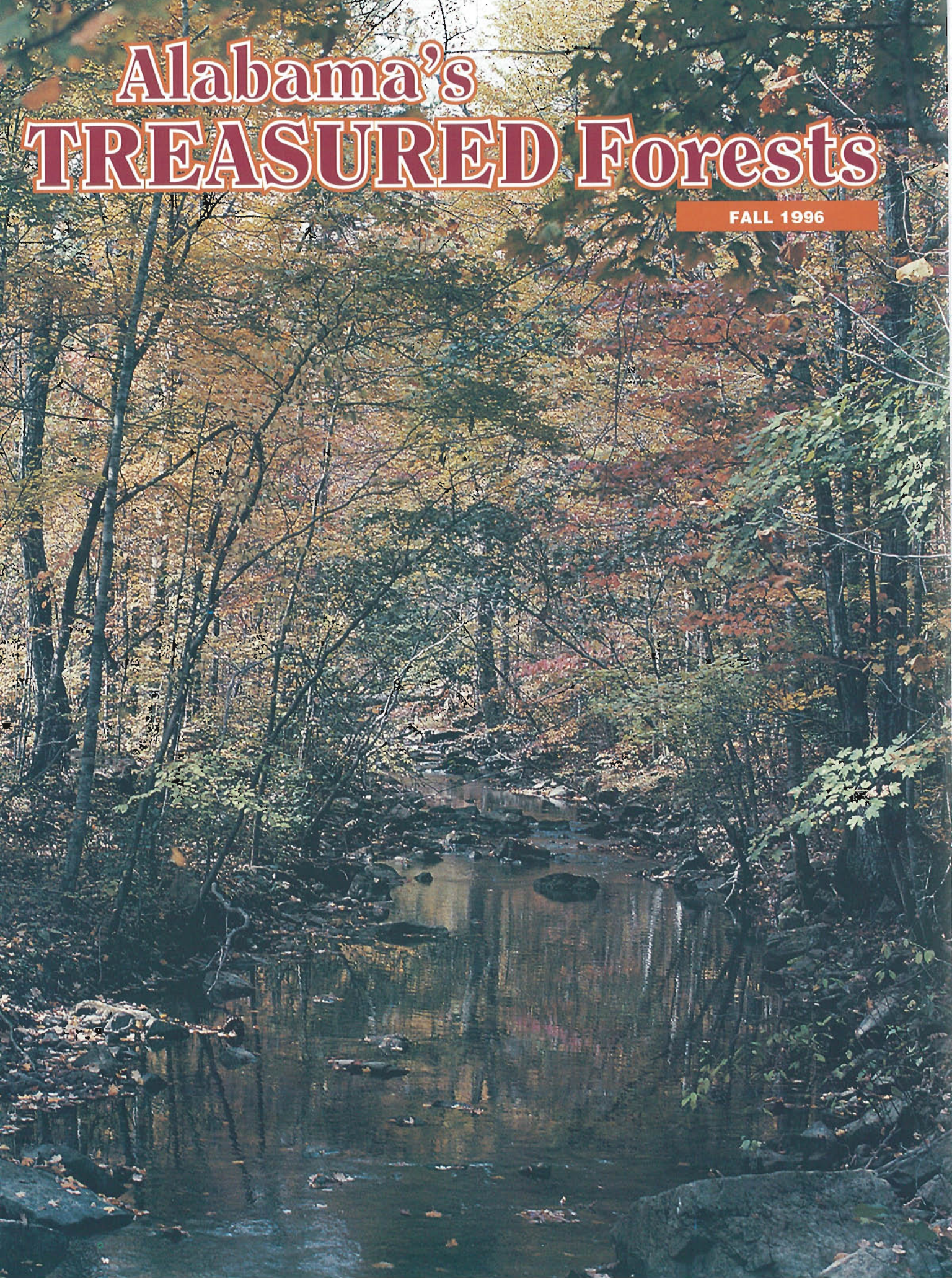


Alabama's TREASURED Forests

FALL 1996



STATE FORESTER'S MESSAGE

by TIMOTHY C. BOYCE, State Forester



In the past few years we have witnessed many changes in rural forestry assistance programs, and I believe that trend will continue for some time. In fact, passage of the new Farm Bill resulted in significant changes in programs that have historically been available to private landowners.

Most notable are the changes in the ACP Program. In recent years an average of 20,000 acres of trees were planted annually under the program. Based on the changes, reforestation and forest stand improvement are no longer allowed. However, those landowners who plan to convert open land into forested acres for soil protection may continue participating in the program. You can read more about the new Farm Bill on page 11 of this issue.

Another topic I want you to know about is an increased effort on the part of the Forestry Commission, with assistance from the U.S. Forest Service and forest industry, to have a more up-to-date forest survey.

Traditionally, the U.S. Forest Service conducts a Forest Inventory and Analysis (FIA) throughout the country on a 10-year cycle. In Alabama this has meant a partnership with the Forest Service, Alabama Forestry Commission and forest industry having responsibility for data collection on more than 5,800 plots. This process usually takes about two years to complete.

We are presently exploring the possibility of gathering the data every five years, thereby providing more current information to the citizens of this state. We propose to accomplish this by using Forestry Commission personnel, with assistance from forest industry and the U.S. Forest Service, to survey 20 percent of the FIA plots each year, which would result in a more timely survey with annual updates.

Needless to say, a more current survey would allow us to track trends in the development of our forests; provide more reliable timber growth and removal estimates; and would help us ensure that our forests stay healthy, both economically and environmentally.

Sincerely,

A handwritten signature in cursive script, appearing to read 'T. C. Boyce'. The signature is written in dark ink on a white background.

Timothy C. Boyce
State Forester

Alabama's TREASURED Forests

Volume XV, No. 4

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COVER: Fall comes to Muckleroy Creek in St. Clair County. Photo by Wayne Ruple.

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The Alabama Forestry Commission supports the Alabama Forestry Planning Committee's TREASURE Forest program. This magazine is intended to further encourage participation in and acceptance of this program by landowners in the state. Any of the agencies listed above may be contacted for further information about the TREASURE Forest program.

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Urban TREASURE

by TILDA MIMS, Forest Education Specialist,
Alabama Forestry Commission, N.W. Region, Northport

The 670-acre Cunningham farm in northeast Shelby County offers quiet sanctuary from the nearby congestion and noise of Highway 280. During peak traffic times it is difficult to imagine that in only a few moments you can enjoy the serenity and tranquility of this TREASURE Forest.

It is a feast for the senses. A crystal clear 30-acre lake surrounded by native plants and wildflowers. A cooling breeze. Songs of colorful birds. Glimpses of deer, turkey and quail. Managed for wildlife and aesthetics, the Cunningham's forestland is a masterpiece of hard labor, dedication and wise stewardship.

They purchased the property from someone who managed extensively and exclusively for quail habitat. The property is dominated by mature stands of longleaf and loblolly pine that were subjected



The lake and house provide a peaceful getaway from city life.

to frequent and intense prescribed burning.

Although the property was in good shape when purchased, the Cunninghams decided to improve it through total resource management. "We didn't know much about TREASURE Forest then but we managed the land with those principles in mind since day one," said Emory Cun-

ningham. His son, David, who works full time managing the family farm, agrees. "I think that TREASURE Forest just fit right in. Our management approach is not something we started doing after hearing about the program. From the beginning we wanted to take care of this place—aesthetics, wildlife and timber were at the forefront of what we wanted to do."



The property is dominated by mature stands of longleaf and loblolly.



This pond offers 10- to 12-pound catfish.

Wildlife

Emory and David manage for deer, turkey, quail, dove, ducks, squirrels, and non-game species such as songbirds, martins and bluebirds.

A nutritious supply of wildlife foods is provided year-round. "When we acquired this place there was already a fantastic amount of bicolor," said David. "We've added millet, sorghum, clover, and even some wheat and heavier grains that have done real well. I guarantee you it is working."

There are two acres of bicolor lespedeza and honeysuckle plots per 50 acres of woodland mowed and fertilized annually. He also fertilizes berries and other native plants as much as possible.

Thirty-five acres of fallow field were converted to a loblolly plantation with interplantings of sawtooth oak, plum, autumn olive, crabapple, Chinese chestnut and persimmon.

The Cunninghams bushhog and disk strips to create beneficial edge effects. Battery and solar powered feeders offering corn or scratch feed help provide optimum protein for maximum rack development and heavy birth weights within the deer herd.

When the land was purchased in 1991, there were plenty of deer but they were small. After four years in the Deer Management Program, culling does and protecting bucks of high quality genetic material, they have observed excellent rack growth.

Fisheries Management

While the 30-acre lake was a good one when the fisheries management program began, it was also full of weeds and the

fish were small and old. One fish tested was seven years old yet weighed only one and one-half pounds.

With the guidance of Dr. William Davies of Auburn University, the lake and two fishing ponds now add great beauty and entertainment to this haven. There are also two other ponds provided for wildlife habitat.

Dr. Davies helped design a fisheries management plan for 30 inches of visibility, with liming and fertilizing done regularly. "We found that it is just like taking care of your land, like fertilizing a hay field or garden—it promotes the growth of the fish we want," noted David. "Fertilizing helps create an algae bloom that is in essence the beginning of the food chain. If the lake is not properly limed, then the fertilizer doesn't work as well. As we get the alkalinity up, the process to begin life in the pond begins."

Fish are harvested in the size class recommended by Dr. Davies to ensure a healthy population of bluegill and trophy bass.

The Cunninghams feel that forest management can be compatible with downstream fish production if some forethought is given to how timber is extracted. Streamside Management Zones outlined in timber contracts exceed those recommended by Alabama's Best Management Practices to protect watersheds from sedimen-

tation and excessive downstream mineral turbidity.

Education

The Cunninghams welcome educational and recreational groups to their property. The Jefferson County, Shelby County and Alabama Forestry Planning Committees have held meetings at the farm. The Cunninghams also host regular meetings for the Audubon Society, the Wildflower Society, the Cahaba River Society and a local Boy Scout troop. The Twelfth Annual TREASURE Forest Landowner Conference tour was held on the property in 1995.

Just a 10 minute drive from the Cunningham farm brings you back to the hectic pace of city life. Most of us live and work in cities and enjoy the opportunities that urbanization brings. It is satisfying to know that good stewards like the Cunningham family preserve a way of life that is rich in tradition and family values—and that sharing their good fortune provides great pleasure. 🌲



Dr. Bill Davies, Auburn University Fisheries Department, makes a presentation on pond management during a 1995 TREASURE Forest Conference tour stop.

Editor's Understory

by TILDA MIMS, Forest Education Specialist, Alabama Forestry Commission, N.W. Region, Northport

During the 1995 Landowner and TREASURE Forest Conference tour of the Cunningham farm, several visitors were overheard saying, "This looks like something out of *Southern Living*." They were referring, of course, to a popular magazine that features Southern landscaping, architecture, foods and vacation spots. Although the compliments accurately described the scenic beauty of the property, the comments were perhaps most appropriate because Emory Cunningham was the founder and publisher of *Southern Living Magazine*.

As a successful businessman and forest landowner, Cunningham is an eloquent advocate for TREASURE Forest principles. "I think the greatest test of the free enterprise system—and I strongly believe in the free enterprise system—is really the principles that TREASURE Forest stands for. These principles can be incorporated into a large corporation—the larger they are, the more they need it. By that I mean building value—value to the nation and the customer as well as the bottom line. What we are talking about as I see it are principles that are great for the Army, Navy, corporate America and forestland."

"I hope it doesn't seem too boastful to say this but I think we built *Southern Living* magazine with that principle in mind and it worked out pretty well. And we did it in our corporate offices as well. We spent a little extra money there to not disturb the surface of the earth. If you drive by the Southern Progress Buildings today, it's hard to see them because of the trees. Also,

if you drive by in a major rainstorm, you'll notice that the water coming off of that site is clear and it comes off gradually."



The Cunningham property was selected as the Helene Mosley Award winner for the Northwest Region this year. David (left) and Emory Cunningham accepted the award from County Forester Andrew Nix at a Shelby County Forestry Planning Committee meeting.

The Southern Progress Building was the first building in Birmingham to be truly environmentally conscious. Emory was President and CEO of the company at that time and was instrumental in the construction decisions. The building has been widely acclaimed by the Audubon Society and other organizations.

Although investment and return are important concerns for any business decision, the Cunninghams are quick to point out that the farm is not for sale, and that their true motivation is heartfelt. "I believe that land in Alabama that is well managed is a great investment. The wise use of resources can be profitable. But the

real value of owning this place is in the intangibles," Emory said. "In our case it adds a lot to our family. When we bought this place, I knew my wife Jeanne would like it a little bit but I didn't know she would grow to love it so much. She is its best advocate."

His son, David, who manages the land full-time, wholeheartedly agrees. "I've seen more of my family since we bought this place than I did in the past 15 years. My sisters and their families love the place as much as I do. We all enjoy it and it brings us together more."

"When Dad asked me to manage this place for him I didn't really didn't know what to expect. I expected a lot of hard work and it's been true. As far as the wildlife and the woods, I've gained so much knowledge that I didn't have before about the cycles of nature, of wildlife, of birds and of fish. Managing this and becoming a part of it, I

feel that I have grown inside and it's just been fantastic. I couldn't ask for a better situation. It's something my father gave me as a little boy—the love of nature."

This TREASURE Forest has it all. Healthy timber, abundant recreation, great beauty, educational use and the goal of sustained resources. Of the multiple benefits it offers, what gives Emory his greatest pleasure? "Having people come here and enjoy it—to catch the biggest fish they've ever caught—is easily the most satisfying thing about owning this place," he says. "I hope that we have started something here that will carry on for a hundred years after we are all gone." ♣

THREATENED & ENDANGERED SPECIES

Orange-nacre Mucket— A Threatened Fisherman

by TIM L. GOTHARD, Forest Management Chief, Alabama Forestry Commission

Alabama is home to a tremendous number of freshwater mussels. Twenty-four of these mussels are listed as threatened or endangered with one or more occurring in 36 counties across the state.

Perhaps the most interesting aspect of mussels is their method of reproduction and development. Except for a few cases, the larvae of native freshwater mussels require a host fish in order to develop into adults. By some manner, they must encounter a suitable host fish and attach to their gills or fins. Once attached, they become encased and extract nutrients from the fish's tissue to support their growth. After a period of usually two to three weeks, the newly developed juvenile mussel will exit the encasement, drop to the bottom of the stream, and continue the process of maturing into an adult.

The tactics adult mussels use to increase the chance that their larvae will come in contact with a host fish vary from species to species. Some species release their larvae directly into the water column accompanied by mucous secretions that float. This method relies on random contact with a host fish for the larvae to become attached. Others exude their larvae in small masses that resemble worms. When eaten by fish, the mass ruptures and larvae attach to the fish's gills. Another technique involves the use of an appendage-like protrusion on the female that attracts host fish. When fish

strike at the lure, the female mussel closes quickly and squirts a stream of larvae-filled water directly into the fish's mouth.

Perhaps the most interesting technique is that used by the orange-nacre mucket (*Lampsilis perovalis*), which is found in streams in Dallas, Fayette, Greene, Hale,

and attach to the fish—mission accomplished. The threatened fine-lined pocket-book mussel (*Lampsilis altilis*), which also occurs in Alabama, is thought to use this same technique.

Factors that have influenced the decline in orange-nacre mucket and other mussel populations include impoundments created to facilitate navigation, flood control, water supply, and hydroelectric power generation, as well as water quality problems associated with sedimentation and effluent discharges. This species and all mussels can benefit from the use of Best Management Practices (BMPs) when conducting forestry or agricultural activities by helping to protect and improve water quality in streams where they occur. ♣



A superconglutinate containing larvae attached to an orange-nacre female in Brown's Creek at the Bankhead National Forest. It has a dark lateral stripe, as do many minnows in the stream. The clear mucus strand attaching it to the shell is not visible.



Service biologist Paul Hartfield holds an orange-nacre mucket with attached "line and lure."

Lawrence, Tuscaloosa, and Winston Counties in Alabama. This

species places all of its larvae (75,000-100,000) in a single mucous casing that resembles a minnow in size, shape, and action. The larvae package is attached to the female by a mucous strand that can be as long as eight feet in length. Much like a fisherman with a rod and reel, the female presents her lure to attract a host fish. When a fish feeds on the lure, the larvae disperse

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Keeping Our Cities Cool

by DR. JEFFREY C. LUVALL and DR. DALE A. QUATTROCHI,
NASA's Global Climate and Hydrology Center, Marshall Space Flight Center, Huntsville

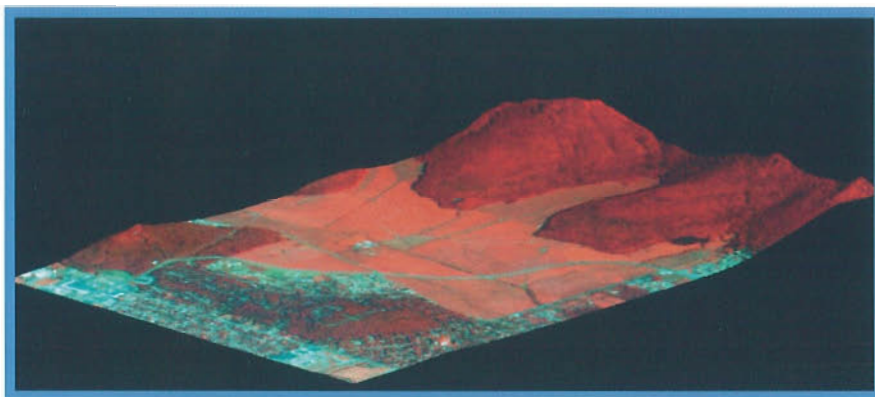


Figure 1. A false color (vegetation is red) digital image combined with topographic relief for part of Huntsville, Alabama.

If you ask most people about what their ideas are of forestry and forest management, the first thing that comes into mind is non-urban parks, national forests or favorite hunting areas. Yet most people do not routinely come in contact with these types of forests—particularly the residents of large metropolitan areas

where most of the world's population lives. Their only contact with trees is in city parks and residential areas. These urban residents associate the economic benefits of forests with the forest products industry's production of paper and wood products, not with the economic benefits urban trees and forests provide.

The low importance associated with urban forestry is evidenced by the few cities in Alabama that have a city forester position. But trees in urban settings do provide a valuable economic benefit—they help keep our cities cool. By helping keep our cities cool, urban forests reduce city power demands for air conditioning and thereby help reduce carbon dioxide.

This gas is released into the atmosphere from some methods of electric power generation and may contribute to global climate change. In this article we will discuss how trees help keep our cities cool and how NASA technology is being used to take the "temperature" of our cities.

How Do Trees Help?

First, we need to explain how trees keep our environment cool. We all know on a hot summer day that sitting under the shade of a tree makes our southern summers tolerable. Sitting under a tent or pavilion keeps the sun off, but does not seem as "cool." Trees shade us from direct solar radiation. This is particularly

important in urban areas where many surfaces are covered by concrete or asphalt. The temperatures of these artificial surfaces can sometimes be over 72°F warmer than vegetated surfaces. Materials such as asphalt store much of the sun's energy and remain hot long after sunset. This

produces a dome of elevated air temperatures called the "urban heat island." This island can be 10°F greater over the city, compared to the air temperatures over adjacent rural areas.

By absorbing the sun's energy, trees also convert solar energy into latent heat, which results in transpiration of water from the leaf stomata. The evaporation of water takes much more energy than to heat the air, so the energy that would normally heat the air is used to evaporate water.

New Technology Monitors Temperature

How can we measure the effect trees have on keeping our urban areas cool?

Well, we could go out and measure the air temperature at various points throughout the city, but that would require thousands of measurements and the coordination of many people on the ground taking these measurements at the same time. It would be difficult to take enough temperature measurements over a large city area to characterize the temperature variability. To access the impact of trees on keeping our cities cool as part of NASA's Mission to Planet Earth program, we are using tools developed for exploration of the universe to examine the role of trees in helping keep our cities cool. Such instruments mounted on aircraft were used in a study funded by NASA's Marshall Space Flight Center, for a series of flights over Huntsville, Ala., to examine the heating and cooling patterns of the city.

Foresters and land managers frequently utilize and recognize the value of aerial photography in the management of our forests. With this new technology, we can produce aerial photographs that are similar to those produced from photographic films—but in digital format—which allow the user to manipulate the image with computers. This new technology uses digital cameras or scanners to produce the image.

An advantage of using digital data is that they allow us to measure or “scan” different types of “energy” given off (emitted) or reflected from a forest. Although the human eye is only sensitive to visible light, there are many other wavelengths of “light” that are given off (emitted) or reflected by a forest canopy. The type of energy we measure to take the temperature of the city is called “thermal infrared” energy. A good analogy is by holding your hand in front of a fire, you can “feel” the heat radiated from the fire. The instrument or scanner mounted

in the NASA Learjet is specifically designed and calibrated to measure such energy as we fly over a city or forest. The image produced by the instrument is a picture of the city based on the heat given off from the ground.

Being able to use computers to manipulate the data allows us to combine the



Figure 2. Daytime thermal image of Madison Square Mall in Huntsville.

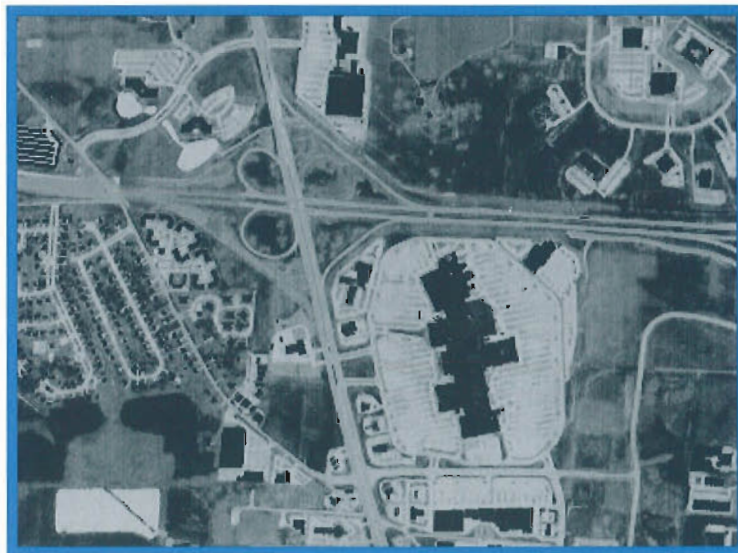


Figure 3. Nighttime thermal image of Madison Square Mall in Huntsville.

image with other information—for example, elevation from a topographic map. A good example of such an image is Figure 1, where the digital image was combined with topography information for part of Huntsville, Ala., giving a three-dimensional “picture.”

An example of the kind of “data” obtained from the NASA scanner is an

image from the area around Madison Square Mall (Figure 2) in Huntsville. Warmer temperatures are represented by lighter shades of gray and white and darker shades as the cooler temperatures. The average temperature was 113.2°F, compared with a nearby forested area at 85.3°F. A spot check of day temperatures around the mall shows that in the middle of the parking lot temperatures reached about 119.8°F. However, a “tree island,” a small planter containing a couple of trees in the parking lot, is only 88.9°F. So, even a small area of tree coverage surrounded by a very hot parking lot reduced temperatures by a significant 30.9°F!

At night a spot check of temperatures approximately five hours after sunset reveals that the Mall parking lot is about 75.2°F and 64.6°F for the tree island (Figure 3). A nearby forest was 62.8°F. So the amount of heat stored by the asphalt parking lot was significant. The beneficial effect of the “tree island” is also evident in reducing the storage of heat for an asphalt surface, thus reducing the night time heating of the air from heat stored in the asphalt.

The airborne data allow us to quantify the effect of tree canopy cover on the heating of the urban environment. These data provide a foundation for determining a cost benefit of planting trees and reinforce the need to maintain and develop urban forests. Analysis of these data can also help in the environmental design of cities, for example by constructing parking lots to include “tree islands” to shade the asphalt. Tree-lined streets would also shade the concrete and asphalt. Additional benefits would come from shading roofs and reducing the heat load on houses and buildings, thus reducing power requirements for cooling. So think cool and plant a tree. ♻️

constructing parking lots to include “tree islands” to shade the asphalt. Tree-lined streets would also shade the concrete and asphalt. Additional benefits would come from shading roofs and reducing the heat load on houses and buildings, thus reducing power requirements for cooling. So think cool and plant a tree. ♻️

It's Time for Action

A Report on the Alabama Forest Resources Roundtable and the 7th American Forest Congress

by TED MEREDITH, Director, Alabama Forest Resources Center

As a forest landowner you have probably carried out many improvements on your property. By becoming a TREASURE Forest landowner, you have taken a further step and made a commitment to manage several resources of your forestland. It will take continued improvements to remain faithful to that commitment. But what if every time you walked your land you came up with great ideas on how to improve your forest resources, but then you never took the steps to make those improvements? It is a sad fact that many nonindustrial landowners have not improved their forestland ownerships. What can be done to provide the incentive so that more landowners implement forest management practices?

The Alabama Forest Resources Roundtable and the Seventh American Forest Congress are steps that will produce an action by many of those landowners. There are plenty of studies with recommendations that would improve forestland resources. Alabama's and the United States' forests have been nearly studied to death, but very little action is taken to implement recommendations of all these studies. Many of these studies cost hundreds of thousands or millions of dollars.

Why is it that action is not taken to achieve the needs of forests and owners? One of the reasons is that most organizations are so busy doing a good job of their normal work that taking action steps on a new project is not a priority. We know as a fact, though, that there are immense opportunities to improve forestland properties that can benefit the owners and the public.

Taking action steps on forest resource matters is not easy. It requires thoughtful, diligent work and a coalition of people and organizations to work together. It's

also risky—there is a chance of failure. And success will not occur overnight. The other side of the coin is that old saying “nothing ventured, nothing gained.” In addition, there can be some great challenges, experiences and learning by taking initiative on action steps.

Roundtable and Seventh Congress Meetings

The Alabama Forest Resources Roundtable Meeting was held November 15, 1995, in Montgomery, Alabama, and was attended by about 100 people. More than 1,500 people, 33 from Alabama, attended the Seventh American Forest Congress in Washington, D.C., in February of this year. People with diverse interests were invited to participate in both meetings. Attendees included nonindustrial private forest landowners, industry representatives, environmental activists, government employees, and university professors. At both meetings participants sat at round tables of 10 people each and discussed forest issues. On some items they cordially disagreed with each other. But at the end of both meetings, recommendations were agreed on that, when implemented, will enhance the future of forests in our state and nation.

The intention at both meetings was to identify what the majority of people could agree on. Everyone had the chance to hear and vote on everyone else's opinions. Hardly anyone left the meetings as a result of their opinion being in the minority. At the Seventh Congress, representatives from Alabama had the opportunity to interact with people from all over the country. Both meetings helped lower barriers between antagonist groups and people.

Broad Recommendations

At both the Alabama Roundtable and Forest Congress, the participants worked on three areas:

1. A Vision
2. Principles to follow when working to achieve the Vision
3. Next Steps (actions) to enhance forests

The Vision and Principles agreed on by the majority at both meetings were broad and general, but exhibited a true concern about the future of forests and trees. They are good snapshots of many people's hopes and aspirations for Alabama's and America's future forests.

As an example, the Vision produced at the Alabama Roundtable is the following: *America's forests for the future will be healthy and sustainable—biologically, ecologically, socially and economically. They will be diverse in ownership, uses and conditions, and productive in values which enhance the quality of life for all Americans. Their management will be based on credible science in partnership with community values.*

The Next Steps (the action items) from the meetings are briefer and more specific. They may turn out to be the most important items if for no other reason than because they are recommendations for **action**. The Next Steps produced at the Alabama Roundtable and Forest Congress are similar.

Here are the Next Steps produced by Alabama participants at the Forest Congress. They are listed in the order of frequency of being recommended by participants.

1. Follow up on Congress and Roundtable:
 - A. Inform many about Congress and Roundtable.

(Continued on page 26)

THE 1996 FARM BILL

by TIM L. GOTHARD, Forest Management Section Chief, Alabama Forestry Commission and
DAVID HOGE, Rural Forestry Assistance Program Manager, USDA-Forest Service, Atlanta, Georgia

After many months of deliberation in Congress, the 1996 Farm Bill—or as it is officially known, the Federal Agriculture Improvement and Reform (FAIR) Act—was signed into law by President Clinton on April 4, 1996. If the major conservation emphasis within the 1985 and 1990 Farm Bills was our soil, water, forest, and wetland resources, respectively, then the FAIR Act gives equal attention to the wildlife resource. Indeed, some say that the reason the farm bill passed was due to the efforts of the wildlife community. Presently, various rules and regulations are being developed by the U.S. Department of Agriculture (USDA) regarding the implementation of new programs and the changes to old ones brought about by the act. Several of these programs may be of interest to forest landowners, with actual utility depending on the various policies being developed and Congressional appropriations.

Programs Combined and Created

Within the Farm Bill's Conservation Title, the Environmental Quality Incentives Program (EQIP) combines the former functions of the Agricultural Conservation Program (ACP), Water Quality Incentives Program, Great Plains Conservation Program, and Colorado River Basin Salinity Control Program into one program, which will be administered by the USDA-Natural Resources Conservation Service (NRCS) after October 1. Authorization is set at \$200 million per year with initial appropriation marks for Fiscal Year (FY) 1997 around \$180 million. Fifty percent of EQIP funds are to assist crop and livestock producers with installing environmental improvements on the farm or ranch. The remaining funds are for addressing conservation concerns.

Much of the EQIP language in the law relates to soil and water conservation and livestock concerns, with little reference being made to forestry. The USDA-Farm Service Agency (FSA), which retained administrative authority for ACP in the interim, reacted to this perceived oversight by recently notifying its state offices that the reforestation and forest stand improvement (FR1 and FR2) practices were no longer eligible for ACP cost-share. Though there is interest among the forestry community in reversing this action and reinstating these practices, current ACP/EQIP forestry activities are limited to components associated with tree planting on open land designed to conserve soil and protect water quality. For the past several years, ACP forestry accomplishments in Alabama, primarily tree planting, have averaged around 20,000 acres per year. The removal of reforestation and timber stand improvement practices from ACP will be significant.

Earlier reference was made to the relative importance of wildlife, and FAIR further reinforces these concerns by creating the Wildlife Habitat Incentives Program (WHIP), raising wildlife to the same level of consideration as soil, water, forests and wetlands. Funding is authorized for \$50 million over the next seven years. Congress is still debating over the actual appropriation, if any, for FY 1997. NRCS will administer WHIP.

Continuing Programs

Under the 1996 Farm Bill, the Conservation Reserve Program (CRP) continues for the protection of highly erodible and environmentally sensitive lands through the establishment of grass, trees, and other long-term cover. A cap of 36.4 million acres is placed on enrollments. Potential new enrollments will replace expired or terminated contracts. Unlike the early years of CRP, when each state and coun-

ty looked at CRP applications independently, future CRP applications will be nationally competitive based on a much broader set of criteria. There has been talk within the USDA of additional opportunity for early release from CRP contracts for pine plantings over five years old. Further information in this regard as well as future signup periods will be addressed by FSA, which continues to administer CRP.

Also continuing is the Wetland Reserve Program (WRP), administered by NRCS, but with additional emphasis placed on 30-year easements and cost-share agreements. A national cap of 975,000 acres has been placed on WRP enrollments, with one-third of WRP in permanent easements, one-third in 30-year easements and one-third in cost-share agreements. The 1996 Farm Bill also makes several changes to existing swampbuster provisions to give farmers more flexibility in complying with wetland conservation requirements while protecting natural resources.

Money Appropriated

Whereas in the 1990 Farm Bill there was a Forestry Title, in the 1996 version forestry appears as a subtitle under the Conservation Title. Within this subtitle, a provision from the 1990 Farm Bill was scratched and the Forestry Incentives Program (FIP) was reauthorized by FAIR through 2002. However, funding is again expected to be limited to just \$6.3 million nationwide in FY 1997. For Alabama, this should equate to approximately \$500,000 compared to nearly double that amount in years past. NRCS continues as the administrative authority for the program, in consultation with state forestry agencies at the local level and with the

(Continued on page 26)

TREASURE Forest Gems

TREASURE Forest Gems is designed to highlight accomplishments, inventions or creative ideas of TREASURE Forest landowners and feature special places found on their properties. The frequency of this section will be based on reader response. If you have an example on your property that would be appropriate for this section, write to Kim Gilliland, *Alabama's TREASURED Forests*, P.O. Box 302550, Montgomery, AL 36130-2550.



Before:

Orin Fannin, Mr. Champion's farm manager, looks at the muddy problem left by Hurricane Opal.



After:

A combination ford/broad-based dip solved the problem.

Eight inches of rain during Hurricane Opal last fall left TREASURE Forest owner Leon Champion of Huntsville with a very messy road problem. Mr. Champion's TREASURE Forest is located in Pike County. The problem area was a wet weather spring; the unusual amount of rain from the hurricane forced Mr. Champion to solve the problem. Taking information he had learned at a landowner training session, he combined a ford with a broad-based dip and came up with a solution to his problem. By digging out a trench in the affected area and filling it with 25 tons of softball-sized gravel, he was able to solve the problem. The gravel stays in place and allows water to flow over during the rainy season. Good access is now possible throughout the year. ♣

Rustic Hideaway



This rustic cabin looks like it may have been here for 100 years, but actually it's quite new. The cabin is located on the TREASURE Forest of John Ponder in Talladega County. Mr. Ponder built the two-room lofted cabin by hand, even down to the hand-cut shingles on the side. The cabin serves as a hunting lodge and is a favorite spot for visitors.

Census Sign



You won't find yourself included in this census report located at the Jack McQuinn TREASURE Forest on the Paint Rock River in Jackson County. Frazier Cove is one of the many beautiful hideaways on the property.

A Big Dam Across Little River



No, this concrete dam is not an Alabama Power Company or a TVA project. It's the brainstorm and project of Frank and Bess Mason of Birmingham. The Masons' 3,000-acre TREASURE Forest is located on Lookout Mountain at Mentone. The dam was built in 1988 to provide access across Little River. As a result, Lake Bess was created and named after Mrs. Mason.

Managing Ponds for Better Fishing

by MICHAEL P. MASSER, PH.D., Extension Fisheries Specialist

Private ponds are important recreational resources for many Alabamians.

Alabama has over 50,000 private ponds, and it is estimated that 20 to 25 percent of all fishing trips in Alabama are to private ponds. Properly managed, these ponds can provide fantastic fishing. In fact, the world record bluegill bream came from an Alabama pond and many biologists believe that the next state record largemouth bass will come from a private pond!

First a pond needs to be properly constructed. The Natural Resource Conservation Service (NRCS) is available to assist landowners with pond design and supervision of construction. Once a pond has been properly constructed, the keys to managing private ponds for better fishing are stocking the right species, fertilizing, maintaining population balance, and controlling weeds.

as long as the bass are not over-harvested. Ample bluegill survive bass predation to provide good bluegill angling. Shellcracker bream and channel catfish may be added to a bass-bluegill pond, but both species will

based on whether or not the pond will be fertilized.

Bass and bream (not catfish) for stocking may be obtained from the Alabama Department of Conservation and Natural Resources, Game and Fish Division. Applications are made through a district fisheries biologist with Game and Fish and must be received by February 1 for spring stocking. Many private hatcheries in Alabama produce fish for stocking and can provide fish any time of the year.

County Extension offices have lists of private hatcheries in Alabama.

Ponds should be thought of as miniature, complete ecosystems. Each pond ecosystem has internal cycles that produce food, often called the food chain or web.

Plankton are the start of the pond's food chain (see Figure 1). Plankton is a term used for all microscopic life, both plant and animal, that float in the water. Planktonic animals are called zooplankton and planktonic plants are called phytoplankton or algae (but not filamentous algae). Algae, which often make the

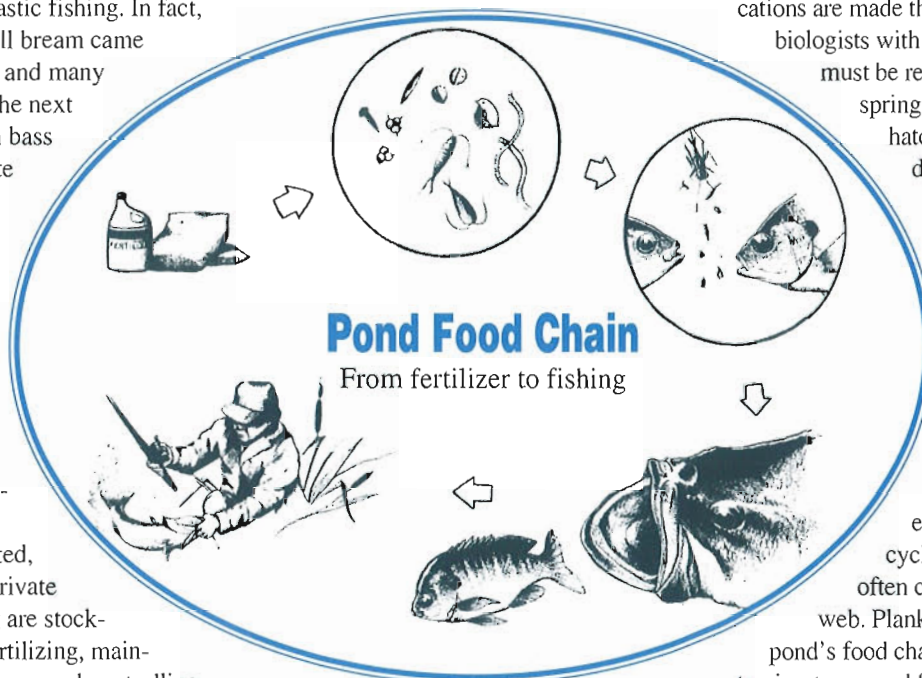


Figure 1

consume a portion of the food supply, slightly reducing the total pounds of bass and bluegill the pond can sustain. Recommended stocking rates (see Table 1) are

(Continued on page 14)

Stocking

The largemouth bass and bream (or sunfish) combination is the most common stocking strategy throughout the Southeast. This combination was developed by Dr. Homer Swingle in research done at Auburn University starting in the 1930s. No one has ever discovered a better system for private ponds. The beauty of the bass-bream system is its simplicity and the fact that it provides a surplus of fish for human consumption.

In a fertile pond, plankton and insect larvae supply food for all sizes of bluegill bream. The bluegill grow rapidly and reproduce prolifically with this abundant food supply and provide forage (or prey) for the bass. Bass prey on the bluegill and keep them from overpopulating the pond,

Table 1

Recommended Bass, Bream, and Catfish Stocking Rates

Species	Fertilized Yes/No	Number to Stock/Acre
Bluegill(bg)/ Shellcracker(sc)	yes no	1,000 bg OR 800 bg & 200 sc 500
Bass	yes no	100 50
Catfish	yes no	50 to 100 25

Managing Ponds for Better Fishing

Continued from page 13

water look green, are the plants at the start of the food chain. Zooplankton and aquatic insects feed on algae, which in turn are eaten by small fish. Small fish are then eaten by larger fish. Directly or indirectly, algae provide all the food for the pond except for a small quantity of terrestrial insects and worms which fall or wash into the pond. Managing planktonic algae is essential in producing food for an abundant and healthy fish population. The key to producing planktonic algae is to provide them with nutrients or fertilizer.

Liming and Fertilization

Fertilization provides planktonic algae with nutrients for growth, much the same as fertilizing fields or gardens increases plant yields. Fertilization increases available food throughout the food chain, thus increasing the amount of fish the pond supports. Fertilization, however, will not stimulate a good algae bloom if alkalinity (a measure of chemical bases in the water) is below 20 ppm. If alkalinity is below 20 ppm, then agricultural limestone needs to be added. The amount of limestone depends on the chemical characteristics of the pond mud. A dried mud sample can be analyzed at the Soil Testing Lab at Auburn University to determine the amount of limestone needed.

Limestone must be applied evenly over the entire pond so that it can react with the mud. If the pond is thoroughly dry, limestone can be applied with a spreader truck. If the pond is full of water, then the limestone has to be distributed from a boat. Several pond management consultants in Alabama lime ponds. A list of these consultants may be obtained from any county Extension office.

Limestone slowly dissolves into the pond water and is flushed out through overflow water. This means ponds need to be re-limed every few years. It is practical to double or triple the amount of lime recommended by a soil test to increase the length of time between applications. Adding extra agricultural limestone will not harm the pond. A typical liming rate in Alabama is around 2 to 4 tons per surface acre of pond.

Remember: if a pond needs lime, then it will not respond to fertilizer.

Fertilizers are labeled with N-P-K ratios or percents of nitrogen (N), phosphorus (P), and potassium (K). Phosphorus is the nutrient most needed in ponds. Over time phosphorus is absorbed and trapped in the pond mud. Once trapped, it is not available to planktonic algae but can promote the growth of nuisance aquatic weeds and filamentous algae. The equivalent of 8 pounds of granular, or 4 pounds of liquid, phosphorus per acre per treatment are commonly recommended application rates. Occasionally, new ponds need nitrogen, but once a pond is established nitrogen generally is abundant. Granular, liquid, and time release fertilizers are available for pond fertilization. Once fertilization is started it should be continued. If fertilization is stopped the fish will stunt due to the reduced food supply. For additional infor-



A Secchi disk should be used to determine when to fertilize.

mation on fertilization and application rates contact any county Extension office.

The best and simplest method of knowing when to fertilize is based on water clarity. The depth to which light can penetrate into the pond is a measure of the algal density or bloom. The optimum algae bloom is one that allows light to penetrate to a depth between 18 to 24 inches. Light penetration can be measured using a Secchi disk. A Secchi disk is an 8-

inch diameter disk divided into black and white quarters (see photo) attached to a yardstick or pole. Finding the point at which the Secchi disk just disappears from sight is the key. A bloom that makes the Secchi disk disappear between 18 and 20 inches is ideal. If the Secchi disk is visible near 24 inches then it is time to fertilize again. **Do not overfertilize;** a bloom with a 12-inch visibility or less will probably cause an oxygen depletion and a fish kill.

Fertilization should begin when water temperatures start to rise, usually late February or early March. **Do not fertilize if a weed problem exists in the pond.** The first fertilization does not always stimulate a bloom. Continued fertilizations at two- to three-week intervals usually produces a bloom. Once a bloom is established, fertilize as necessary to maintain it, using the Secchi disk to determine when to fertilize. Continue until the water temperature drops below 60°F, usually in November.

Infertile or unfertilized ponds in Alabama seldom produce 100 pounds of fish per acre. Well managed and fertilized ponds can sustain 300-400 pounds of fish per acre. If, however, the pond is not going to receive much fishing pressure, why waste time and money fertilizing.

Harvesting Ponds to Maintain Balance

Ponds should not be fished for at least one year after bass are stocked. This permits the bass to spawn before harvesting starts. Once fishing begins some fish must be harvested to keep a pond in balance.

Bass harvest is critical in maintaining quality fishing. Bass are often easy to catch, especially the first year a pond is fished. It is possible in the first-year pond to catch over 70 percent of the bass in a few days of intensive angling. After this the bluegill can quickly overpopulate and stunt. If this happens it will be extremely difficult to regain a balanced population and may require renovating the pond. As a general rule, a fertile pond can sustain the harvest of about 25 pounds of bass per acre per year. If the pond is infertile (unfertilized), only about 10 pounds of bass per acre per year can be harvested. Catch-and-release, and enjoy successful angling more often once the prescribed amount of bass have been removed.

An increasing problem in many Alaba-

ma ponds is the under harvest of bass causing a "bass-crowded" condition. In a bass-crowded pond too many bass are present and few bream reach maturity. The few bream that do escape grow rapidly to a large size but are too few for good fishing or spawning. The bass do not have enough bream to eat, become stunted, and have poor physical condition. Many times this situation can be corrected by heavily harvesting the stunted bass.

Over- or under- harvest of bream has little affect on population balance. Heavy fishing will reduce the average size of bream. A good rule of thumb is to harvest 4 to 6 pounds of bream for each pound of bass. Heavy angling is not effective at countering bream over-population. However, quality bream fishing can be produced by regulating the harvest of bass. Harvesting only about 10 pounds of bass per acre per year (fertilized pond) will increase the average size of bream. The more numerous bass eat more bream and bream that survive grow faster because there is more food or less competition per fish. Remember, however, that if no bass are harvested, a bass-crowded condition may occur.

Catfish can be harvested when they reach sufficient size, usually one year after stocking. Catfish stocked with bass and bluegill are generally unable to reproduce successfully. Therefore, catfish will have to be restocked periodically. A large (8 inch or larger) catfish fingerling should be stocked into ponds that have adult bass. Do not rely on your memory. Keep records of numbers and sizes of fish caught, so that total pounds of harvested fish can be evaluated. Pond balance can be evaluated from catch records plus seine data.

Ponds should be checked for balance every one to two years. The district fisheries biologist with the Alabama Department of Conservation and Natural Resources, Fisheries Section may be able

to assist you in checking pond balance. Call the district office well in advance to schedule a visit. Private fisheries consultants are also available to evaluate pond balance.



A balanced pond has staggered populations of bass (predator) and bream (prey) in abundance.

Aquatic Weed Control

Aquatic weeds are a common problem in farm ponds. Some aquatic vegetation might be good for a pond. Rooted aquatic vegetation does provide habitat for small aquatic animals which are part of the food chain. Vegetation also provides small fish with places to hide from larger predators. The problem with weeds is uncontrolled growth. If too many weeds become established in the pond, then too many small fish survive. This over-populates the pond, and the removal of nutrients by weeds reduces algae production, limiting food production in the pond.

Aquatic weeds can be controlled by manual, chemical, and biological methods. Manual control of woody vegetation and species, like cattails, is practical when they first start to colonize a pond.

Chemical control with herbicides is possible but few herbicides are approved for aquatic use and the type of aquatic vegetation must be accurately identified before treatment. Herbicide application can cause an oxygen depletion. Oxygen depletions after herbicide treatment are particularly common in hot weather or if the pond is heavily infested with weeds. Check with a

fisheries biologist or the county Extension office for plant identification and current herbicide recommendations.

The simplest, most economical long-term aquatic weed control method is to stock grass carp. The grass carp, or white amur, is an Asian carp brought to the U.S. for aquatic weed control. They cannot reproduce in ponds, will not muddy the pond like common carp, will not disturb the nests of other fish, and they can consume 30 to 40 percent of their body weight in weeds every day during warm weather.

Grass carp are attracted to running water and will leave the pond over the emergency spillway during heavy rains. Escape can be prevented by building a barrier across the spillway. A

list of where to purchase grass carp, how many to stock and information on how to build an escapement barrier can be obtained from any county Extension office.

The number of grass carp that should be stocked depends on the type of weed and magnitude of the weed problem, but usually varies from 5 to 20 per acre. Even new ponds with no weeds should be stocked with 5 grass carp per acre. In a pond with mature bass, stock an 8-inch or larger grass carp fingerling. Grass carp are less effective at controlling weeds after they reach 20 to 30 pounds in size (usually in 5 to 7 years). At that point, the pond will need to be restocked with grass carp. The large grass carp can be removed by bow-fishing and are excellent table fare.

All ponds attract, support, and enhance wildlife. But ponds are not Mother Nature's creations; we built them and we must manage them if they are to be productive fishing ponds. Again, think of a pond as you would a garden. It must be properly laid out, fertilized, planted (i.e. stocked), weeded, and harvested. All of this takes time and effort, but the rewards are outstanding recreation and great fish fries. ♣

LANDOWNERS



LEGISLATIVE • ALERT

NATIONAL

by TERRI BATES, Washington Office, National Association of State Foresters



Election year politics were clearly driving what was accom-

plished this year and what was passed over for another year. Recognizing the fallout from last year's budget impasse, Congress to date has sought to avoid similar confrontation in the 13 annual appropriations bills for 1997. Funding for most existing forestry and conservation cost-share programs was anticipated to be at continuing levels.

The Conservation Reserve Program (CRP) was reauthorized in the 1996 Farm Bill and capped at 36.4 million acres. Though currently near that cap, CRP contracts from the initial years of 1985-86 will soon begin expiring. Rules and regulations are being promulgated, which will set new standards and criteria for landowners wishing to either re-enroll existing contracts in CRP or enroll new acres for the first time. The agricultural appropriations bill included language that would stop the current practice of allowing producers to re-enroll CRP acreage at current rental rates.

Private Property Rights

A new version of Sen. Bob Dole's "Omnibus Private Property Rights Act" was introduced in the Senate in mid July. The new bill is somewhat narrower than the original. It restricts the bill's landowner compensation provisions to U.S. government actions which result in reduced fair market value of private property (defined as real property, fixtures, crops including timber, mineral

rights, and water rights) by 50 percent or more; provides an exemption for "taking" under civil rights statutes; and allows agency personnel to enter private property with the landowner's written consent for criminal enforcement or emergency purposes.

The House has passed a similar bill with a 25 percent threshold. As Majority Leader, Sen. Dole had committed to bringing the bill to a floor vote early this year. However, this was jeopardized when he resigned to spend full time on his presidential campaign. New Senate Majority Leader Trent Lott (R-MS) has said he will assess whether S. 1954 should be brought to the floor for a vote.

Other Legislation

A rider added to the agriculture appropriations bill that passed was the Northern Forest Lands Stewardship Act. This act implements the recommendations of a broad-based council from the region that represented landowners, state conservation agencies, environmental organizations and local communities. The council focused on maintaining traditional uses of property and promoting economic development, while maintaining the ecological fabric of the region as it is increasingly faced with intense development and population pressures. Under the legislation, technical and financial assistance can be provided to aid the northern forest region in protecting its forest resources and creating a sustainable economy.

The Safe Drinking Water Act may be about the only other major environmental


law reauthorized this Congress. Renewed attempts to move forward reauthorization of the Clean Water and Endangered Species Acts ultimately failed and will be left to the next Congress.

Tree Planting Declines Nationwide

Tree Planting on all ownerships in the U.S. totaled 2.4 million acres in fiscal 1995, according to a new USDA-Forest Service report. That is down 2 percent from 1994 for almost all categories of ownerships. The report also concludes that tree planting is not keeping pace with harvesting in the South where both the most timber harvesting and tree planting occurs.

State Initiatives: Update

Support for the Maine Green Party's Forestry Ban ballot referendum was down, according to a July poll. The initiative, which will be on the Maine ballot in Nov., would ban all forms of even-aged management on both public and private timberlands. Reportedly, support dropped from 70 percent to 35 percent, due to a major education effort against the initiative. Over 98 percent of Maine's land base is privately owned and is heavily forested.

A group called Oregonians for Sustainable Forestry has failed to get enough signatures to put their proposed initiative on the state ballot. Termed the "Sustainable Forestry Initiative," it would have severely restricted clearcutting and the use of forest pesticides. 



While attending a funeral in Birmingham recently, this writer had the occasion to meet Rick Johnson, a logger/landowner/registered forester with Tuscaloosa Forestry Services and an avid reader of this magazine. In the course of our conversation, he asked about the Alabama Legislature and the special session just concluded, which was somewhat of a funeral itself as far as Forestry Commission appropriations were concerned.

"You need more funding," Johnson suggested. "How can those of us in forestry help get your budget restored?" Now this is the kind of question we always like to hear, because we are going to need the assistance of every forestry-related person in this state to work with us to encourage the governor to put the \$1-plus million into his recommended budget for fiscal 1997-98.

Lobbying our legislators is one thing, but anyone with an ounce of forestry blood in his veins knows it will take more than that if the Forestry Commission is to function as mandated by a 1969 Act of the legislature. It has to begin in the governor's recommended budget for each new fiscal year, then action from the House Ways and Means Committee.

State Forester Timothy C. Boyce and Assistant State Forester Richard Cumbie are making the most of existing manpower and equipment to get the job done, but there's just so much an under-staffed, under-funded organization can do.

The Act of 1969

It might be well at this point to reach back into the Code of Alabama and extract a couple of sections that spell out the role of the Forestry Commission, as specified by Act No. 764, the Regular Session of the 1969 Legislature.

Section 4: "The functions and duties of the Commission shall be as follows: To protect, conserve and increase the timber and forest resources of this state and to administer all laws relating to timber and forestry and the protection, conservation,

and increase of such resources; to make exploration, surveys, studies, and reports concerning the timber and forest resources, and to publish such thereof as will be of general interest; to maintain, supervise, operate and control all state forests; to cooperate with and enter into cooperative agreements and stipulations with the Secretary of Agriculture of the United States or any other federal officer or department, board, bureau, commission, agency or office, thereunto authorized, with respect to the protection of timbered and forest-producing land from fire, insects and disease, the acquisition of forest lands to be developed, administered and managed as state forests, the production, procurement and distribution of forest trees and shrub planting stock, the carrying on of an educational program in connection therewith, the assistance of the owners of farms in establishing, improving and renewing wood lots, shelter belts, wind breaks and other valuable forest growths, the growing and renewing of useful timber crops, and the collection and publication of data with respect to the timber and forest resources, or any other matters committed to the Commission by this title; to make and enforce all regulations and restrictions required for such cooperation, agreements or stipulations; to carry on a program of education and public enlightenment with respect to the timber and forest and other natural resources of Alabama; to make an annual report to the governor concerning the activities and accomplishments of the Commission for the preceding fiscal year; to recommend to the legislature such legislation as may be needed further to protect, conserve, increase, or to make available or useful the timber and forests and other natural resources of Alabama; to supervise, direct, and manage all activities of the Forestry Commission and its staff and employees."

Section 5: "The Commission shall give such advice, assistance and cooperation as may be practicable to private landowners, and promote, so far as it may be able, a proper appreciation in this state among all classes of the population, of the bene-

fits to be derived from forest culture, preservation and use. The Commission may take such measures as may be reasonable and practicable to prevent and suppress forest fires and other influences harmful to forest growth and may apply such parts of the forestry fund and other funds accruing to it as may be necessary to such purposes and to providing such systems of control as it may establish, either independently or in cooperation with the federal government and other agencies, public or private. The Commission shall be the sole cooperating agency in joint work in the promotion and development of forestry and other matters and interests devolving upon it by law, among all classes of land ownership in the state, in which both the state and the federal government may have financial or administrative participation."

We quote this section of the act to acquaint many of our readers who are not familiar with the mission of the Forestry Commission. One of the sponsors of this legislation, Rep. Pete Turnham of Auburn, is still serving in the Alabama House and is very well aware of the Commission's financial needs. He is currently vice chairman of the powerful Ways and Means Committee.

Ways and Means Committee

Other members of the Committee are Bill Fuller, the chairperson, Lafayette; Ralph Burke, Rainsville; Joe Carothers, Dothan; Johnny Curry, Hueytown; Jim Haney, Huntsville; John Hawkins, Birmingham; Dr. Yvonne Kennedy, Mobile; John Knight, Montgomery; Albert Morton, Birmingham; Tim Parker, Tuscaloosa; Walter Penry, Daphne; John Rogers, Birmingham; Nelson Starkey, Florence; and James Thomas, Camden.

These are the 15 members who decide the initial phase of the budget when it comes from the governor's office. From there it goes to the floor of the House for further consideration. Once adopted there, it moves to the Senate. In this case it is handled by the Committee on Eco-

(Continued on page 18)

50-Year-Old Dream Now a Reality

by TILDA MIMS, Forest Education Specialist, Alabama Forestry Commission, N.W. Region, Northport

“Wanting to leave the land in better condition” is a familiar wish of TREASURE Forest landowners. For many years, scores of Alabama landowners have purchased cutover, worked out tracts with the goal of transforming them into healthy forestland.

Robert Crow of the Woods Creek community in Marion County has pursued this dream for over 50 years. Though he says there is still work to be done, his progress is impressive.

When Robert left the Army in 1945 he bought 120 acres for \$1,200. That was \$2 more per acre than timber companies were paying. The land was highly eroded and all the merchantable timber had been cut out. During the next 20 years or so he bought several adjoining parcels of poorly managed land to bring his total ownership to 672 acres.

That seemingly hopeless stretch of land now contains healthy, abundant pines and hardwoods, wildlife openings, a lake, and homes for him and his family.

Robert gives some credit for his success to the assistance of Forestry Commission employees Tony Avery, Flavil Logan and Vernon Tucker. “The Forestry Commission has been a great help to me. Years ago they had to spend most of their time fighting fire. Now they have time to really help you with cost-share assistance,” he said.

Robert is mostly self-taught in forest

management, beginning his study of forestry while in the Civilian Conservation Corps. “I studied forestry and planted a lot of trees on erodible land.” He chuckles and adds, “I hate to tell you but I set out kudzu, too.”



Robert Crow (left) and Marion County Forester Tony Avery stand in a 5-year-old plantation. Less than 10 years ago the area was waist deep in kudzu.


Kudzu was a pervasive pest on this property, affecting almost 20 acres with waist-high plants that choked out all other vegetation. About eight years ago, he

began an aggressive eradication program, poisoning the kudzu with Tordon 101M every year for three years. The treatment was so effective that Crow successfully planted pines in that area five years ago.

Robert doesn't really want to sell his timber. He says he always promised himself that if he ever owned forestland, he would sell only what he had to and simply watch the rest grow. So far he has kept that promise. “I cut just what I need to pay on the land,” he says. “I've cleaned out damaged trees, too, and now have better, healthier timber than ever.”

As a forest landowner for over 50 years, Robert Crow is an eyewitness to the success story of Alabama forests. “The forests in Marion County are in much better shape than when I came out of World War II. The land was cutover and there were few deer or turkeys. People that think today's forests are in bad shape don't know what it looked like 50 years ago.”

Remember the 120 acres that he bought in 1945 for the above-market-price of \$120? A forest industry bought 120 acres adjoining the Crow's TREASURE Forest a few years ago for \$135,500—and it was considered a very fair price.

“Making the land better” is the spirit of TREASURE Forest. Landowners like Robert Crow and his wife, Alpha, are making a difference in the environmental and economic success of forestry in Alabama. 

State Legislative Alert


Continued from page 17

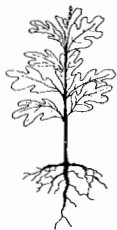
conomic Expansion and Trade—not the Finance and Taxation Committee, as has always been the case. Sen. Dewayne Freeman of Huntsville heads this panel of five senators.

Following this committee's adoption, the budget then reaches the Senate floor for final passage, but there are always some differences that force it into a Conference Committee before it gets final approval or veto by the governor.

It will be February of next year before we have another opportunity to get a budget introduced, but you can be sure a lot of

work will be done with the governor and members of the two aforementioned committees before the frost hits the pumpkin.

The Alabama Forestry Commission is a rock-solid organization, but it needs the support of the governor and the legislature to maintain a sound budget base. Rick Johnson said it so well: “You need our help, too.” And we do! 



TREE PLANTING: Success or Failure Depends on You



by TIM L. GOTHARD, Forest Management Chief, Alabama Forestry Commission

Quality and successful tree planting do not happen by chance. Success requires thought, planning, and attention to detail. Failure and less than desired results are the end products of many tree planting ventures every year. True success occurs more frequently than failure, but when failure happens, time, effort, and often a lot of money go down the tubes. For the effected landowner it is no laughing matter, especially when failure could have been avoided. From the first seed planted at the nursery to the last seedling planted in the field, all persons involved must accept responsibility for tree planting success or failure—negative impacts on seedling survivability accumulate and cannot be reversed.

Certainly there are items beyond anyone's control that can contribute to a tree planting failure. Dry weather and severe freezes are two factors most commonly associated with such an event. They will claim their casualties infrequently over large areas across the state, but on a regular basis will do so in isolated pockets. However, there are a far greater number of factors totally within human control that contribute to tree planting failures. Time of planting, storage, handling, seedling quality, and tree planting techniques are the most commonly overlooked or "left to chance" aspects that can make or break the success of a tree planting operation. Identifying and ensuring that methods are in place to address these factors and maximize the chance for success is essential.

Whether you do the work yourself, hire someone to do it, or hire someone who hires someone else to do it (contracting), you the landowner have the most vested interest in the success of the operation. You need to get involved and make sure, one way or another, that all the ducks are in a row before planting begins.

When to Plant

Planting season for bareroot seedlings is December through March. Containerized seedlings allow for fall planting as well as

during the bareroot planting season. For best results, once bareroot seedlings have hardened off in the nursery, they should be planted as early in the planting season as possible (December-February). Early planting allows time for new root growth during the dormant season and enables seedlings to compete more successfully for water and nutrients during the upcoming spring. If at all possible, complete planting by March 15 to avoid the traditional dry weather of late winter and early spring. Survival of seedlings planted after March 15 will depend largely on adequate rainfall.

more forgiving months of December through February.

Seedling Care and Handling Before Planting

Planting trees that will live starts with proper transportation and storage of seedlings between the nursery and planting site. Just like apples, oranges, and milk, **SEEDLINGS ARE PERISHABLE!** They need to be in a relatively controlled environment and do best when stored at a temperature between 33-38°F with 85-95 percent relative humidity. If they are mishandled

Figure 1. Percent Survival by Month Planted 1994-95 Planting Season

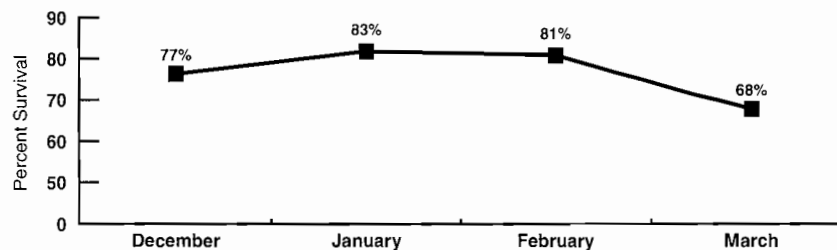
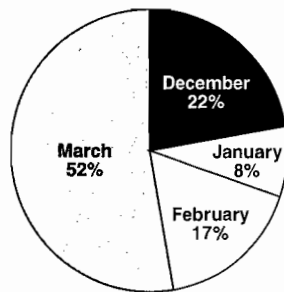


Figure 2. Percent of Reported Failures by Month 1994-95 Tree Planting Season



Based on survival checks of one-year-old cost-share tree plantings established during the 1994-95 season, Figure 1 displays the survival trend based on month of planting. Average one-year survival dropped significantly for sites planted after March 1. Figure 2 displays the percentage of reported failures by month planted. Both of these observations suggest that landowners should make every effort to plant in the

during transportation and storage and over-heat, **THEY WILL SPOIL AND DIE!** Ultimately, you want your seedlings to arrive at the planting site with as little unrefrigerated exposure as possible. How you address this issue depends on whether you do the work yourself or hire a vendor or consultant. Use the following suggestions appropriately to match your situation and ensure that your seedlings are properly transported and stored before planting begins:

1. Order your seedlings from a nursery within 1-2 hours of the planting site or from a nursery that can provide refrigerated delivery to a point within 1-2 hours of the planting site.
2. If you must arrange for your seedlings to be transported, consider lining up refrigerated transportation.
3. Arrange for your seedlings to be delivered as close as possible to the date planting will actually begin.

(Continued on page 20)

Table 1. Minimum Quality Measures For Pine Seedlings

Quality Measures	Loblolly, Slash and Shortleaf	Longleaf
Stem Length	5"	8" (needle length)
Root Collar Diameter	1/8"	3/8"
Root Length	5"	5"
Lateral Roots	Abundant	Abundant
Winter Buds	—	Present
Mycorrhizae	Present	Present

Table 2. Day Classes For Tree Planting Based On Weather Condition

Day Class	Weather Conditions
Normal	Temperature: 33 - 75°F Relative Humidity: >50% Wind Speed: <10 mph Soil Moisture: abundant
Marginal	Temperature: 76 - 85°F Relative Humidity: 30 - 50% Wind Speed: 10 - 15 mph Soil Moisture: marginal
Critical	Temperature: <32°F or >85°F Relative Humidity: <30% Wind Speed: >15 mph Soil Moisture: low to absent

Tree Planting

Continued from page 19

4. Use a consultant/vendor who has refrigerated transportation and storage abilities.

If you are forced to deal with unrefrigerated transportation and storage, remember these important points:

1. If seedlings must be hauled in open truck beds, use a tarpaulin to cover the seedlings. Leave sufficient air space between the top of the seedlings and the tarpaulin so air can circulate and reduce heat buildup.
2. Keep seedlings in the shade to limit sun exposure and reduce the chance of heat buildup.
3. Unload and properly store seedlings as soon as you reach your destination.
4. Store in a protected area such as a shed to avoid freezing, wind, and heat buildup, provided that the area is not prone to overheating during direct sunlight.
5. Do not stack seedlings more than 2 bundles high and use spacers to provide sufficient air space between stacks of bundles to reduce heat buildup.
6. Plant your seedlings as soon as possible; within 2-3 weeks if storage temperatures range from 38-50°F; within 3-5 days if storage temperatures range from 50-70°F.

Use Quality Seedlings

Once you receive your seedlings, make sure they are quality seedlings suitable for planting. Seedling quality is determined by two seedling properties: physical features and condition. Evaluating both types of features is critical to quality and successful planting and seedling establishment.

Many physical features are used to assess seedling quality, such as stem length, root

length, root collar diameter, and lateral root abundance. Unless altered during the handling and/or planting process, these physical features remain the same from the time a seedling is lifted at the nursery until it is planted and begins to grow. Nearly all survival studies show that balanced, medium-sized seedlings (7-13 inch stem height) with sturdy stems and well-developed, fibrous root systems have a higher survival rate and make better initial growth than do either larger or smaller seedlings.

One of the most important physical features that is vital to seedling survival is the relationship between the size of the root mass and the size of the foliage. The foliage of top-heavy seedlings can transpire water out of the seedling faster than the roots can bring water in to the seedling. As a result, seedlings can dry out and die. For pine seedlings, the best quality stock is that which has a relatively small top and a large, fibrous root system. Table 1 lists the minimum requirements for acceptable pine seedlings. You should evaluate your seedlings before planting. If most of your seedlings meet these requirements, make sure that occasional inferior seedlings are culled as they are pulled for planting. ***If the majority of your seedlings do not meet these minimums, notify the nursery where you obtained your trees—don't overlook it.***

Equally important is the condition of your seedlings before planting. Unlike physical features, the condition of seedlings can change rapidly when seedlings are improperly stored or transported. For this reason, seedlings should be monitored and inspected continuously—from pickup until they are successfully planted. Indicators of seedling deterioration and unacceptable condition include:

- Sour smell due to heat buildup and fermentation
- Yellow needles

- Seedlings are warm to the touch
- Bark slips off easily, especially on the roots
- Cambium layer is yellow to brown
- Seedlings are molded

The color of the cambium layer is a very good indicator of seedling condition and can give clues to potential problems that have not begun to show up in the foliage. The cambium layer is the layer of soft tissue that lies between the bark and the woody portion of the seedling. This layer can be inspected by peeling back the bark with your fingernail or a knife blade. If the seedling is in good condition, the cambium layer should be glistening white. If the color of the cambium is yellowish or brownish, do not plant the seedling.

Care and Handling During the Planting Process

Proper care and handling often takes a back seat to the actual planting task when seedlings are taken to the planting site. However, this period may present the harshest conditions seedlings will face before being planted. Weather conditions can be beneficial or adverse on young seedlings. Cool, moist conditions help minimize seedling exposure during the planting process. High temperatures, low humidity, strong winds, and dry soil conditions will do the opposite and can harm seedlings. Take the following precautions to minimize the adverse effects of on-site storage:

- Don't carry more seedlings to the site than can be planted in one day.
- Keep seedlings shaded to reduce sun exposure.
- Cover seedling roots in open bundles and keep them moist.
- Avoid exposing seedlings to freezing temperatures.
- Plant seedlings as soon as possible.

To the maximum degree possible, avoid planting when weather conditions are critical. Take special care when they are marginal. If one or more of the weather conditions in Table 2 fall within the critical class, take precautions to protect seedlings from potential damage.

Root Protection

From the moment you open a seedling bag or bundle until each seedling is in the ground, PROTECT THE ROOTS. Many failures can be attributed in whole or in part to root damage or pruning, particularly with respect to lateral roots. Follow these simple root protection guidelines and require those you hire to do the same.

- When separating seedlings, do not beat seedlings against objects to loosen the roots.
- Don't shake off or remove moisture retentive root coatings.
- Don't root prune seedlings to make them easier to plant.
- Protect and keep lateral roots intact—they are the primary source of water and nutrient uptake.
- Carry seedlings in planting bags or buckets during planting and keep roots moist.

Proper Planting Techniques

Proper planting techniques begin with using adequate equipment. Pine seedlings will require a hand-planting tool or machine planter that will create a planting slit at least 8 inches deep (10 inches is preferred) and 3 inches wide to accommodate pine seedling roots and allow proper root alignment. If the equipment being used is not adequate it should be replaced. Most hardwood seedlings have more massive root systems than pine seedlings and therefore require larger planting holes for proper planting. Hardwood planting tools and machine planters should be capable of making a slit 12-15 inches deep and 4 inches wide to accommodate proper root alignment.

When planting, the most important points are to create a good planting hole and properly align and pack the seedling. After a proper planting slit is made, insert the seedling until the tap root reaches the bottom of the planting slit, then raise the seedling to the proper planting depth. For

hardwood seedlings, loblolly, slash, and shortleaf pine, the root collar should be 1-2 inches below ground line. On droughty soils such as deep sands and dry ridges, seedlings may benefit from deeper planting as long as the terminal bud is at least 3 inches above ground line. **For longleaf pine, proper planting depth is critical. Longleaf seedlings should be planted so that when the soil settles after planting, the root collar should be at or slightly below ground line.** After the seedling is raised to the proper planting depth and it is in a vertical position without leaning, close the planting slit and pack the soil around the hole. Proper packing can be determined by grasping four of the terminal needles; if the seedling moves up when the four needles are pulled, the seedling is improperly packed. If the seedling remains still and the four needles release, packing is suitable.

Additional Steps to Ensure Quality and Successful Planting

The risk of planting failure due to human causes can be significantly reduced by following the guidelines in this article. You should also employ the following to ensure the chance of tree planting success is maximized:

1. Plan ahead—don't wait until the last minute to perform site preparation, acquire seedlings, and hire a tree planting vendor. You may benefit by hiring someone to handle all the work from start to finish.
2. Ask others in your area who have hired tree planting vendors in the past and use a vendor with a good reputation who can transport and store seedlings correctly.
3. Sign a contract with the vendor that clearly states the following:
 - Planting equipment must be capable of creating proper planting slits.
 - Seedlings planted must meet the minimum criteria outlined in Table 1.
 - Seedlings must be properly transported, stored and handled at all times.
 - Planting must be performed during suitable weather conditions.
 - Date by which planting must be completed.
 - Number of correctly planted seedlings per acre required to receive payment.
4. Visit the site during the planting operation and inspect the work for proper performance. 🌳

Table 3. Alabama Forestry Commission Incorrectly Planted Seedling Criteria

Cull Seedling	A seedling that does not meet the minimum criteria as noted in Table 1, or is deformed, forked, or has evidence of fusiform rust.
Debris in Planting Hole	Limbs, leaves, and or other debris are in the planting hole in amounts that create air pockets.
Improper Depth	A seedling that is planted too deep (terminal bud less than 3" from ground line) or too shallow (root collar above ground line).
Excessive Lean	A seedling with a top lean in excess of 45 degrees from vertical or with a tap root with lean in excess of 30 degrees from vertical.
Improper Packing	A pine seedling that does not pass the "four needle test" or a hardwood seedling that is excessively loose.
J-rooted Seedling	Improper root alignment due to the planting hole being too shallow or improperly placing the seedling in the planting hole.
L-rooted Seedling	Improper root alignment within 5" of ground line due to the planting hole being too shallow, improper placement of the seedling in the hole when planted, or with machine planters due to improper furrow depth and/or excessive tractor speed during planting.
Twisted or Balled Roots	Improper root alignment due to root damage during removal from the planting bale, due to field attempts at root pruning, or due to forcing roots into planting holes that are too shallow and/or too narrow.
Improper Pruning	Improper root condition due to removal of lateral roots and/or pruning of the tap root to a length less than 6".
Needle Discoloration	Evidence of a seedling that is highly likely to die. Causes can include improper transportation, storage, and handling prior to planting, as well as many other causes.
Dead Seedling	A seedling that is no longer alive.

Minimum standard for approving cost-share tree plantings: 75% of the number of trees recommended per acre must be alive and correctly planted.

If you would like more information on seedling care and proper planting procedures, write to the Alabama Forestry Commission, Forest Management Section, P.O. Box 302550, Montgomery, AL 36130-2550. Request the publication **Seedling Care and Reforestation Standards**.

TREASURE Quail Management

by TED DEVOS, Trust Department, First Alabama Bank, Montgomery

With the emphasis that TREASURE Forest owners place on wildlife management, it seems unfair that wild quail are sometimes scarce. Many large landholdings, even those devoted to good quail management, often have very few coveys. As recently as the early 1970s, however, anyone who put a little effort into providing good quail habitat had all the birds they wanted. Today's environment is a different scenario.

Why Are Populations Declining?

In the early to mid 1900s, the southeastern landscape was dominated by tenant farming. These farms and this era had a distinct personality. Farmers used a system of small patches to grow crops and fencerows grew up in brush. Existing woodlands were primarily large, older sawtimber pines or young "patchy" regeneration and burned regularly due to natural causes or purposely to protect against snakes, chiggers, and ticks. All the "chicken hawks" were shot and raccoons and other furbearers were taken regularly for their pelts or the dinner table. All of these factors contributed to quality quail habitat and conditions promoted abundant quail numbers.

Things have changed. Current research suggests that a variety of factors, both locally and southeast-wide, are combining to depress existing quail populations and to hinder expansion and recolonization of suitable habitat. Many of these factors are a result of land-use changes that reduce or eliminate habitat favored by quail. Agricultural operations that use production advantages such as "clean" or "fence-to-fence" farming and consolidation of small fields into larger fields result in the loss of valuable escape cover, edges, and perennial food sources that dominated agricultural areas of years past. Intensive production silviculture can result in understories too sparse for quail and limited food supplies, especially when thinning is not used. The less frequent occurrence of fire in today's forests has also had an effect by promoting

the development of understories too dense for quail. Another suspected but not fully understood factor is the potential effect of repeated pesticide applications on quail populations and their food chain.

sive pasture grasses, such as Bermuda and fescue, which encroach on plantings and leave no bare ground available for the birds to walk and scratch. Weather also plays a role as uncontrollable



Pine types should be kept open to allow native grasses and weeds to occupy the understory.



There are not many sights that compare to a bird dog locked on point.

What, however, is going on with the small landowner who practices good stewardship, leaves field borders to grow and unharvested crops in the field, prescribe burns, and plants shrubs and patches for wildlife? Other less noticeable factors that may be at work in these situations include increases in mammalian (raccoons, etc.) and avian (hawks, etc.) predator populations due to the lack of fur trade and federal protection. Severe problems also occur with aggres-

sive drought cycles directly affect quail recruitment.

However, the days of finding 15-20 wild coveys in a half-day hunt still exist on some of the better properties. The quail "plantations" of today attempt to recreate the personality of the landscape in the early to mid 1900s. If surrounded by similar habitat, they usually meet with good success. Isolated "island" properties surrounded by young planted pines or large agricultural production areas often do not fare as well.

Private Landowners Can Manage for Quail

So, what opportunities exist for the smaller landowner who wants to put down a dog and find a few coveys in the

afternoon? Although the beginning of this article paints a rather bleak picture, wild quail management can still meet with success and pleasurable hunts can be had! Although quail biology and behavior is covered extensively in many other articles, some basic biological points should be made which relate to management of the birds. Adult quail are primarily seed eaters, although fruits, soft mast (blackberries, etc.), and insects are eaten to a large extent in the summer. Grown quail usually suffer 70-80 percent mortality from one fall to the next, caused almost entirely by predation (humans included). Hunting losses exceeding 20 percent of the population can depress already low quail populations. Neither the males nor the females are generally monogamous in the Southeast, and either will incubate clutches of eggs and raise the young, alone if necessary. Young chicks suffer large losses in the first two weeks of life approaching 70-80 percent in some years. Hens will renest after their brood is raised to a month of age if there is enough time left in the summer, although droughts may depress nesting attempts. Young chicks feed almost entirely upon insects in their first few weeks, which is why fallow fields and burned woodlands are so important. With these points made, how can we have birds on our property?

One of the most important basic factors known to determine the potential quality of quail habitat (other than large tracts of land managed for birds) is soil. Fertile sands, sandy loams, and light red clays are some of the best growing grounds for quail. Unfortunately, these same soils are also in high demand for agricultural purposes. The beauty of these light soils is that the woodland grasses and weeds grow in a way that leaves bare dirt. Quail are weak scratchers and need bare ground to find food and walk through the vegetation. This is the reason that pasture grasses are so poor for quail and that fire is so important for quail management. The heavier clays in central Alabama can cause additional problems, drying hard and becoming sticky when wet.

Prescribed Burning Helpful

Obviously, one of the easiest things a landowner with pine woodlands can do is burn. Some land managers are burning in planted stands as early as 8 years. By early thinning to allow sunlight to the ground, and burning the understory to stimulate

native grasses, forbs, and legumes, we can create a woodland suitable for quail.

When thinning a pine or mixed stand, the key indicator to look for is that at least 50 percent of the ground has some sunlight exposure during midday. In sawtimber stands this would equate to approximately 70 square feet of basal area per acre or less, depending on the pine species and age. In pulpwood stands this would generally mean a substantial thin. Burning should be conducted with an objective of leaving 25-40 percent of the woodlands unburned each year. These unburned "roughs" can be disced upland "ring-roughs" of 1-4 acres in size or blocks of less than 20 acres where convenient roads or firelanes allow fire exclusion.

Areas thick with hardwood sprouts or saplings can be burned hot at the "normal" time of year (Feb.-March) or late summer for ensuring good hardwood control. These roughs are very important for nesting, late winter/spring cover and soft mast production. Late winter/spring burning tends to coincide with the northerly migration of hawks and owls and, therefore, adequate cover when these woodlands are bare becomes extremely important. Once these areas begin to grow thick (3-4 years), they should be included in the burned area and new unburned roughs established. Burned areas usually have a higher percentage of bare ground throughout the summer, good insect densities, and regrow in various legumes and forbs that are important for seed production in the fall. This woodland habitat with its complement of native vegetation is the basic building block to begin growing huntable quail populations.

Other Techniques

Field or "patch" management for quail can be as simple as leaving a 30-foot unplanted edge and a few rows of unharvested crops, to planting a variety of species in a small field devoted to quail management. If crops are grown on the property, some area should be left on the edge of the field unplanted and unsprayed. This edge will grow up in native vegetation such as ragweed, pigweed, etc. and allow birds to forage along the edges of the planted crop. This "fallow" ground is especially important for growing broods of quail because of the high concentrations of insects that they create. Every couple of years these edges can be disced under to

keep the vegetation in this herbaceous stage. Unfortunately, this simple, effective technique is very seldom used. In addition, leaving a few rows of the crop unharvested will benefit quail and other species such as deer, turkeys, and songbirds.

Quail patch planting is often considered to be just a bicolor thicket in a thick woodland. In reality, these patches should be a combination of plantings in a suitable woodland or other area which quail inhabit. Bicolor lespedeza is justly known as one of the best plantings for quail. To ensure utilization of the patch throughout the year, a summer planting of Egyptian wheat or some other large grain should be combined beside it. It's even better if there are plums or other thicket covers nearby. Disced lanes around the complex will enhance its attractiveness, providing bare ground for dusting and an area where millet can be lightly planted for bugging ground and seed production. The idea is to provide as many of a quail's yearly needs as possible in a small area.

Seasonal discing is another technique that is probably underutilized on most properties. While various plantings enhance food and cover conditions on a property, nothing can beat the plants that have adapted to our climate and soils. Turning the soil at various times of the year encourages different species of grasses, forbs, and legumes that quail and other wildlife have adjusted to utilizing. While discing in the summer encourages plants such as pussley, beggarweeds, and grasses, discing in the winter encourages ragweeds, doveweeds, and partridge pea. Different soils and latitudes will experience different plant communities, and experimentation is encouraged here. In addition, these disced lanes can be used to slow fires in broad expanses of woodlands or serve as firebreaks.

While these management techniques may not resolve all of the questions, it is good to know that there are still landowners interested in quail management. Local landowners of the Southeast have the greatest potential to improve the population of one of the greatest game birds in the U.S. There is nothing greater than to see a good bird dog locked solidly on point and to experience the covey rise of wild birds. Although the situation is harder than in days past, the experience can still be had! ☪

Anticipating Good Longleaf Pine Cone Crops

The Key to Successful Natural Regeneration

by WILLIAM D. BOYER, Research Forester, USDA-Forest Service, Southern Research Station, Auburn University

Unlike other Southern pines, or most intolerant pioneer species, longleaf pine is a poor seed producer. Cone crops are highly variable from year-to-year, and also from place-to-place in the same year. Crops large enough to assure adequate regeneration are few and far between, especially in the longleaf pine belt of the southern Coastal Plains. Not only is this species a poor seed producer, but the large, heavy seeds have a limited dispersal range. Seedlings, once established, are very poor competitors and may remain in the stemless grass stage for years.

None of these characteristics are normally associated with intolerant, early successional species that depend on prolific seed production, wide seed dissemination, and rapid early growth in order to quickly occupy and dominate an open site. Longleaf pine's adaptation to frequent fire, which its principal competitors cannot tolerate, has given this species its only competitive edge, and has allowed it to maintain itself in place for thousands of years.

How Large of a Cone Crop Is Needed?

First, there must be enough seeds to feed all the little critters so fond of the large, nutritious longleaf seeds, with enough left over to establish a good stand of seedlings. On the average, 360 longleaf cones per acre will barely provide for even one seedling! In most years, a minimum of 750 cones per acre is needed for adequate longleaf regeneration, provided other conditions affecting seedling establishment

Table 1. Long-term Records of Longleaf Cone Production

Cones/Tree	Location of Observed Sites		
	Alabama (39 yrs)	Florida (29 yrs)	Georgia (29 yrs)
75	2	1	1
40	6	2	3
30	8	4	3
25	8	5	3

Table 2. Estimates of Longleaf Pine Cone Crops from Springtime Binocular Counts of Flowers and Conelets

# Flowers Counted/Tree	Estimated Cone Production/Tree	# Conelets Counted/Tree	Estimated Cone Production/Tree
2	1	2	6
4	4	4	9
6	6	6	12
8	9	8	15
10	11	10	18
12	13	12	21
14	16	14	24
16	18	16	27
18	20	18	29
20	23	20	32
22	25	22	35
24	27	24	38
26	30	26	41
28	32	28	44
30	34	30	47
32	37	32	50
34	39	34	52
36	42	36	55
38	44	38	58
40	46	40	61
42	49	42	64
44	51	44	67
46	53	46	70
48	56	48	73
50	58	50	76
52	60	52	78
54	63	54	81
56	65	56	84
58	68	58	87
60	70	60	90

and survival are favorable. The preferred goal is 1,000 or more cones per acre.

How big of a cone crop does it take to provide the minimum 750 cones per acre? That will depend on the density of seed trees. Given 10 seed trees per acre, cone production must average 75 per tree. A shelterwood stand with 25 to 30 trees per acre affords a better opportunity for successful regeneration. With 25 trees, production must average 30 cones per tree to reach the 750 cone minimum, but 40 or more cones per tree is preferable to provide at least 1,000 cones per acre.

How Often Can a Good Crop Be Expected?

Just how often can longleaf cone crops of the needed size be expected? Long-term records of cone production in regeneration areas at three locations along the central Gulf Coastal Plains may provide an indication. This includes 39 years on the Escambia Experimental Forest in south Alabama, and 29 years each at a south Georgia and northwest Florida site. The number of years (from 1957 or 1967 through 1995) in which longleaf cone crops reached or exceeded the indicated size is shown in Table 1.

Only once or twice in 29 or 39 years did longleaf cone crop size reach the 75 cones per tree level. Given a seed-tree stand of 10 trees per acre, the wait for even the minimum cone crop could be very long! During the wait, of course, the land is essentially out of production.

Managers working toward longleaf natural regeneration now prefer a shelterwood system. The extra trees increase the frequency of acceptable seed crops up to three to five times in 29-39 years. Not only will there be a shorter wait for a good cone crop, but also reasonably good volume growth on high quality trees, plus the pine needle litter needed to fuel



Two female flowers can be seen at the end of the terminal shoot, while mature, closed cones can be seen near the bottom.



Binocular counts of flowers and conelets can be used to determine the potential size of longleaf pine cone crops.

fires hot enough to inhibit growth of hardwood brush.

The minimum size cone crops at these three sites occurred an average of only once or twice in 10 years. The time between these minimum useable cone crops

ranged from 1 to 17 years on the Escambia Experimental Forest, 1 to 16 years at the Florida site, and 2 to more than 23 years at the Georgia site. So it is possible to have two good cone crops almost back-to-back, and then not again for 15 to 20 years or more.

Preparation for a Good Seed Crop

Advanced preparation is needed in longleaf pine regeneration areas in order to promote seedling establishment and survival. This includes control of excessive competition and also seedbed preparation, as the large winged seeds must reach mineral soil to germinate and survive. Provided hardwood competition has been controlled, a burn within a year of seedfall should remove the surface litter and expose enough mineral soil for seedling establishment. Anticipation of a cone crop large enough to ensure an adequate supply of seeds becomes very important, as timing of preparatory measures is tied to this event.

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It's Time For Action

Continued from page 10

- B. Continue dialog between industry, agencies, environmental groups and landowners.
 - C. Create committee for follow-up.
 - D. Hold meetings and demonstration tours.
2. Educate and inform public and landowners about forest resources and management.
 3. Establish equitable federal tax policies for landowners:
 - A. Estate (inheritance).
 - B. Expensing forest management costs.
 - C. Capital gains treatment.
 - D. Repeal passive loss rules.
 4. Promote a wide variety of land conditions and management, from preservation of unique areas and wilderness, to areas used for a wide variety of private and public uses.

5. Pass private property rights legislation.
6. Secure adequate funding for research and technology transfer.
7. Discuss new management options for USFS National Forests.

What Happens Now?

In Alabama something will happen. The Alabama Forest Resources Center will work to implement the Next Steps by bringing together people who participated in the Roundtable and Congress and others interested in the future of forests. The Next Step to be tackled first is federal taxation. A task force will be established that will decide on federal tax changes needed and recommend how to achieve the changes. The Federal Taxation Task Force is scheduled to meet this fall. Some of the changes that the task force may recommend could be measures to reduce the impact of estate taxation, to allow expensing of forest management costs, to permit capital gains treatment for sales of timber, and to make changes in passive loss rules.

To make progress on federal taxation is a prominent undertaking, but tax changes can be accomplished, especially if Alabama is joined by groups in other states working to achieve the changes.

We're off on a bold, new adventure to enhance the future of Alabama's forests. You can help as time passes by urging your U.S. senator and representatives to make the needed changes in federal tax laws and regulations.

Keep reading *Alabama's TREASURED Forests* and similar publications for updates on the work of the Federal Taxation Task Force in Alabama. You can be an important part in helping to change the federal tax law, which will provide you and other forestland owners with greater incentive to implement forest improvement practices.

To receive free summaries of the Alabama Roundtable and Seventh Forest Congress, call the Alabama Forest Resources Center at 334-343-9747; or write to AFRC, 3632-C Dauphin St., Mobile, AL 36608. ☪

The 1996 Farm Bill

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Forest Service at the regional and national level.

Though not specifically referenced in the 1996 Farm Bill, the Forest Stewardship Program (FSP) and the Stewardship Incentives Program (SIP) remain viable under the authority of the Cooperative

Forestry Assistance Act of 1978. Both programs have been effective tools in providing technical and financial assistance to private landowners interested in multiple resource management of their forestlands. Over 100,000 landowners and 12,350,000 acres are currently enrolled in Forest Stewardship nationwide. Expectations are that funding for both will equal last year's levels, with Forest Stewardship at \$23 million and SIP at \$4.5 million nationwide.

Alabama's share of the \$4.5 million SIP allotment should total \$80,000 to \$100,000, compared to previous year's funding of \$500,000 to \$600,000.

The 1996 Farm Bill also provides for additional technical and financial assistance for private grazing land, farmland protection and flood risk reduction. The private Grazing and Land Initiative seeks to improve the nation's rangeland and provide related benefits, enhancing its utility for livestock and wildlife. Congress is authorizing \$40 million in FY 1997 for this purpose, increasing to \$60 million in FY 1998 and beyond. The Farm Bill also looks to conserve up to 340,000 acres of prime or unique farmland through the conservation easements of the Farmland Protection Program and provides up-front payments through the Flood Risk Reduction Program to farmers of frequently flooded land, encouraging conversion of such sites to more permanent types of vegetation.

If you have any questions regarding any of the programs listed above or their availability in Alabama, contact the local offices of the FSA, NRCS, Alabama Forestry Commission or Cooperative Extension Service. ☪

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ALABAMA'S TREASURE FOREST LANDOWNERS: A Valuable Human Resource

by JOHN C. BLISS, TAMARA L. WALKINGSTICK and MARY L. SISOCK

Alabama's TREASURE Forests are among the state's natural resource jewels: productive, diverse forestlands nurtured with tender loving care by participants in the TREASURE Forest Program. In April 1996, the authors of this article, in conjunction with the Alabama Forestry Commission and the Alabama TREASURE Forest Landowners Association, designed and conducted a two-day workshop. Its aim was to improve our understanding of these important resource owners, their motivations and attitudes, and to gather their suggestions for improving the programs that serve them. The 85-90 workshop participants were selected by the Alabama Forestry Commission to represent every county in the state. The selection procedure was not random, so *workshop results should not be interpreted as being statistically representative of TREASURE Forest owners, or of forest owners in Alabama in general.* Nonetheless, the results provide insight into the views of some of the most active TREASURE Forest owners. The enthusiasm and commitment to workshop objectives demonstrated by these individuals was overwhelming, and is reflected in the volume and quality of the ideas they contributed.

The workshop consisted of a series of focus group sessions in which groups of eight to 10 people gathered around tables to participate in a structured discussion

focusing upon a predetermined theme. Focus groups are utilized widely in marketing research, where it has been found that the interchange of ideas among participants can yield insights beyond those produced by surveys. Workshop participants were also asked to complete and return a survey questionnaire.

Ownership Objectives

In the first working session, we asked participants to list their personal objectives for owning forestland. Clearly, these TREASURE Forest owners appreciate the multiple values and uses their forests provide. They expressed a wide range of objectives, which can be condensed into four families of related objectives. *Environmental objectives* are those related to environmental quality (mentioned by 80 percent of the tables); aesthetics (73 percent); and diversity (47 percent). *Managerial objectives* include producing income from timber sales (80 percent), following best forest management practices (67 percent), and pursuing wildlife-related objectives (87 percent). *Stewardship objectives* include reclaiming abused resources and improving resources for the benefit of future generations (60 percent), and educating oneself and others about resource stewardship (87 percent). Finally, *social objectives* include creating or continuing a family heritage (67 percent), providing a place in which to recreate (60 percent), and

enhancing life for one's family, friends and community through developing close relationships with the land (40 percent).

From previous research, we know that few forest owners hold only a single ownership objective; most simultaneously pursue several complimentary goals. These workshop results confirm the commitment of these TREASURE Forest owners to multiple management objectives.

Use of Forestry Services

In the next session we asked participants at each table to list the types of assistance they used to fulfill the ownership objectives they had just identified. One important category is *management assistance*, including forest management assistance, wildlife management assistance, and cost sharing. Forest management assistance (130 mentions) and wildlife management assistance (107), were used by the greatest number of participants. *Information and outreach* comprise the second category of assistance activities. Most participants (114 mentions) want to educate themselves through receiving information about aesthetics, prescribed burning, pond improvement, and plant diversity. These landowners are not only interested in educating themselves, many (68 mentions) want to extend their knowledge to

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BACKBURNING:

Alternative to Traditional Precommercial Thinning

by DR. F. THOMAS LLOYD, Project Leader and DR. THOMAS A. WALDROP, Research Forester,
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Typical backing fire.

Where its seeds fall on bare ground in full sunlight, loblolly pine usually has no trouble re-establishing itself after a harvest. Unfortunately, from an economic viewpoint, this natural regeneration process is often too successful, resulting in overstocking. Species such as pines that regenerate primarily from seed can produce too many seedlings.

If timber profits are important land management objectives, then dense pine stands should be thinned when they are young. Thinning concentrates growth on the trees left behind and reduces the time they take to grow to a merchantable size. Unfortunately, this kind of thinning, called precommercial thinning, produces no income because it must be done before any of the trees are large enough to be merchantable. To maximize profits, landowners can either take preventive actions to avoid overcrowding or lower thinning costs for stands that are already too dense. This article will focus on lowering costs for the landowner by using backburning to thin pine stands.

Precommercial Thinning When Pines Are Too Dense

Numerous studies have shown that precommercial thinning of natural loblolly pine stands is a sound investment. Two methods of precommercial thinning are common. Mechanical thinning uses heavy equipment to mow wide strips, leaving narrow strips of pine or pine and hardwood saplings. The second method, called hand thinning, entails the use of string-trimmer-type saws to cut all trees except those preselected for size and spacing. Hand thinning gets the best results because it leaves an optimum number of desirable tree species; these trees are evenly spaced for better growth.

Although economic analyses show good returns from both of these thinning methods, the costs are relatively high.

Many landowners cannot afford this investment. Others are reluctant because there are risks that can negate or postpone the return on their investment. Per-



A dense stand (6,800 stems per acre) prior to burning.

haps landowners might be more willing to take the risk if the cost of precommercial thinning was lower.

Two studies suggest that the cost of precommercial thinning can be reduced with low-intensity prescribed burning.

These studies were done at USDA Forestry Science Laboratories in Macon, Georgia and Charleston, South Carolina.

Because of the natural characteristics of Southern pines to develop a range of sizes (ground-line diameter and height) early in stand life (by age three to six), careful use of backing fires can successfully thin dense stands. Burning kills many small trees but spares larger trees. The largest trees are often undamaged. They will later become the crop trees. Results of these two studies show that backing fires kill very few pine saplings with ground line stem diameters over 1.5 inches. Below this threshold size, the smaller a sapling, the greater its probability of being killed. Backing fires are slower and more expensive than other firing methods. However, they are effective and their cost is a fraction (5 to 15 percent) of the cost of mechanical or hand thinning.

The timing of burning is critical, but depends more on tree size than tree age or the season. The ideal time for burning is when enough trees reach 1.5 inches in diameter at the ground line to leave a fully stocked stand. Early tests of burning in stands with trees larger than 1.5 inches at the ground line were unsuccessful because low-intensity fires did not kill enough trees. In the Charleston study, the stands were four years old. However, the best age for burning can be as young as three years or as old as eight years as long as sufficient numbers of trees are 1.5 inches in ground line diameter. As might be expected, fires this close to the crowns of young trees will scorch the needles. It looks bad, but scorching usually does not kill pines. The main determinant of survival is ground line stem diameter.

Although these results are promising, widespread application awaits further testing under a range of conditions. Land managers who have training and experience with prescribed fire can play an important role in testing this method by applying it in limited areas.

Economic Analyses

The Charleston study applied five pre-commercial thinning treatments including burning and hand thinning to very dense stands (8,000 to 12,000 pine saplings per acre) at age four. Tree growth was measured until age eight when most of the trees were uprooted by



Five weeks after burning. The trees have experienced severe crown scorch, which caused some loss of growth the year following burning. This loss was only temporary and was compensated for in later years by the thinning effect.



The same area during the spring following burning. Scorched needles have fallen and new needles have emerged. Burning reduced the stand density to 2,850 stems per acre.

Hurricane Hugo. Economic analyses were conducted by projecting the eight-year-old stands forward to age 30. Growth projections and economic comparisons were done with GATWIGS, a computer growth simulation model developed at Auburn University. GATWIGS is based on data collected by the USDA-Forest Service Forest Inventory and Analysis unit in Asheville, North Carolina. The purpose of these economic

comparisons was to compare the two thinning treatments, not to predict actual income. It would be a mistake to compare these values with those of other forestry operations or other types of investments.

The economic analyses showed that both burning and hand thinning were good investments. Burning gave the highest internal rates of return (20.3 percent versus 13.0 percent for hand thinning), suggesting a greater return on each invested dollar. Both methods gave positive net present values (NPV), indicating that they are better choices than not thinning at all. The thinning method with the greatest NPV (indicating the most profit) depended on the discount rate used. At a discount rate of 4 percent, the NPV for stands thinned by hand was \$512.91 per acre, as compared to \$487.71 for stands thinned by burning. At the higher discount rate of 8 percent, hand thinning increased stand value (NPV = \$148.87 per acre) but not as much as burning (NPV = \$171.97 per acre). The low cost of burning, compared with the higher discount rate, made additional investment in hand thinning unnecessary.

Summary

Precommercial thinning of young dense loblolly pine stands can be a good investment. Hand thinning is expensive but it ensures that the best trees and the optimum numbers of trees are left standing. Prescribed burning looks promising and is much less expensive than hand thinning. However, burning allows very little control of tree spacing, and its application is somewhat risky. It remains for land managers knowledgeable in the methods of prescribed burning to refine this promising field application. ♣

Adapted from an article first published in the September/October 1995 issue of *Forest Farmer* magazine.

Alabama's TREASURE Forest Landowners

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their schools, communities, and churches. Finally, *financial and legal assistance* (62) and *forestland protection* (54) are important areas of assistance for these landowners.

What Is TREASURE Forest Management?

Day two of the workshop focused on strengthening the TREASURE Forest program and building the Alabama TREASURE Forest Landowners Association. In each session, participants brainstormed on the session theme, recorded their responses on a flip chart, and selected the five most important items through a simple hand vote.

The first task was to consider what activities, conditions, and landowner attitudes constitute TREASURE Forest management (see Table 1). As might be expected, participants identified multiple use, a stewardship ethic, planning for the future, and wise management practices "to leave the land in better shape than we found it" as important aspects of TREASURE Forest owners' philosophy. They also recognized several conditions which must exist before TREASURE forest management is feasible, including suitable land, time, available assistance, and an appropriate policy environment. Other themes which the focus group discussions brought out are seldom uncovered in traditional landowner surveys. Several participants identified attributes related to generosity, dedication, and sharing as being essential to successful TREASURE Forest management. Related to this spirit of sharing is the emphasis placed upon leadership, especially in the area of education. Clearly, these TREASURE Forest owners feel a responsibility and a willingness to share their resource management philosophy with others.

Constraints to TREASURE Forest Membership

In the second session participants were asked to identify factors which constrain forest owners from practicing the principles of TREASURE Forest management (see Table 2). The most frequently cited factor was a lack of knowledge among

Table 1.
What Attitudes and Activities Constitute TREASURE Forest Management?

Attitude/Activity	Examples	% of Tables Mentioning This Attitude/Activity
Stewardship Ethic	"To leave the land better than we found it"	67
Dedication/Sharing	"Willing to work," "Willing to share"	60
Leadership/Education	"Leadership by example"	53
Multiple-Use Management	"Multiple resource plan for proper management"	53
Plan for the Future	"Pass on to future generations ownership and love of the land"	53
Wise Management	"Manage your property so there will always be 'a place to be' "	60
Prerequisites to Management	"Suitable land," "Appropriate assistance," "Time"	27

forest owners about the TREASURE Forest program. This was followed by the perception that many forest owners lack attitudes which characterize TREASURE Forest owners, including personal pride, a focus on the future, dedication, and optimism. Seven tables suggested that the program has not been sufficiently promoted, especially by county planning committees and TREASURE Forest owners themselves. Finally, participants identified a number of possible misgivings and misconceptions about the program, especially concerns about a potential loss of personal control over management decisions, unwanted governmental intrusion, and a perception that the program is only for "big landowners."

Encouraging TREASURE Forest Management

Participants generated dozens of ideas on how to overcome the factors which constrain forest owners from practicing TREASURE Forest management. These include ideas for promoting the TREASURE Forest program, recruiting new members, educating existing and potential members, improving coordination and cooperation between forestry agencies and organizations, and more effective organizing of TREASURE Forest owners. These TREASURE Forest owners want to be involved in building the program themselves, through leading tours of their forest lands, visiting local schools, involving local church groups, reaching out to their neighbors, and building stronger county planning committees.

Building the TREASURE Forest Landowners Association

Similar ideas for promotion, recruitment, and education arose in the closing discussion regarding building the Alabama TREASURE Forest Landowners Association. Running throughout this discussion was a strong theme of organizing TREASURE Forest owners at the local or county level. Some participants called for strengthening county planning committees. Others called for formation of local ATFLA chapters. Some expressed a desire to emphasize local agendas in ATFLA programs. There was also frustration expressed over an apparent lack of coordination and cooperation between private forestry organizations and programs.

Overall, amid many creative suggestions for specific activities to build, improve, and expand both the TREASURE Forest program and the ATFLA, two recurring themes bear repeating: the desire and commitment of these forest owners to be personally involved, and their desire for a greater degree of local control and direction for these programs.

Workshop Participant Survey

During the course of the workshop, we distributed a brief survey questionnaire to all participants. From the survey we learned that, compared to the general population of Alabama, workshop participants are very well educated. Half are retired. Roughly half of the respondents reported owning fewer than 500 acres of forest, while about one-fifth report owning more than 1,000 acres. Most respon-

Table 2.
Constraints to Landowner Participation in TREASURE Forest Management

Constraining Factor	Examples	% of Tables Mentioning This Factor
Lack of Knowledge	"Lack of knowledge, awareness"	67
Lack of Resources	"Lack of ...time, money, education, manpower..."	40
Attitude	"I do like I've always done it—Daddy's way"	53
Insufficient Promotion	"Lack of communication between TREASURE Forest landowners and public"	47
Misgivings	"Fear of lawsuits, government," "It's just for big landowners"	47
Misconceptions	"Too many rigamarole," "Just another government program"	27

dents report that income from timber sales, the enjoyment of ownership, wildlife, and the desire to pass on an estate to children are important reasons for owning forestland.

To reach their objectives, most participants have a management plan (85 percent), most of which were prepared by AFC foresters (66 percent), and most of which are deemed very useful (61 per-

cent). These owners look to a variety of sources for forest management assistance and information and belong to an interesting variety of natural resource organizations, including the TREASURE Forest Landowners Association (90 percent), the Alabama Forest owners Association (58 percent), and Stewards of Family Farms, Ranches, and Forests (39 percent). Fewer participants belong to such environmental

Anticipating Good Longleaf Pine Cone Crops

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Estimating the Cone Crop Size in Advance

The potential size of longleaf pine cone crops can be anticipated up to 18 months in advance by springtime binocular counts of flowers and conelets on selected sample trees within regeneration areas. Twenty-five or more typical seed trees in each regeneration area are selected for sampling. Counts are done, usually from mid April to early May, when conelets for the current year's cone crop are rapidly enlarging and easily seen, but before growth of new foliage obscures the new flowers that will form next year's cone crop. An observer with binoculars will select a position where the entire crown of a sample tree is visible. Then the crown is scanned, beginning at the bottom of one side of the crown up to the top and back down again on the other side. A count is made of all flowers and conelets that can be seen from that position.

Not all flowers and conelets can be seen from one position, but the ratio of

flowers or conelets to mature cones have been determined for average observers and is available (Table 2). This was done by counting mature cones on each sample tree after seedfall, and relating this to the earlier flower and conelet counts. Counts are likely to differ among observers, so anyone who expects to regularly estimate cone crop size from flower and conelet counts should also count the mature cones and develop their own ratios.

Flower counts are relatively unreliable predictors of cone crop size, due to the variable and sometime heavy losses among flowers during their first year. This may result from a late freeze, a hail storm, insect attacks, disease, or often spontaneous abortions from unknown causes. A large flower crop, then, indicates only the **potential** for a large cone crop. However, flower counts can indicate cone crop failures with certainty—no flowers this year, no cones next year.

Prospects for 1996 and 1997

Flower counts in the spring of 1995 at eight locations in the southeastern Coastal Plain revealed a distinct possibility for one of those rare region-wide

groups as the Nature Conservancy (15 percent), the Sierra Club (4 percent), or the Bankhead Monitor (3 percent).

Conclusion

One lesson from the workshop is clear: TREASURE Forest owners themselves are, like the forests they nurture, valuable resources. They are overflowing with ideas, experience, enthusiasm, and dedication to the principles of TREASURE Forest management. Given the opportunity to contribute, they will improve and invigorate the TREASURE Forest program. ♣

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good longleaf pine cone crops in 1996, possibly better than the last such crop in 1987. Counts of longleaf pine conelets at nine locations in the spring of 1996 confirmed that, indeed, there will be an exceptionally good longleaf cone crop in 1996, greater than that of 1987 in most sampled locations. In terms of size, the 75 cones per tree level should be exceeded at seven of the nine sampled sites. This increases the likelihood that the 1996 longleaf cone crop will be generally good almost everywhere. The 1996 crop will provide a unique opportunity for natural regeneration wherever needed, and also an opportunity to collect cones and extract seeds that can be stored and used over the lean years that are sure to come.

Anyone who is planning to naturally regenerate longleaf pine should first check their regeneration areas. If a large 1996 cone crop is evident, then make every effort to take full advantage of this rare event.

Flower counts in the spring of 1996 indicate a poor year for 1997. Only two of the nine sampled locations have any chance for even a fair cone crop next year. ♣

TREES OF ALABAMA

SHAGBARK HICKORY

Carya ovata

by COLEEN VANSANT, Forest Education Specialist, Alabama Forestry Commission, N.E. Region, Cullman

The shagbark hickory (*Carya ovata*) gets its name from the tree's characteristic rough shaggy bark. On old trunks, shaggy, light gray, 3/4- to 1-inch thick bark separates into rough strips that are loose at both ends and give the trunk a shaggy appearance. Also known as the Carolina hickory, scalybark hickory, and the shellbark hickory, its wood has the unique characteristics of most other hickories.

Hickory wood is very heavy, very hard, very strong, and very stiff. It has exceedingly high resistance to shock. There are some woods that are stronger than hickory and some that are harder, but the combination of strength, toughness, hardness, and stiffness found in hickory wood is not found in any other commercial wood.

The shagbark and other hickories have large shrinkage and must be carefully seasoned to avoid checking and warping, but can be glued satisfactorily. Hickory is a good finishing wood, bleaches well, and takes most stains. It also has a very attractive natural finish.



About four-fifths of all hickory wood is used for manufacturing tool handles, for which no other wood is as well suited. It is

also used in agricultural implements and athletic goods such as bats and skis. Hickory is also used to make ladder rungs and interior parts of furniture. Hickory wood is also used in smoking meats because it produces a unique flavor.

The nuts of the shagbark hickory are edible and very sweet. They are considered the best commercial nuts on the market.

The range of the shagbark hickory in Alabama is about the same as the mockernut hickory; it prefers rich, moist soil along streams and moist hillsides.

A mature tree commonly grows 70-90 feet in height but can reach heights of 120 feet or more. Its leaves are 8-14 inches long with five (rarely seven) tapered-oval, finely toothed leaflets. The terminal leaflet is largest, being 5-7 inches long and 2-3 inches wide.

The hickory tree has an interesting connection with our seventh president. General Andrew Jackson was nicknamed "Old Hickory" by his backwoods militia because he was "tough as hickory." 🇺🇸



Alabama's TREASURED Forests

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