Fire on the Land: The Consequences
Part 1

The following is the first of a three part series about the role of fire as a natural and human agent on the land. This first article gives a historical perspective. The second article will explain why and how fire is being reintroduced as a land management tool. The third will give the specifics of a prescribed burn.

Kimble County lies in the ecological region of Texas referred to as the Edwards Plateau. Like most of Texas, the local landscape no longer appears as it once did. The land itself has not changed shape but the vegetation covering it has changed. When our European ancestors first showed up in the area 200-300 years ago, they found a land covered predominantly by grasses and wild flowers, with most of the trees and other woody species found mainly in the draws and along the waterways. Today's experts describe what these early settlers found as grassland savannas with only a scattering of small Shin Oak or Live Oak motts and an occasional larger Live Oak. There were no extensive cedar (Ashe juniper) breaks which we find covering our hills today. Neither was there nearly the amount of Mesquite nor prickly pear we find today on the land. The one thing they did see more in abundance was flowing springs and creeks. So, as you look across our landscape try to visualize large expanses of tall grasses and wild flowers rather than the cedar breaks and scrub that exist today.

How did we get here and is this a good thing? To answer these two questions one should first understand what had been happening here before the European settlers moved in. Archeological evidence and research have led many experts to believe that the first humans showed up in our area somewhere between 10,000 and 12,000 years ago or more. Since then, the land has seen many short and long term climatic changes which affected both the plant and animal life. The consensus, though, is that for thousands of years, up until the appearance of the Europeans the region was, as described, a grassland savanna with wooded draws and valleys. These grasslands thrived for all of those years because they were frequently visited by fires set by lightning and then by the first Americans as they learned to use fire as a tool. Studies have shown that the frequency of these fires varied from 1 to 6 years in our region. Most of the lightning fires, as well as those set by the Native Americans, occurred during the hot dry summers. These summer fires suppressed or killed most woody plants while stimulating the regeneration of grasses and forbs (wild flowers). The cedar, Spanish oaks, and other woody plants along the steep slopes and bluffs survived the fires because of a lack of surface fuel. Therefore, the Native Americans learned to use fire as a tool to maintain the grasslands for the buffalo, upon which they depended.

This all began to change with the introduction of cattle, sheep, and goats brought in by the settlers. What looked like an unlimited supply of tall grasses was soon grazed off and replaced by shorter grasses, which were more resistant to grazing. With less fuel in the dry summer, fewer lightning fires occurred. Living in wooden houses and fencing with cedar posts and stays settlers feared fires and unlike the native people did not set fires to manage the land. One rangeland expert tells a story of a distant relative sweeping the dirt yard around her home until it was bare of potential fuel as a defense against possible wild fires. So with the fuel gone and the removal of fire as a tool by the people, things began to change rapidly. The small Live Oak and Shin Oak, which had always been suppressed by fire, began to sprout more and grow larger. Likewise other woody plants began to appear in greater numbers. Bare soil allowed cedar berries, dispersed by birds to germinate and take root, so the cedar came out of the draws and began to move across the land as did Mesquite also.

What about those flowing springs and creeks which were here? Many of them are still flowing, but not as many or as much as they did over those thousands of years of tall grasslands. Their flow has always fluctuated with the climate as there have always been cycles of drought. The ground water that provides these flows remains somewhat of an unknown, but more is being learned everyday about the recharge and how this subsurface water moves. One advantage of tall grasses is that their deep root systems not only hold the soil in place, but help rainwater percolate deep into the subsoil to be stored for use later. There's various information on how much rain water is used by a cedar tree, but there is a consensus that each cedar uses a substantial amount and either prevents much of that water from going deeper or allows for more of it to become runoff. Besides the affect on our water table, probably the greatest loss, since the Europeans first showed up, is the topsoil that the grasses helped create and held in place. Figures, such as 5 to 12 inches, have been given for the amount of soil that once covered our rocky hill tops.

This transformation from grasses to woody plants has taken about 100 years. When ranchers began to realize what was happening, they brought out the ax, the chain saw, and the bulldozer. Even with the aid of government sponsored programs, it's been an expensive and labor intensive battle for the ranchers, who meantime have had to also deal with markets, droughts, and all the other uncontrollable factors in their business. During this time, they have depended upon the land for their livelihood, often having to "work the land hard" to just survive or help put their children through college. So, it's not fair to judge past practices, but rather to learn from history and understand the importance of good stewardship and the type of management practices that will preserve the valuable natural resources for future generations on the land. Every land owner has the right to manage his or her land as they wish in order to reach the goals they have for his or her land. It is important though, that all understand that what each does or not does do on their land, will be a major contributor to what the land becomes. For example, a new land owner might say "I think I'd like to just let my land go back to nature." If so, then those cedar and brush species already there will more than likely become thicker, choking out the grasses that may or may not be there. If an evergreen forest of thick cedar bushes or a prickly pear and Mesquite flat is what they believe nature intended, then by doing nothing it's a good chance that's what they will have. Remember, nature has not been totally in control of the land since the human species first showed up and started hunting and gathering and using fire as a tool to help them survive.

The next article in this series will look at the reintroduction of fire as a management tool and the ramifications of such. Much of the information of this article was derived from articles written by Dr. Charles "Butch" Taylor with the Texas A&M University Research Station, Sonora, Texas and Dr. Jake Landers, Extension Range Specialist, Emeritus at the Texas A&M University Research & Extension Center in San Angelo, Texas.

Fire on the Land: The Consequences
Part 2

The following is the second of a three part series about the role of fire as a natural and human agent on the land. The first article gave a historical perspective. This article will explain why and how fire is being reintroduced as a land management tool. The third will give the specifics of a prescribed burn.

Fire, either naturally set by lightning or by humans for different reasons, has always crossed the land. It was also explained in the first article that due to grazing practices and the absence of fire our landscape has changed drastically in the last 100 years from a grassland savanna with wooded draws and valleys. Today the land continues to change through a process called fragmentation, which is the division of land areas by such things as fences, roads, utilities, etc. Therefore today we have not only large tracts of land but a growing number of smaller tracts. In both cases land owners set goals for their land and apply management practices to reach those goals. Those goals and economics are major factors determining the management practices used.

What are some of the goals various land owners might have for their land? The ones that have been going on forever and continue today have to do with surviving off the land. For the hunter gatherers of the past it was just that, to use the land to provide water, food, and shelter. For ranchers the goals have always been to use the land to provide water and food for livestock, and then for wildlife as it has become an important source of income in the form of hunting. With the growing number of land owners and smaller tracts of land the goals may be changing because most of the newer land owners are not depending on the land for their total income. They may be operating eco-tourism type businesses, smaller hunting operations, hobby ranching, various recreational enterprises, or just surrounding themselves with land for peace and well being in retirement. The point is that every land owner most likely has goals for his or her land and to reach those goals each is applying various management practices. Otherwise, as was mentioned in the first article, a lack of management more than likely will lead to a solid cedar break or mesquite flat.

For larger land owners, especially ranchers who are still depending on the land to provide income to survive, the management practices they use are driven by economics. One of the practices for many of them is to remove the cedar and bring back grasses and better browse species for their livestock and wildlife. Remember from the first article that their past grazing practices and exclusion of fire had set into motion a radical change from grasslands to cedar breaks and an increase in many other brush species. Many of them tried to correct the situation by first using an ax, the chain saw, and then the dozer to mechanically remove the cedar. But with the loss of soil, and fire taken out of the picture it has been hard to reestablish those grasses needed for the livestock. Soil takes hundreds to thousands of years to form and even though many of our native grasses have adapted to shallow soils and less water they are also adapted to fire for regeneration and to the nutrients released from soil by fire. The mechanical processes mentioned for removing cedar and the newer chemical agents being used for both prickly pear and woody species, like mesquite are growing in cost, which can be very hard to recoup in today's markets. Yes, the smaller land owner who can afford to own property and not depend on it for income can more than likely also afford such management practices to remove cedar or other undesired species if that's their goal.

Thus for a growing number of ranchers and other large land owners the answer has been to return to nature's way and reintroduce fire as an effective and economic management tool to reach their goals. With the overall increase in smaller tracts due to fragmentation, there is no argument that

purposely setting fires today may have totally different consequences than when the Native Americans set them and let them sweep across thousands of acres at one time unchecked. Today when ranchers intentionally set fires on their lands they do so by following “guidelines that establish the conditions and manner under which fire will be applied on a specific area to accomplish specific management and ecological objectives.” Such fires are called **prescribed burns** with conditions being environmental ones, such as humidity, wind speed, air temperature, amount of fuel, type of fuel, soil moisture, and etc. The manner in which such fires are carried out begins years before the actual fire is set. Initially a burn plan, which will be detailed in the final article of this series, has to be developed and written. This plan would include the above mentioned conditions and the controls to be used, not only to get the desired results but foremost to make the fire just that, controlled, and not a wildfire endangering lives and property. During the early stages of planning the landowner must commit to such things as lower stocking rates to give the grasses or fuel load time to build up for a more effective burn which might take up to two years. Prior to the burn one must go to the expense of having a fire-lane, a bare strip of land 7-15 feet wide, dozed out around the perimeter of the area to be burned. More details of this process will be given in the final article.

At this stage one might ask if this is not taking an unnecessary risk to others’ property and lives for an individual landowner to reach his or her goals. First, the prescription itself is written and carried out to put the risk at the minimum. Second, drive around the hill country and notice how much land is covered by solid green in the winter time. That is partially the green of live oak, but mostly the green of cedar or Ashe juniper, an extremely flammable green fuel in winter and summer during dry times. In other words, that green represents thousands of acres of continuous fuel that once ignited can become a wildfire, which under the right conditions of humidity, temperature, and wind can sweep across the land out of control, as opposed to the prescribed manner in which prescribed fires are carried out. The recent devastating fires in the west and north Texas were mainly the result of heavy fuel loads and extreme weather conditions. Even the U. S. Forest Service has returned to fire not only to improve the conditions of our forest and range lands but also to help decrease the fuel loads that have built up over the years due to the diligence of suppressing fire. So, like the rancher, the public land managers have also come to realize that fire or lack thereof has more than one consequence.

Now should you, as a landowner, consider using fire to reach your goals? That would depend on your goals, the size of your property, and your economics. For landowners with larger tracts of land, say a few hundred acres or more, it might not only be good for encouraging grass species over brush species and a more economical tool, but also would be easier to contain and control by a proper prescription, than on smaller tracts. Therefore, it might not be as advantageous to use fire on smaller tracts because they are usually a part of developments with more fences, structures, and power lines, in close proximity, creating an unacceptable risk to property and lives. Along with the risk factor it might be more economical to use mechanical or other practices to reach your goals on a smaller tract.

The third and final article in this series will cover the specifics of caring out a prescribed burn.
Much of the information of this article was derived from articles written by Dr. Charles “Butch” Taylor with the Texas A&M University Research Station, Sonora, Texas and Dr. Jake Landers, Extension Range Specialist, Emeritus at the Texas A&M University Research & Extension Center in San Angelo, Texas, and Larry D. White and C. Wayne Hanselka extension range specialist with Texas A&M University.

Fire on the Land: The Consequences
Part 3

The following is the final article of a three part series about the role of fire as a natural and human agent on the land. The first article gave a historical perspective. The second article explained why and how fire is being reintroduced as a land management tool. This final article will go over more of the specifics in planning and implementing a prescribed fire.

Once a landowner has decided that fire is a proper management tool to use to meet his or her specific management and ecological objectives, then the landowner must commit to a long term plan in advance of the actual prescribed burn. This begins with sound range, livestock and wildlife management both before and after the actual burn. With that in mind the actual plan which includes the prescription should be written. This is called a burn plan, which should be filed with and written with the guidance of a certified prescribed burn manager, NRCS or the local burn association. Along with the plan, the landowner should acquire adequate liability insurance as protection for themselves and their neighbors.

The plan or prescription is in the form of a checklist, usually recommended by the NRCS, TPWD, TFS, USFW, PBAT or other agencies actively engaged in prescribed burning and covering everything from pre-burn management, to safe guards, equipment needed, required weather conditions, the actual burn steps, and etc. One must first plan for adequate fuel, in other words it "takes a lot of grass for an effective burn." Therefore depending on the range conditions a landowner must commit to deferring grazing or under stocking for a half year or more depending on the time of year of the burn and growing conditions.

The next part of the plan would be to begin making arrangements to put the necessary controls in place. This would include the construction of fire-lanes, usually bulldozed strips of land from 7-15' wide, around the perimeter of the area to be burned. This should be done close enough to the time of the burn so that new vegetation within the lane does not have time to develop as a potential fuel. Necessary equipment including adequate suppression units and an experienced crew should be planned for and listed in the prescription. One of the controls that may be done before or the day of the prescribed burn is the burning of black-lines, which again are done under a prescription. These strips of land about 100 to 200 ft. in width are burned by setting what's called a backfire near the edge of the fire-lane down wind so the fire creeps slowly into the wind and is then extinguished once it has reached a desired width.

Communication with one's neighbors, local fire department, and sheriff's office in both the planning stage and the day of the fire is imperative. The neighbors especially need to understand the process and be included as much as possible. This brings up the need to consider where the smoke is going to go the day of your burn, and who it might affect. Therefore depending on the situation, the neighbors, nearby communities, and roadways need to be addressed by including smoke management in the plan.

Under the guidelines of our local burn association, Upper Llanos Prescribed Burn Association, the anticipated date of the prescribed burn should be put on the association's group email so equipment, personnel, and emergency support can be allocated. However, this can only be a target date because the prescribed weather conditions called for in the plan often do not fit a human calendar and must be monitored closely as the scheduled date approaches. Starting with

the morning of the burn and continuing through the day, weather conditions should be closely monitored on the ground. If factors such as, temperature, humidity, or wind go out of the range set in the prescription then the burn may not begin, be delayed, or may be shut down before completed.

Whether on the day the black lines are burned or the day of the actual prescribed burn, every person involved should be informed of their roles, be in communication by radios, and follow the plan under the direction of the burn boss. There is no item or condition that should go unchecked in order to have a safe and effective burn. Following the burn, the landowner continues his commitment to the long term plan by deferring grazing, allowing the grasses and forbs time to come back. This again depends on the landowner's objectives; however one obvious reason would be to get cover back on the newly exposed soil to prevent erosion.

Fire on the land has and always will have consequences. Today those consequences depend on whether it is a wildfire, burning out of control through the heavy fuel load of a cedar break, or a prescribed burn, carried out with a thorough plan in the form of a prescription, which is written and implemented not only to reach the landowner's objectives, but also to address all those who might be affected both directly and indirectly. It has been the objective of the Upper Llanos Prescribed Burn Association for this three part series on fire to better inform the public of the consequences of fire both past and present and to better understand its value to land stewardship, when applied in a scientific and controlled manner, with all possibilities planned for and addressed.

For more information and questions, interested parties should contact the local NRCS office. For information on our local burn association, visit the ULPBA website www.ulpba.org, which includes educational material from experts and experienced prescribed burners, as well as guidelines and policies for members and a membership application. Or contact ULPBA through the website for further information.

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