

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 environ-

ment, 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 poly-wire 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

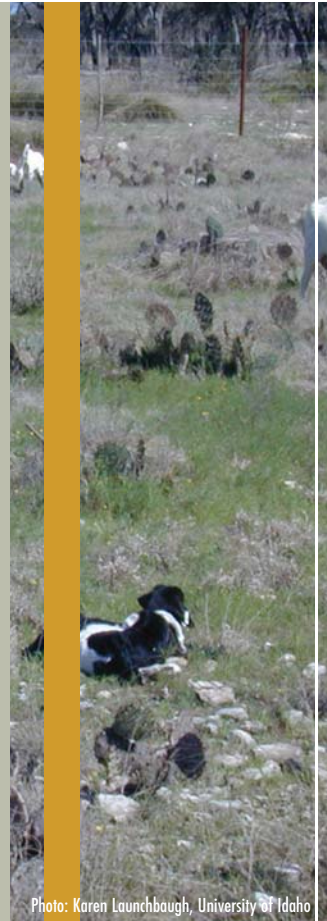
In a business venture involving livestock, the amount of equipment needed can be extensive and the upkeep expensive. The targeted grazing service provider typically will need a living facility for herders, water tankers, water troughs and hoses, ATV and wagon, dog kennels and feeders, portable fencing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



Photo: ASI



Photo: Karen Launchbaugh, University of Idaho



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.

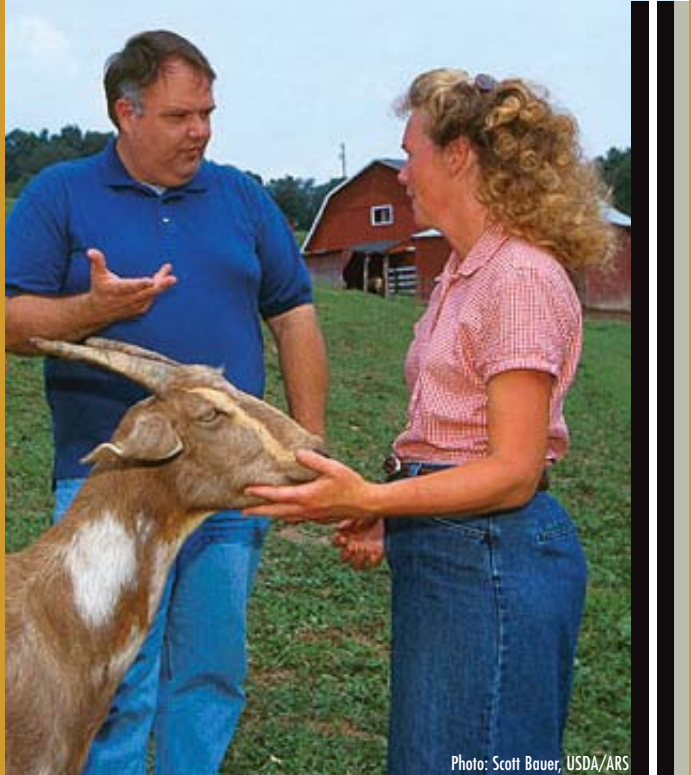


Photo: Scott Bauer, USDA/ARS

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, portaloos, 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

Sheep Production Handbook. 2002 – Version 7. This reference handbook covers the basics of sheep production. Topics include Sheep Breeding, Forages, Handling, Health, Management, Marketing, Nutrition, Predator Control, Quality Assurance, Reproduction, Sheep Care, Wool, and Contact Lists for State Extension Personnel, State Extension Veterinarians, and State Animal Health Officers. Published by the American Sheep Industry Association, www.sheepusa.org.

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.