

## Chapter 2 – GRAZING

Grazing can either promote or reduce weed abundance at a particular site. By itself, grazing will rarely, if ever, completely eradicate invasive plants. However, when grazing treatments are combined with other control techniques, such as herbicides or biocontrol, severe infestations can be reduced and small infestations may be eliminated. Grazing animals may be particularly useful in areas where herbicides cannot be applied (e.g., near water) or are prohibitively expensive (e.g., large infestations). Animals can also be used as part of a restoration program by breaking up the soil and incorporating in seeds of desirable native plants.

When not properly controlled, however, grazing or other actions of grazing animals (wallowing, pawing up soil) can cause significant damage to a system, and promote the spread and survival of invasive weeds. Overgrazing can reduce native plant cover, disturb soils, weaken native communities, and allow exotic weeds to invade. In addition, animals that are moved from pasture to pasture can spread invasive plant seeds.

In general, the specific weed and desirable native plants will determine the number and species of animal grazers and the duration and frequency of grazing. A grazing plan should be developed in situations where prescribed grazing is desirable, and this plan must be tailored to fit the specifics of the site.

### ANIMAL CHOICE

Cattle, goats, sheep, and even geese may be used to control weeds. Cattle will graze invasive grasses, can trample inedible weed species, and can incorporate native seeds into soil. Horses can also be used to control invasive grasses, but horses tend to be more selective than cattle. Geese are also useful for the control of invasive grasses, but are more subject to predation than other animals. Predation problems in many areas may dictate the type of grazing animals that can be used.

Sheep and goats prefer broadleaf herbs and have been used to control leafy spurge (*Euphorbia esula*), Russian knapweed (*Acroptilon repens*), and toadflax (*Linaria* spp.). These animals appear to be able to neutralize the phytochemicals toxic to other animals that are present in these and other forbs (Walker 1994). Goats can control woody species because they can climb and stand on their hind legs, and will browse on vegetation other animals cannot reach (Walker 1994). Goats additionally, tend to eat a greater variety of plants than sheep.

Sheep can be useful in the control of spotted knapweed (*Centaurea maculosa*), kudzu (*Pueraria lobata*), and oxeye daisy (*Chrysanthemum leucanthemum*) (Olson and Lacey 1994). Sheep are not recommended for the control of St. John's wort (*Hypericum perforatum*) or senecio (*Senecio* spp.) as these plants can be toxic.

Sheep do not graze an area uniformly. Consequently, a method (i.e: herding, fencing, or the placement of salt licks) should be employed to concentrate activities in an area (Olson and Lacey 1994). Sheep often need a period of adaptation before they will start to consume a new forage type. This process can be expedited by using herds as opposed to individual animals because sheep will follow the lead of their peers. Finally, leafy spurge seeds can remain viable after passing through the digestive tracts of sheep. Animals should therefore be kept out of uninfested areas until nine days after the last leafy spurge is consumed (Olson and Lacey 1994). Both sheep and goats are well adapted for grazing in steep or rocky terrain.

Plant availability, hunger, and previous experience can determine a grazer's selection of food plants (Walker 1994). Differences in vegetation quality may cause an animal to eat one species in one situation and to ignore the same species in another. A period of adjustment is generally required to get a grazing animal to eat a new type of forage (Walker 1994). It is therefore helpful to find animals previously experienced with the target weed.

Finding grazing animals to use for weed control is frequently a problem in the U.S., particularly when sheep or goats are needed. Land managers are sometimes forced to make use of the animals available in the immediate area, especially since transportation costs can be excessive. The following groups\* lease-out goats specifically for weed control:

Southern Oregon Goat Producers  
HC 64 Box 77  
Lakeview, Oregon  
541-947-2691  
hbsb@ptinet.net

Ewe4ic Ecological Services  
Land Whisperer, LLC  
P.O. Box 3253  
Alpine, Wyoming 83128  
307-654-7866  
ewe4icbenz@aol.com

\*Note: TNC does not endorse or necessarily use these listed services. The short list provided here is primarily for examples of grazing services, which may be available in your local area.

### **TIMING & DURATION OF GRAZING**

Animals should be brought into an infested area at a time when they will be most likely to damage the invasive species without significantly impacting the desirable native species. Grazing during seed or flower production can be especially useful. On the other hand, some weeds are palatable only during part of the growing season. For example, cheatgrass (*Bromus tectorum*) is preferred in spring before seed heads develop, but avoided by cattle once it has begun to set seed because the seed heads have stiff awns that can puncture the mouth and throat tissue of livestock (Carpenter & Murray 1999).

Grazing will often result initially in an increase in stem density and root buds, but repeated grazing should lead to reduced stem densities in the longer term (Olson 1999).

Grazing should be closely monitored and the animals promptly removed when the proper amount of control has been achieved and/or before desirable native species are impacted. Consequently, land managers must be flexible and have control over herd movements. Lack of control can result in overgrazing of desirable species, which can enhance weed infestations or allow new weed species to become established. The necessary flexibility is not always possible with commercial herds.

In most cases, several years of intensive grazing followed by annual brief periods of grazing by the same grazing species is required to gain and maintain control of an infestation. However, gains achieved by grazing goats and sheep one year will not be maintained by cattle-only grazing in subsequent years because cattle tend to graze different types of plants.

#### **ANIMAL FENCING & MOVEMENT**

The containment and movement of grazers within and between infested areas is necessary for the successful implementation of an appropriate grazing plan. Temporary fencing erected to contain animals in a particular area may be suitable for goats and sheep, but is often inadequate for cows and horses. More stable and expensive barbed wire fencing may be required to contain these larger animals. Salt licks have been used successfully to concentrate animal impact in a particular area.

A herder is usually required to move goats and sheep between pastures or infestations and to ensure that the animals concentrate grazing on the appropriate species. Cattle must be moved periodically, but generally do not require a herder. Goats have been tied to stakes within infested areas to concentrate their activity and eliminate the need for full-time herders. "Open" herding is usually more beneficial than "close" herding, where animals are kept close together causing much of the forage to be trampled (Olson and Lacy 1994).

#### **CONTROLLING SEED DISPERSAL**

Seeds of leafy spurge (*Eurphobia esula*), spotted knapweed (*Centaurea maculosa*), and other species, can pass through the digestive tract of animals and remain viable. Animals that are removed from an infested area should not be transported to weed-free areas until all seeds have passed through their digestive tracts (five to nine days). Weed seeds can also be transported to new areas in animal hair. Care and precaution should be taken when moving animals from infested areas.

## GRAZING CASE STUDIES

### Patagonia/Sonoita Creek Preserve, Arizona – Cattle Grazing

Jeffrey Cooper and Ed Wilk have been using cattle and horses in Arizona to reduce the density of Johnson grass (*Sorghum halepense*) enough to allow native grasses to become re-established. They chose to use cattle and horses because they could be found locally and were not likely to suffer from predation.

Because they needed fenced pastures only while the grazers were using the land, they initially set up electric fences, which are cheaper and easier to install and remove than barbed wire fences. The electric fences, however, were inadequate for corralling these large animals and barbed wire fences are now being considered.

The animals were put on the land during the summer growing months. Ideally, Jeffrey and Ed would have liked the grass to be grazed repeatedly during a summer, moving animals on and off throughout the growing season. However, they did not have the personnel required to move the animals repeatedly. The animals were instead moved onto the pasture once, when the grass had achieved some significant growth, and were allowed to graze until the grass forage was essentially gone. The Johnson grass, however, did recover somewhat with the arrival of the rainy season.

After four years, stem density counts on established transects showed that stem densities decreased by 75%. Once the infestation was significantly reduced, the herbicide glyphosate (RoundUp<sup>®</sup>) was applied to control the remaining Johnson grass. Herbicide was applied in late spring to small plots from which cattle was excluded. One to two months following herbicide application, large native bunch grasses were planted on the herbicide-treated plots.

The results of this grazing-herbicide combination have been mixed. Although the combined grazing and herbicide treatments had reduced Johnson grass infestations significantly, this allowed other invasive broadleaf weeds to become established. In an effort to control these new weeds, Jeffrey and Ed cut down the invaders during flowering to reduce seed production and dispersal. Approximately five acres have been replanted with native grasses following the grazing and herbicide treatments. Some of the transplants, especially the more mature plants, are doing well. In other areas, the replanted natives were destroyed by gophers, and Johnson grass reinvaded. Jeffrey and Ed believe that if the exotic weeds can be kept down, the native grasses will eventually outcompete the exotics.

### Marsh Creek, Idaho – Goat Grazing

Goats have been used to control leafy spurge (*Eurphorbia esula*) on approximately 1,500 acres of mostly private land along Marsh Creek in South Central Idaho. Two trained herders spent five months on the site with approximately 600 goats. The goats were of mixed breed and age class. The area was stocked at about one goat per acre. Goats were herded on open range conditions. Trained herders were necessary to keep goats moving to new infestations and to prevent desirable native species such as willows (*Salix* spp.)

from being grazed. Because goats prefer to graze only two or three times in a particular area, herders were forced to continuously move the goats to new areas. Base camps were established and temporary fencing set up to corral the animals at night. These camps were moved on a regular basis according to the movements of the herd. By the end of the project, goats were traveling approximately four miles a day.

In addition to the cost of herders and temporary fencing, medical examination costs were also incurred. A few goats became ill due to the diet of almost exclusive leafy spurge. Supplemental feeding was required to maintain a balanced diet for the goats. An unexpected problem was that goats would not cross water, and makeshift bridges had to be erected for water crossings.

The land managers' long-term plan is to continue intensive goat grazing for five years until the abundance of leafy spurge is sufficiently reduced. Goats will be brought in for short periods once or twice a year thereafter, or small numbers of goats will be used along with grazing cattle to maintain leafy spurge control.

### **Sheep Grazing in Montana**

Sheep have been used to control leafy spurge (*Eurphorbia esula*) in pastures and along rivers in Montana (Olson & Lacey 1994; Olson 1999). In some cases, continuous grazing by sheep resulted in significant reductions of leafy spurge stem density and viable seed bank (Olson & Lacey 1994; Olson & Wallander 1998). Leafy spurge is nutritious forage for sheep and can comprise up to 50% of their diet without ill effects. An added bonus is that sometimes the use of sheep for weed control does not cost anything to the landowner, because they provide free forage for the sheep (Olson 1999).

### **Red Canyon Ranch, Wyoming – Animal Impact**

Bob Budd has used cattle to “beat down” infestations of Russian knapweed (*Acroptilon repens*) and leafy spurge (*Euphorbia esula*), and to prepare soil for native seeds on the Red Canyon Ranch in Wyoming. Although goats and sheep traditionally have been used to control these broadleaf species, these animals also eat some of the desirable native woody species on the Ranch. Consequently, Bob developed a plan to spray the infestations first with a 2,4-D herbicide, followed by a heavy dose of “animal impact”, or animal trampling, which breaks down any remaining weeds and turns up the soil in preparation for re-planting.

Bob uses approximately 800 head of cattle on three acres for one-half to one full day. Salt licks are placed within the infestations to help concentrate cattle in a specific area. After the animals are removed, native seeds are spread throughout the area.

Bob also uses animal impact without herbicides against infestations of dock (*Rumex* spp.) and kochia (*Kochia scoparia*) and believes that “animal impact” is the best use of animals for weed control. His advice to land managers is to not be afraid to hit the area hard with many animals. He states that one cannot gently “ease into” an animal impact strategy.

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