

Brush Management: A Balanced Perspective

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Figure 1. Examples of 'tools of the trade' for brush management (left to right): biological (sheep), herbicides, prescribed fire, and mechanical control.

INTRODUCTION

Brush (woody vegetation) has been viewed as both a blessing and a curse. Your personal perspective will likely depend on your values and the management objectives you have for the land. In reality, woody species have inherent positive and negative attributes that land managers should weigh. The purpose of this article is to: 1) discuss a few ideas to consider when developing a brush management plan, 2) highlight tools that are available for brush management, and 3) provide a few key references that you can consult for more specific information.

THINGS TO CONSIDER WHEN DEVELOPING A BRUSH MANAGEMENT PLAN

A well thought out, comprehensive resource management plan reflecting short, medium, and long term goals and objectives should be in place before attempting brush control. What do you want to accomplish? Increase forage production for a certain class of livestock? Increase habitat quantity or quality for certain wildlife species? Improve watershed function? Or, do you just want to clean the land up by eradicating a few brushy weeds? What are the costs and benefits of doing something vs. nothing? The answer to these questions will help you formulate a long-term vision for the land and guide specific management activities needed to realize your goals. Evaluating multiple options will help you to assess the advantages and disadvantages of several alternatives. After refining your vision of what you actually want

the land to look like, you can develop a timeline for accomplishing your goal with the best tools for the land in light of the resources at your disposal. While pondering a timeline, remember that brush treatment effects are temporary and that follow-up treatments will eventually be necessary. Also consider that some brush treatments (e.g., mechanical, fire, grazing) can produce varying levels of disturbance, which can open the door to unintended weed problems.

Various ecological, economic, and social aspects of your proposed management activities should be considered when developing your vision. Ecologically, remember that some brush management decisions can result in cascading consequences across the entire watershed. Thus, decisions must be integrated with the ecological characteristics, limitations, and capabilities that are unique to each piece of land. Learn to identify both desirable and undesirable plants and plan your control treatments to conserve and enhance the desirable vegetation already present on the management unit. Work with natural processes to reduce costly inputs whenever possible. Economically, does it make more sense to implement some form of brush control or to do nothing? Brush management is a recurring expense. Profits occur when expenses are lower than income over a given planning horizon. Risks of complex brush management practices are magnified in arid ecosystems because of low and unpredictable rainfall. In some instances, the aesthetic benefit you achieve in controlling brush may

personally outweigh the real economic cost to you. Socially, how will what you do on your land affect your neighbor and their land? Are brush management practices that accomplish your management objectives, but that alienate your neighbor, really worth it? Tools such as Pestman can help you make these decisions (<http://pestman.tamu.edu/#0>).

In developing your brush management plan, decide what level of brush cover is appropriate to accomplish your management objectives. Generally speaking, more brush cover means less herbaceous cover, and vice versa. Some animal species require lots of brush while others require little if any. Shrubs and trees growing in a given pasture may appear as a brush-infested eyesore to cattlemen, but nirvana to goat raisers or wildlife biologists. Knowing the correct mix of brush and herbaceous species for the kind(s) of animal species you are trying to benefit, as well as the structure and species composition of vegetation that those species require, is a critical part of developing a comprehensive brush management strategy. Treating individual plants, patches, or small areas will create mosaics of habitats with lots of 'edge.' This approach will cut expenses and promote a wider range of plant and animal diversity than completely clearing shrubs across large areas.

TOOLS OF THE TRADE

Below is a brief summary of possible tools available for brush management practices (see Figure 1). These tools can be very effective when applied properly but can produce disastrous results when misused. Every brush management tool has risks which can be magnified without due diligence towards application guidelines. We strongly recommend contacting your local extension or conservation office for specific guidance before venturing into any brush management project.

Herbicides are chemical compounds used to kill unwanted plants. Herbicides can be an effective tool to improve brushy habitats. However, they are expensive, hazardous to your health if not handled properly, and can kill desirable as well as undesirable plants if applied indiscriminately. It is critical that the correct kind and rate of herbicide application (read the label!) be used at the right time of year for the targeted woody species, as well as the appropriate pattern of application that will benefit the desirable animal species on your land. For broad coverage across large areas, herbicides can be applied from fixed-wing aircraft or helicopters. ATVs and hand-held or backpack sprayers can be used for precision applications to spot-treat individual plants. Mechanical control can range from small-scale practices such as hand cutting or grubbing, to large-scale practices such as mowing, shredding, bulldozing, root plowing, cabling, etc. Prescribed fire is used under a very specific set of environmental conditions to accomplish brush management objectives. Non-sprouting woody plants such as palo verde trees and certain species of juniper are readily killed by fire. Sprouting species such as mesquite and rabbit brush may be top-killed but then resprout quickly. 'Classical' biological control agents may include insects, fungi, or rusts that are 'natural enemies' of targeted plants. These are collected from the original homeland of the undesirable plant, screened for specificity, and eventually released into the management area. Biological control could also involve the use of domestic herbivores (e.g., sheep and goats) to control woody species.

Each brush management project will of course differ with respect to environmental impact, implementation cost, effectiveness, and treatment longevity. An integrated brush management systems (IBMS) approach considers the type, timing, and pattern of initial brush management technologies, as well as follow-up treatments, which may differ greatly from initial treatments. Thus, this approach requires knowledge of how woody and herbaceous plants will respond to

certain treatments, and how soils, topography, and native and domestic herbivores might influence plant responses. The basic premise behind IBMS is that the integrated application of a combination of tools, strategically timed to target specific plants, is more effective than using one tool, one time. For example, the IBMS approach often uses a given tool (e.g., a mechanical treatment) as a "set up" treatment, which is then followed by the application of another tool or tools in subsequent years (e.g., herbicide treatment or prescribed fire). The correct order of treatments and the number of tools used will depend on the biology and ecology of the target and non-target vegetation, as well as most of issues previously discussed under the heading, 'Things to consider when developing a brush management plan.'

As mentioned earlier, it is best to design brush management control practices to maintain existing desirable vegetation. However, in some cases, it may be necessary to 'jump start' brush management projects by reseeding desirable species (e.g., when remnant seed sources or root crowns of desirable species have been depleted in the plant community). This will mean an added expense that may have a low probability of success. Whether or not a seeding project works in arid ecosystems largely depends on favorable timing and amount of precipitation occurring for the species you plant. Non-native plants may have a higher probability of success in establishing but they may be controversial due to undesirable impacts on ecosystem structure and function. Furthermore, it may be against the law to use some species of introduced plants. This is yet another reason to contact your local extension or conservation office for advice prior to getting started.

CONCLUSION

There is no cookbook or 'one size fits all' approach for brush management. Each project should be customized according to your vision, management objectives, the inherent capability or limitations of the land, the land's current state, and your abilities as a manager. For more information on creative brush control practices for specific plant and animal species in your area, peruse the following references and contact your local county extension or conservation office.

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