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## Targeted Grazing Business Decision Model

### Background

This brief study considers the revenues and costs and potential gains from using targeted grazing as a technique of rangeland management. Both targeted-grazing businesses and land owners can gain from using livestock to manage pastures. An example targeted-grazing business is illustrated here through its revenues and costs from providing services, including estimates of start-up costs, such as equipment. The model considers the present value of starting such a business to direct potential business owners to making decisions.

### Targeted Grazing Defined

Targeted grazing focuses on vegetation and landscape management using livestock, different from managed pasture grazing because the idea is to clear vegetation versus managing growth. Planning the timing of grazing is important to maximize efficacy. Specific vegetation may be “targeted”; the ability to manage plants depends on livestock preferences. Goats are used in many cases based on their digestive systems’ tolerance to many types of vegetation. The basic goal of targeted grazing is to provide desired plants a competitive advantage over other vegetation to be managed. Other, specific goals may include:

- Wildfire prevention through the removal and modification of fine and ladder fuels;
- Management of invasive weeds;
- Removal and incorporation of cover crops in agricultural settings;
- Integrated pest management through removal and/or modification of habitat; and
- Restoration or maintenance of key ecological function (e.g., carbon cycling).

### The Targeted Grazing Business

Like any other business, targeted grazing services have both revenues and costs, the difference is the business’ profit. Pricing depends on the size of the job. Pricing for these services is generally by acre, but some providers may charge a price per day. We assume that these businesses price such that profit (revenue less costs) is greater than zero by design. We assume that the business will grow primarily be serving more acres. Overall, revenues come from grazing services provided and some small amounts from culling sales.

Table 1 shows the typical costs of such a business. Costs come from a variety of start-up costs that are spread over time and also operational expenses once animals are in the field. We are only considering cash expenses here, not other expenses that may be useful for tax purposes

(such as depreciation). Please see the Appendix for more complete definitions of each line-item expense in Table 1.

**Table 1: Sample of Grazing Business Operating Expenses**

• Feed Costs: Goats/Sheep/Livestock	• Insurance
• Fire Protection	• Herding
• Water for Animals	• Maintenance
• Fencing	• Predator Protection
• Hauling	• Other feed/supplements
• Fuel	• Animal Health/Vet
• Permits	• Advertising
• Wages	• Worker's Comp and Insurance
• Livestock Disposal	

Table 2 shows a sample of start-up expenses; we assume the typical targeted-grazing business will use sheep or goats as the livestock choice. The livestock choice affects the start-up costs (trailer choice and size, corral and fencing systems, etc.). We also assume that the business starts with some equipment such as main vehicles that have towing capacity for a livestock and camping trailer.

**Table 2: Sample of Grazing Business Start-Up Costs**

• Water Troughs	• Guard Dogs
• Livestock Kit (first aid for animals/dogs)	• Portable Corrals (sheep and goats)
• Camp Trailer	• Extra panels (as inventory)
• Two-deck trailer for livestock (sheep/goats); assuming currently owned vehicle to pull trailer (if not, add to start-up costs)	• Initial Livestock Purchase
• Fencing costs	• Herding dog, if needed
• ATV, if needed	• Vehicle, if needed

## Time

The model has a timeline of 5 years. For targeted grazing companies, the up-front costs are one of the largest hurdles to long-term profitability. Our model spreads the initial costs over the first five years (depreciation and amortization methods may differ from five years for tax purposes). While it may be easy to consider the start-up costs as “sunk” or unrecoverable, we consider these costs as simply “fixed”, where scale and utilization help pay back those start-up costs over time. In some cases, the targeted-grazing business owner will have vehicles or animals already under ownership.

Knowing that it will take time to both scale the business and also generate enough revenue to cover both the fixed and variable costs of targeted grazing, the grazing business should consider what costs their business faces and how those costs may evolve over time.

## Land-Owner Benefits

Land owners also receive benefits from paying for grazing services. For land owners, benefits include cost avoidance versus direct cash benefits otherwise. For example, a fire or an inability to utilize land for growing hay or providing rangeland for livestock otherwise may create larger costs than expected for land owners. Land that has consistent and significant vegetation challenges may benefit from targeted grazing as a lower-cost, more sustainable option than mechanical land management or herbicide use. This is especially true for land parcels that may present vehicle-access challenges and other safety concerns while maintaining the property.

Some land owners may also be able to reduce their insurance and general maintenance expenses due to targeted grazing. A selling point of targeted grazing is an eco-friendly, natural process (livestock consuming fuel they would need otherwise) while reducing invasive or unwanted levels of weeds, grasses or other plant life that may create costs for land owners otherwise. However, land owners may also face some initial costs to support targeted grazing if the current infrastructure on the property is inadequate, including water and road access.

Below is a sample of potential, alternative methods to targeted grazing in a recent study by Marin Municipal Water District (2018). All alternatives shown here are mechanical methods using labor and equipment and no animals.

<b>Option</b>	<b>Estimated 2023 Cost per Acre</b>
Retreatment of fuels in existing fuel breaks	\$1,955
Cyclical mowing of fine fuels, grasses	\$414
Roadside mowing	\$2,300
Reduce accumulated fuels and brush in forests	\$14,145
Douglas-fir thinning in oak woodlands and grasslands	\$552

Source: [Marin Municipal Water District](#)

Note: the original costs in the MMWD study are from 2018, a 15% inflation factor was used based on Consumer Price Index (CPI) movements to bring the data to 2023 dollars.

### ***Why these Options are Important for Targeted Grazing***

Land owners face opportunity costs for parcel management under any method. If targeted grazing costs less at current prices than other land management methods, and also reduce costs in the long-term even if slightly more costly now, a simple rationale exists to use targeted grazing. This can also help market grazing services in terms of providing comparisons.

Let's now look at the model's details and using the model.

## Using the Model

The model starts with initial expenses and operating costs. Services pricing per acre or per day starts the estimate of revenue. The largest differences from business to business is the mix of start-up costs, as some grazing business owners may already have livestock, vehicles and other initial needs. Targeted grazing businesses should consider all costs, including the costs of credit lines to finance cashflow needs while waiting for payments or trying to grow the business (“Other Expenses” in our model).

The model user can fill in the **heavy-bolded** cells in the model tab called “**Input Tab**”. These include:

1. **Initial Expenses:** these are assumed start-up costs and additional items that the model user can fill in as “Other Initial Expense” if there is a start-up cost not covered:
  - a. The user should enter the total, start-up expense in the corresponding cell;
  - b. For example, a livestock trailer that cost \$25,000 would be in the heavy-bolded box in the same row as the “Livestock Trailer” title.
2. **Operating Expenses:** These are the recurring monthly expenses, either per month (fixed) or variable depending on the amount of work (per head or per acre); the user should enter the estimated monthly expenses faced by the targeted grazing business;
  - a. For example, livestock feed equal to \$625 per month is entered into the heavy-bolded box next to the livestock feed title as the monthly estimate for that cost;
  - b. The heavy-bolded cell that has “250” in it based on the assumed 250 head of goats or sheep;
    - i. That assumption can be changed by the user to define per-head costs;
    - ii. The model assumes the business will have its herd turnover every five years (20 percent per year is lost or sold) and filled in primarily by breeding.
3. **Revenue Projections:** this is where the targeted grazing pricing goes
  - a. For per-acre businesses, fill in the number of acres per month and the amount charged per acre on average;
    - i. We assume the business runs 10 months of the year;
  - b. For per-day pricing, fill in the number of daily acres per day in the first box, then the next box to its right will fill assuming 30 days per month on average for 210 months of the year;
    - i. The user should then fill in the Per Acre charge on average based on their day pricing on a per acre basis (if you charge \$2,000 for one day on average and your livestock grazes 2 acres per day, the average is \$1,000/acre/day).

4. **Per Day or Per Acre:** The pull-down menu allows the user to pick a pricing system, and the tab called “Basic ROI” changes accordingly in terms of the forecasted income statement for this business;
  - a. The pricing data change based on the user’s choice in the “Basic ROI” tab of the model.
5. **Discount Rate:** when considering investing in this business, the business owner needs to discount estimated, future cash flow to the current period;
  - a. the user could change this interest rate, but 5% is a good, conservative number:
  - b. More than 5% implies the user believes she could earn more than a 5% rate of return on their use of cash; less than 5% suggests the owner could earn less with cash not invested in this business.

Once the model’s data are in place, the user can see how profitable the projected business is and how long it takes for the targeted grazing company to recover its start-up costs. The supposition is that the business is profitable by design annually in terms of operations; how long it takes to recuperate initial costs based on accumulated profit paying back initial costs is a key decision point for a new business owner.

#### Other Model Tabs:

- **Basic ROI:** the projected income statement after the model’s data are entered;
- **PayBack Period:** thinking in present value (because time is money), the payback period tells how long does it take to get paid back for initial costs given the business’ start-up expenses, operating expenses, and pricing as entered in the model;
  - **When the blue line crosses the red-dotted line, the user paid back start-up expenses, so any additional profits are now additional cash flow to the business/owner.**

The model assumes no debt is incurred initially. A growth rates of 3% is used for expenses to stay conservative; recent inflation in 2021 and 2022 is likely to subside after 2023. Revenues grow steadily toward the five-year level, approximate \$600,000 in year 5 from growth of acres and pricing from the original levels. Future cash flows to the targeted grazing business are discounted at a 5% interest rate; the grazing business should make decisions based on the estimated, **present** value of profits. This perspective is that every year the targeted grazing business is operating, the business owner could have done something else with their time or money that would have earned a minimum of 5% return on investment (the opportunity cost). Using this interest rate helps convert future cash flows to today’s dollars to do a true assessment of recuperating initial expenses today. The present value is for the “current year”, looking five years ahead.

## Summary of Sample Business Model Parameters, Year 1

### Revenues in Year 1 (can be changed by user)

Revenue	Units	Monthly Revenue/unit
Service Charges	Per Day	\$1,000 per day
	Per Acre	\$700/acre +\$10,000 set up fee
	Acres per month	60 acres (in year 1)

### Operating Cost Table for Year 1: Assume 250 head in example business shown here

Operating input	Units	Monthly Cost per unit	Total Annual Costs	Monthly Costs per head
Livestock Feed	Head	\$30	\$7,500	\$30
Replacement Livestock	Head	\$200	\$10,000	\$200
Water for Animals	Head	\$20	\$5,000	\$20
Fuel/Hauling Expenses that are not labor	Head	\$30	\$7,500	\$30
Permits	Head	\$10	\$2,500	\$10
Wages for Labor (Not for the Owner)	Month	\$6,250	\$86,400	\$346
Wages/Salary Owner could make otherwise	Month	\$8,333	\$100,000	\$400
Lost Livestock (Disposal Cost)	Head	\$50/12*20	\$1,000	\$4
General Liability Insurance	Month	\$208	\$2,500	\$10
Maintenance	Head	\$10	\$2,500	\$10
Predator Protection	Head	\$30	\$7,500	\$30
Other feed/supplements	Head	\$10	\$2,500	\$10
Animal Health/Vet	Head	\$10	\$2,500	\$10
Advertising	Head	\$10	\$2,500	\$10
Worker's Comp	Acre	\$10	\$2,500	\$10
Rental for land	Head	\$20	\$5,000	\$20
Other Expenses	Month	\$104	\$1,250	\$5

### Start-Up Costs: To be amortized per year for annual on a monthly basis

Overhead Expense	Initial Cost
Water Storage	\$2,500
ATV	\$10,000
Camp Trailer	\$20,000
Two-deck trailer for livestock (sheep/goats)	\$25,000
Guard Dogs + Herd Dogs	\$7,500
Portable Corrals (sheep and goats)	\$7,000
Extra panels (as inventory)	\$1,000
Initial Livestock Purchase	\$50,000
Pickup with Gooseneck (livestock haul)	Owned
Pickup to haul camp trailer	Owned
Fencing	\$2,500

Footnote: after year 5, re-invest in the above shown with an \*

## Appendix: Assumptions and Definitions

The assumptions contain background in developing [tables] and pertain to sample costs associated with establishing and operating a targeted-grazing business in Northern California. The management practices described are based on real-world examples from actual targeted grazing businesses and are considered typical for the region; actual practices and associated costs and revenues will vary.

**Targeted Grazing Business:** The hypothetical business consists of sheep or goats, 250 head, primarily in Sonoma County. The business also produces offspring – lambs/kids, cull animals. We assume a five-year life span for the business at 250 head in the model above.

### Initial Capital Costs

Capital expenses involve the exchange of one asset (usually cash) for another (equipment, breeding livestock, etc.). While some targeted-grazing businesses may convert assets from an existing livestock production business (livestock trailers, for example), there may be start-up costs that are necessary for the current livestock production business to pursue targeted grazing.

**Livestock:** Most targeted-grazing contractors use a mixture of sheep and goats to maximize flexibility and opportunities for grazing. We assume an attrition rate of 20 percent per year (through culling and death loss). Replacement females are retained; new breeding males are acquired every 2 years. For purposes of this analysis, we assume a new producer will use 250 head with 95 percent yearling females and 5 percent males; 250 head is approximately one semi-truckload. We assume the sheep will be a hair breed (e.g., Dorper or Katahdan) that will breed to lamb in the fall/winter and that will not need to be shorn. (Note: some producers prefer wool sheep).

**Stock Trailer:** A 25-foot, double-deck gooseneck trailer will be needed for hauling into and out of smaller jobs and for hauling sale animals to a processor or auction yard. In some cases, this may be owned already, we assumed the trailer needs to be purchased.

**Vehicles:** A base-model, 1-ton diesel pick-up is assumed to be owned by the owner/operator for travel. A base-model, 3/4-ton truck is assumed to be owned for hauling a water trailer, camp trailer or other herder travel as needed by an additional worker (see below).

**Water Trailer:** A 2,000-gallon water trailer with pump will be purchased for hauling water to livestock where on-site stock water is unavailable.

**Portable Fencing:** Portable electrified netting fence and portable energizers will be used to contain livestock on most jobs. Fencing is assumed to have a seven-year lifespan. Three complete energizer systems (energizer, ground rods, batteries, and solar panels) will be purchased, along with 50 rolls of electrified netting fence.

**Portable Corral System:** A portable corral system for gathering, loading, and processing livestock will be purchased. The system will be large enough to accommodate all 400 females at one time.

**Predator Protection:** Small ruminants require protection from a variety of predators in Northern California, including domestic dogs, coyotes, mountain lions, and black bears. Most producers prefer to use livestock guardian dogs. These dogs are usually purchased as pups and are mature enough to begin guarding livestock at 2 years of age. We assume a working life of 6 years (which means the dogs will be retired at age 8). While the appropriate livestock-to-dog ratio depends on a variety of operation- and site-specific conditions, we assume this operation will utilize a total of 4 mature dogs (100 head per dog).

**Herding Dog(s):** Herding dogs (border collies, etc.) are typically used to move livestock from pasture to pasture, into corrals for shipping or processing, etc. We assume this operation will have one working herding dog at any point in time.

**ATV:** A 4-wheel-drive, all-terrain vehicle (ATV) will be needed to provide on-project transportation for the herder. We assume the owner/operator has such a vehicle and thus does not need to purchase the ATV.

**Camp Trailer:** Many projects require on-site herders for the project's duration to ensure livestock and public safety. A camp trailer will be purchased to provide housing for one on-site herder unless otherwise owned (we assume initial purchase needed).

## Revenues

Most targeted grazing businesses are assumed to have more two revenue streams: (1) service revenue (e.g., grazing services); and (2) livestock revenue (sales of offspring, cull animals, wool, etc.). Most grazing businesses charge for services on a per-acre basis, so that customers can compare the cost of grazing with other types of vegetation management services. Depending on the size and nature of a particular contract, however, some service providers charge by the day. Our model allows flexibility between these two ways to charge clients.

We assume all lambs and kids are marketed at weaning through the closest available auction yard. Females (ewes and does) may be culled for a variety of reasons, including reproductive problems, health issues, and behavior problems. Breeding males (rams and bucks) may also be culled to inject new genetics (or to avoid inbreeding problems). We assume cull animals are marketed through the closest available auction yard. Producers who utilize wool breeds of sheep or fiber goats may sell wool or fiber, either directly to end users or through a broker. For this analysis, we assume that producers are using hair breeds of sheep and meat breeds of goats, thus generating no revenue from fiber specific to targeted-grazing operations.



## Variable Costs

Variable costs are expenses that vary directly in relation to the unit of production (e.g., number of acres treated or number of livestock raised). Most livestock businesses base variable costs on the total number of livestock (in the tables shown above, we use a “per-head” cost for comparisons).

**Supplemental Feed:** Supplemental feed is provided to balance the livestock’s nutritional intake. Feeds may include trace minerals (provided as blocks or loose mineral), supplemental protein (provided as molasses tubs, soy-based loose protein or alfalfa hay), supplemental energy (provided as corn or other grain), or supplemental forage (provided as hay). We assume that minerals are provided year-round, protein is provided during dry season grazing (June to October), and hay is provided to supplement forage at lambing/kidding (October to November).

**Fuel:** Fuel costs include vehicle fuel for both pick-ups, propane for the camp trailer, and gasoline for the ATV. The more jobs, the more fuel used.

**Veterinary Costs:** Veterinary costs include preventative vaccinations, deworming and medical treatment of sick animals. Antibiotic use in livestock is regulated by the State of California and requires a valid veterinarian-patient-client relationship (VCPR), so we assume a veterinarian will visit the operation at least once per year. Guard and herding dogs will also have veterinary costs on a regular basis.

**Animal Identification:** While some operations do not use individual animal identification, others use visual and/or electronic identification systems to manage inventory and to identify sale animals. We assume that our hypothetical targeted-grazing operation uses electronic identification tags on all breeding animals.

**Hauled Stock Water:** Some grazing contracts do not provide access to livestock drinking water. Contractors may need to pay for water on a per gallon basis. We assume this water is marginally free either as provided by the client or from the owner’s home property (the owner would have spent the money to pay for water to have the livestock anyway).

**Shearing:** Wool sheep and fiber goats must be shorn at least once a year. Since we assume that this hypothetical operation uses hair sheep and meat goats, we do not include any shearing costs.

**Hired Transportation:** While some transportation is provided by the owner/operator, we assume that large contracts requiring entire flocks will be facilitated by contract haulers. Typically, livestock haulers can accommodate approximately 44,000 pounds of livestock. We assume that the entire flock of 250 sheep and goats can be transported in one load by the owner/operator.

**Dead Stock Disposal:** Livestock that die on contracted projects must be removed and disposed of off-site. We assume a mature animal death loss as incorporated in the 20 percent per year turnover, with a per animal disposal charge of \$20/head.

### Gross Margin

Gross margin is defined as total revenues less variable costs. The ratio of gross margin to total revenue represents a useful benchmark for evaluating business performance. Successful businesses should keep at least \$0.70 out of every \$1.00 in revenue after paying variable costs to cover fixed (or overhead) costs and profit targets (a gross margin ratio of 70%).

### Fixed Costs

Fixed costs are sometimes called overhead costs. These are expenses that the business incurs regardless of scale of operation (management labor, insurance, etc.). Fixed costs can be cash or non-cash (e.g., depreciation), where non-cash costs are generally used to reduce tax liabilities and recognize the remaining value in assets.

**Management:** Management labor the owner/operator time for project management, project bidding, oversight of livestock, regular bookkeeping (not taxes), and other functions.

**Herding Labor:** Herding labor is typically provided via contract or producer association. Most herders are foreign H2A visa (temporary agriculture workers), with wages and working conditions regulated by both the State of California and the U.S. Department of Labor. Herding labor costs include monthly wages, room and board expenses (and other required expenses), and application and travel costs. We assume \$1,800 per week for 44 weeks per year (8 weeks are time when animals are on winter rest)

**Land Rent (Headquarters/Rest):** Most targeted- grazing operations do not provide services year-round; most utilize a fall/winter headquarters for lambing/kidding. Some operations rent alfalfa stubble in the fall and early winter; other operations rent ranches or individual pastures during this period. We assume that this hypothetical operation does not operate two months of the year. We assume \$50 per acre and 25 acres for 250 head, if the owner/operator does not already own the home property.

**Professional Services (Legal and Accounting):** Tax filing and contract language review are provided by outside professionals.

**Repairs and Maintenance:** Repairs and maintenance of pick-ups, trailers, and fencing equipment are required to maintain equipment in proper functioning condition.

**Liability Insurance:** Most (if not all) targeted grazing contracts require the contractor to carry at least \$1 million in general liability insurance; larger contracts often require more insurance. We assume this business will need a \$2-million general liability policy.

***Dues and Subscriptions:*** We assume this business is a member of its state and national sheep producers' associations and its local farm bureau.

***Depreciation:*** We include depreciation as a non-cash fixed cost to represent the cost of using the assets associated with the business.

***Permits and Licensing:*** Many targeted grazing operations hold business licenses. Some jurisdictions require contractors to acquire additional local licenses before providing grazing services.

***Marketing and Advertising:*** Marketing and advertising may include print advertisements, signage, websites, and other techniques. We assume this operation utilizes project signage and online marketing (website) for advertising purposes. Marketing costs include commission and yardage charges at auction yards, which are associated with culling herds.

***Worker's Compensation Insurance:*** This insurance may be a requirement of some jobs and is likely an investment worth making assuming one injury could take place or one client will demand the owner hold this policy to engage the owner in targeted-grazing services.

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