

CHAPTER 3:

Animal Husbandry of Sheep and Goats for Vegetative Management

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10 KEY POINTS

- Vegetation management projects can impose extra challenges on both animals and their managers.
- Many target plant species make good forage because of their high protein and energy content.
- Modifying breeding times can place mature animals on projects without their offspring.
- Early-season lambing, early weaning, and out-of-season lambing are options.
- Targeted grazing requires well trained herders who can remain with the animals.
- Predator attacks can be reduced with proper bedding grounds and trained guard animals.
- Using the right kind of fencing in the right situation is key to animal control.
- Managers should take steps to minimize transport of noxious weed seeds.
- Grazing arrangements can take several forms, including cooperatives, partnerships, and contracts with service providers.
- Land managers should be aware that managing unwanted vegetation is a long-term commitment.



SETTING MANAGEMENT GOALS FOR PRODUCTION AND VEGETATION

When embarking on a targeted grazing program, both land and animal managers should consider the simultaneous needs of maintaining animal health and production and manipulating vegetation. While strategies for each can work in concert, the goals for managing vegetation may impose extra burdens on both animals and their managers. For example, a grazing prescription may limit the use of non-target vegetation like native grass, which could mean moving animals more frequently than might otherwise be the case. In addition to stress from frequent moves, managers and animals must find and adapt to new bedding grounds, campsites, and trails, all of which can disrupt normal production practices. This chapter addresses key considerations for successfully producing livestock while manipulating vegetation. Armed with such information, animal and land managers can more clearly identify mutually beneficial goals.

Recognizing Enterprise Expenses

The typical livestock operation incurs expenses for feed, medicine, veterinary services, and labor as well as non-cash costs for production losses resulting from weight loss, injury, or death from predators, toxic plants, and diseases. Vegetation management projects often accrue extra expenses beyond these normal costs of production, expenses that can vary widely depending on the project. For instance, veterinary expenses may be higher because of increased confinement and transportation. Moving animals to unfamiliar areas may reduce initial forage intake or increase risk from poisonous plants.

Several extra costs result directly from well managed targeted grazing projects. To ensure contract fulfillment, a higher level of monitoring is usually required to document how the vegetation is responding to grazing. The increased management and more frequent animal movement typical in such projects may mean hiring more people to control and herd the animals. If a management goal entails a higher density of animals confined to smaller grazing areas, additional fencing and movement of that fencing may be required. Also, because targeted grazing may be considered more environmentally safe than herbicides, many projects are conducted in areas with high human populations, like parks and the wildland-urban interface, resulting in

problems with domestic dogs or requiring more attention to fencing or increasing the number of guardian dogs.

Nutritional Considerations

Efficiently producing lambs, kids, wool, and mohair requires knowing the animal's specific nutrient requirements – protein, energy, vitamins, minerals, and water. Proper nutrients are especially critical during breeding, late gestation, and early lactation, so it's important, when possible, to match livestock needs with the proper feed. Most plant species targeted in grazing projects make fairly good forage because of their high protein and energy content. For instance, leafy spurge, an invasive plant that infests vast tracts of land in the Intermountain West and Northern Great Plains, is nutritionally similar to high quality alfalfa. The nutrient composition of early-growth leafy spurge is 18-20% crude protein and 65% total digestible nutrients, making it ideal for lactating ewes or nannies. However, as plants mature their nutritive value decreases, so managers should try to use animals that have lower nutrient requirements, such as those not lactating, at times when the plant nutrients are low. Many plants targeted for management contain chemicals that are toxic or poisonous – tannins, terpenes, and alkaloids. However, just because a plant contains such compounds does not mean it will have dire consequences. Grazing animals

evolved with these compounds and have physiological and behavioral mechanisms that can ameliorate their negative effects. For example, microbes in the rumen of sheep, goats, and cattle can often detoxify a poisonous plant compound before it enters the animal's blood stream. Livestock managers must be aware of toxic plant compounds, but they must also realize that their danger to animal health or well-being may not be readily apparent.

Providing adequate water is critical in vegetation management programs. A lactating ewe or nanny requires 2 to 2.5 gallons of water a day during hot summer months when forage is relatively dry. Some target plants contain compounds that may increase an animal's water needs, or the plants may even become toxic if water is limited. For example, goats readily consume saltcedar. But, as the name implies, it contains high concentrations of salt. With adequate high quality water, animals can flush this salt from their bodies without ill effects. (For more information, see the American Sheep Industry's "Sheep Production Handbook" and its chapters on nutrition and range and pasture nutrients, available at www.sheepusa.org.)

Modifications to Traditional Breeding Schemes

Using mature animals without young in grazing projects can mitigate several management challenges, including predator problems, transportation difficulties, and the need for increased fencing when lambs or kids are present. Ewes or nannies that are dry or in early and mid pregnancy have lower nutritional requirements providing greater feeding flexibility. The challenge of managing lactating animals with their young has prompted many contract grazers to opt for adult females that are without lambs (dry ewes) or for castrated males (wethers).

Several management strategies such as early-season lambing followed by early weaning and fall lambing have been tried to manipulate breeding or lambing time so that only mature ewes or nannies are available for summer vegetation management programs. In a traditional sheep operation, ewes are bred in the fall, lamb in the spring, and lambs are weaned in late summer or early fall. Many breeds of sheep and goats are seasonally anestrus, meaning they don't cycle and can't be bred during certain times of the year. Shorter days and cooler temperatures signal breeding times, and most will enter breeding condition and be able to conceive between late summer and early winter.

Lambing and kidding typically occur in mid to late spring in the northern regions and in early spring in southern regions. Success in changing these times requires careful planning and management. Managers have two options, early-season and out-of-season lambing or kidding.

Early-Season Lambing and Kidding

This strategy involves lambing or kidding between January and mid March. Gestation lasts about five months (145-150 days), so animals must be in good breeding condition by late August or September to accomplish this strategy. Weaning lambs at two to three months of age makes ewes ready for vegetation management projects by April or May.

Advantages of early-season lambing or kidding include:

- Reduced predation risk and easier flock management because of the absence of lambs and kids.
- Fewer labor conflicts between lambing and other ranch activities.
- Reduced nutritional requirements for the herd or flock allowing for contracts on lower quality forages or where intense stocking rates are required.
- Potential for better prices by marketing lambs or kids when supplies are limited or to meet ethnic holiday demands.

Disadvantages include:

- Increased housing and facilities to protect young animals from winter weather.
- Increased need for winter feed or high quality shrublands for foraging when nutrient requirements are high for lactating animals.
- Increased labor for shed lambing or kidding compared to range-based approaches.

Early Weaning

Early weaning strategies in sheep are fairly well established. As a general rule, lambs can be early weaned at 60 days of age or 45 pounds with minimal problems. Some individuals wean lambs as early as three weeks of age. More information on early weaning is available in "The Sheep Production Handbook."

Advantages of early weaning:

- Dry ewes or nannies available for grazing projects earlier.
- Decreased predator risk by having dry ewes on the grazing project.

Disadvantages:

- Increased management skills by the livestock owner.

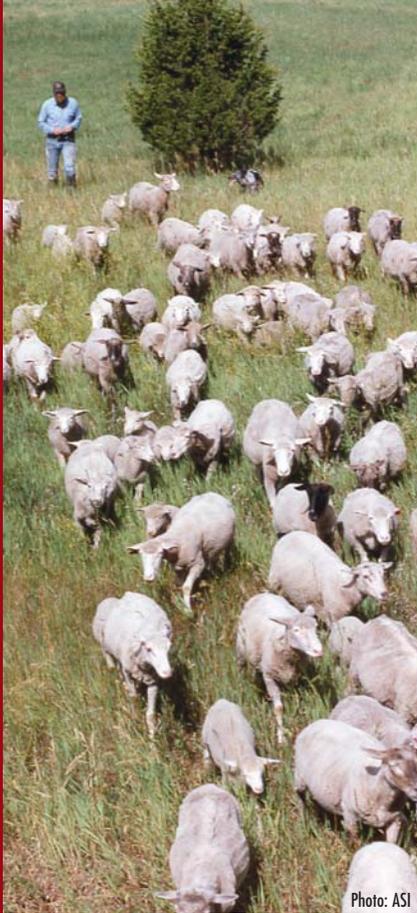


Photo: ASI



Photo: Karen Launchbaugh, University of Idaho

- Increased costs for harvested feed.
- Lambs not exposed to noxious weeds so training is not occurring.

Out-of-Season Lambing and Kidding

Considerations for employing out-of-season lambing are similar to those for early-season lambing. Out-of-season or fall lambing and kidding can require significant technical input to be successful, such as administering hormones or artificially controlling day length. Information on out-of-season breeding and lambing is available from local extension specialists or ASI's "Sheep Production Handbook." Breeding plans that deviate from the traditional lambing or kidding season need carefully developed business plans with economic justification. Plans should be sufficiently researched to assure they're biologically possible. The Hettinger Research Extension Center in North Dakota has developed a fall lambing management calendar that explains the requirements (for more information email HREC@ndsu.edu).

Animal Handling and Control

Using sheep or goats for targeted grazing requires careful and accurate control of grazing location and intensity. As the numbers of sheep operations have declined over the last 20 years, fewer people have experience raising and handling them. Even though many

ranches in the Western United States once raised sheep or goats, few current owners and managers have experience with these livestock. Adding sheep or goats to an existing cattle ranch will require modification of fences, shelters, and working facilities.

Prescribed or targeted grazing projects require attentive, well trained herders who can remain with the sheep, living in a camp wagon or camping near the animals. Herders control where the animals graze, how much they consume in a given area, and where they drink or bed down. Where grazing is limited to smaller areas, and more precise control of animals is needed, some type of fencing (often in the form of temporary electric fence) may be required to contain the animals. In large unfenced areas, where precise and heavy utilization levels are not needed to achieve the vegetation management goal, herding can be used to control grazing. Several factors will determine the size of the herd or band. Steep, heavily timbered terrain with little water is best suited for yearlings or smaller bands (around 600 mature animals). Relatively open country with good water and an experienced herder can accommodate larger bands (up to 1,500 ewes or nannies).

Herding Strategies and Tips

The following tips on animal handling and control may be useful for both experienced and inexperienced managers. A herder's day typically begins at daylight



Photo: Jodie Mink, Idaho Rangeland Resources Commission

when he or she pushes the sheep off the bed ground and drifts them in mass toward the day's intended grazing area. The herder checks the band for sick animals or any missing from the previous night. After returning to camp for a quick meal, the herder then returns to check the location of the animals and to keep them from heading to water too early. Before lunch, the flock or herd is allowed to drift to water for the hottest part of the day. The herder can then return to camp for a noon meal and afternoon nap while the animals rest and ruminate. In early afternoon, the herder gets the sheep moving for afternoon grazing. Depending on the heat, this may last until late afternoon, when the herder will slowly drift the animals back to the night's chosen bed ground, bedding them around dusk. During mid summer, the workday can last from 4 a.m. to 11 p.m. As the summer gets hotter and drier, the band will awake and graze early, spend most of the day resting, and graze late into the evening. Many weed-infested areas are heavily timbered, complicating tracking and moving the animals. Herding dogs and horses are essential when moving animals and navigating rough terrain. This means that provisions must be made for guard and herding animals. It is important to store dog and horse food in bear- and sheep-proof containers.

Well-sited bed grounds can alleviate many problems. The herder should place camps in areas with good fields of view and above the bed ground so that sheep wandering at night will awaken the dogs. The camp can

be placed away from the bedding ground if the herder has good guard dogs and the area has few predators and little timber. To minimize predator attacks, bed the sheep away from creeks on small open hills. Make sure they're full in the evening to reduce night wandering, and remember that yearlings tend to be restless at night, especially during a full moon. The herder may opt to pitch a small tent near bed grounds distant from the camp trailer to be nearer to the stock at night.

Bed grounds and camps should be moved at least every three days. Set the date for moving the camp several days in advance, then move on that day. Timely scheduling helps the herder effectively plan grazing paths. Provide the animals with salt and mineral mix on the bed grounds in troughs.

When starting a grazing project, several considerations must be addressed before the sheep arrive. Who will tend and move camp, and how often? When and from where will the sheep arrive and depart? Where is the available water? Does the land manager or herder prefer horses or four-wheelers to assist in moving stock? What will be the predator management program? Herders should be provided with cell phones and local contacts for emergencies. And they should have reliable maps of the ranch listing water holes, fences, and roads. In short, to encourage herders to perform well, give them respect and the resources to do the job.

In small areas, some grazers have combined extremely intensive herding with night penning to manage sheep or goats on a grazing project. Night pens are usually well constructed conventional or electric fence. It is not unusual to have additional herders managing fewer sheep or goats on small or marginally fenced acreages.

Fencing Options for Animal Control

Fencing requirements will depend on the species and breed of animal and type of project. The typical western whiteface ewes of predominantly rambouillet ancestry may be the easiest to confine, mainly because of their gregarious nature. Dr. Scott Kronberg, a TEAM Leafy Spurge scientist from North Dakota State University, documented that most sheep breeds are acceptable as vegetation control animals, but speckled-face and black-face breeds tend to be more aggressive grazers and less gregarious. Goats typically require more and better fencing because they are more aggressive and athletic grazers than sheep.

Tight woven (net) wire fence is standard for sheep and goats and the most desirable, although horned goats can cause some problems. These woven wire

fences also provide some protection against predators. They are, however, rather expensive. Many sheep producers have chosen to utilize single-strand fences. A minimum of four tight and properly spaced strands of barbed wire are needed to control sheep (four strands will only provide marginal control). Wire spacing, starting at the ground, should be 7, 7, 10, and 12 inches for four-wire fences and 6, 7, 9, 10, and 12 inches for five-wire fences. That makes the four-strand fence 36 inches tall, probably not high enough for cows. The five-strand fence at 46 inches should be adequate for most animals. With an existing four-wire fence designed to confine cows, it may be easier to add two new wires than to move existing wires to meet the spacing needs for controlling sheep in a five-wire application, especially when lambs are present. A secure six-wire fence, adequate for sheep, cattle, and some goats, can be spaced at 5, 6, 7, 9, 10, and 12 inches, giving a top wire height of 49 inches. A six-wire fence provides excellent control even when the pasture adjoins regularly traveled thoroughfares. In many more confined situations producers have gone to smooth wire because of the potential for injury to livestock from the barbs.

Land managers who use sheep or goats to control invasive plants on land previously grazed with cattle should consider re-fencing areas at the bottoms of washouts, draws, or thickets. Smaller species may find escape routes that were inaccessible to larger species.

In pastures where fencing already exists but is inadequate for sheep and goats, it may be more economical in the long run to build new fence to meet livestock enclosure needs. When a producer or land manager is willing to make this level of investment, such commitment should be documented and the grazing plan developed based on a longer-term approach.

In small pastures, electric fencing may provide some protection from predators, although that's usually minimal and should not be relied on as the primary protection. In some cases, it may be effective to add two electric wires to an existing barbed wire fence, one between the two bottom wires and the other between the second and third wires from the bottom.

Another application for small pastures is high-tensile electric fence, which can be erected quickly at low cost. While electric and high-tensile fencing work well in smaller pastures, they don't work as well for more extensive areas because of the challenges of retaining power over long distances and keeping the system functional. Adequate voltage must be maintained along the entire length of the fence, which requires a good charger and proper installation. A minimum charge of 3,000

volts is usually required to contain sheep. In many cases additional voltage will be required. If the charge is sufficient and consistent, sheep and goats can be trained to respect electric fences. Proper construction of electric fence is essential for satisfactory animal control. Those considering electric fencing should work with reputable companies experienced with sheep and goat fencing.

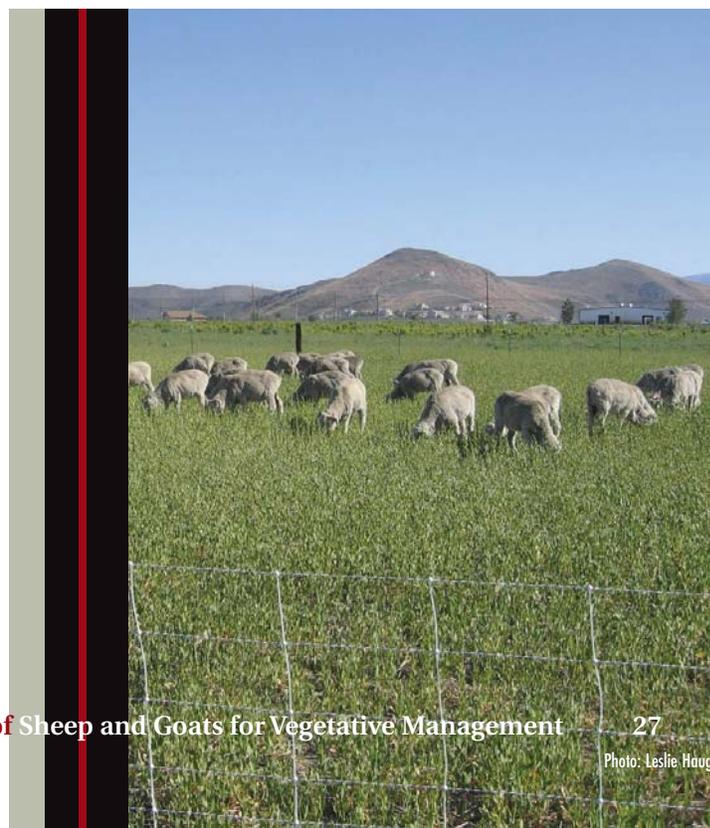
Another option is three- or four-strand polywire electric fence. It can be rolled up, transported, and erected on portable electric fence posts. Polywire fencing also comes in a net form that can be highly effective in small areas. The net wire can be gathered section by section and then expanded like an accordion to fence an area.

Minimizing Losses to Predators

Predators pose a major threat in many prescribed grazing projects. Coyotes are usually the biggest concern, but producers must beware of foxes, bobcats, wolves, bears, mountain lions, and domestic dogs. Several tools (lethal and non-lethal) can help producers mitigate predation. The degree to which such tools can be employed will often determine the economic cost or risk predators impose on an operation.

Among the non-lethal management tools are penning stock at night, predator-resistant fencing, guard animals, and modifying the production cycle so that only mature animals are used in vegetation management projects.

Because most predator attacks occur at night, corraling animals in a secure area can reduce predation.



Locate corrals near buildings, lights, and human activities to discourage predators. If losses are high enough, fences designed to exclude predators may be needed. Exclusion fences can reduce livestock losses to coyotes, but no fence is coyote proof. Electric fences are the most economically feasible, either as new fences or electric strands added to the outside of existing fences. Keep in mind when building the fence that coyotes prefer to crawl under or through a fence than over it. Net wire fences can also keep predators out of corrals and pastures. It is important to remove or bury dead animals, covering carcasses with hydrated lime and then with soil. Most predators can smell carcasses from long distances. Leaving carcasses in pastures or open pits not only teaches predators to associate livestock with food, it encourages them to congregate near livestock.

Guardian animals – guard dogs, llamas, and donkeys – can also deter predators. Guard dogs work well in open range and larger pastures, while llamas and donkeys are often most effective in fenced pastures smaller than 300 acres. The appropriate species depends on the specific setting and the breed or individual animal. All

three species can be trained or raised to “adopt” a flock of sheep or goats as their own and will go to great lengths to protect them. For the best results with dogs, they must be raised with sheep or goats from the time the dogs are eight weeks old. Treat them as working dogs, not as pets. Common breeds of guard dogs include Great Pyrenees, Komondor, Anatolian Shepherd, and Akbash. As with dogs, llamas and donkeys need a period to adjust to the flock or herd they will be protecting. Guarding skills will vary among individuals. For more information on selecting and managing guard animals, consult the “Sheep Production Handbook.”

Address predation problems quickly. Once a problem develops, it will continue until actively resolved – it won’t go away on its own. It may involve removing the offender, which can be a problem with attacking domestic dogs that are usually someone’s pet. For assistance with predation problems, consult with local animal control officers or the U.S. Department of Agriculture’s Wildlife Services.

Minimizing Seed Transport

Prescription grazers should be sensitive to the potential for spreading the seed of noxious weeds. The seeds are rarely dispersed in the wool. Grazing typically occurs during the summer when fleeces are short and unlikely to pick up many seeds. Seeds that are picked up will become embedded in the fleece and remain there through shearing. One study confirmed that there is little risk of spreading leafy spurge through fleece contamination.³

The rate of passage and viability of noxious weed seeds consumed by sheep or goats is very low. Still, some viable seeds may pass through the digestive system.⁵ Chewing or partial digestion renders most seeds unviable. The longer the seeds remain in the sheep’s digestive system the greater the possibility of digestion. Research at Montana State University showed that less than 20% of leafy spurge seeds ingested by sheep escaped digestion.² Most of the undigested seeds were passed in the first four days after ingestion, and all were passed by day nine. Seed viability decreased from 40% one day after ingestion to 0% after five days or more. One study⁵ found that sheep no longer passed viable seed of spotted knapweed seven days after consumption.

Several strategies can retard the spread of viable weed seed. One is to graze the weeds before seed set. If stock consume seeds, place them in drylot or weed-free pasture for five to seven days after the animals have been removed from the seed source before moving them to non-infested areas. The animals could be moved to a small area where any new weeds from seed-contaminated feces can be managed with herbicides, remembering that the viability of any seed passed in the feces has been vastly reduced.

Spreading noxious weed seed to uninfested areas by ranch vehicles and four wheelers is as great a concern as spreading the seed by livestock. The undercarriages of vehicles should be cleaned after being driven through weed-infested areas after seed set.

Financial and Operational Considerations

Land managers exploring the addition of a targeted grazing enterprise must learn new skills for managing both livestock and capital investments. Adding such an enterprise requires equipment, facilities, and management expertise for day-to-day operation. With this increased responsibility, the land manager accrues the profits from the sale of lambs, kids, wool, or mohair. The land manager has other options. One is to form a cooperative to own and manage the enterprise. A second is a share rental agreement where a sheep or goat owner partners with a land manager needing vegetation management. A third option is to contract with a professional prescription grazing service provider who will meet grazing specifications for a contracted price. All three options have potential benefits and each requires the land manager to contribute a different set of resources.

In a cooperative, members typically hire a competent manager to provide day-to-day labor and management. Such an arrangement requires minimal involvement from the land manager, who can count on the cooperative staff to provide the husbandry needed for success. In a share agreement, the land manager leasing the sheep or goats would need to be more involved in animal management. At least one of the partners needs specific expertise with sheep and goats as would any partner handling day-to-day responsibilities. A land manager employing a contract grazer needs to negotiate the specific terms of the contract (*see chapters 16 and 17 in this handbook for more information*). Contract grazers, for a pre-arranged service fee, typically will supply and manage the animals and provide the equipment needed to meet the agreed-upon vegetation standards.

Capital investment is handled differently under each grazing scenario. A land manager who buys animals and conducts the grazing assumes the capital investment. A cooperative allows several people to own the animals, facilities, and equipment, and it spreads the risks and rewards of the venture among all the owners. A shared agreement is typically between a livestock owner who provides the stock and a land manager who provides most other inputs. The investment is reduced for each partner, and risks and rewards are shared according to the percentage of their respective inputs. With contract grazing, the land manager assumes no capital investment. The grazing service provider, who is paid by the land manager, supplies the animals, equipment, and facilities and, ideally, is insured and bonded to assume the risks under the contract.

Cooperatives and share agreements can apply to both small and large targeted grazing operations. There is an important difference: the cost of establishing the agreement. By law, a cooperative has many requirements. A share agreement can be as simple as the two parties wish to make it. Two publications can help land managers assess the risks and rewards of each scenario. “Feasibility of a Sheep Cooperative for Grazing Leafy Spurge” addresses the feasibility of forming a large-scale cooperative to own sheep and related facilities for leafy spurge grazing.⁴ “Sheep on Shares” details strategies for two parties to negotiate a share rental agreement for sheep production.¹

Cooperatives, leasing agreements, and contracts all differ in investment costs, risk exposure, and tax implications. Evaluate each in the context of desired outcomes and each participant’s financial situation and explore options with a financial advisor.

PUTTING IT ALL TOGETHER TO ADDRESS VEGETATION MANAGEMENT PRESCRIPTIONS

Land managers should be aware that using sheep or goats to manipulate vegetation is a long-term treatment that can achieve long-term effectiveness when prescriptions are properly applied. The first year will seldom run smoothly – the herder may be unfamiliar with the terrain and the sheep may be untrained on the target plant. But skill and patience can overcome these.

The key to success lies with a skilled herder who understands that the sheep are being used as a vegetation management tool. When the target vegetation is grazed to the prescribed level, animals should be moved to the next area. The herder should never attempt to remove 100% of the target plant. For example, it can be effective to “remove the yellow” from leafy spurge or to “hedge the top” off knapweed. The herder should pay close attention to the desirable forbs and grasses to keep them from being overgrazed. It may be more important to assure that desired species are not overused than to attain a certain degree of use on the target plant.

Targeted grazing with sheep and goats can be a powerful tool to manage vegetation. Success on the ground starts with a healthy, well managed herd or flock and effective planning to address key questions: When to breed? Herding or fencing? Guard dogs, donkeys, or llamas? How to minimize seed transport? Cooperative, share agreement, or contracted grazing service provider? A successful targeted grazing enterprise is built on maintaining a productive flock and making good decisions to manage grazing.

Proper management of all aspects of animal husbandry, including nutrition, supplements, breeding, health, and preventative maintenance, is essential for a successful grazing project. The “Sheep Production Handbook,” the local county extension service, and large animal veterinary practitioner are important sources of additional information.

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