



Brush Management

In Texas, the clearing of “brush” species—Ashe juniper, mesquite, and salt cedar—is a popular technique to increase water yields and improve livestock grazing and wildlife habitat. Many factors must be considered for responsible brush control projects to achieve these results, including amount of rainfall, evaporation rate, physical characteristics of the site, and the region of the state. Since brush management can be expensive, it is important to ensure that it is done correctly, with an eye toward long-term follow-up maintenance practices and grazing management so that both wildlife and human communities will benefit.

The State has 12 climatic regions and a range of vegetative characteristics. In Texas, brush is categorized as either “upland” (growing on range or forest lands) or “riparian” (growing along streams or rivers). Absent special circumstances, scientists generally agree that upland brush management is only likely to provide water supply benefits in areas that receive at least 18 inches of rain per year.

Brush management can, under some circumstances, increase water yield. The amount of water “freed up” by brush control can vary widely, however, depending on site characteristics and on what vegetation comes in to replace the brush. In some cases, the grass that replaces the brush may actually have an evapotranspiration rate equal to or higher than the brush that was removed. Ideally, if increased water yield is the primary objective, managers will understand the water use characteristics of the brush being removed and of the vegetation that will be re-established. On certain sites, brush clearing might be effective because it could enhance groundwater recharge. Brush management on sites with shallow soils that drain rapidly and are underlain by fractured materials, such as the Texas Edwards Plateau, is most likely to increase groundwater recharge. Although the potential water savings from properly located brush control projects may be significant, continued research is needed on the potential for projects to achieve and maintain results in field applications.



It is in the best interest of the landowner to carefully work out a plan for brush treatment that will best serve the long-term viability of the land’s natural resources.

In the right locations, brush management can be used to simultaneously increase water yield and to improve wildlife habitat. A variety of wildlife species prefer low, shrubby plants that are stimulated by brush management techniques such as prescribed fire and “shearing,” including white-tailed deer, quail, wild turkey and the endangered Black-capped Vireo. In Central Texas, the endangered Golden-cheeked Warbler nests in mixed Ashe-juniper and oak woodlands, so it is important to identify the Ashe juniper stands that are serving as habitat.

Brush management on a large scale can be costly, requiring heavy equipment, such as bulldozers, hydraulic shears, or airplanes to spray herbicides. Moreover, most areas need repeat treatments every few years and must be re-vegetated. For land to retain its value for grazing or hunting, cleared areas may need to be replanted with grasses unless sufficient seeds remain in the soil to establish the desired cover.

As research into the potential benefits of brush control continues, the Texas Living Waters Project proposes the following set of principles to help shape responsible brush control projects.

A responsible brush control project should:

- 1) **Demonstrate effectiveness.** Projects should be able to provide predictable and measurable water benefits if increased water yield is the primary objective of the brush management project. Before implementation, the project developer should establish realistic hydrologic goals considering local conditions.
- 2) **Be cost-effective.** When viewed solely as a water conservation project, a brush control strategy should only be adopted if the costs per unit of water produced by the project are equal to, or less than, the costs of water produced by other agricultural conservation practices, if such practices are feasible.
- 3) **Be compatible with the natural soil profile and conditions.** Excessive removal of brush or removal of brush in areas that have thin soil profiles or steep slopes can lead to severe erosion. This can negatively impact water quality downstream and remove important soil microorganisms from the site.
- 4) **Be compatible with natural vegetation.** Before removal of brush, project managers should have a clear idea of what native vegetation is appropriate for restoration of the area. Managers need to assess whether or not the restoration can occur naturally or if it needs to be augmented with planting.
- 5) **Maintain or promote affected wildlife.** A properly designed brush control plan can improve habitats for a variety of species, including endangered species such as the Black-capped Vireo.
- 6) **Incorporate an effective maintenance plan.** Maintenance of the brush control area is critical to ensure continuance of water production or retain wildlife habitat values. Brush control plans should be designed to require low maintenance where possible.

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