact tools.
- Length: A 2 1/4-pound axe head (some consider this a “boy's axe”) will take a 28-inch handle, and a 3 1/2-pound axe will take a 32-inch-long handle. Although most factory-made handles offer ample taper to properly fit the axe head, it helps to bring the axe head with you to size up the “eye” with a few handles.


- Density: Examine the “doe's foot” (the holding end of the handle) and make sure the lines or growth rings in the wood are many and running as straight as possible. The handle is less likely to split during use if the growth rings are close together and oriented in parallel straight lines.

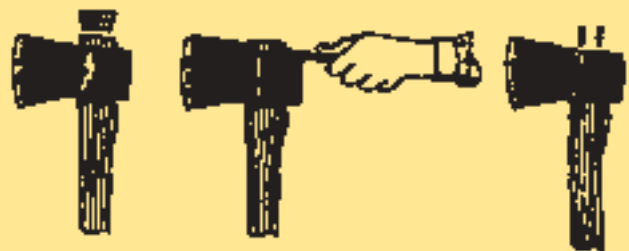
## Hang a new handle.

Insert the new handle into the axe head and drive the handle into the eye as far as possible, preferably within a quarter inch of the handle shoulder. When driving the handle in, hold the axe and handle upright and firmly tap the flat end of the doe's foot on a hard level surface. The weight of the axe head will gradually “seat” itself onto the handle. Once the head is down to where you want it, use a hacksaw blade to remove all but a quarter inch of excess handle sticking out the top.



## Insert wedges.

Most axe handles will come with a large wooden wedge taped to the end. You should buy two small metal wedges found in the axe-handle section of your hardware store. Hold the axe with the doe's foot on a hard, flat surface. Drive the large wooden wedge into the seam at the top of the handle as far as possible. The wedge can go down below the eye of the axe head, but shouldn't go deeper than a quarter inch. Saw off the remaining handle sticking from the top. To further secure the handle, pound the two small metal wedges into the eye at a 45° angle to the wooden wedge. The metal wedges will tighten the wood in the eye even more. 



### Editor's Note:

This article originally appeared in the Winter 2002 issue of *Northern Woodlands* magazine ([www.northernwoodlands.org](http://www.northernwoodlands.org)). Text by Forest Resources Association and illustrations by Bill Shaw; used with permission.



# HIDDEN



# TREASURES

## A Commitment to Conservation

By *Tilda Mims*

Information Specialist, Alabama Forestry Commission

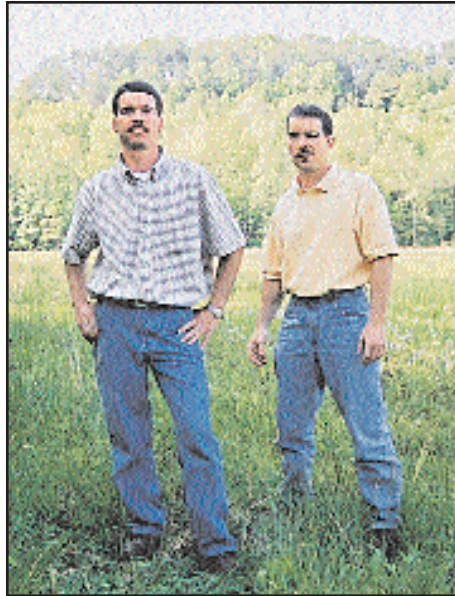
The Alabama Wildlife Federation named Franklin County TREASURE Forest landowners, Jeff and Joel Pounders, as the 2003 “Forest Conservationists of the Year” at the annual Governor’s Conservation Achievement Awards program in Montgomery. In a competition among many distinguished Alabama landowners, the brothers were selected, in part, for their lifelong commitment to conservation of natural resources – a steadfastness they exhibit in their personal and professional lives.

The Pounders brothers of Russellville became interested in natural resource conservation as young men, learning to enjoy the forests and waters of Franklin County through hunting, fishing, hiking, and other outdoor activities. While students at the University of North Alabama, they continued to learn about the broad scope of forest conservation and completed their studies in Environmental Biology.

As young couples, both Jeff and his wife, Paula, and Joel and his wife, Rhonda, made a commitment to acquire property of their own to manage according to the principles they embrace. In 1994, they began purchasing land and today own a 360-acre TREASURE Forest in the Mt. Hebron community managed for wildlife habitat enhancement and timber production. They also lease an adjoining 750-acres from both private and industrial landowners. It houses a cattle operation and is used for timber management as well.

Less than ten years after their first purchase, they have made significant accomplishments in multiple-use forest management and continue to practice cutting-edge management techniques. These techniques include selective harvest, formation of wildlife food plots, constructing sediment control structures, and implementing riparian buffers to protect water resources on the farm. Some of their accomplishments in the promotion of wildlife habitat enhancement noted in the award presentation were as follows:

- Created Franklin County’s first waterfowl pond under the Wildlife Habitat Improvement Program, a federal cost-share program. The shallow water wetland provides habitat for wood ducks, mallards, and other species of wetland wildlife.
- Received the WILD (Wildlife Improvement through Land Development) Award from the Natural Resource Conservation System.



Brothers (L to R) Jeff and Joel Pounders.

- Host the Franklin County Envirothon where students learn about five environmental subjects.
- Allowed a Belgreen High School team to train on the property, who later won the 2002 Envirothon state competition.
- Sponsor “Kids in the Creek,” a TVA project modeled after Envirothon with emphasis on water quality. Students conduct water analysis of Little Bear Creek, a forest creek crossing the property.
- Work with Muscle Shoals High School ecology and oceanography classes to conduct field tests of water, testing for pH level, and nitrate contamination.

Fortunately, both Jeff’s and Joel’s careers with GoldKist, Inc. allow them to promote and practice wise conservation of natural resources, as well. Joel is Director of Environmental Compliance Management for North Alabama, and Jeff is Breeder Supervisor. The company twice won the Alabama Water Environment Association Award and the inaugural Clean Water Award from the U.S. Poultry and Egg Association.

Joel is chairman of the Soil and Water Conservation District and also chairman of Bear Creek Watershed Advisory Committee. He founded the Bear Creek Millennium Project, a citizen volunteer group that performs conservationist work on the watershed. This project received the 2001 Regional Watershed Management Award from TVA.

Both brothers assisted Dr. Doug Phillips with The Bear Creek Watershed segment of the award-winning “Discovering Alabama” program on Alabama Public Television and have developed wildlife slide presentations they present to local civic groups, hunters, conservationists, and other interested parties.

Tim Gothard, Executive Director of the Alabama Wildlife Federation, says the purpose of the Governor’s Conservation Achievement Award program is to promote leadership by example and, in turn, increase conservation of the natural resources of the State of Alabama – its wildlife, forests, soils, water, and air. Among landowners devoted to protecting and enhancing forest resources, Jeff, Paula, and their daughters, Gracie and Tess; and Joel, Rhonda, and their daughter, Chloe, are certainly at the top of the list. Their concern for forest conservation, multiple use, clean water, and wildlife management is genuine and they have worked to instill these ethics in others. ♣





Photography by Mildred Owens

10-Year 2nd Cycle Loblolly Orchard

# 3rd Cycle Seedlings

by *Chris Mead*  
 Manager, Geneva State Forest

**T**he Alabama Forestry Commission (AFC) is committed to producing quality seedlings for Alabama landowners. For the past 35 years the Commission has made huge efforts to improve quality traits in the pine seedlings produced. Improvements in quality traits include volume, disease resistance, and form.

As a landowner, you might ask how these improvements would benefit you when harvesting begins. Consider this, trees grown from our 1st cycle seedlings produce on average 12% more volume at harvest than trees grown from unimproved seedlings. Trees grown from our 1.5 cycle seedlings produce on average 18% more volume at harvest than trees grown from unimproved seedlings. Trees grown from our 2nd cycle seedlings produce on average 25% more volume at harvest than trees grown from unimproved seedlings. Also, infection by fusiform rust at harvest can be decreased

from 10-23% below that of trees grown from unimproved seedlings.

Currently, the AFC is completing establishment of Piedmont and Coastal Loblolly 3rd Cycle seed orchards. Our plans include offering 3rd Cycle Piedmont and Coastal Loblolly seedlings within ten years. We expect gains from trees grown from our 3rd Cycle seedlings to produce at least 30% more volume at harvest than trees grown from unimproved seedlings.

Future improvements in seedlings offered by the Alabama Forestry Commission will be directed more toward other quality traits such as fusiform rust resistance and drought resistance. 🌱



Photography by Mildred Owens

3rd Cycle Piedmont Loblolly Orchard



# Tree Seedlings Available from AFC's E. A. Hauss Nursery 2003-2004 Season Prices

## PINE SEEDLINGS

	<u>Price per 500</u>	<u>Price per 1000</u>
<b>Loblolly</b>		
Coastal 1.5 Cycle	\$25.00	\$39.00
Coastal 2nd Cycle <i>SoldOut</i>	\$28.00	\$44.00
Piedmont 2nd Cycle	\$28.00	\$44.00
<b>Slash</b> 1.5 Cycle	\$25.00	\$39.00
<b>Longleaf</b> 1st Cycle	\$45.00	\$70.00

## HARDWOOD and WILDLIFE PACKAGES

Cherrybark Oak	Water Oak	Crab Apple <i>SoldOut</i>	Sawtooth Oak
Green Ash	White Oak	Dogwood	Redbud <i>SoldOut</i>
Nuttall Oak	Yellow Poplar <i>SoldOut</i>	Overcup Oak	*Chinese Chestnut
Shumard Oak	Swamp Chestnut Oak	Persimmon	*Sawtooth Oak (Gobbler)
<i>(Please order in multiples of 25s, 100s or 1000s)</i>			* Limited quantities: available only in multiples of 25 for \$15.00.
<b>Prices:</b> \$15.00 per 25	\$35.00 per 100	\$135.00 per 500	\$200.00 per 1000
<b>Lespedeza</b> - Thunbergii	\$26.00 per 500 <i>SoldOut</i>	\$42.00 per 1,000	
Bi-Color	\$26.00 per 500	\$42.00 per 1,000	

## Ordering Information

- **TO PLACE YOUR ORDER** - Call Hauss Nursery at 251-368-4854 or your county Alabama Forestry Commission office. OR visit our website at [www.forestry.state.al.us](http://www.forestry.state.al.us) where you can print out an order form and fax it to 251-368-8624. You will receive an acknowledgment within five to seven working days.
- **UPON RECEIPT OF ACKNOWLEDGMENT** - Remit a 10% non-refundable deposit if your order is for more than 50,000 pines or 10,000 hardwoods. Remit full payment for all other orders.
- **PAYMENTS** - All payments/deposits are due within 30 days of the acknowledgment date. We accept credit cards and checks or money orders payable to the Alabama Forestry Commission. For proper credit, please note your customer ID number on your payment. We do not accept cash.
- **AVAILABILITY** - Orders are available for delivery during December, January, and February only.
- **HAUSS NURSERY PICK-UP** - Schedule your delivery at least two weeks in advance by calling 251-368-4854.
- **UPS DELIVERY** - Orders of less than 2,000 hardwood seedlings are shipped via UPS or are available for pick-up at Hauss Nursery. Select shipping date from calendar enclosed with your acknowledgment and return with your payment. UPS charges (available upon request) are based on the number of seedlings shipped per order.
- **COOLER DELIVERY** - All pine seedlings and orders of more than 2,000 hardwood seedlings may be shipped to our cooler locations in Atmore, Autaugaville, Florence, Huntsville, Opelika, Ozark, and Tuscaloosa. Schedule your delivery at least two weeks in advance, then call your cooler location to verify delivery.

**4165 Ross Road • Atmore, Alabama 36502 • Phone: 251-368-4854 • FAX: 251-368-8624**  
**E-mail: [haussnursery@forestry.state.al.us](mailto:haussnursery@forestry.state.al.us) • Web Site: [www.forestry.state.al.us](http://www.forestry.state.al.us)**  
**Business Hours: Monday-Friday 7:30a.m. - 4p.m.**



# From Little Seeds Grow Big Trees

By: *David Mercker*

University of Tennessee Extension Forester

It is interesting and even comical to watch squirrels and other wild things in your yard during the fall and early winter. There seems to be a clear focus, envious to most of us, as they go about their work. It's with a tone of surety that each nut or acorn is lifted, examined, stuffed, stored, buried, or if deemed a bad nut, "thrown to the birds."

The animals seem to be picky too. Did you ever stop to wonder why? After all, a seed is a seed. Or is it? Have you ever taken on the project of collecting tree seeds with the intent of starting your own seedlings, only to have none of them survive? "Nothing to it," you'd think, "after all, each spring new young trees seem to pop up everywhere in the yard. Surely if squirrels and birds can do it, then I can too."

Wildlife are experts at this subject, and somewhat reluctant to share their knowledge. They know that many seeds that drop to the ground — indeed most — are not viable, healthy, or sound. In some cases, up to 90% of the seeds could be rejects. That's because throughout the growing season, opportunistic insects have feasted on them, boring small holes through the seed coat leaving a cavity inside. Through quick examination, wildlife can tell by the weight and smell whether their valuable time should be spent on this or another nut. In addition, prolonged droughts can make seeds useless by causing them to abort early, crack, or develop improperly.

Assuming that you desire to start some trees from scratch and that you have the nose and touch to ascertain which seeds still contain life, there's still more science that you'll need to be schooled on. Understand that in order to germinate, seeds need these three things: moisture, oxygen, and temperature. Many seeds, because of their thick or rigid seed coat, will not easily allow water and oxygen to reach inside them. Others may have adapted to require a "pre-treatment" to break their dormancy and begin growth.

For these types of seeds, processes called stratification or scarification must occur. Stratification, also called "chilling," is exposing the seeds for a time to temperatures close to freezing. Wrapping seeds in moist paper towels and placing them in an unsealed zip-lock bag in the refrigerator though the winter is an example of chilling seeds. Some common tree seeds that need to be chilled include: walnut, hickory, red oak, and ash.

Scarification is a scratching or breakdown of the protective seed coat that allows moisture and gases to permeate the coat and continue growing. In the environment, this is done either by the seeds falling on rocks and being carried by wind and water across abrasive surfaces, or by being swallowed whole by animals, whose stomach acids break the seed coat down, preparing it for germination upon passing. You can scarify a seed coat by scratching the surface with a finger nail file. Trees requiring scarification include: locust, cedar, redbud, and baldcypress. Many species require both chilling and scarification.

For technical details on how to properly collect, store, treat, and plant seeds, refer to the book *Seeds of Woody Plants in the United States* (U.S.D.A. Forest Service). Or, if you prefer, find a naive squirrel willing to surrender his tricks of the trade! 🌱



John and Karen Hollingsworth/U.S. Fish & Wildlife

## Direct Seeding Oak Acorns

By *David Mercker*

Oak trees are a very important component in many hardwood forests, not only for market value, but also for mast production — essential to an array of wildlife. Efforts to restore oak trees on farm sites have increased over recent years, a result mostly from government programs. The lack of availability of oak seedlings and costs associated with transplanting them sometimes deters would-be tree farmers from establishing an oak plantation. An alternative to traditional tree planting is the direct seeding of acorns.

Direct seeding is less expensive than traditional seedling planting. Planting stock, labor, storage, and equipment are cheaper, leading to an overall establishment cost of about 40% of the alternative. Survival results are less reliable, however, and direct seeding is more likely to need reinforcement planting to bring the stocking to acceptable levels. To counter the poorer survival rates, planting spacing is normally tightened to ten feet between rows and three feet within rows, a sowing rate of about 1,500 acorns per acre. Direct seeding can be done at any time of the year (provided conditions are not too wet or dry and that your stored acorns are still viable).

For satisfactory results, follow these guidelines:

- Collect the acorns as soon as possible after seedfall and store them immediately in 4 mil polyethylene bags at about 35° F. If cold storage is not available, bury them in the bags about one foot deep in the ground.
- Acorns should be floated in water, discarding the ones that float. The sinkers are potentially viable. A humidified cooler is preferred for storage. The moisture content of the acorns should be kept at 40 to 45%. If it falls below 35%, the acorns

(Continued on page 30)



# Mussel Recovery Plans and Critical Habitat Locations Recently Published by the U.S. Fish and Wildlife Service

By *Bruce Springer*

Management Division Director, Alabama Forestry Commission

Recently, the U.S. Fish & Wildlife Service (FWS) published draft recovery plans and critical habitat proposals for several freshwater mussels and other aquatic species in Alabama. These plans and proposals can be reviewed on the U.S. Fish & Wildlife Service, Southeast Region 4 website (<http://southeast.fws.gov>). The goal of these recovery plans is to restore viable populations of the threatened and endangered species within a significant portion of their historical ranges, and to eliminate or reduce threats to their continued survival so that their protection under the Endangered Species Act is no longer required.

The decline in range and abundance of these species has most likely resulted from changes to their habitat. These have included the introduction of contaminants, the construction of dams and other impoundments, dredging and channelization activities, gravel mining, agricultural activities, loss of riparian buffers, unrestricted livestock access, road building, urban development, and non-point sedimentation. Silvicultural practices have minor impacts as long as Best Management Practices are properly used.

Critical habitat refers to specific geographic areas that are essential to the conservation of a threatened or endangered

species and which may require special management considerations or protection. A critical habitat designation does not set up a preserve or refuge and only applies to situations where federal funding or a federal permit is involved. The designation of critical habitat on private land will have no impact on private landowner activities that do not require federal funding or permits.

bances or are representative of the historic geographical and ecological distributions of a species.

## Mobile River Basin

Eleven freshwater mussels were listed March 17, 1993, under the federal Endangered Species Act. These species with proposed critical habitat are the “threatened” finelined pocketbook,



*Cumberlandian combshell*

(courtesy Steve Ahlstedt-USGS)

orangenacre mucket, and Alabama moccasinshell; and the “endangered” Coosa moccasinshell, ovate clubshell, southern clubshell, dark pigtoe, southern pigtoe, triangular kidneyshell, upland combshell, and southern acornshell. (Pictures and other information about these species can be found on the FWS website.) These eleven mussel species are historically native to portions of the Mobile River

When determining areas to designate as critical habitat, the FWS considers physical and biological habitat features that are essential to the conservation of the species. These features include space for individual and population growth and normal behavior; cover or shelter; food, water, air, light, minerals, or other nutritional or physiological requirements; sites for spawning and rearing offspring; and habitats that are protected from distur-

Basin. The Basin is composed of seven major river systems (Mobile, Tombigbee, Black Warrior, Alabama, Cahaba, Coosa, and Tallapoosa) and drains portions of the states of Alabama, Mississippi, Georgia, and Tennessee. A Recovery Plan has been drafted for these species with proposed critical habitat locations scattered

(Continued on page 20)



# Mussel Recovery Plans and Critical Habitat Locations

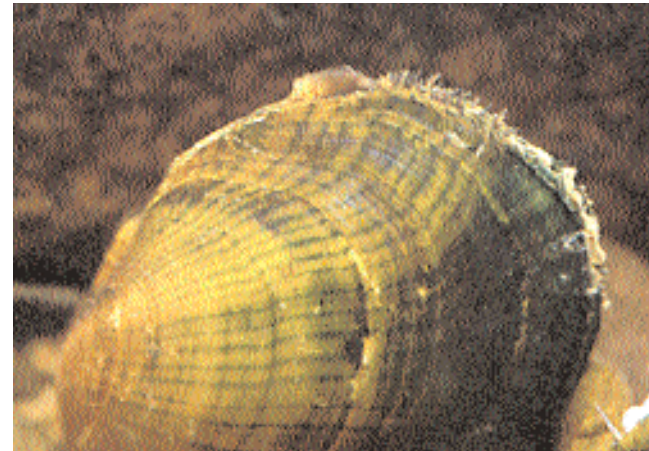
(Continued from page 19)

throughout central Alabama waterways (see Figure 1).

## Cumberlandian Region Drainages

The Cumberland elktoe, oyster mussel, Cumberlandian combshell, purple bean, and rough rabbitsfoot were federally listed as endangered species under the Endangered Species Act on January 10, 1997. These five freshwater mussels are endemic to either the Cumberland River system (Cumberland elktoe), the Tennessee River system (purple bean and rough rab-

bitsfoot), or to both river systems (oyster mussel and Cumberlandian combshell). A Recovery Plan has been drafted and the FWS has also proposed critical habitat for these species. However, the only species and area in Alabama under the critical habitat proposal are the oyster mussel and Cumberlandian combshell along a section of Bear Creek in Colbert County (see Figure 2).



Oyster mussel

(courtesy FWS)

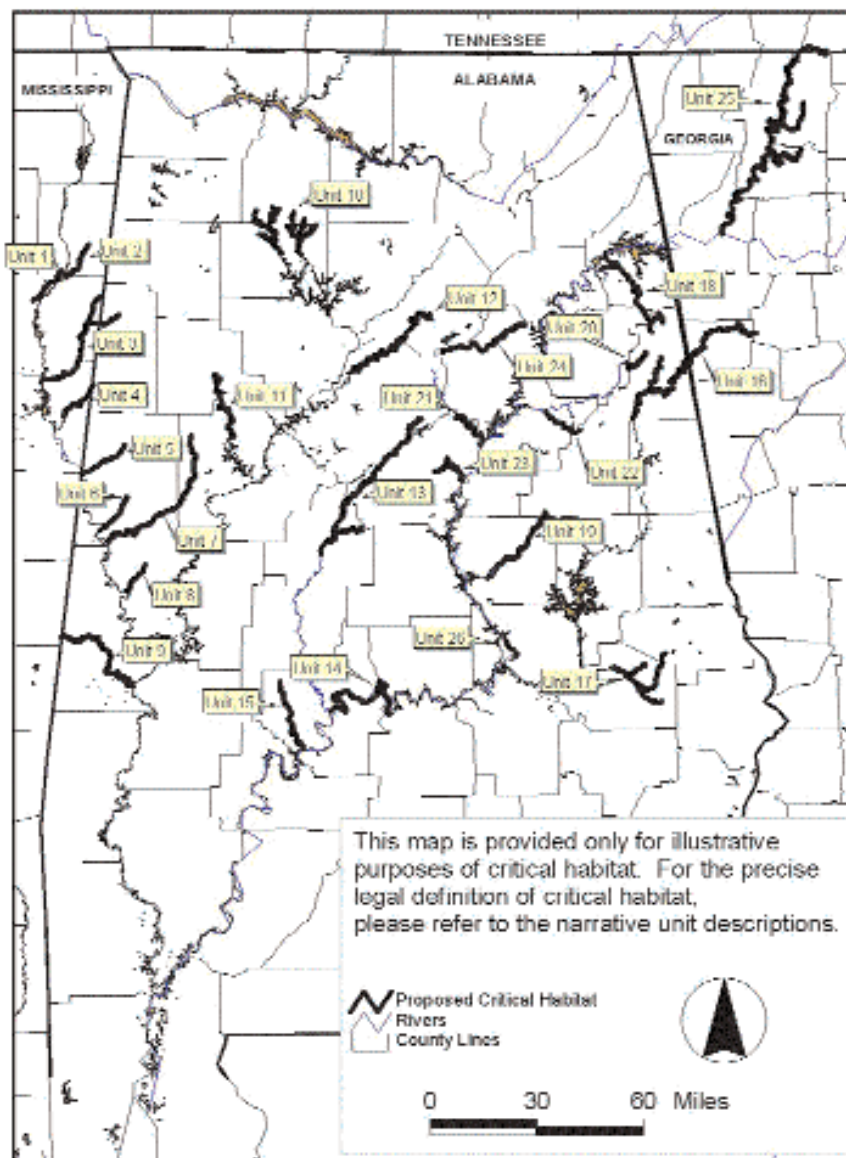


Figure 1: General locations of proposed critical habitat in the Mobile River Basin

## Apalachicolan Region Drainages

The fat threeridge, shinyrayed pocketbook, Gulf moccasinshell, Ochlockonee moccasinshell, and oval pigtoe were federally listed as endangered species while the Chipola slabshell and purple bankclimber were federally listed as threatened species under the Endangered Species Act on March 16, 1998. The eastern Gulf Slope streams draining the Apalachicolan Region are defined as streams from the Escambia to the Suwannee River systems (see Figure 3). Occurring in southeast Alabama, north Florida, and west-central and southwest Georgia, these river systems collectively form one of the largest drainage areas in the eastern Gulf Coastal Plain. Historically, these rivers were known for their rich freshwater mussel populations. However, these mussels have all undergone significant reduction in total range and abundance. A Recovery Plan has been drafted, but critical habitat locations have not yet been published.

## Conservation Measures

Maintaining vegetated riparian buffer zones adjacent to stream banks is a well-known method of reducing stream sedimentation and other runoff. Buffers reduce impacts to fish and other aquatic faunas and are particularly crucial for mussels. The Fish & Wildlife Service, other government agencies, conservation organizations, and local watershed protection groups have implemented ecosystem management programs to conserve,



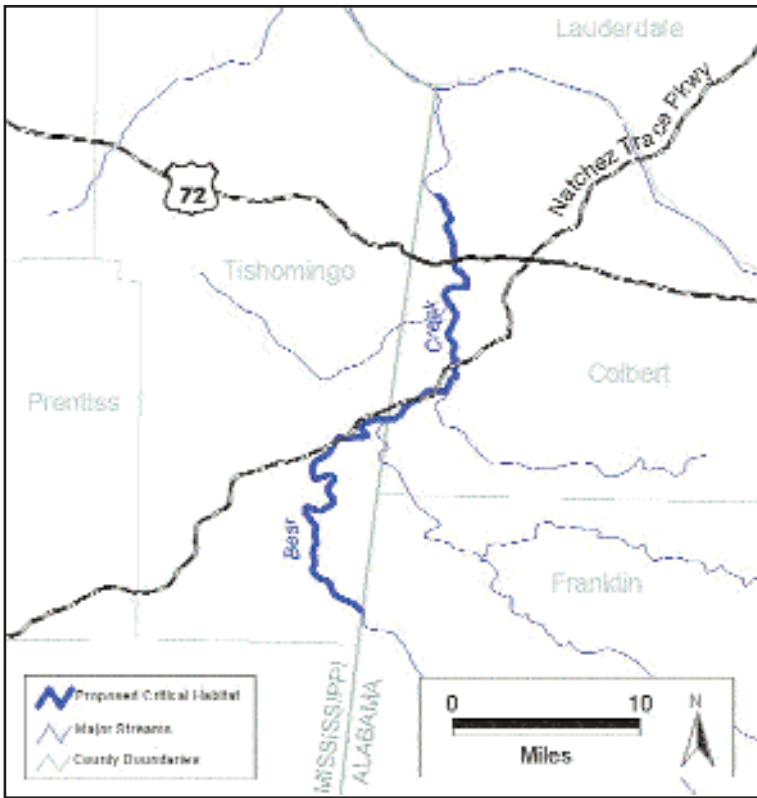


Figure 2: Bear Creek Cumberlandian combshell Critical Habitat Area Map

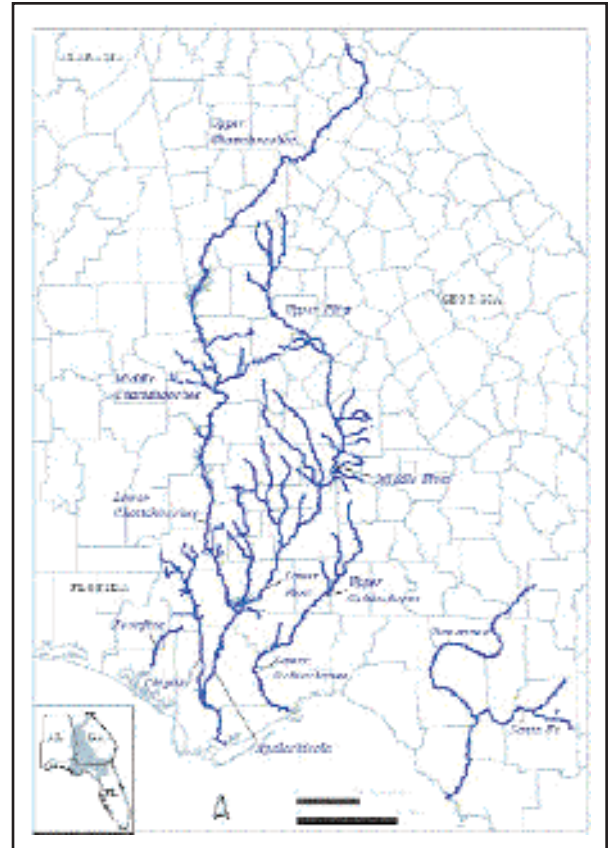


Figure 3: Apalachicola Recovery Area Map

restore, and recover federal trust resources and other rare aquatic species and their habitats nationwide. These include prioritizing ecosystems in need of protection, identifying and partnering with all potential agencies and organizations with watershed interests, prioritizing ecosystem threats, identifying strategies to minimize or eliminate threats, and educating ecosystem inhabitants and other stakeholders.

Numerous grassroots organizations have sprung up to initiate community-based watershed restoration projects in the region. These groups, comprised of local citizenry, band together to promote water quality and aquatic habitat issues in their focus areas. In Alabama alone, the Alabama Rivers Alliance has identified nearly fifty “grassroots watershed guardians.” The importance of grassroots organizations cannot be overstressed.

### Grants

Millions of federal, state, and private funds have been awarded for projects designed to protect these endangered species. In fiscal year 2003, FWS will award approximately \$91 million in federal funding under five types of endangered species grants. A variety of tools are available under the Endangered Species Act (ESA) to help landowners plan and implement projects to conserve species. The Cooperative Endangered Species Conservation Fund (Section 6 of the ESA) has been available for several years. An additional grant program, the Private Stewardship Program, was funded in fiscal year 2002 through the Land and Water Conservation Fund to respond to the burgeoning interest shown by landowners in managing their lands in ways that benefit species and their habitats. The Recovery Land Acquisition Grants Program provides funds to states and ter-

ritories for acquisition of habitat for endangered and threatened species in support of approved recovery plans. Additional grant programs and applications are shown on the FWS website (<http://grants.fws.gov>).

Despite their current level of imperilment, the Fish & Wildlife Service remains optimistic that nearly every stream with historically or currently significant mussel populations will become suitable for restoration if impacts are reduced.

Perhaps the greatest accomplishment of all is that riparian landowners and other stakeholders are proving that they can be good stewards of the land by taking increased interest and pride in aquatic resources. 🌿

### Reference

U.S. Fish and Wildlife Service.

**Visit the AFC website at  
[www.forestry.state.al.us](http://www.forestry.state.al.us)**





# Coyotes . . . Can They be Controlled?

By *Ryan Prince*

Wildlife Biologist, Alabama Forestry Commission

**T**here is a growing concern among landowners about the effect of coyote predation on wildlife populations. This seems to stem from the decline of certain local wildlife populations and the increasing contacts with coyotes through visual sightings or hearing vocalizations. These conclusions may be drawn prematurely because most wildlife population decline is because of habitat loss.

## History

Originally the native range of coyotes (*Canis latrans*) was confined to the Great Plains and western regions of North America. Coyote presence in

Alabama was not documented until the early 1920s. These initial populations were the result of local releases by fox-hunters for sport hunting. A significant increase in coyote populations became obvious in the 1970s. The eastern expansion of coyote populations was aided by the decline of red wolf populations and land management practices such as widespread timber harvesting.

## Ecology

The coyote is a highly adaptable species. This ability to adapt to a changing environment makes the coyote a hard species to control. It shows no habitat preference and therefore is considered

generalist. Not only will a coyote's diet shift to whatever prey items are in abundance or readily available, but it may also reduce or increase reproduction to adjust to its changing environment.

Coyotes are highly omnivorous, feeding on a variety of plant and animal material. They may prey on such items as rodents, deer, rabbits, insects, or fruit. Their diet varies seasonally: fruits and insects may comprise the bulk of their diet during summer and fall, whereas small mammalian prey may comprise the bulk of the diet in winter and spring. Coyotes are opportunistic feeders; meaning that they will feed on whatever is available. They will readily scavenge



carcasses of cattle and deer when available. Studies suggest that the highest incidence of deer in a coyote's diet occurs during fawning periods.

Perhaps contributing to the coyote's ability to expand its range so rapidly throughout the southeast is its high reproductive potential. Coyotes breed only once a year, with litter size averaging four to six pups. However, they are capable of having litters ranging up to twelve pups. Research suggests that litter sizes may vary depending on prey availability. Studies also suggest that coyotes will increase their fecundity rates in areas where attempts are made to eradicate them. This type of reproductive capability could explain why coyotes are capable of withstanding such rigorous control measures.

### Conclusion

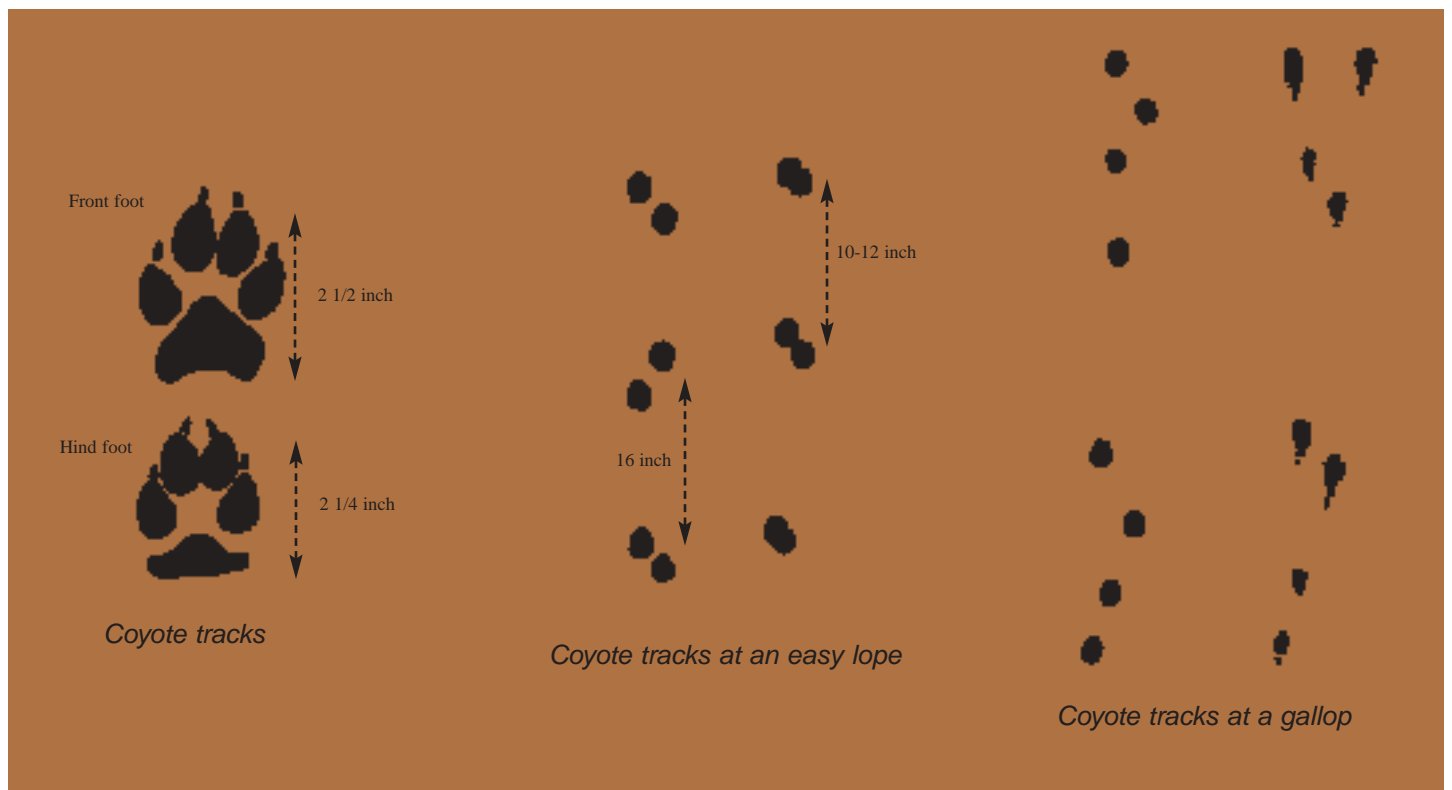
The coyote population is difficult to control due to the nature of the species. As land managers we must realize that any control measure will be an ongoing process. In isolated incidents, problem individual coyotes may be removed by trapping or shooting. All control attempts should be done with the intent to eradicate the species; however, we must realize that such extreme measures are not feasible. For many landowners it is just not possible to attempt such a task. 🐾



*Coyote presence in Alabama was not documented until the early 1920s.*

### References

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 College of Forest Resources, Mississippi State University:  
 ([www.cfr.msstate.edu/predator/rfcoyote.html](http://www.cfr.msstate.edu/predator/rfcoyote.html))





# Topographic Maps & Contour Lines

Part 5 in a Series by **Douglas A. Smith**  
 Fire Operations Officer, Alabama Forestry Commission

**A** **topographic map** (graphic of the topography) is a two-dimensional map designed to depict a third dimension, i.e. height. It has a variety of uses that include identifying geographical features, measuring slope, planning routes, as well as general use you would receive from a basic highway map. It is frequently called a “topo” map.

A map is a graphic representation of a portion of the earth’s surface as seen from above and is usually drawn to scale. A major feature of a topo map is the **contour line**. It is a line on a map that represents equal vertical elevation, above mean sea level, at any point along the line. Since each line is equal elevation, it is impossible for lines to cross.

The most common place to find contour lines is on a U.S. Geographical Survey (USGS) or Military Topographic Map. The standard color for a contour line is brown. Starting at zero elevation, every fifth line is heavier. These heavy lines are called *index lines* and each has the elevation written on them. Lines between the index lines are called *intermediate lines* and give additional shape to the map. Figure 1 depicts an index line at both 500 and 600 feet. The intermediate lines are interpolated as 520, 540, 560 and 580 feet. The map legend will indicate the contour interval for the vertical distance between lines.

Let’s begin our journey into topography by introducing **slope**, the relationship between vertical and horizontal distance.

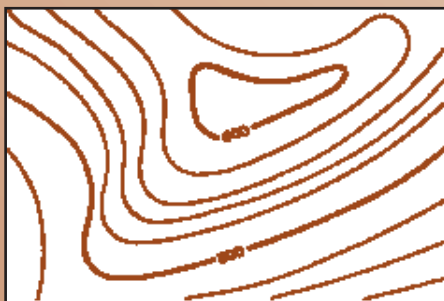


Figure 1 - Contour lines.

When contour lines are close together, that means that there is a steep rise or fall in the terrain. See Figure 2a. When lines are relatively far apart, that indicates generally flat terrain. See Figure 2b.

A closer look at slope presents two possibilities. A slope may be convex or concave. Contour lines showing a concave slope will be closely spaced at the top of the feature and widely spaced at the bottom. See Figure 3a. The convex slope will be just the opposite; contour lines will be widely spaced at the top and closely spaced nearer the bottom. See Figure 3b. Understanding this relationship and recognizing it on a map might cause the traveler to choose one path over another.

Now that we recognize steep and relatively gentle sloping terrain, how can we determine an average percent slope over an identified straight path? To do this, make a point on your map. Draw a straight line to another point. Measure the length of the line and determine the ground distance by using the map scale. Now determine the elevation of both ends of the line. The remainder is a mathematical computation. Divide the difference in elevation by the horizontal distance and multiply the answer by 100. This produces the average percent slope between your two points. See Figure 4. (Be sure to use the same units of measurement for both the vertical and horizontal distance.)



Figure 2a - Uniformly steep slope.



Figure 2b - Uniformly gentle slope.

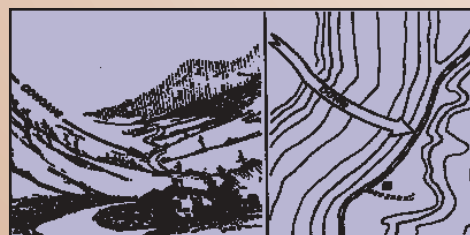


Figure 3a - Concave slope.



Figure 3b - Convex slope.

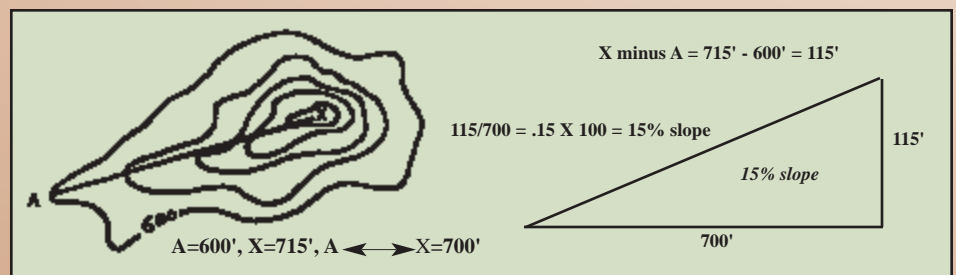


Figure 4 - Percent Slope = Difference in Vertical Distance / Horizontal Distance X 100. Percent Slope is an expression of the number of feet of rise or fall per 100 feet of linear distance and is not a degree of angle.





Figure 5 - Hill with uniformly gentle slope.

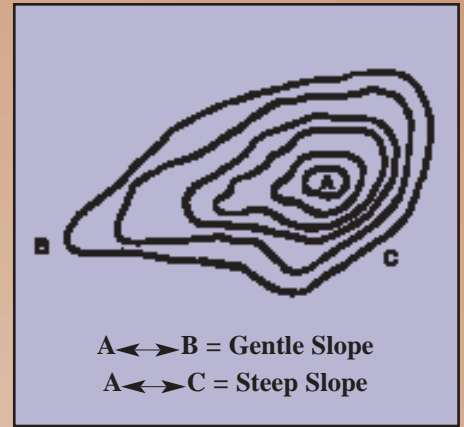


Figure 6 - Hill with varying slope.

As we continue our journey into contour lines, we learn there are five major topographic features: the **hill**, **saddle**, **ridge**, **valley**, and **depression**. Each has value, depending upon the need of the user and each will be depicted along with an explanation.

Let's begin with the **hill**, which is an area of high ground. From the top of a hill, the ground slopes downward in all directions from the top. It may have a gentle or steep slope in any given direction. Figure 5 depicts a hill with a relatively uniform slope in all directions. The smallest circle is near the top. The "X" marks the highest point past the last contour line. (This point is often excluded on maps.)

Figure 6 depicts a hill with one side having widely spaced contour lines and the other side with closely spaced lines. This means that one side of the hill is a gentle slope and the other side is steep.

A **saddle** is a dip or low point between two areas of higher ground. If you are in a saddle, there is high ground in two opposite directions and lower ground in the other two directions. A saddle is normally represented as an hourglass. See Figure 7. When traveling through hilly terrain, the traveler would probably choose to cross at



Figure 7 - Saddle.

the saddle instead of going over the top of either hill.

If a hill can be seen to rise above the terrain, a **depression** can be described as going below the surrounding terrain. A more exact description is an area from which you see higher ground in all directions. One example of a depression would be a mining pit. If the depression is shallow, there are "tick marks" on the map indicating everything inside the marked circle/contour line is a hole. See Figure 8a. If the depression is deep, there are tick

marks and contour lines within the depression indicating the depth of the depression. See Figure 8b.

A **ridge** is a fairly long, narrow piece of terrain extending away from a hill. Think through this mental picture. When standing on a ridge, you are looking downhill in three directions (down the length of the ridge and down on either side) and uphill in one direction. Notice in Figure 9 that the "U" shaped contour

(Continued on page 26)

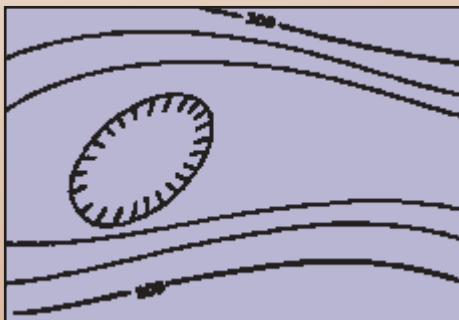


Figure 8a - Shallow depression.

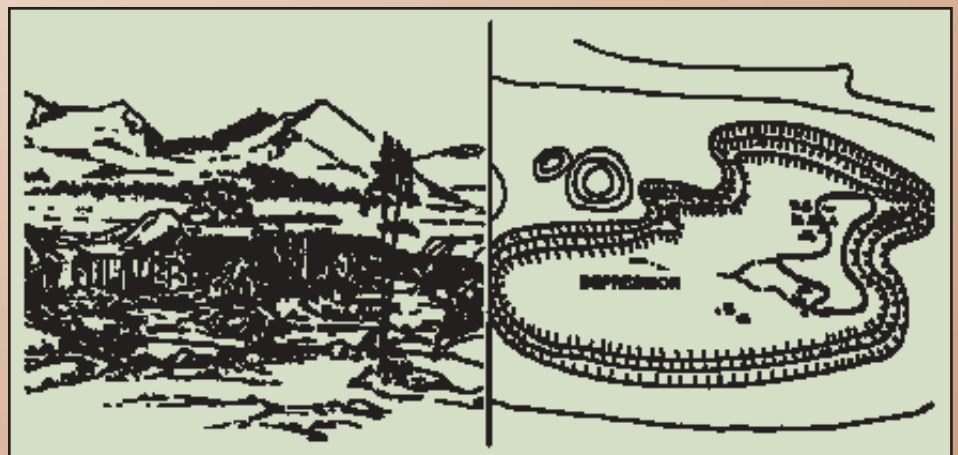


Figure 8b - Deep depression.





Figure 9 - Ridge.



Figure 10 - Ridgeline.

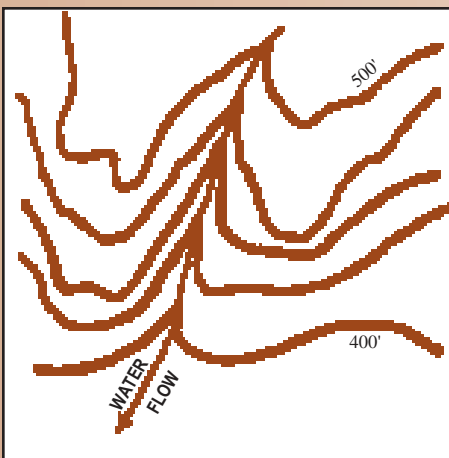


Figure 11 - Contours and water flow.

lines point downhill or down ridge. If a short, similar feature juts from a ridge, it is called a **spur** (Figure 13). A spur is classified as a minor terrain feature. The term **ridgeline** (Figure 10) is not interchangeable with the term **ridge**, and a **ridgeline** is not a major or minor terrain feature. A **ridgeline** is a line following the highest points along a series of terrain features.

If the “U’s” point downhill on a ridge, what happens to contour lines when they cross a stream? Since contour lines must stay at the same elevation, they cannot drop down into the stream bottom. They must continue upstream until that elevation requirement is met.

This produces a “V” shaped graphic. Notice that contour lines always point upstream, or water in the stream flows in the direction opposite the point of the lines. See Figure 11.

Now that you know more about contour lines, elevation, and slope, think about the question: Do rivers flow from north to south or south to north? The most common flow in the U.S. is north to south (one exception is the St. Johns River in Florida which flows north). However, the answer is that water flows from a higher point towards a lower point. That might be any direction for any given segment of the flow. Ask your friends and evaluate their response.

The **valley** is the last of the five major terrain features to be explained. A valley is a stretched-out groove in the land, usually formed by water flow. When standing in a valley, you would see high ground in three directions and low ground in one direction.

Valleys take on a variety of shapes. In Figure 12, the bottom of the valley (lowest point between the sides of the valley) has a water flow that empties into a bay. There are many other variations, but remember that a detailed view of contour lines at the water flow will look like Figure 11.

An understanding of contour lines lets you look at a topo map and get a general feel for the shape of the land on the entire map. Another aid to getting a feel for the entire map is color. Always look at your map legend, but the standard is *brown* = contour lines, *green* = vegetation, *blue* = water, *black* = roads, and *red and black* = man-made features such as roads, buildings, urban areas, railroads, and boundaries. Synthesize topography and color and impress your friends with your ability to quickly describe the real world depicted by a topographic map.

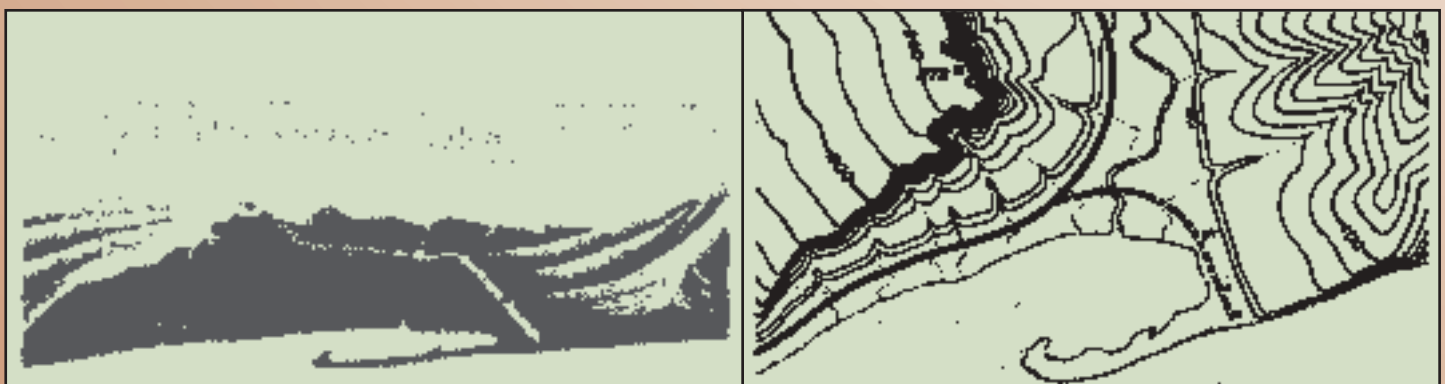


Figure 12 - Valley.



Figure 13 - Spur and draw.



Figure 14 - Cliff.



Figure 15 - Cut and fill.

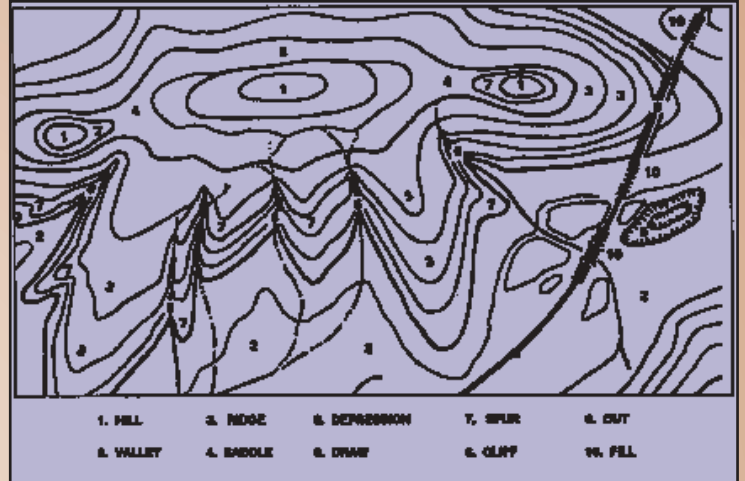


Figure 16 - Terrain features.

The five major terrain features have been previously presented. Now, the five minor/supplementary terrain features will receive a brief mention. They are the **draw**, **spur**, **cliff**, and **cut and fill**. The **draw**, a mini version of the valley, and the **spur** are depicted in Figure 13.

Figure 14 depicts a **cliff**, a vertical or near-vertical feature. It is an abrupt and potentially dangerous change in the terrain. It shows that the slope is so steep for a cliff, that accordingly the contour lines are close together enough to merge into one line.

**Cut and fill** are features not commonly used to navigate. However, they are

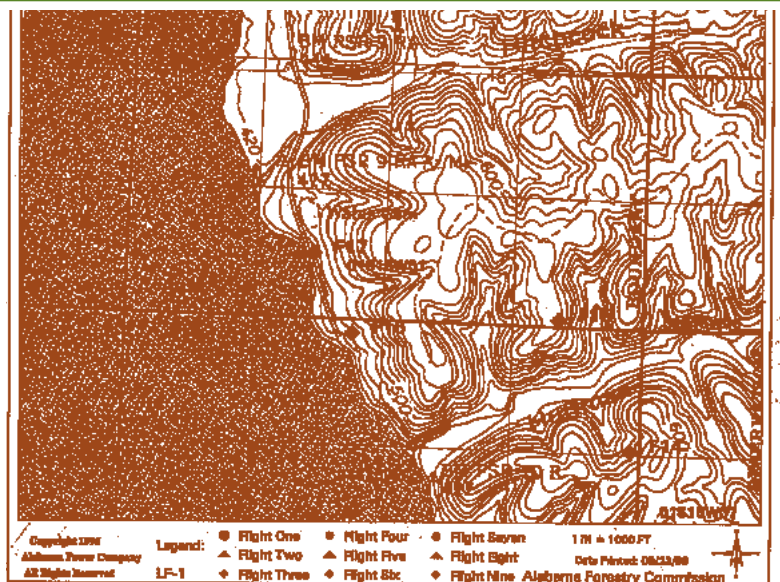
discussed and shown since you may see them on a map and wonder what they mean. A **cut** is a man-made feature resulting from cutting through raised ground. This is usually done to form a relatively level bed for a road or railroad track. Graphics show tick marks that extend from the cut line to the roadbed, similar to a depression. **Fill** is just the opposite. Fill is a man-made feature resulting from filling in a low area. Tick marks point towards lower ground. See both cut and fill in Figure 15.

Figure 16 is a graphic that includes all ten features discussed here and in previous articles. Test your memory and try to identify them before looking at the answers. 🗺️

*Most graphics were previously published by the USGS or military.*

## Topographic Maps and Southern Pine Beetle Detection

The use of topographic maps is an essential part of the Southern Pine Beetle (SPB) detection surveys. The observers in an aircraft mark the location of active SPB infestations using a Global Positioning System (GPS). This GPS data is then put on a topographic map. The map is sent to the landowner whose trees are infested. Using the information in the "Contour Lines and Topographic Map" article, the landowner should be able to find the SPB infestation on the ground and begin control measures. (See example of a topographic map with an SPB infestation denoted.)





## Folklore:

# Water Witching

By *Coleen Vansant*

Information Manager, Alabama Forestry Commission

In by-gone days, a water witch was as common as the rolling store.

There were one or more persons in most rural communities who were always called on to witch for underground streams of water before any well was dug. Today, water witches are not as common but there are still those around that can take a simple forked stick or metal rods and find ground water.

Over the centuries water witching (also called dowsing or divining) has been controversial. Some people say a person has the "gift."

Others call it the "touch" or the "power." Folklore gives many reasons as to why some people can successfully witch and others cannot. Some folks say that it is passed down on the maternal side of the family, others that it is only passed from the third son to the third son, and some believe that people are bestowed with the gift as a result of being struck by lightning. Centuries ago and even today, many

people consider the craft of water witching as a paranormal activity, demonic possession, witchcraft, or just plain nonsense. They put dowsing in the same category with voodoo, séances, and Ouija boards.

## History

Witching or dowsing is primarily considered as a search for water. This is how the tradition began centuries ago. However, one can dowse for anything including bodies, ancient artifacts, oil, and gold. Some people even dowse for medical reasons.

Dowsing goes back for thousands of years. There are pictographs in the Tassili-n-Ajjer caves in southeast Libya that show a group of people watching a dowser with a forked stick. These arti-

They were responsible for witching both water and gold.

Dowsing rods were used in 16th century German mines. Colonial settlers later brought witching sticks and rods to America to search for water.

## The How and Why

Ask 50 different dowsers how it works and they will give 50 different answers. Some believe it is putting one's self on a spiritual plane with Mother Nature, or that it has something to do

with the magnetic energy of the water crossing with the magnetic energy of the human body. Others say it is a mental communication with the earth. But for those who have the "gift," they don't always have an opinion as to *why* they can, they just know that they can. Many state that it is simply a science that is not clearly understood. According to one unidentified man, "I don't believe in it, but I wouldn't dig a well without it."



Photo by Coleen Vansant

facts are estimated to be approximately 8,000 years old.

Tradition indicates that the Queen of Sheba included dowsers in her group when she traveled from Africa to the City of Jerusalem to visit King Solomon.

## The Tools

The greatest thing about witching is that it takes very little equipment and you can make that yourself. You can also purchase dowsing tools commercially. Although there are many things you can

use, I'm going to concentrate on two of the most common.

## Angle Rods

Angle rods are just that, two pieces of metal bent at a 45-degree angle. Metal coat hangers are excellent to use or you can use welding rods, copper wire, or any other type of flexible metal. These are considered to be the best to learn on for beginners because it is easier to experience the "feel" or "tug" with the metal rods. (The tug has been described as that of a dog pulling on a leash.)

The rods can be of whatever length is comfortable to the user but a 6-inch section held loosely in the hands with a 12-inch long section that faces forward is a good start. You can use them bare handed or insulate them with something like the tube of an ink pen, drinking straws, or even soft drink bottles. The idea is for them to be free floating. The rods are held in the hands with the longer sections parallel and pointing straight-ahead and level. The person holding the rods walks slowly in a random pattern. When he or she crosses water, whether an underground stream or water pipes, the rods will either cross over each other or move outward.

Soldiers in Vietnam used a single rod, as they carried a rifle in their other hand. They knew they were at the correct location of what they were searching for by the 90-degree movement of the rod. They witched for mines, booby traps, unexploded shells, and even tunnels.

## Traditional Wand

More traditional, the witching wand is a forked stick in the shape of a Y. It is made from cutting the fork out of a branch of a tree. Many different species of trees can be used. For some people, fruitwood such as peach, apple, and cherry works best. Others say willow, redbud, mulberry, and birch are also good. The main thing is that the stick be flexible. Most water witches like to cut a new green stick every time they work.

Most diviners hold the stick with their palms upward, elbows close to the sides, gripping the rod until the fork bends out. When they walk over whatever they are searching for, they feel the "pull" or "tug" of the wand as it turns down. A word of caution, however: some people report they've been hit in the head with

the rod when it suddenly pulled upward!

These are two of the more common tools. Others say you can dowse with anything including pendulums, long sticks, pliers, scissors, pencils, rulers, bare hands, and even the human body.

## Conclusion

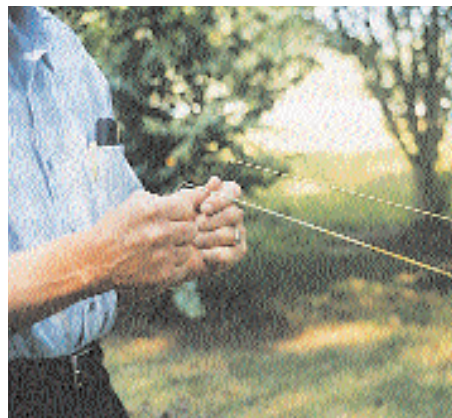
Although not as common today, there are still well witchers out there. Some consider themselves professionals and charge up to \$100.00 to witch a well, while some work on the "no water, no pay" philosophy. For most of the old timers, they just love to show off.

Although folklore says that being able to witch water is a "gift," both the American and British Society of Dowzers believe that it is a craft that can be learned by anyone. Whether a gift or a learned practice, it is something to do at family gatherings as well as a great controversial conservation topic when the talk is going nowhere. ☪



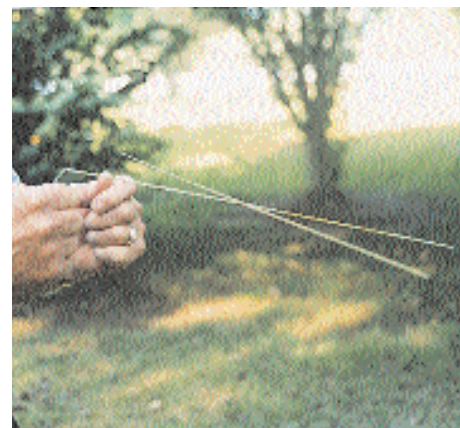
Photo by Coleen Vansant

Bobby Vansant of Hanceville demonstrates the forked witching stick as it points to underground water. Some of Bobby's uncles on his mother's side of the family also had the "gift."



Photos by Coleen Vansant

Angle rods are the easiest tools to use when witching for water and also the easiest to make. These were made from metal coathangers.



The angle rods will cross each other when they pass over underground water.

## Resources:

<http://www.britishdowsers.org>

<http://seattlepi.nwsource.com/lifestyle/dows28.shtml>

<http://www.texas-ec.org/tcp/200water.html>

<http://texnews.com/1998/2000/local/witch0712.html>

Webster, Richard. *Dowsing for Beginners*. St. Paul: Llewellyn Publications, 2003.

Patton, Darryl. "Water Witching." *Wild Alabama*, vol. 6 issue 2, March/April 1996.



# Legislation and Policy

The United States Department of Agriculture (USDA) and the Society of American Foresters (SAF) have joined together to provide better technical assistance to private landowners.

In July of this year the USDA and SAF signed a memorandum of understanding (MOU) that will help landowners obtain assistance in forest management. This partnership will provide a much-needed service for landowners who need technical support in the development of forest management plans for their property. SAF-certified foresters will help the Natural Resources Conservation Service (NRCS) expand its capabilities and meet the enormous demand for Farm Bill conservation programs.

The five-year MOU allows SAF to recommend its certified individuals to the USDA to provide technical services in forest management and agro-forestry practices. Their work must meet USDA standards and specifications for effective forest management. The 2002 Farm Bill expanded the availability of technical assistance to private landowners by encouraging the use of third parties.

These technical service providers will assist the USDA in delivering conservation technical support services to forest owners, farmers, ranchers, and others.

The certified specialists will be placed on a national, web-based registry called TechReg that is available to anyone seeking conservation technical assistance on their property. This list can be accessed at <http://techreg.usda.gov>.

## In Washington

### State and Private Forestry

Overall, State and Private Forestry (S&PF) programs changed little from Fiscal Year (FY) 2003 funding levels. The House of Representatives allocated \$290.8 million for S&PF in FY 2004, compared to \$284.6 million in FY 2003. The Senate Appropriations Committee increased the House mark to \$295.3 million.

The most significant differences are found in the Forest Legacy and Economic Action Programs. The House provided only \$45.6 million for Forest Legacy, a drop from the \$68.4 million allocated in FY 2003, while the Senate

increased the Legacy budget to \$84.7 million.

### National Fire Plan

Both the House and Senate have provided increased funding for the National Fire Plan, which in FY 2003 received an appropriation of \$1.4 million. While the Senate Appropriations Committee set the 2004 mark at \$1.5 million, the House approved a total of \$1.6 million for the coming year.

### Forest Inventory and Analysis

The House mark includes \$9 million for Forest Inventory and Analysis (FIA) in State and Private Forestry Programs, and \$49.4 million in Forest and Rangelands Research. The Senate Appropriations Committee combined the funds into a single line item of \$57.4 million under Forest and Rangelands Research. The S&PF programs will receive FIA funding from the Research budget line item. ♣

*(Information taken from the Washington Update, National Association of State Foresters; Volume 19, Number 3; August 2003.)*

## Direct Seeding Oak Acorns

*(continued from page 18)*

should be soaked in water at room temperature for 24 to 48 hours.

Properly stored, red oak acorns can be stored for up to three years.

- To reduce animal predation on the acorns once planted, it is best to choose planting areas larger than two acres and preferably not surrounded by forest. Predation will be worse along the forest edge where wildlife frequents. Sites should be fairly well-

drained and not with heavy clay soils (see a professional forester for specific site requirements for each oak species).

- Sowing depth of two to three inches seems to favor germination.
- Seeds can be sown by hand, although commercial planting machines are now available.

The initial growth rate will be slower for seedlings that originate from direct seeding. Also, they can't tolerate strong herbicide rates which are important for early weed control.

Direct seeding is a viable alternative to restoring farm land to hardwood forests. Explore it. ♣

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**Reference:** Sims, Daniel. 1986. U.S. Forest Service.

## Oops! We goofed . . .

In the Summer 2003 issue of *Alabama's TREASURED Forests*, we mistakenly identified Mr. Evan Frank Allison in the photo on page 29 as the man "with the cigar." We regret this error and are happy to set the record straight. -- The Editor

# Alabama Hunting and Fishing Licenses Now Available Online

The Department of Conservation and Natural Resources is pleased to announce that consumers may now purchase hunting and fishing licenses online by credit card. The licenses are available 24 hours a day, 7 days a week through the Department's web site at [www.conservation.alabama.gov](http://www.conservation.alabama.gov).

The sale of hunting licenses for the 2003-2004 season began on August 1. A hunting license purchased on or after that date will expire July 31, 2004. Fishing licenses expire one year from the date of purchase.

Conservation Commissioner Barnett Lawley says that online purchasing is just one way the Department is providing more efficient services to the citizens of Alabama. "We want to make it as convenient as possible for people to purchase a license," he said. "The online purchase only takes a few minutes and can be done at home or anywhere a customer has access to the Internet and a printer."

"Hunters and anglers totally fund the Wildlife and Freshwater Fisheries Division, which is responsible for management and protection of wildlife and aquatic resources," said Division Director Corky Pugh. "No General Fund money

goes to fund these programs. It is critical that we make licenses as readily available as possible."

Residents ages 16 to 64 are required to purchase a license to hunt or fish in Alabama. Some prices for the most common types of licenses are as follows:

- Resident Hunting: \$15.00
- Resident Freshwater Fishing: \$8.50
- Resident Saltwater Fishing: \$15.00
- Hunting/Freshwater Fishing \$23.50
- Freshwater/Saltwater Fishing: \$23.50

A \$1.00 issuance fee per license and a 2% convenience charge of the total will be added to the price of a license. For example, a combination hunting and freshwater fishing license is \$23.50. With the \$1.00 issuance fee and convenience charge of .49, the total paid by the consumer is \$24.99. Visa and MasterCard are accepted.

Also available online are lifetime licenses, non-resident licenses, wildlife management area licenses, duck stamps (no actual stamp is issued) and Harvest Information Program permits.

Some vital information is needed to purchase a license online. Besides name

and address, the following are also needed: driver's license number, social security number, date of birth, sex, height, weight, eye color, and hair color. If born after August 1, 1977, and you are purchasing a hunting license, you will also need to provide a Hunter Education number. All information is processed on a secure server. "We've done everything possible to keep the information secure and to also prevent counterfeit licenses," Lawley said.

Once the online transaction is complete, consumers may print their license and cut it out. An e-mail with a link to each license is also sent to confirm the purchase. If the license is lost, consumers may go back to the Department of Conservation web site, enter some vital information and print another copy of their license.

For those who prefer to purchase licenses the old-fashioned way, they are still available at all county probate offices and over 900 vendors statewide. They may also be purchased with a credit card over the telephone at 888-848-6887 for the cost of the license plus a processing fee of \$3.95. ☎

**For current information on the Southern Pine Beetle situation in Alabama, visit the Alabama Forestry Commission web page at: [www.forestry.state.al.us](http://www.forestry.state.al.us)**

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# White Mulberry

*Morus alba L.*

By *Coleen Vansant*

Information Manager, Alabama Forestry Commission

**A**lthough native to China, the white mulberry (also known as silk or Russian mulberry) was introduced into the southeastern part of our country by the British before the American Revolution. They wanted to use the leaves of the tree to feed silkworms in what they hoped would be a prosperous and profitable silkworm industry. The silk industry failed but the white mulberry became naturalized throughout the southeast.

The white mulberry can grow to 80 feet in height with a rounded crown of spreading branches. It can reach a diameter of 1 to 3 feet. Its bark is brown tinged with red or yellow, thin and shallowly furrowed, with long narrow ridges. Twigs are light brown and slender.

The leaves of the white mulberry are broadly ovate but variable in shape with three main veins from a rounded or notched base. They are coarsely toothed and often variously lobed even on the same plant. Some are un-lobed while others are glove or mitten shaped. The long-stalked leaves are shiny green above and paler and slightly hairy beneath.

The white mulberry is named for the color of its buds, rather than the color of its fruit. The flowers are on short, green, pendulous, nondescript catkins that appear in the axils of the current season's growth and on spurs of older wood. They



are wind pollinated. Mulberry trees are either male or female and sometimes will change from one sex to another.

Although called a mulberry, it actually bears a fruit resembling a large blackberry. White mulberries can produce white, lavender, or black fruit that is generally very sweet but lacking tartness. The fruit ripens in the late spring and is most favored by wild birds, hogs, chickens, and children. Berries can be eaten out of hand

or used to make pies, tarts, and puddings or sweetened and pureed as a sauce. They can also be made into wine and they make an excellent dried fruit. The leaves can be used as a vegetable as well as cattle fodder.

White mulberry is a drought-tolerant species and can be found on poor soil although it prefers a well-drained loam soil. The sapwood is white to yellowish-white and the heartwood is golden brown, darkening after exposure. It is easy to work and finish and is used mainly for hockey sticks, tennis and badminton rackets, racket presses, cricket bats, agricultural implements, and furniture.

Historically all parts of the white mulberry tree (bark, leaves, and fruit) have been used for various folk remedies such as asthma, bronchitis, bug bite, cold, constipation, cough, diarrhea, dropsy, epilepsy, fever, headache, hyperglycemia, hypertension, inflammation, insomnia, melancholy, snakebite, sore throat, tumors, vertigo, and wounds.

The Alabama Champion white mulberry grows in Madison County. It is 47 feet high, has a 54.25 foot crown spread and a circumference of 188.25 inches. Its total point value is 248.8. Johnson County, Missouri, is the home to the National Champion white mulberry. It has a height of 59 feet, a crown spread of 73 feet, and a circumference of 292 inches. Its total point value is 369. 🌳



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