



Forestry, Wildlife & Fisheries Update Newsletter

Department of Forestry, Wildlife and Fisheries
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Calendar of Events - 2002

January 29

Timber Tax Workshop, Memphis
Shelby County Extension Office

January 30

Timber Tax Workshop, Columbia
Tennessee Farm Bureau

January 31

Timber Tax Workshop, Knoxville
U.T. Ag. Campus, Ellington Plant Sciences Bldg.

February 5 - March 19

Master Tree Farmer Advanced Program (MTF II), Satellite Shortcourse
Knoxville and Jackson

February 21

West Tennessee Foresters, Boyettes Restaurant, Reelfoot Lake
Tiptonville

Faculty:

Brian Bond, Forest Products
Wayne Clatterbuck, Forest Management
Craig Harper, Wildlife Management
Thomas Hill, Fisheries Management

George Hopper, Natural Resources
David Mercker, Forest Management
Larry Tankersley, Forest Management

Fire!!

*Larry Tankersley
Forest Management*

Fire is fundamental in nature. Fires have occurred across the planet before there were people. It is one of the elements, you know Earth, Wind and Fire. As someone responsible for forest land, it is helpful to understand fire as a potential hazard for your forest and as a potential tool you can use to help accomplish various objectives.

Fire is a physical/chemical reaction, basically oxidation. This reaction has three components, the first is heat. Heat is what starts a fire. Requiring a heat source is fundamentally how to control a fire. Do we set it or not? Lightning and arsonist's are other sources of **ignition**. Pouring water on a fire controls it by cooling the reaction.

The second component is **fuel**. This is what is oxidized. **Fire breaks** work to control a fire by breaking or removing the fuel from the heat. **Fuel characteristics** determine the characteristics of a fire. Hardwood leaves burn differently from pine needles and broome sedge fields.

Fuel moisture largely determines the type of **combustion** that we will have. There are two types of combustion common to forest fuels. The first is **flaming** combustion. This is the most efficient combustion and is highly desirable in reducing air pollution, i.e. **smoke**. Forest fuels can produce a great deal of air pollution especially when the second type of combustion occurs. **Smoldering** combustion produces no flames but fuel is still being oxidized, just less efficiently.

The effect of fuel moisture is a significant concern in fire management as it also contributes to the intensity or heat generated by the fire.

The final component of fire is **oxygen**. Oxygen assists oxidation of fuels in the presence of heat. To control oxygen flow, a fire manager should be concerned with **fuel structure**. Matted leaves prevent air flow around the fuel and generally smoulder if they burn at all. Broome sedge fields on the other hand generally have plenty of oxygen available and burn efficiently.

Wind is important for a variety of reasons other than adding oxygen. Wind also disperses smoke which is important. Smoke drifting on highways or cities can be a problem. **Wind direction** and **wind speed** are also major considerations before we ignite a fire. Managing wind direction and how we light the fire or our ignition pattern determines whether we have a **back fire** burning into the wind or a **head fire** burning with the wind. Back fires generally burn more efficiently producing less smoke and are easier to control than fire blowing along with the wind.

Using fire is exciting! Fire is a great forest management tool for reducing fuels, freshening habitat for critters and weeding out undesirable plants and usually makes the woods visually more appealing. Likewise fire can cause irreversible damage especially to valuable sawtimber. Fire misapplied can stress trees from crown scorch or damage the fine roots in the upper soil.

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Benefits of Prescribed Burning

Wayne Clatterbuck, Associate Professor, Forest Management

Prescribed burning is defined as fire applied in a knowledgeable manner to forest fuels on a specific land area under selected weather conditions to accomplish predetermined, well-defined management objectives. A premise of fire ecology is that fire is neither innately destructive nor constructive. Fire simply causes change and change is biologically necessary to maintain a healthy ecosystem. A few of the benefits of prescribed burning are described below.

Periodic fire tends to favor understory species that require a more open habitat. A mosaic of burned and unburned areas tends to **maximize edge effect** that produces a large and varied wildlife population. Wildlife benefits from burning include: stimulation of fruit and seed production; increases in yield and quality of herbage, legumes and browse from hardwood sprouts; and creations of openings for feeding, dusting and travel.

Low-value, poor-quality, shade-tolerant hardwoods often occupy or encroach upon land best suited to growing pine. Unwanted species may crowd out or suppress pine seedlings. With the judicious use of prescribed fire, the understory can be managed to **limit competing vegetation** while at the same time providing browse for wildlife. Burning is most effective in controlling hardwoods less than 3 inches in diameter. Periodic fires throughout the rotation can keep competing vegetation below that 3-inch threshold.

Prescribed burning can **enhance the appearance** of many forests for recreation and visual values. Burning maintains open stands for viewing, produces vegetative changes, and increases numbers and visibility of flowering plants. Unburned islands increase vegetative diversity that will attract a wider variety of wildlife.

Many plants have structural adaptations or reproductive features that favor them in a fire-dominated environment. Changes in the natural fire pattern as a result of fire exclusion have led to dramatic decreases in many of these fire-tolerant and fire-dependent species. Periodic prescribed burning can **perpetuate fire-dependent species**, in both the understory and overstory.

Forest access is improved for forest harvesting operations and other activities with prescribed fire. Judicious burning **reduces the amount of fuel** to help offset the greater risk of wildfire. **Visibility** for hunting and other recreational activities is enhanced with prescribed burning.

Many plants need bare-mineral soil for the seed to germinate. Prescribed burning can **prepare sites for seeding and planting** by removing debris from logging operations or heavy litter layers that have accumulated through many years of fire exclusion.

Changes in food and cover caused by prescribed fire can **benefit wildlife**. Prescribed burning can increase the edge effect and the amount of browse material, thereby improving conditions for deer and other wildlife. Quail and turkey favor food species and more open conditions that can be created and maintained by burning.

Prescribed burning has been recommended primarily in pine stands, not hardwood stands. Fire can damage many high-valued hardwood trees, reducing the economic and growth potentials. Research at the University of Tennessee is looking at prescribed burning regimes in hardwoods, primarily for wildlife enhancement as well as a tool to regenerate and maintain oaks over trees that are not as fire tolerant such as maple and poplar. Although, we are not at the stage to make recommendations of using prescribed fire in hardwoods, its potential is being investigated. Fire shaped many of our present hardwood forests and its judicious use may benefit some management alternatives.

The benefits of prescribed fire are many, but prescribed fire is a complex tool and should be used only by those trained in its use. Proper diagnosis and detailed planning are needed for every area where burning is contemplated. The incomplete assessment of any factor can pose serious liability questions should a fire escape or its smoke cause damage. Contact a forestry professional to help you evaluate and apply the use of prescribed fire to your property.

Adapted from: Wade, Dale A. and J. D. Lunsford. 1988. A Guide to Prescribed Fire in Southern Forests. USDA Forest Service, Southern Region. Atlanta, GA.

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Why Plant Pine After Southern Pine Beetle?

Wayne K. Clatterbuck, Forest Management

Larry Tankersley, Forest Management

1. **Site Quality** --- Most southern pine beetle areas occur on marginal sites that are better suited for pine (both ecologically and economically) than hardwood. These sites are often low in nutrients required for hardwood growth or agricultural crops. Hardwoods are more site-demanding than pines. Although various hardwoods will survive on these sites, they are not as prosperous and will not produce the “quality” hardwood sawtimber that brings the most income. Hardwoods are more sensitive to weather fluctuations, particular the late summer droughts that frequently occur on these shallow, dry soils. Pine will produce a product on these marginal soils in a shorter time period than hardwoods.
2. **Ease of Planting and Seedling Cost** --- Pine seedlings are cheaper and easier to plant than hardwoods. Seedling costs for pine average \$40 per 1000 seedlings while hardwoods such as yellow-poplar and oaks average \$250 per 1,000 seedlings. Pine seedlings are much more uniform in size and less costly to plant than hardwoods.
3. **Economics and Returns** --- Pine is more valuable on the timber market than the red maple, low-grade oaks and sweetgum that generally occur on these poorer sites. Pines are cheaper to establish and are grown at shorter rotations (20 to 30 years) than hardwoods. Establishment and management costs are recovered quicker with the shorter rotations. An annual rate of return for pine in Tennessee averages 10 to 12 percent per year. Refer to UT Extension Publications PB 1462 (White Pine) and PB 1466 (Loblolly pine) for typical financial analyses in growing these species.
4. **Risk to Further Southern Pine Beetle Attack** --- Over the next 60 to 80 years, there is probably a 100 percent chance that you will have to deal with southern pine beetles (SPB). They are a native pest, are always present and tend to build to outbreak population levels every 8 to 10 years. However, in any one year, the probability of beetle attack is about 0.01. Our skills as pine managers will be tested to monitor, manage and capture the value of these trees before potential losses to SPB. The key is to manage these stands so that they remain healthy, vigorous and less susceptible to SPB. Consider that most of the trees killed during this outbreak survived 3 to 5 earlier SPB outbreaks over the last 60 years.
5. **Species** --- Several pine species are available for planting in Tennessee. Each species has its advantages and disadvantages. The species selected will depend on the site, management objectives, product objectives and costs.
 - a. Shortleaf pine: Long-lived tree with dense wood and straight form. Shortleaf is less susceptible to ice than loblolly and white pine, but grows slow and is highly susceptible to SPB. The market for shortleaf is primarily sawlogs, which requires longer rotation lengths. Seedlings are sometimes difficult to find.

- b. Loblolly pine: Fast growth, widely available, inexpensive seedlings. Usually grown at shorter rotations for pulpwood or sawlogs. Loblolly pine is particularly susceptible to ice storm breakage when young and SPB. Grows on a variety of sites, a “generalist.”
- c. Eastern white pine: Fast growth and less susceptible to SPB than shortleaf and loblolly. Limited markets and very site specific. Usually grows best at cooler temperatures at the higher elevations. Will not tolerate excessive heat and droughts. Seedlings are the most expensive of the pines.

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New Publication Helps With Timber Taxes

Larry Tankersley, Forest Management

“*Setting up the Books: A Forest Owner’s Guide to Capital Accounts and Recordkeeping for Federal Income Tax Purposes*”, PB 1691, is now available at the mail room and online under Forestry Publications for your use.

As many of you know for years, we have been trying to explain the idea of a “Timber basis” to many of our forest stewardship clients. This has been especially difficult relative to casualty losses due to ice, wind and most recently southern pine beetle. This publication attempts to explain what a timber basis is and how one might go about setting one up, thus the title “*Settin’ up the Books*”.

Each office should have received one copy a few weeks ago. If you need additional copies order them through the usual process. If you need more than they will send you, let me know and I can get the number you need.

Don’t forget to promote the upcoming timber tax workshops in Memphis, Columbia, and Knoxville on Jan. 29,30, and 31. These are day long sessions but we cover a lot of material. If you would like a shorter version for your folks, let me know. For some groups this is a pretty popular winter meeting.

Keep up the Good work and Keep in touch!

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Treatment Tips for Fish Ponds

Tom Hill, Professor, Fisheries Management

Pond owners often find it necessary to treat their ponds for various reasons. For example, aquatic weeds, turbid water and fish parasites are common problems that often require treatment in order for ponds to be successful.

Some recommendations are based on surface area only in the pond. A treatment of five gallons of diesel fuel with a quart of oil mixed in per surface acre before stocking either catfish fingerlings or freshwater prawn juveniles will help control surface breathing predaceous insects. Turbidity in ponds can often be cleared by spreading 100 pounds of cottonseed meal per acre on the surface of the pond.

Other treatment recommendations are given in parts per million and require that the volume of water in a pond be calculated. The volume of water in a pond is expressed in acre-feet. Acre-feet are computed by multiplying the surface area (in acres) by the average depth (in feet). An acre-foot is a unit of volume of water having an area of one acre and a depth of one foot. Since an acre-foot of water weighs 2.7 million pounds, then 2.7 pound of a treatment material mixed in an acre-foot of water provides one part per million by weight solution.

There are two publications that are available from the University of Tennessee that can be very helpful when ponds require treatment. Calculating Area and Volume of Ponds and Tanks (SP374-Q) and Calculating Treatments for Ponds and Tanks (SP374-R) are both filled with examples of step-by-step calculations. As always, manufacturer recommendations for their treatment materials should be followed.

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Control Parasites on Catfish Fingerlings

Tom Hill, Professor, Fisheries Management

The presence or absence of parasites on catfish fingerlings as they are stocked into production ponds can mean the difference between success and failure. Buyers of fingerlings should insist that they be treated and free of parasites. If they plan to stay in business, sellers of fingerlings will want to diagnose and treat any parasites before the fish are stocked.

Access to a good microscope is required because most fish parasites cannot be seen without magnification. If a sample from a group of fish is examined and found to be infested with a certain parasite, it is reasonable to assume that the entire batch is infested and should be treated accordingly. Since water chemistry varies from place to place, it is a good idea to treat a few fish and observe their reaction before treating the entire group. A single treatment for parasites as fish are stocked is usually sufficient for an entire growing season.

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Plateau Receives Haying/Grazing Label

Craig Harper, Assistant Professor, Wildlife Management

Plateau herbicide was recently registered for use on haying/grazing lands. Plateau is primarily used in establishing native warm-season grasses and associated forbs, which are highly recommended when enhancing habitat for small game, particularly quail and rabbits. However, NWSG also may be used for haying and grazing in the summer. This provides increased forage at a time when forage production with cool-season grasses is low. Plateau is also used to release bermudagrass pasture. The active ingredient in Plateau is ammonium salt of imazapic.

Plateau is manufactured by BASF and is available through your local Farmer's Cooperative. If improving wildlife habitat is your objective, you may be able to enroll in the Tennessee Wildlife Resource Agency's Farm Wildlife Program and receive cost-share assistance with the herbicide and various seeds available. Another contact is your local chapter of Quail Unlimited. For information on using Plateau to improve wildlife habitat, contact your county Extension office or the TWRA.

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Pen-raised Quail Are NOT The Answer!

I have gotten several requests lately for information regarding pen-raised quail. People are looking for a quick fix to increase quail numbers on their property. Releasing pen-raised birds is not the answer! Years ago (1930's – 1950's), state game agencies in the South and Mid-west hatched, incubated, and raised millions of bobwhites. Upon release, they were to bolster and re-establish quail populations. All of these efforts failed. Wildlife managers learned a lot in the process.

Pen-raised birds seemed to lack many behavioral characteristics of wild birds. Most females wouldn't nest and those who did would not incubate their clutch. In the rare instance a female incubated her clutch, upon hatching, she would simply walk off and leave the brood. Without the hen, the chicks died quickly, either from exposure, starvation, or predation. In short, pen-raised quail will not reproduce and sustain a population. Moreover, mortality among these birds is extraordinary. This makes sense as the birds have never learned to avoid or escape predators. In addition, it is relatively common for pen-raised birds to transmit diseases into the local wild population (if one exists), which leads to increased mortality for the native birds.

In most circumstances, released quail would not survive to re-establish a population even if reproduction and mortality were not a problem. The real problem is that they do not have an adequate place to live; that is, the habitat is not suitable for quail. Ever wonder why the native birds are no longer there?!? If the area does not support quail presently, there is a reason.

There are many factors that have contributed to declining quail populations: 1) habitat destruction (quail can't live in shopping centers, parking lots, and subdivisions so there is less area available), 2) changing land-use practices (large "clean" farms with no cover; conversion of row-crop farming to fescue-dominated pasture), and, yes, 3) increased numbers of predators (nobody traps anymore).

Over the past few years, several research projects have studied what we need to do in order to bring quail back to appreciable numbers. Every study points to habitat—improving habitat conditions to once again favor the year-round needs of bobwhite quail is the key to restoring bobwhite populations. Not pen-raised birds.

For information on improving habitat for bobwhites and how to receive cost-share assistance, contact your county Extension office.

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West Tennessee Forester's Annual Meeting

David Mercker, Extension Forester

Mark your calendars for the West Tennessee Forester's Annual Group Meeting. The meeting is scheduled for February 21st at Boyettes Restaurant at Reelfoot Lake in Tiptonville. Registration will begin at 4:30 p.m. and dinner will be served at 6:00 p.m. Featured speaker, Timothy Diehl, U.S. Geological Survey, will talk about "Sediment and the Drowning of Our Forests". Please plan to attend and bring a friend!

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