APPENDIX K
TABLES OF CONTENT and INTRODUCTIONS FROM 2 SECTIONS IN MONSEN (2005)

Restoration Manual

For

Colorado Sagebrush and Associated Shrubland Communities

Section I. Attributes and Features of Select Grasses, Broadleaf Forbs and Selected Shrubs

By

Stephen B. Monsen

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Introduction

Restoration of wildlife habitats is much more difficult and complicated than revegetation or enhancement of rangelands for livestock grazing or watershed protection. Recovery or reestablishment of wildlife habitats normally involves the treatment of a number of broad vegetative types. Animals are usually confined to a specific plant community, and remedial treatments often involve reestablishment of a number of plant associations. Restoring or improving any one plant or even a number of species may not be entirely satisfactory to maintain or improve the health of a particular animal population. Wildlife, particularly sage-grouse, seek and use individual species at different seasons both for cover and food (Appendix I). Sagebrush is a major part of the diet and cover for these animals, yet plant density, site location, height, and associated species significantly influence the value of the shrub. Planting or reestablishing sagebrush may not provide the age classes, plant structure, or density as required to support sage-grouse (Appendix I). Restoring the seasonal forage and cover species is difficult as a number of incidental or less common species are also required, but they are not easily established in the amounts needed.

Certain broadleaf herbs that are normally a minor part of most sagebrush communities are apparently vital to chicks and hens at particular seasons. To be effective, the plants must furnish green herbage or succulence in the spring and early summer months. To do so, these plants must occupy sites where additional moisture accumulates or exists as an understory with the shade provided by some shrubs. If the herbaceous species are not properly located in close proximity to the shrubs, their summer value is limited. Seeding to accomplish a specific arrangement of plants is difficult, as most broadleaf herbs are not easily established in combination with grasses and shrubs. Planting complexities are much more difficult when a number of plants with different life forms are being planted together.

Many sagebrush sites that require remedial treatments have been seriously altered or disrupted. In many situations the principal species have been replaced by competitive weeds, and a seed source for natural recovery is not present. In addition, many sagebrush communities occur in arid or semiarid environments. Annual and seasonal moisture is normally low and unpredictable. The lack of moisture in the spring months to support and sustain plant growth is critical to restoration. New plantings are dependent upon sufficient and continued amounts of moisture to germinate seeds and assure the uninterrupted growth of the young seedlings. Weed containment is also essential to assure young plantings can establish. Control of weedy species is often costly, and sites are frequently poorly accessible to most equipment and control measures.

Planting an assembly of native species is usually necessary to restore the desired plant communities. Presently seed of most native species is not universally available to support large projects. However, some native seed programs are being developed, particularly in Colorado that could improve this situation.

Even with these difficult restrictions, remedial treatments to improve and enhance sage-grouse habitats are feasible and possible. Many sites can be substantially improved and

returned to a native assembly if appropriate site preparation treatments, seeding practices, and adapted species are used. Sufficient seed of sagebrush, and some native grasses and herbs are available for planting. Site preparation and planting methods are well understood and can be accomplished with a high degree of success if properly instigated. Many sites can be improved though proper management. Plant recovery can be expected within a reasonable time period if areas are carefully managed. Improvement of wildlife habitats will be a continuing and evolving process, but many areas can be improved with current resources.

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Section II. Developing Objectives to Manage and Improve Plant Communities and Wildlife Habitats

By

Stephen B. Monsen

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Colorado Division of Wildlife
Department of Natural Resource
6060 Broadway, Denver, CO 80216

Introduction

Improvement of sage-grouse and other wildlife habitats usually involves the treatment and management of a number of associated shrubland communities. However, big sagebrush communities and other shrubland associations occupy quite different environments and climatic conditions. It is important to understand the different community associations that may occur together to effectively implement remedial treatments. Although natural recovery of disturbances is most effective and ecologically sound, this may not be possible in many situations, particularly some sagebrush, pinyon-juniper woodlands, and salt desert shrublands. Often, the vegetation in these plant associations has been so altered that few remnant plants are left to repopulate the sites. Active control measures are needed to reduce the presence of weeds and other invaders. Desirable species must be restored by introducing seed in an effective manner to assure reestablishment.

Active restoration normally involves the physical removal of competitive species, preparation of seedbeds, and seeding of desired species. Since a number of species are normally planted, it is essential to understand the principles required to restore all seeded species. Sagebrush is a major species in many projects and requires specific seedbed environments to establish. Failure to adhere to all aspects of site preparation and planting practices will result in widespread failures.

In many situations, improvement or protection of plant communities is related to wildfires and other disturbances. Many sagebrush and associated shrubland communities are subjected to fires, grazing, drought, and other influences that can create considerable change in species composition. Wildfires are particularly common and quickly reduce the presences of sagebrush and other woody species. Fires are also being promoted as a means to change the composition of many shrublands. It is important to understand the conditions that must occur to allow sites to recover, particularly to regain shrub dominance. Utilizing effective seedbed preparation and planting techniques are essential to site restoration. Planting at appropriate seasons and utilizing techniques that are more likely to be successful are critical to any restoration project. Techniques and practices must be employed that promote initial establishment of seeded species, but also facilitates the recovery and growth of residual species. Reestablishment of native communities is largely dependent upon the species that initially establish, including the recovery of surviving plants and the development of plants from intact seed banks. The manner that sites are treated significantly influences the species that become established as well as the plants than recover naturally. Remedial treatments, including management of sites to promote natural recovery, must be carefully planned and directed.

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