

**Brush Management Guidelines and Considerations**  
**Livestock – Wildlife – Water – Aesthetics**  
**Central Texas**

Brush management can have a long term effect on livestock grazing, wildlife habitat, land value, aesthetics, water, and ranch economics. The amount of brush management done and the way in which it is done will determine to what extent these things are affected. To help assess your goals and priorities and help in decision making, rank the following factors and priorities for your ranch with 1 being Not Important and 10 being Extremely Important. The “right way” and the “wrong way” to do brush control will be determined by how you rate the following factors and priorities.

	Not Important										Extremely Important
1. Improvement in forage production, grazing and livestock manageability	1	2	3	4	5	6	7	8	9	10	
2. Maintaining or improving deer habitat	1	2	3	4	5	6	7	8	9	10	
3. Maintaining or improving quail habitat and improving hunt-ability for quail	1	2	3	4	5	6	7	8	9	10	
4. Achieving a balance between livestock grazing, deer habitat and quail habitat, with all being of equal consideration	1	2	3	4	5	6	7	8	9	10	
5. Maintaining aesthetic appeal and future land values	1	2	3	4	5	6	7	8	9	10	
6. Obtaining the least expensive reduction in brush canopy	1	2	3	4	5	6	7	8	9	10	
7. Obtaining long term control of brush	1	2	3	4	5	6	7	8	9	10	
8. Enhancing water yields	1	2	3	4	5	6	7	8	9	10	

For those factors which were rated as most important, find the corresponding numbered section below to find out how brush control can be conducted to be compatible with the listed priorities.

These guidelines and considerations were developed with the support of a number of range and wildlife professionals including specialists from the Natural Resources Conservation Service, Texas Agrilife Extension, and Texas Parks and Wildlife.

These guidelines are not meant to replace on-site consultation from experienced professionals. The information is not intended to be a comprehensive description of brush management or its effect on livestock grazing, wildlife and water. The information is meant to provide general guidance and a framework to begin planning brush control to achieve specific objectives.

**1. If improvements in forage production, grazing and livestock manageability are a priority**, and if wildlife considerations are not very important, a very high percentage of the brush in a pasture can be controlled (90% or more). It should be noted that some woody plants provide valuable forage for goats and sheep and to a lesser extent, cattle. Therefore, it is usually advisable to leave some of the more desirable tree, shrub and brush species in place. Shade trees should be left, and trees and shrubs should be left in draws and creek bottoms. Clearings on uplands can be large with little or no cover left. A loss or degradation of deer and quail habitat will occur in proportion to the amount cleared. Quail habitat and aesthetic value can be maintained or improved if clumps or stringers of low mixed brush such as lotebush, sumac, wolfberry, algerita and pricklyash is left within cleared areas as well as scattered trees. Land value and wildlife habitat will generally decline as more brush is controlled, especially if aerial spraying is used. The residual brush that is killed during mechanical operations may leave the pasture rough and cluttered. If gathering and working of livestock by horseback or four-wheelers is important, dead brush may be raked and piled and burned to give a cleaner appearance. The restoration of native grasses is usually retarded by raking, piling and burning. If extensive re-seeding is to be done, these cleanup operations will be needed to allow adequate seedbed preparation and seeding.

**2. If deer habitat is an important priority**, and if livestock grazing and quail hunting are not as important, it may not be necessary or advisable to do any brush control at all, especially if the brush is of moderate density. If brush is very thick over large areas and if hunting visibility is very poor, conduct patterned brush control on 25 to 40% of the upland areas and leave all draws and bottomland areas in thick brush. See end note for caveats. The key is to insure that openings are small or narrow and that deer are always within 50 yards of protective cover. Setting aside "buck sanctuaries" with large areas of thick brush is recommended if production of mature quality bucks is the goal. In rolling and rough terrain, leave a band of cover on ridges, saddles, headers, canyons and draws and clear numerous small openings in between these features. In flatter terrain, clearings can be straight or curved strips 150 to 300 feet wide with adjacent brush strips about twice the width of the cleared strip. Brush control can also be conducted with a series of irregular shaped clearings 5 to 10 acres in size surrounded by brush. Selective mechanical methods are recommended, such as excavating, grubbing or shearing. Aerial spraying will harm desirable forbs and shrubs. All desirable shrubs and trees such as bumelia, hackberry, oak and sumac should be left within the clearings as well as a few large mesquite or cedar. A moderate increase in forage production for livestock will occur and quail habitat will be improved in proportion to the amount cleared. Aesthetic appeal would be maintained if brush is removed in a more natural mosaic pattern. For greater aesthetic value, avoid straight line clearing and leave scattered trees and shrub clumps intact within cleared areas. "Feathering" the edges of clearings will also add to aesthetic appeal and a more natural appearance. Livestock gathering will be easier if a series of straight strips are planned which can help funnel livestock to fencelines, traps and pens. Clearing of strips on both sides of interior fences is often recommended to aid in livestock movement. A buffer of brush on all outside perimeter fences is often recommended as a visual barrier. An alternative to traditional brush control, is to thin the existing brush canopy by selectively removing a given percentage of trees and shrubs to attain the desired canopy density. This can be accomplished by selective mechanical or chemical IPT methods (Individual Plant Treatment).

End note: If topography is rough, somewhat higher percentages of brush control may be appropriate. If hunting activity or hunting pressure is heavy, more brush should be retained. In very large pastures and where hunting pressure is relatively light, more brush can be removed.

**3. If quail habitat and the huntability of quail are the important priorities**, and if deer are much less important, open up 70 to 80% of the upland areas, yet be careful to leave an adequate amount of low mixed brush for loafing cover or "quail houses". See end note. Leave low brush such as algerita, lotebush, condalia, plum, sumac, pricklyash, wolfberry, catclaw and scattered large mesquite within cleared areas. Mechanical brush control is recommended since the soil disturbance will stimulate the production of desirable quail food plants such as croton, spurge, pricklypoppy, buffalobur and others. Aerial spraying will damage or kill desirable

shrubs and forbs. A loss of deer habitat will result at this rate of clearing, although the remaining deer will be more visible and it may seem like there are just as many. This level of clearing will definitely harm the potential to retain mature bucks. Grass production and grazing capacity will normally improve with this level of brush management. Since quail require an abundance of large, lightly grazed bunch grasses for nest cover, livestock grazing will need to be managed accordingly.

End note: Quail can thrive equally well in many different densities of brush including moderately thick brush, but the ability to effectively hunt quail is impaired by thick brush. In many cases brush management is more for the enhancement of quail hunting rather than the improvement of quail habitat.

**4. If livestock grazing, deer and quail are all about equally important,** a compromise will be required. With multiple and competing objectives, it must be understood that each will suffer some loss or reduction relative to its maximum potential. For this triple objective, open up about 40 to 60% of the uplands but leave thicker brush in draws, bottoms, ridges and saddles. Clearings can be strips or blocks no more than about 300 to 500 feet wide. A reduction in the deer population should be expected and a decreased potential to retain mature bucks, especially if neighboring ranches have more cover. Quail habitat and huntability will be enhanced in proportion the amount cleared as long as low mixed brush loafing coverts are left intact within the clearings. Aerial spraying will favor grass production over wildlife habitat, while mechanical methods will favor wildlife.

**5. If obtaining the least expensive reduction in brush canopy is very important,** aerial spraying, mechanical top-kill methods or prescribed burning can be used. If aerial spraying is used for mesquite, initial canopy reduction and top-kill will be high, but actual root kill will often be 60% or less. Unless follow up control is carried out, regrowth and canopy cover will increase substantially within 5 to 10 years. Aerial spraying for mesquite will have a detrimental effect on several desirable shrubs as well as desirable forbs. The addition of picloram for control of pricklypear will have an even greater negative effect on desirable trees, shrubs and forbs. For quick and relatively low cost canopy reduction of some other brush species, chaining or roller chopping can also be used. Chaining will uproot and kill some of the larger trees if soil moisture is adequate. Chaining and chopping will normally only break off the tops of most brush plants allowing the live root system to remain intact. In almost all cases, these plants will quickly re-sprout from the stump. These top-kill methods can be valuable to temporarily reduce canopy, improve visibility and to increase browse availability, but they should not be considered long term brush control unless other types of follow up control are carried out. Prescribed burning will also result in a reduction in woody cover depending on the intensity of the fire. Cool season fires will usually reduce the low growing cover while summer burns may substantially reduce the upper canopy. Almost all woody plants except ashe juniper will resprout from the stump following a fire. It should be noted that fires may have a short to medium term impact on quail nest cover and loafing coverts. Precautions can be taken to minimize these impacts.

**6. If obtaining long term control of brush is important,** initial mechanical control followed by an ongoing program of chemical or mechanical maintenance, or prescribed burning is recommended. The initial mechanical treatment will be more expensive, but it will also give a higher root kill if done properly. Follow-up control with herbicides should take place within 3 to 5 years to kill new plants and plants that were not killed initially. Individual Plant Treatment (IPT), also known as "Brush Busters" is the preferred method of herbicidal control. Mechanical follow-up can be with small equipment or even hand tools. An ongoing program of prescribed burning should be an important part of a long term brush management program. A single fire will seldom give the results desired, but a planned program of fire will help keep most brush species from developing excessive canopy and is very effective at killing small blueberry cedar.

**5. If maintaining aesthetic appeal and future land value is a high priority,** then brush control can be done in a natural and visually appealing manner. To a large extent, aesthetic beauty is in the eye of the beholder. Some people consider wide open grasslands devoid of

woody cover as beautiful, while others consider it unappealing. A serious deer hunter may think that thick brush looks wonderful, while others think it is ugly. Land value is very closely tied to aesthetic appeal (as defined by the prospective buyer). This information is written from the standpoint that the value of ranch land is currently being driven more by wildlife habitat than livestock grazing value. Most land buyers are interested in quail and/or deer habitat and are willing to pay more for moderately to heavily wooded property. Brush control can usually be done in moderation in a way that maintains if not increases land value and aesthetic appeal. Be certain to communicate very clearly ahead of time with contractors and equipment operators regarding your specific wishes regarding how brush control will be done. Check the progress and status of any brush control projects on a daily basis to insure your intentions are being carried out.

**8. If increasing the supply of water on-site and off-site is an important priority,** then it is important to note the different paths that rainfall takes once it falls. In some geologic settings, especially fractured limestone, brush control may result in the restoration or increase of spring flow, especially in higher rainfall areas. Maximizing the infiltration of rainfall into the soil is important if aquifer recharge or enhancement of spring-flow is important. A dense ground cover of grasses and/or litter is critical in order to slow down runoff, improve soil structure and increase the rate and volume of infiltration. If there is fractured limestone near the surface and if there is evidence of past spring-flow, then control of juniper, oaks and other woody plants may have a positive effect on subsurface water. If there is not fractured limestone near the surface or if there is no history of nearby springs or seeps, then control of brush is not likely to enhance subsurface water. In some cases where brush control is conducted on areas of fractured limestone, there will be a short term response of increased springflow until grasses and other woody plants increase and begin to use the “extra” water. In this situation, there is little or no long term net gain in water. The targeting of brush control on those specific fractured limestone sites where there is evidence of historic springs may regenerate spring flow. Proper grazing management, which increases the cover of tall and mid bunch grasses is just as important as brush control. It is interesting to note that the fastest infiltration rates are often found directly under the canopy of mesquite, juniper, oaks and other woody plants. Infiltration is also high in mid and tall grass areas, but is low where short grasses predominate.

Increasing runoff into ponds, creeks and rivers requires a completely different type of management. Runoff is increased when there is an increased amount of bare ground. Unfortunately, this also results in accelerated erosion, sedimentation and land degradation. Runoff can be increased by a combination of brush management and heavy grazing. When bare ground, sparse vegetation or short grasses are the predominant cover, then there will be increased runoff during and after heavy rainfall events. This treatment is generally not compatible with good overall land management, livestock production or wildlife management.

During prolonged periods of very heavy rainfall, there will be large amounts of runoff, no matter what kind of ground cover there is. These are the times when lakes and reservoirs are refilled and when aquifers are recharged. If the ground cover in the water catchment is good, the quality of water entering the reservoir will be good, and erosion and sedimentation will be minimized.