SECTION IV: Applying Targeted Grazing

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CHAPTER 16: A Primer for Providers of Land Enhancement

By An Peischel

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10 KEY POINTS

- Targeted grazing is a business — service providers must earn a profit or it won’t work.
- Landscape goals should embrace all aspects of the ecosystem — biological and environmental.
- Creating a business plan is a priority for setting goals and objectives.
- Site inventories are critical for preparing an efficient plan of work.
- Healthy animals are necessary for the success of any land enhancement endeavor.
- Equipment for targeted grazing projects can be extensive and its upkeep expensive.
- Effective livestock guardian animals are of utmost value in extensive, isolated, and predator-infested habitats.
- Catastrophes can strike at any time — preparation is panic prevention.
- Hiring and keeping good employees is a major challenge in targeted grazing projects.
- A written contract with a land manager should be agreed upon before a project begins.
INTRODUCTION

Land enhancement can encompass rejuvenating lands, creating firebreaks, reducing fuel loads, abating weeds, improving wildlife habitat, restoring streams and stream banks, cleaning the land — the list goes on. Likewise, the range of potential landscapes for enhancement projects is vast, from farmland to rangeland, from orchards to forests. Many tools are available for land enhancement projects, but carefully controlled livestock grazing is being harnessed more frequently for these activities. The key point for the service provider (the livestock owner) is that enhancing landscapes with targeted grazing is a business. The potential for ecological value from the grazing service cannot be achieved if the service provider cannot profit from the endeavor.

Land and livestock managers engaged in landscape enhancement must maintain biodiversity, understand plant physiology, maintain soil health, and be empowered to make decisions that are environmentally, economically, and socially sound. The management goals for land enhancement must embrace all aspects of the ecosystems — biological and environmental — with project success centering on planning flexibility. In essence, the grazing/browsing service provider is utilizing the natural energy from the sun to accomplish landscape goals. To utilize this natural energy flow efficiently, the service provider dictates the season and timing of treatment and the livestock species to be used for grazing and browsing for a specific project area and target plant species.

Before starting a project using sheep, goats, or other livestock as land-enhancing tools, several assessments must be made. First, the landowner should set a land management goal and describe the final goal for the landscape. This should then be discussed with the targeted grazing service provider. An effective service provider conducts an initial site analysis, stays in communication with the landowner, and makes the final decision as to whether livestock are the best solution to attain the landscape goal. A service provider must be skilled at managing both land and livestock production as well as managing a business. What follows are some major considerations that can facilitate success.

Business Plan

The most important first step for any business venture is a plan. Without a plan, a business won’t know where it is or where it’s going. A financial plan will help incorporate enterprise evaluation into business decisions. It will generate a profit and loss statement showing gross margin based on gross income and variable and fixed expenses. The planning process will provide the flow, allocation, and value of the different classes of livestock in before-and-after inventories. Planning also involves conducting research and making important first-hand contacts.

Why bother with a business analysis? Because it can show the gross revenue generated for each business segment within the plan, which will help in achieving consistent, predictable production. It will show the cost of generating the revenue and the net profit for each business segment. And it will show whether a reasonable return was obtained for time invested, allowing an assessment of effectiveness and possibly providing information that might lead to the pursuit of other options.

Planning requires developing goals and objectives for the business. The goals of a land enhancement business should be realistic and attainable, and the production management should be sustainable. The business must be marketable, economically feasible, and able to serve the needs of prospective clients.

Site Analysis and Description

For the land enhancement service provider, conducting a quality assessment of the plant communities on a site is critical to the success of the business. The assessment should yield a graze/browse preference list including the time of year the livestock are most likely to select or prefer the target vegetation in the area and the class of livestock most suited for managing the site. Plants targeted for removal must be described and poisonous plants and their toxins identified. Soil textures and their infiltration and percolation characteristics must be understood to address potential erosion.
Sites will need to be monitored with an initial set of monitoring points. Vegetation utilization can be measured and observed with photos, plots, and transects. (See Chapter 5 for additional detail on monitoring.) As part of costing out the project, the service provider will need to know how much biomass is available for browsing or grazing. A site's history should be researched, including livestock usage, as a reference for disease potential (e.g., blackleg, leptospirosis, listeria, and caseous lymphadenitis) or contaminants in the soil (e.g., herbicide and pesticide residues) or water (e.g., excessive nitrate and sulfur, salmonella, and *Escherichia coli*).

A base map of the area will show specific sites being considered for land enhancement. The map should include the perimeter, topography, and ecological constraints and exclusions. This will help in understanding fire ecology and identifying shelter options during bad weather. Service providers and their clients must understand and carefully follow wetland regulations, EPA (Environmental Protection Agency) and NEPA (National Environmental Protection Act) requirements, the Endangered Species Act, and Fish and Game Conservation Corridors. Neighbors and adjacent landowners should be briefed fully on the plans for using livestock to enhance land. (For more information on site analysis, see “Primer for Land Managers” – Chapter 17.)

**Overview of Operations – What It Takes to Make It Happen**

**Animal Health and Well-Being**

Healthy animals are an asset to any land enhancement endeavor. The priority for the service provider is animal welfare and issues related to the health and well-being of livestock. That includes a health maintenance program, a current internal parasite assessment, and the assurance that no known transmissible diseases are present. Another priority is to establish each animal’s body condition before the project begins and to monitor it regularly throughout the project. If the score falls below an established mark, individuals should be removed from the group or, if necessary, supplemented separately with a high quality forage or ration. Sheep are generally evaluated on a 5-point scale and should have a score of 2.5 to 3 at the beginning of a vegetation project. In general, goats should have a body condition score of 6 at project initiation (the maximum is 9) and not drop below a 4.

The provider must also select the correct species, breed, age, and class of livestock for the targeted land enhancement venture. Animals adapted to the environment, vegetation community, and topography are assets as are animals with experience on previous projects.

**Containing and Handling Animals**

Fencing and herding, or a combination, are the two practices most commonly used to handle livestock for vegetation management. Portable solar-powered polywire electric fencing allows mobility, flexibility, and time confinement on target vegetation. Various types of electric fencing are available; the choice is up to the provider and depends on the specific goal of the landowner. The most important component of electric fencing is the energizer and the grounding system of the energizer and the fence. Depending on the landscape, setting up the fence requires tools like a chainsaw, weed eater, machete, tree pruner, and rope. Here are some other considerations for managing the livestock:

- Portable welded stock panels can assist in loading and unloading trucks and trailers.
- When herding livestock, one or more horses and all pertinent gear are often required.
- Herding dogs are an absolute necessity. The breed should fit the environment and the nature of work expected. Dog food should be of high quality, both in energy and protein. It is important that dogs be fed regularly and excess food removed to ensure that sheep and goats are not tempted to eat it.

**Water Requirements**

Water is critical to any project. Sheep can consume up to 2.5 gallons of water a day and goats up to 1.5 gallons when it is hot and dry or the vegetation is decadent and stemmy. Fresh, potable water should be available at all times in easily accessible troughs. Water supply location should be specified on base and site maps so the provider knows whether portable or fixed storage tanks are needed. The type of water supply available will determine its method of distribution (siphons, solar pumps, gravity, etc.). Knowing water sources also can aid in rapid fire suppression.

**Equipment Needed**

In a business venture involving livestock, the amount of equipment needed can be extensive and the upkeep expensive. The targeted grazing service provider typically will need a living facility for herders, water tankers, water troughs and hoses, ATV and wagon, dog kennels and feeders, portable fencing and related materials, portable shelters for inclement weather, mineral/supplement feeders, an array of small hand tools, and tools for machine and engine repair.
Transportation will be needed for the livestock, dogs, employees, and gear. Livestock trailers, portable corrals, and loading facilities are also essential.

**Livestock Guardian Animals**

Effective livestock guardians are of utmost value when working in an extensive, isolated, or predator-infested habitat. In some areas, the most dangerous predators are domestic dogs that have joined as a pack to kill for the thrill. Guardian species and breed will depend on the class of livestock to be protected, topography, type of predator (nocturnal or diurnal), and setting (rural or urban). The age, level of experience, and number of guardians needed should be based on species and aggressiveness of predators, herd size, and animal herding or fencing practices. Livestock guardian dogs under two years old should not be required to put their lives on the line for livestock. They need time to gain experience from a skilled mentor and should be used as visual backup until they are at least two. As the number of guardians increases, each will find its niche in the working scheme of the herd or flock. Each dog’s duty within the mob should be understood before a dog is added to or removed from a functioning group.

As with herding dogs, guardian dogs should be fed high energy, high protein food daily in their own feeders, spaced apart, to prevent squabbling and ensure that sheep and goats do not consume dog food.

**Supplements**

Grazing or browsing animals may need to be supplemented with protein or energy, depending on the deficiencies in the vegetation, desired plant utilization, body condition, weather, and topography. A balanced, chelated mineral and vitamin mix containing less than 10% salt should be available free choice at all times. A base mix can be formulated and individual ingredients added as the chemical composition of the vegetation changes. Sea kelp meal supplies many of the micro elements needed to stimulate the immune system and effectively utilize other macro mineral elements. The mineral and vitamin mix and products like sea kelp meal should be provided in separate all-weather feeders.

Horses, llamas, or donkeys used as livestock guardians may need supplements if the available vegetation is a forage type they normally would not consume. For example, donkeys or horses may perform well as guardians in brushy country, but they do poorly on browse, preferring grass instead.

**Crisis and Catastrophe Preparedness**

A catastrophe can strike in an instant, be it from fire, weather, natural disaster, or improper management. Preparation is panic intervention. The service provider needs a contingency plan for various events that can arise and the ability to plan and re-plan in light of subsequent events.
As a minimum, a contact and emergency notification list should include all individuals involved in the project, neighboring communities, local authorities (i.e., police, fire, and animal control officers), truckers with the ability to remove livestock on short notice, a radio operator monitoring the fire response team, and the humane society.

**Insurance**

Because a catastrophe can occur at any time, insurance is a necessity. It is vital to carry enough insurance and the correct type of insurance to avoid losing the operation. In addition to consulting a farm insurance agent, legal counsel should be obtained. Each provider will be working under specific conditions that change with each project. When consulting with an insurance agent or legal counsel, the following items should be considered. These are only recommendations; professional advice should be sought when appropriate.

A **Comprehensive General Liability** insurance policy should be purchased. **Broad Form Property Damage** coverage will be based on “what if” a specific situation arises. The probable occurrence of property damage and type of damage that may be sustained is determined by the land enhancement service provider during a site analysis. These concerns should be discussed openly with the client to reach a consensus and purchase a policy that satisfies both parties.

**Livestock and Full Mortality** insurance covers the animals working on the vegetation and their guardians. Such a policy should cover the replacement value of the animals plus the time and monetary value of lost browsing or grazing for interrupted projects.

**Workers Compensation and Health Policies** are determined by: a) whether the service provider is a private contractor, b) whether the client has specific demands specified in the contract, c) individual state regulations, and d) pending federal requirements.

**Equipment** owned should be insured, including coverage for third-party drivers. Equipment includes, but is not limited to, trucks, trailers (with contents covered), ATVs, RV or camper trailer, and fencing materials.

**Third-Party Firefighting and Fire Suppression Expense Liability** coverage should be considered. When the project involves reducing fire fuel loads, opening defensible spaces, managing ladder fuels, and creating firebreaks, third-party fire insurance should be secured.

**Labor**

Acquiring and keeping good workers has been a major weak link in the land enhancement business. Before prospective employees are interviewed, the service provider should know the experience and knowledge level employees will need to do specific projects. A site analysis can help determine the number of employees required, the employee knowledge and experience base required, and the salary structure (hourly, daily, monthly, by project, etc.). Costing employees into the business plan should include food allowance, transportation (pickup, ATV, horse, and gear), accommodations (travel trailer, RV, portaloo, etc.), other items (cell phone, first aid kit), and the insurances discussed earlier.

Each employee needs a job description to know what’s expected. Potential employees need a chance to digest what the job requires so they can make a valid decision. These expectations will provide the basis for the performance evaluations that will determine job security and pay raises.

The employee and employer should read and discuss the contract together. Then each should sign the agreement in good faith. The contract should include the location of the project(s), time or season of year, duration, and whether the project has job requirements not included in the employment contract. Details for the project may need to be specified as an addendum to the contract. Salary should be specified and indemnity and release clauses included. Indemnity clauses will vary by state, but the work to be accomplished must be identified in the contract. A lawyer should draw up all legally binding contracts or agreements.
Contract and Services Negotiation
Considerations

A targeted grazing service provider needs a written contract with the landowner (private, organization, government agency) before any land enhancement is started or livestock moved. The landowner should specify in the contract the exact location of the project and provide clearly marked perimeters, information that will determine the dynamics and approach. Specific project goals should be clearly described – abating weeds, reducing ladder fuel, creating firebreaks, restoring ponds, suppressing vegetation. The project goals and site characteristics dictate the number of livestock needed and the breed, age, and class of individuals. Start and end dates should be specified. The lead time for land enhancement contracts can range from two weeks to a year. The time the stock are inclined to eat specific plants will vary through the year, depending on the species of livestock used and the physiological state of the vegetation. To work successfully within a vegetation time frame, an extension or renewal clause agreeable to both parties should be included. This will allow the provider, if necessary, to return to the site several times within a growing season to attain the client's desired landscape.

Fee assessment can be designed creatively for each project and should include a non-refundable setup and delivery charge. A payment schedule, with specific dates and details, should be negotiated along with a specified lead time. The indemnity clause and the work to be accomplished must be defined within the contract. Even though good faith and good management practices will be attempted, animal welfare takes priority.

Contracts and the services offered under those contracts are site specific. Here are some other important items to consider when negotiating a contract:

- Specify the exact name of the land manager and the service provider and include business addresses and phone numbers.
- Identify all local, county, state, and federal environmental legislation, regulations, guidelines, and standards to assure compliance.
- Detail rules regulating any subcontractors.
- Determine terms relating to possible contract suspension or termination.
- Firefighting costs incurred to extinguish a fire not caused by the service provider are the responsibility of the land manager.
- The agreement date and work commencement date should be in writing.
- A security deposit should be retained or withheld to ensure project completion. The deposit should be held in an escrow through a bank, lawyer, or real estate officer.
- The grazing service provider assumes risks and dangers based on the nature of the operation, but any negligence of the land manager is the manager's responsibility and liability.
- Contracts can be suspended or terminated for various unforeseen conditions beyond the control of either party. An agreement, in writing, should designate the number of days before stock need to be removed from the project under unanticipated circumstances.
- If the costs of performing the work increase after the project has started, both parties can agree, in writing, that the additional costs be covered by the land manager or the contract can be terminated.
- If the land manager determines that the acreage to be treated is less than originally stated, the manager is responsible for costs incurred by the service provider.
- The vacated vegetation treatment area should be left in acceptable condition.
- When working in areas with predators, protecting human life is paramount. If firearms are used for protection, they should be lawful and the individuals using them qualified and licensed.
- In a commercial forest or re-forested plantation, the number of trees per acre required to attain a healthy stand as required by the land manager should be known. The condition of the conifers (seedlings) should be monitored and the livestock managed accordingly.
- All conditions regarding water sources (lakes, streams, buffer strips) must be in writing.
- Ready access to high quality water is a major human resource concern.
- An indemnity clause included in the business agreement or contract should be spelled out by legal counsel in the state where the project is conducted. An indemnity clause is engaged to save another from a legal consequence of the conduct of one of the parties or of some other person. It generally obligates the indemnitor to reimburse the indemnitee for any damages. A contract as well as the intention of the parties is binding, so the work being done should be spelled out explicitly in the contract.
TAKE HOME MESSAGE

The targeted application of livestock grazing and browsing holds great potential for accomplishing landscape enhancement. The targeted grazing service provider faces two major challenges in this endeavor: meeting landscape goals and simultaneously running a successful business. Both are essential and require expert knowledge and skill to accomplish. On the one hand, knowledge of vegetation, soils, and animals is required to accomplish the prescribed landscape enhancement goals such as managing weeds and reducing the risk of fire. On the other hand, business savvy and careful financial planning are required to stay in business and continue offering landscape services.
Additional Resources


Nutrient Requirements of Sheep. 1985 - Sixth Revised Edition. The National Research Council publishes this reference book, which uses the latest research in sheep nutrition. Information on nutrient requirements, nutritional deficiencies, and feed quality requirements are presented for all phases of lamb, wool, ewe, and ram production.

Nutrient Requirements of Goats: Angora, Dairy, and Meat Goats in Temperate and Tropical Countries. 1981. Published by the National Research Council with detailed information about nutritional requirements of goats in various production systems. This volume is being updated for availability in 2007.
CHAPTER 17: Contracting for Grazing and Browsing to Achieve Resource Management Objectives: A Primer for Land Managers

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10 KEY POINTS

- Grazing for hire can be a powerful tool for changing and maintaining vegetative composition.
- Land managers should take the time to select the right service provider for the job.
- Targeted grazing is as much an art as it is a science.
- Land and livestock managers need a long-term commitment to alter landscapes.
- A land manager’s most important step is clearly establishing long-term goals.
- Open communications can foster harmonious relationships between service providers and land managers.
- Potential service providers need to conduct on-site tours and evaluations.
- Key elements for success are water, livestock placement, transportation, and equipment.
- Service providers must know the applicable regulations and obtain the needed permits.
- The land manager is responsible for determining whether targeted grazing is the right tool for a particular situation.
INTRODUCTION

Contracting for targeted grazing services is a viable option for land managers with significant vegetation management challenges. This primer is designed to help land managers evaluate whether targeted grazing services will work in their situations and, if so, how they can choose a qualified service provider. Thinking through the following ideas and gathering the suggested materials will help in picking the right grazing service providers for the job. Some of the following suggestions may seem obvious, others counterintuitive. But they should illuminate what targeted grazing services can and cannot do and whether a service provider has enough experience to do the job right.

This primer focuses on points to consider in contracting with a service provider for targeted grazing. It should help address basic questions about whether a grazing prescription is appropriate for a particular problem. It does not provide enough information to teach someone how to operate a contract grazing business or to manage prescribed grazing on a day-to-day basis. That requires greater knowledge than is found here.

Accomplishing Landscape Goals with Targeted Grazing Services

Over the past several decades, controlled, directed grazing and browsing by sheep and goats has evolved into a business. No matter what it’s called – targeted grazing, contract grazing, prescribed grazing, managed herbivory, ecological grazing services, or paid-to-graze – this type of grazing for hire is a powerful tool for changing and maintaining the vegetative composition and structure of a wide variety of landscapes. Grazing has been used effectively to reduce fire fuel loads, eliminate invasive and exotic plants, restore water tables, and clear and maintain land in open vistas. Potential applications are virtually endless, limited only by the imagination of land managers, landowners, and service providers.

Targeted grazing services apply grazing animals, under a fee-based contract, to control vegetation and achieve a specific desired plant community. Although grazing is often viewed as a way to remove undesirable plants, it is really a method for creating and maintaining the complex habitat conditions for a desired plant community.

Using the vegetative grazing preferences of animals like sheep, goats, and cattle, one can suppress or eliminate certain undesirable plants from a landscape and encourage other more desirable species. If a landowner’s management needs coincide with an animal’s grazing preferences, targeted grazing can be a powerful and cost-effective tool for reaching those land management goals.

For targeted grazing services to work effectively, however, the land manager must have a clear long-term vegetative goal. What should the land look like when it has been restored? This is the most important question that a land manager must answer for targeted grazing to be effective. Once the desired outcome is clearly known and described, a skilled service provider can employ the correct animal species and advise the best options to reach these landscape goals.

Effective targeted grazing is as much an art as a science, and the level of experience of both the contract grazer and the animals will be critical to long-term success. A good service provider will properly evaluate whether grazing will or will not work in a particular situation and whether complementary techniques are needed.

Site restoration using grazing entails two phases. The first is to suppress undesirable plants and restore a desired plant community. The second is to maintain that desirable community indefinitely. These two phases use different grazing approaches, take different lengths of time, have different costs per acre, and, in some cases, may even use different species or breeds of livestock.
Land managers interested in targeted grazing services must have an appreciation of the challenges that contract grazers face if they expect to develop an effective relationship with the service provider. The concept of targeted grazing is easy to grasp, but its implementation is logistically complicated and capital intensive. As opposed to other techniques like mowing or applying herbicides, targeted grazing requires daily care of livestock throughout their lives. Although a few operators have been able to survive a nomadic existence, moving from one job to another over a large geographic area, the future of contract grazing services will likely involve large, long-term contracts on contiguous or proximate land holdings of many hundreds of acres. In these situations grazing service providers can make long-term investments in equipment and animals, provide steady employment for qualified herders, and respond effectively to varying seasonal and annual growth patterns of the target plants. Under these circumstances, a provider can establish a “home farm” where animals can retreat in case of crisis and during winter awaiting the next grazing season.

With long-term contracts on large acreages providers can train workers and provide them with jobs. Such operations can invest in quality control and long-term results, which are essential for assuring that grazing is a reliable tool for land managers.

A challenge for the contract grazing industry is that too few land manager clients are willing to make long-term commitments on significantly large acreages. However, once land managers become familiar with the progress that can be made using livestock to control invasive plants, restore lands to native or desirable plant communities, reduce fire fuel loads, or any number of other applications, and they understand how best to choose a qualified service provider, the targeted grazing service community should grow and prosper.

The cost effectiveness of a targeted grazing service is determined by the value of the change in the vegetative community, for example, reducing fuel loads, saving water, restoring native plant communities, increasing forage yields of pasture, or opening up impenetrable brush for public recreation. The size of an area and the length of a contract make big differences in the service provider’s cost per acre. Targeted grazing is capital intensive. A service provider needs enough financial security over a long enough period to recoup the initial investment and make a profit. Land managers unwilling to offer such long-term contracts may have difficulty finding a reliable and skilled service provider. If too few acres are available to sustain a contract, pooling acres with other interested landowners in the immediate vicinity can generate a cost-effective contract. For this collaborative approach to work, the treatment areas must be close enough together to minimize transportation costs.

In most situations the current state of undesirable vegetation has taken many years to develop, and grazing prescriptions that address such problems will probably take several years to achieve meaningful results. While carefully targeted grazing can be highly effective for restoring vegetative landscapes, it is not a quick fix.

Creating a Targeted Grazing Service Plan and Contract

The most important step for a land manager is to clearly establish long-term goals. Without a description of what the land manager wants the land to look like – its desirable condition – the land manager cannot expect a grazing service provider to achieve the desired goals. The land manager and grazing service provider must develop a plan and agree on the terms of a contract, including when and where to graze. Trying to eliminate an invasive plant also requires determining what plant community should replace it. Knowing the desired appearance of the landscape is essential to a successful plan and contract, and it allows the land manager and grazing service provider to agree on measurable results. The strategies and tactics for achieving the desired vegetation or landscape outcome are largely the job of the service provider.

Working toward a shared vision of the goals, processes, and intended outcomes can foster a harmonious relationship between the service provider and the land manager. Many potential problems and disagreements can be avoided if the two parties discuss their respective visions at the outset. Writing down key discussion points can keep everyone on the same page and essentially creates the plan and contract. Developing a plan and contract may not be exciting, but it beats the heartburn and problems that can arise without them. Disagreements may still arise, but the process of developing a plan and contract should decrease potential problems. More importantly, communication during the process will help the parties more easily address issues.

Goals and outcomes should be described as measurable results, which will provide both parties with a clear understanding of how success will be determined.
Measurable results may take many different forms, but the best are based on easily determined quantitative or qualitative characteristics the land should possess when the contract is satisfied. Before and after photographs from fixed positions are often the most practical form of monitoring. Land managers may want to request pictures of previous contracts on similar vegetation types so they know what to expect. Remember the adage, “A picture is worth a thousand words.” More quantitative monitoring techniques can be used such as canopy cover, percent composition, biomass, stubble height, fire condition class, fuel load, and average number of plants remaining of the targeted species, but they can significantly increase the cost of the contract.

If neither party has experience with specific problems or circumstances, it may be difficult to establish measurable outcomes at the beginning. An experienced service provider will explain what he or she knows or doesn’t know about a specific problem. An experiment of a few weeks or months can help determine what is possible or practical. In such cases, a land manager needs to accommodate the service provider’s management needs and remain flexible with goals until a realistic outcome can be established.

**Site Description and Analysis**

Potential grazing service providers will need an on-site tour and evaluation. No reputable provider will take a job without seeing the site. The questions they ask will reveal a lot about them. The land manager should describe the treatment site and provide maps as described below so the service provider clearly understands the boundaries and other important characteristics. Lack of such information can hamper the provider’s ability to accomplish the objectives, cause bad relations, and even create liability. The land manager and service provider should inspect the site before the project starts to view issues of significance. A good map can show many of the site characteristics that should be described or analyzed. Here are several characteristics to consider:

**Boundaries.** A base map of the project area should show the perimeter of the area to be treated and any exclusion areas that should remain untreated. Fences or landmarks that delineate the property and treatment site should be noted (Map Figure 1).

**Topography.** The base map should provide basic information about topography, which can influence the behavior of grazing animals and must be considered when planning the treatment.
Vegetation. The overall vegetative composition of the property should be described and areas with target plants delineated. It’s important to list all of the known plant species on a site. A good grazing service provider will review this list and point out plants that may pose problems, like poisonous or threatened or endangered species.

Soils and Ecological Sites. Soils influence plant types. Knowing the soil properties on the site will help determine the existing vegetation and what plant communities are possible. Information on soils, combined with topography and climate, can help predict treatment-induced erosion problems. Soils are also the basis for ecological sites, formerly called range sites. Ecological sites delineated on the base map can provide much of the information about vegetation and potential plant communities (Map Figure 2). Soils maps delineating soils and describing ecological sites are available at the local office of the Natural Resources Conservation Service (look in the phone book under United States Government, Department of Agriculture) or on the Internet at the Web Soil Survey http://websoilsurvey.nrcs.usda.gov or Ecological Site Information System http://esis.sc.egov.usda.gov/.

History of the Site. A good history of land uses of the project site is helpful. Have animals grazed on the site before? If so, what kind, how long ago, and to what purpose? Several animal diseases can survive in the soil of grazed land for many years. Past problems with animals may also indicate the presence of poisonous plants.

Knowing past land uses, including soil contamination, agricultural uses, municipal dumps, and old settlements, can help the grazing service provider keep animals healthy and avoid problems or losses.

Neighbors and Other Users. Nearby landowners should be informed that animals will be used on the property and why they’re there. This can eliminate surprise and help avoid conflicts. The service provider should also be informed about ATV and hiking trails that cross the property and whether hunting is active on the site. The land manager should discuss how herders and others should respond to visitors and the kinds of signs or notifications that are appropriate. Keeping a service provider informed about these issues will go a long way toward avoiding problems.

Water. The site map should indicate water sources both on and near the property – streams, ponds, wells, and rivers – with a brief description of the water quality for each. The distance to off-site water and whether it is potable should also be noted. A good service provider will have water-hauling capability – tank trucks or trailers and water pumping and storage capacity – whether drawing water from on or off the site. Also, any wetland or water course issues related to animals drinking directly from them should be clearly indicated. Catchment areas, watersheds, and historical flood zones should be identified. If flash flooding is a problem in the area, the service provider needs to know this to plan escape routes.

Fire. What is the area’s fire history? How long since the last fire and what is known about fire behavior and the prevailing winds? Such information helps the provider plan escape routes and retreat areas.

Animal Welfare

The grazing service provider’s first priority is always the animals’ welfare. While the service provider is managing the animals to reach the desired vegetative outcome, results cannot be achieved if the animals are placed in danger. Situations may arise that force the provider to remove the animals for their protection. These may include fire, flooding, poisonous plants, or the lack of adequate forage. A good provider will anticipate many of these contingencies, but no one can anticipate all of them, especially concerning weather and fire. When such problems arise, both parties need to be prepared to determine whether animals can return and finish the job or whether the site has become unsuitable for targeted grazing or browsing.
Principle Requirements for a Project to Succeed

Water

Clean, plentiful water must be available on site or near enough to be hauled or for the animals to be trailed to it. If there is no on-site water, the land manager should help the service provider find a source for filling 500- to 1,000-gallon tanks easily and quickly.

Livestock Placement

How the animals are managed will depend largely on the target plant species and landscape goals. In some cases herding will be most effective. In others, temporary fencing will be needed. Palatability of the target plant, time of year, weather, and site conditions will also determine management. Some sites may be too rugged to fence, others so urban that fencing is the only solution. Requirements and particular preferences should be clearly stated.

Transportation

Moving animals to and from the site is critical. At least two avenues of access are needed. Can a large truck, semi, or gooseneck access the site easily? In the event of flood or fire is there a second means of egress? Does the vegetation plan require the service provider to move animals on and off the site repeatedly or can they be grazed continuously on the site for a month or more? Transportation can greatly increase a project’s cost so it may be helpful to design a plan so that when the first pass is completed it is time to start the second pass. This may require several hundred acres or more depending on rainfall and vegetation. With 100 inches of rain a year, kudzu grows back faster than does leafy spurge with 15 inches of rain a year.

Equipment

Equipment requirements will vary depending on terrain, number of animals, and weather conditions. Most grazing service providers will have adequate trucking for animals and water, good fencing and the means to move it around, pickup trucks, ATVs, maybe a tractor, tank trucks, water troughs, and portable handling equipment. Equipment needs also will vary by site, contract requirements, and vegetation goals. This is a capital-intensive business. Land managers should be skeptical of anyone who plans to show up with a couple of cattle panels and a pickup truck.

Theft

If theft is known to be a problem in the area to be grazed, the service provider needs to know so he or she can plan to prevent the loss of equipment and animals. Service providers cannot afford to lose expensive equipment like fence chargers, fences, or pumps. Such information can also protect herders from personal risk. Before the contract work begins, it should be agreed who is responsible for losses and who will pay for lost animals and stolen equipment. This also applies to losses from fire, flood, or other natural causes.

Crisis Management

As with any land management activity, things can go wrong. Crises will occur less frequently with an experienced service provider, and the degree of loss can be much less with appropriate planning and preparation. Again the conditions of the site make a big difference. Animals that escape from a pen in a rural area and start grazing tomorrow’s acreage do little harm, unlike animals in an urban setting that get onto a highway or devour someone’s garden. Emergency contacts should
be posted at the project site and all participants should
maintain a current contact list of local authorities and
emergency services. In the event of a crisis, the service
provider needs to get on site as quickly as possible. Cell
phone numbers of the herder and everyone up the serv-
ice provider’s chain of command should be available to
the land manager and to local police and animal control
officers so that if they are the first to be contacted they
can reach people who can solve the problem. It’s a bad
idea to have a local police officer trying to herd animals
in the middle of the night. Notifying key players before
the project begins can minimize surprise and confusion
and speed response times.

Fire
Fire poses a special management problem. An area
that has been heavily grazed is less likely to burn, but
the service provider will always want to remove animals
in danger. That is why it is important to know previous
fire behavior and to have two means of egress estab-
lished. In case of fire, evacuate personnel first, then ani-
mals, then equipment. When in doubt – get out.

Extreme Weather
Lightning, freak snowstorms, hurricanes, hail, and
floods are serious problems. A grazing service provider
will need a safe, fenced retreat area where animals
pulled from a project can go on short notice. Land man-
gagers may have better access to weather information
and should inform the service provider when bad
weather is forecast.

Regulations and Permits
A wide variety of local, state, and federal regulations
may or may not relate to targeted grazing services. Be
sure to review the following:

Wetlands Regulations and EPA, NEPA, and agency
requirements. Working with the U.S. Forest Service,
Bureau of Land Management, Park Service, or other fed-
eral land management agency requires compliance
with federal regulations and agency-specific policies.
State or county regulations may also apply.

Zoning Restrictions. In suburban or urban areas, a
variety of regulations relating to the presence of live-
stock within city limits may apply. The regulations can
be complied with or may be waived. But knowing them
in advance allows for obtaining the necessary permits
before the animals arrive.

Endangered Species. Endangered plants or ani-
mals, or their habitat, in the area targeted for vegetation
management may impose seasonal bans, stipulate
areas of non-use, or restrict specific activities. Federal
and state fish and wildlife agencies can explain area
requirements.

Livestock Health and Identity. Grazing service
providers should maintain and provide health records
for important communicable diseases. Animals that are
hauled across state boundaries must also be accompa-
nied by brand or identity records and meet state health
requirements.
Contract Details

At a minimum, a good contract will contain the following:

- **Where.** A detailed map that identifies the perimeter of the contract area and any areas within the overall area that should remain ungrazed. The land manager should clearly flag these exclusion areas before the contract begins and, if possible, before site visits with potential service providers.

- **Time Frame.** The service provider will determine the timing for achieving vegetation management goals only after a site visit. Contract duration will depend on weather, climate, condition of target plants, time of year, and desired outcomes. If multiple grazing passes are required, notification procedures should be worked out before the service provider returns for successive passes.

- **Up-Front Charges.** Nonrefundable setup and delivery fees are often specified in the grazing contract. For large contracts, a service provider may want one-third of the total annual contract up front to help defray project capital costs.

- **Payment Schedule.** Payment schedules are essential and should include set dates and explicit details of work completed. The land manager should inform the service provider about turnaround time on invoices – 10 days, 30 days, etc. Cash flow is critical to all operators. Late penalties are standard. Prompt payments keep grazing service providers happy and working hard to meet landscape goals. Slow or missed payments will aggravate the relationship.

- **Indemnity Clause or Bonding.** These requirements vary by state. If indemnity clauses or bonds are employed, the work to be accomplished should be clearly defined in the contract. This may include height, percentage of target plant remaining, level of suppression, or other specific vegetation condition. Such conditions or measures may not be possible to ascertain until after a season has shown how the target plants are responding.

- **Insurance.** All service providers should carry liability insurance and list the land manager as an additional insured. Amounts will vary by service provider (some carry as much as $2-3 million) but liability insurance should be a mandatory component of any contract. Service providers must also carry workers compensation insurance on all employees. A performance bond can be used but is not required by law.

- **Natural Disasters.** Disasters happen and can radically change the conditions of a contract overnight. These events can be covered in a contract with a ‘Force Majeur’ clause. However, goals can still be achieved after the dust has settled, even if it’s a year later, as long as parties are reasonable and work together.

Other Issues

**Lead Time**

Putting together large flocks, finding qualified herders, and assembling the necessary equipment takes time, especially with large contracts. The service provider will not begin this process until a signed contract is in hand. A lead time of two to three months is normal. For large projects, six months to a year is reasonable.

**Duration**

The parties should discuss and agree to the duration of a particular outcome. Vegetation often looks impressive right after the animals leave. In most cases it will grow back, so there should be an agreement as to how long the “new” condition will persist – 90 days, six months, a year, etc. Spelling that out protects the service provider and prevents disappointment for the client.

**Media Management**

In many cases, contract grazing will arouse a great deal of media interest. How to handle media queries should be worked out in advance. Is media attention an important aspect of the job? Who should field inquiries? How exposed to public scrutiny will the project be? Can herders handle the public’s questions? The service provider’s principal task is to accomplish the grazing prescription. Public information demands should not be allowed to hinder job performance. If considerable public interest is anticipated, the expected tasks and who will bear any expense associated with them should be written into the contract.
TAKE HOME MESSAGE

Land managers interested in incorporating targeted grazing as one of their land restoration tools should use these guidelines to determine if their situation is amenable to the use of grazing or browsing to help achieve a desired outcome and to evaluate the qualifications of potential grazing service providers. Make sure the knowledge or experience portfolio of the provider meets the needs for land enhancement. Poor results, including an undesirable plant community and increased soil erosion, can occur if these criteria are not met. The service provider should offer information about previous work experience on various types of sites and target species. Land managers should obtain and check references for previous jobs. If potential grazing service providers have little experience, land managers can assess their performance potential by probing their knowledge of land, plants, and animals and assessing their proposals against the information provided in this handbook. Ultimately, it is the land manager's responsibility to determine if targeted grazing is an appropriate tool for a particular situation and if potential grazing service providers are qualified to conduct the project.