CONSERVATION GRAZING

TECHNICAL GUIDANCE DOCUMENT

Document No.: WRG 6A-5
Publication Date: 1/28/2012

TABLE OF CONTENTS

INTRODUCTION

Grazing by bison, elk and deer was historically a natural occurrence in many plant communities in Minnesota. This grazing tended to be nomadic in nature and its intensity depended on the type of grazers, herd sizes, climate conditions, fire frequency, and the composition and structure of individual plant communities. Today grazing is conducted by a variety of species including cattle, bison, horses, sheep, and goats to target specific invasive plants, or to replicate the grassland plant community structure and diversity that historically resulted from grazing. When grazing is conducted to control invasive species the intensity and duration of grazing is often carefully monitored to ensure that target species are managed effectively, and that the integrity of the plant community is maintained. Grazing can have benefits as well as negative impacts so it is important to involve professionals that are experienced with conservation grazing. Detailed grazing plans are an important component in the planning and implementation of prescribed grazing. Equipment that may be needed for grazing includes watering systems, electric, or barb wire fences around rotational grazing areas, moveable fencing to concentrate grazing and to ensure that areas are not overgrazed, and salt licks to concentrate animals (Tu et al. 2001). The following is a list of species commonly used for prescribed grazing and their general characteristics.

Species Characteristics

Cattle

Cattle tend to focus on palatable species such as young green grass and move to find more of the same species as an area becomes grazed. In many cases they will focus on cool-season, non-native grasses such as smooth brome, quack grass and reed canary grass in addition to some forbs. However, they will focus on other plants such as warm season grasses and prairie forbs as their preferred species become less available. Cattle can eat forage relatively close to the ground; a helpful trait when attempting to stress undesirable species (Svedarsky et al. 2002). Cattle can accomplish some control of narrow-leaf and hybrid cattail through trampling and eating the leaves, but cattails are low in nutrition and not a preferred food source for cattle. Hoof rot and liver flukes can also be a concern if cattle are in a wetland for a prolonged period. Cattle can be used to control some trees and shrubs, particularly with fall grazing, but other control methods are often

needed if more desirable food sources are available. Cattle travel in groups which can create bare dirt paths. The use of riparian areas by cattle may also be a concern for projects focused on water quality improvement.

Bison

Bison have a diet similar to cattle but tend to graze an area more uniformly in height. Some studies have shown that bison primarily consume grasses while cattle tend to eat a higher proportion of forbs (Svedarsky et al. 2002). Bison and elk historically influenced the balance between grasses and forbs within prairies. The grazing of grasses allowed for the establishment and growth of forbs. The absence of these animals as part of prairie restorations can often lead to prairies dominated by grasses. The need for sturdy fencing to contain bison and added costs related to transportation can limit where bison can be used for conservation grazing.

Goats and Sheep

Goats and Sheep have be used to control species such as leafy spurge (Euphorbia esula) and Russian knapweed (Acroptilon repens) that other animals won't eat due to phytochemical toxins in the plants (Walker 1994). Goats and sheet are also well adapted to steep terrain where other management techniques may be impractical. Goats tend to eat a wider variety of species than sheep and can control woody vegetation such as buckthorn by standing on hind legs (Walker 1994). Sheep have been used to control spotted knapweed (Centaurea maculosa) and oxeye daisy (Chrysanthemum leucanthemum). Sheep do not graze an area evenly so herding, fencing or salt licks are typically needed to concentrate the herd. To prevent the spread of seed from invasive species such as leafy spurge in their manure, animals should be kept out of potential new areas for grazing for nine days. (Olsen and Lacey 1994). Sheep and goats have limits regarding what percent of their diet can be comprised of species such as leafy spurge, so their consumption should be balanced with other species or supplemented with other feed. Sheep should not be unattended for extended periods around watering holes and riparian areas as they can drown when their fleece becomes waterlogged.

Horses

Unlike sheep or cattle, horses have both upper and lower teeth and active lips, making them very efficient grazers. They are also selective grazers, preferring grass to broadleaved plants and new growth over more mature vegetation. They are large animals that require a significant amount forage. They also like to run and play, which can damage the vegetation and the soil, especially when wet. Frequent monitoring and adaptive management is important when using horses for prescribed grazing. With their preference for grasses, horses can set back reed canary grass early in the year, allowing other wetland species (forbs and sedges) to increase in dominance.

APPLICATION

Grazing of Conservation Lands

When managing planted grasslands through grazing, typical goals include minimizing litter accumulation, maintaining soil cover, and promoting the germination of native plant seedlings. An additional goal may be to create conditions that favor insect populations that act as food for pheasants, waterfowl and other grassland birds. Grazing is most commonly used in upland communities and requires careful monitoring by resource professionals in remnant plant communities. It may not be recommended in some plant communities that are functioning at a high level without grazing, contain grazing sensitive species, or are connected to sensitive water resource.

When grazing is allowed through a conservation program grazing plans are typically required to define goals and determine where and when grazing will be conducted; as well as the intensity and duration. The following is a list of common components of a grazing plan:

-Goals and objectives of grazing
-Forage/livestock balance calculations
-Inventory of existing resources (plant communities, dominant species, forage species, soil types, wetland/riparian areas, structures)
-Sensitive areas and plans for protection (rare species, wetlands/riparian areas, sensitive wildlife areas, areas prone to erosion)
-Plans for fencing and establishment of management units
-Plans for watering systems
-Proposed herd size
-Proposed schedule of grazing (including grazing periods and rest periods)
-Indicators of when grazing goals and objectives have been met, and when grazers should be moved
-Other management methods to be combined with grazing
-Potential problems and contingency plans (drought, flooding, invasive species, disease, etc.)

Conditions that influence the growth rates of forage include the type of animals, grazing intensity and frequency, climatic conditions, time of year, soil types, and competition from other grazers. The ideal time of year, intensity, and duration of grazing, as well as the minimum grazing height vary greatly depending on project goals and related plant community structure and function. Short duration, high intensity grazing may be needed, leading to grass that is grazed to ground level for the control of species such as Kentucky bluegrass and smooth brome grass. Recommended minimum grazing height to prevent damage to native grasses is generally 3-4 inches for cool-season grasses, and 6-inches for warm season grasses (about 3-inches for little bluestem and side-oats grama). Grasses should also be allowed to grow to around 6-inches before the first killing frost.

Grazing producers and landowners can mutually benefit from grazing agreements, such as when extra grazing land is available on private or public lands mid-summer, allowing producers to rest their pastures and protecting them from overgrazing (often called "grass banking"). It is important that project goals are well defined for all parties involved, and that agreements clearly define who is responsible for watering systems and fencing, and who will retain ownership in the future.

Grazing to Manage Invasive Species

In some cases, grazing can set-back specific invasive species while having a minimal impact on native species (Tu et al. 2001). Grazing can allow for decreased herbicide use in critical areas and competitive costs if animals are nearby. In the case of reed canary grass, grazing early in the year will set back the species before many native, warm season species develop. It may take subsequent prescribed grazing events during an individual spring season, and possibly multiple years to effectively set back the species. For the control of Kentucky bluegrass, short duration, high intensity grazing may be needed early in the growing season. Later fall grazing may also help with control of Kentucky bluegrass. Short duration high intensity grazing can also be effective for smooth brome grass, but later in the spring, shortly before warm-season grasses become active. When targeting invasive species in native plant communities, careful oversight is required to ensure that native species are not over grazed, that erosion does not occur, and that weed seeds are not spread from other properties.

Multi-species grazing can have the best overall control of weeds when compared to one species alone. For example, on lands infested with leafy spurge, using sheep prior to grazing cattle or horses in a pasture can reduce leafy spurge and allow desirable forages to dominate the forage canopy. Early sheep grazing on spurge in this case does not necessarily control the spurge, it simply reduces the above ground growth, allowing grasses and other forages to begin to dominate for the remainder of the growing season. The spurge will come back in full-force the following year, or in the same year if cattle or horses overgraze an area, and the process has to be repeated. In Minnesota and other states, there have been several examples of livestock owners using sheep early in the year to reduce the above ground biomass of leafy spurge prior to grazing cattle in the same paddocks later in June and July. These same landowners have often released bio-agents to

provide a more permanent solution to their spurge problems. In this case, landowners are using multiple techniques in their grazing plans: bio-control, early sheep grazing, careful grazing management with other livestock mid-season, and herbicides applied to border areas (Tony Cortilet, MDA, Personal Communication 2009).

OTHER CONSIDERATIONS

Grazing is often used in combination with other maintenance strategies. On prairie plantings for example, grazing may be used to control cool-season non-native grasses, while mowing or prescribed fire may be relied on to control invading shrubs. Spring burning of areas with invasive shrubs followed by grazing can aid removal. If herbicides are used, label recommendations should be followed regarding how soon grazing can follow application. Monitoring is important to ensure that grazing is not causing erosion or other problems.

COSTS

The cost of can be low if fencing is available, and local grazers can benefit by having additional land available. If fencing must be installed and animals moved a long distance, costs can be much higher. The need for watering systems will also influence costs. Staff time will depend on the amount of monitoring and oversight is needed to ensure that project goals are being met.

ADDITIONAL REFERENCES

A Landowner's Guide to Prairie Management in Minnesota, Svedarsky, W.D., M.A. Kuchenreuther, G.J. Cuomo, P. Buesseler, H. Moechnig, and A. Singh.
Minnesota NRCS Grazing Webpage:
http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mn/technical/?cid=nrcs142p2_023539

Weed Control Methods Handbook, Tu, M., Hurd, C., Randall, J (TNC)