



Ranch Sustainability: Monitoring and Assessment for Business Planning

Monitoring and Business Planning Make a Difference for Ranchers and Land Managers

Ranchers must confront many challenges and deal with emerging issues on a daily basis. Comprehensive business planning supported by coordinated monitoring can be useful in making these challenges more manageable. Generally, all ranchers monitor at least one element – everyone wants to know whether their decisions were profitable. However, the ability to turn a profit is directly linked to the land.

Time and effort spent monitoring will enhance a rancher's ability to address changes by optimizing a balance between rangeland condition and financial return. This balance is embodied in sustainability concepts that incorporate economic, ecological and social aspects of a ranching operation. Since 2001, a collaborative partnership called the Sustainable Rangelands Roundtable (SRR) has worked to develop criteria and indicators that can be used to monitor, assess, and sustainably manage rangelands.

This SRR document outlines basic information and resources to assist a rancher in developing an integrated monitoring strategy and business plan for his/her operation. A rancher's business plan represents the desired mix of economic, ecological, and social benefits to be provided by his/her ranch.

Monitoring generates data to assist a rancher in achieving the goals and objectives defined through the business planning process. With increasing frequency, banks are requiring the detailed information outlined in business plans before qualifying ranchers for loans and credit. Incorporating a resource monitoring system into a business plan strengthens credibility by demonstrating intent to document progress toward specified management goals and objectives.

Moreover, as ranchers confront legal disputes over resource use, availability of quantified, consistently collected data provides a solid platform for productive discussions. In the absence of data, such debates may devolve to emotional rhetoric in place of fact-based dialogue.

Acceptable data also informs ranchers' use of state and private leased lands, as well as federal grazing allotments. These lands may have additional use requirements through lease or permit terms and/or applicable legislation, including but not limited to, the National Environmental Policy Act, the Clean Water Act, and the Endangered Species Act.

Business Planning for Ranchers

The Wyoming Business Council (WBC) handbook on *Sustaining Western Rural Landscapes, Lifestyles, and Livelihoods* contains detailed guidance for development of a business plan (www.wyomingbusiness.org). Worksheets included in the WBC guide highlight the importance of accurate information about soil, water, plants, animals, productive capacities and alternate income streams from rangeland

goods and services, comprehensive socio-economic records and legal and institutional frameworks for sustainable rangelands management. The SRR Ranch Sustainability Monitoring and Assessment indicators described herein offer additional guidance for data collection and evaluation to support ranchers' business plans.

According to the WBC, there are several key areas that any agricultural enterprise developing a business plan must address. These include: their business concept and structure, market analysis and plan, management plan, financial plan, and break even analysis. Some agribusiness enterprises also need to consider a design and development section, a manufacturing plan for products, and/or an operations plan for associated service businesses. If a business plan will be read by potential investors or lenders, it is helpful to provide an executive summary, proposed funding information, and appendices of any supporting materials.

Contents of an Agribusiness Plan:

- Executive summary
- Overview of the industry & the business
- Market analysis
- Market plan
- Management team
- Design and development (optional)
- Manufacturing plan/operations plan (optional)
- Financial plan
- Break-even analysis
- Proposed offering (optional)
- Appendix



A rancher and a technical service provider discuss grazing management techniques as the rancher's son looks on in South Dakota. Photo courtesy of USDA NRCS.

Criteria and Indicators for Ranch Sustainability Monitoring and Assessment

Consistent information about social, ecological, and economic aspects of rangeland management is necessary to provide a foundation for a business planning approach to family ranching. As ranchers endeavor to stay on the land and adapt their business practices to changing markets and demands for various goods and services, collection of monitoring data to track trends in elements elaborated in their individual business plan goals will become increasingly important to the long-term sustainability of their ranch operations.

For example, the amount of land available nationally for livestock forage production is expected to decrease over the next 50 years. However, the actual rate will depend upon environmental issues, government policies, urban and ex-urban sprawl, and increased recreation demand.

A monitoring approach encompassing social, economic, and ecological aspects of ranch sustainability facilitates adaptive management techniques that incorporate change in response to resource condition and available financial resources. In recognition of these needs, SRR has identified 17 indicators suitable for ranch-level monitoring.



A Montana rancher and a technical service provider discuss rangelands vegetation composition. Photo courtesy of USDA NRCS.

SRR Soil Monitoring Indicators

Bare ground - Percent bare ground is an indicator of the potential for raindrop impact and wind to move soil particles. Lack of vegetation cover also facilitates the overland flow of water and sheet, rill, or gully erosion. Bare ground may be an artifact of excessive removal of herbage by grazing, other disturbances, or drought. Grazing management should consider the degree of removal or residual herbage left as related to soil surface protection.

Soil Aggregate Stability - This indicator refers to the degree that soil aggregates retain their structural integrity when exposed to a water bath. The degree of aggregate stability is a function of the soil texture and organic matter in the soil surface. Increased stability will reduce soil erosion. This attribute is likely to be more important in semiarid-arid systems.



Bare ground changes with grazing intensity, precipitation, and disturbance. Photo courtesy of USDA NRCS.

SRR Water Monitoring Indicators

These indicators address the timing and amount of water for livestock or other animal species as well as aquatic habitat values that may be important. Intermittent or ephemeral sources or no water may limit use of some areas. Vegetation management has been shown to impact stream and spring flows. Drought also is a large influence. Management objectives would be improvements in timing and amounts of water from various sources for desired uses.

Frequency or duration of surface water (TIME) - The first water indicator addresses the volume of water available, and the length of time that this water is present in the case of ephemeral water features. If the availability of ephemeral water begins to decrease on an annual basis, the cause of this decline should be determined.

Volume of water available (AMOUNT) - This indicator can be quantified by answering some basic questions (1) What and how many reliable sources of water do you have (sumps, surface flows and ground water)? (2) Do you have adequate water supply or reserves year-round or during periods of use? (3) Do you have adequate depth in existing stock ponds and tanks? (4) Do you have adequate storage or flow from a well to supply the water needed? (5) Do you have enough water to allow adequate grazing distribution?

SRR Plant Monitoring Indicators

Ranchers and/or technical assistance specialists must determine whether baseline data exists, perhaps in an ecological site description (ESD) or other monitoring records.

Key species composition - Key species are those that a rancher wants to manage, or those that are sensitive to management. Changes in percent of plants covering the soil surface, categorized by species and age/ growth stage of plants, provide an indication of land management program efficacy in maintaining or improving toward desired composition.

Extent of invasive species - Changes in location and abundance of invasive species can provide an indication of the efficacy of management programs. Presence, location, and density of invasive species may be recorded on an annually updated map.

Extent of wildfire & prescribed fires - In systems where wildfire is prevalent or prescribed burning is practiced, mapping fire extent and frequency will provide indications of the need for better fire control or for prescribed burns.

Extent and condition of riparian areas - The greenline technique provides percent cover by plant community type along streams. A manager implements a grazing program to increase wetland obligate sedges and grasses while decreasing community types less effective in maintaining stable banks.



Land managers near Manhattan, Kansas use drip torches to start a prescribed fire to stimulate new growth and recycle nutrients. Photo courtesy of USDA NRCS.

SRR Animal Monitoring Indicator

Animals include livestock, big and small game, and predators. Some species have commodity value and others may be of special value for their mere presence. Depending on the species, objectives may be to increase, maintain stable numbers, or to see decreases if management is for that change. Large ungulates hold the greatest potential for ranch commodity use.

Population estimates of wildlife (or feral) species important to the rancher - These measurements will be general trends obtained through annual counts on spotlight or day-time transects done at the same time each year, on the same route, with the same weather conditions.

SRR Productive Capacity Monitoring Indicators

Productive capacity indicators are likely to be a key consideration in designing a monitoring program and crafting business plan goals, since these elements may be closely tied to economic returns for ranchers.

Forage utilization - Forage use levels or residual forage may be captured with use maps. These maps represent effects of animal numbers, distribution of grazing, provision of forage for alternative species and soil surface protection. Values will be impacted by slope, water, and presence of shrubs. While not an objective in itself, the forage use attribute selected should have target levels that the manager can correlate with trends in other resource values to calibrate the grazing management program. Possible measurements include the livestock utilization landscape appearance method, stubble height measured along line transects, and/or paired plot sampling with grazed areas and grazing enclosures.

Pounds of domestic meat produced - This indicator is measured as pounds of livestock (i.e. beef, lamb, or bison, etc.) produced, as documented through live-weight sales, rather than numbers of animals. Pounds of domestic stock sold is frequently the only measure of output documented on a ranch, however value per pound varies so additional information should be recorded when practical. Such attributes include the specific product, (i.e. cattle, goat, sheep, bison), season of sale, and size of an individual animal; these factors all may influence value.

Pounds of harvestable materials (hay, seed, nuts, wood and other plant materials) produced - Items that may be included in calculation of this indicator include hay, seeds, nuts, wood, and other plant materials. Alternative profit centers may be of particular value when viewed in the context (i.e. as a percentage) of all sources of income for a ranch operation.

SRR Socio-Economic Monitoring Indicators

These indicators are designed to capture the economic elements of a ranching operation, as well as the social factors which may impact the operation's sustainability; income and expenses predominate.

Cost of livestock production - Purchased and raised feed are generally the largest expense of ranching. Costs, including opportunity costs of hay and grazed forages should be determined. Components of the cost analysis such as amortized cost of haying equipment in addition to direct costs should be determined. This analysis identifies the best opportunities to reduce the cost of production and subsequently reduce the breakeven cost.

Itemized income/ expense for each product produced - A very effective interpretive tool is the cost per unit of production, a breakeven price. The difference between this cost and the return per unit represents the return to the operator. All enterprises (livestock, forage, hay, hunting, etc.) should have separate analysis. The percentage of net return from each enterprise may be useful in allocating time and other resources to various profit centers.

Visitor use information for appropriate enterprises - Trends in dollars/visitor and visitor days are useful in determining efficacy of alternative land use enterprises.



Increasing demand for rangeland recreation opportunities provides ranchers with potential for alternate income streams. Photo courtesy of NPS.

SRR Legal and Institutional Monitoring Indicators

Indicators in this category seek to identify legal constraints impacting the operation of a ranch, as well as availability of opportunities for continuing education, training, and technical assistance. These indicators may be less quantifiable than others in the monitoring framework, but they are equally important for a rancher's business plan.

Continuing Education & Technical Assistance - Whether ranchers seek technical assistance and continuing education may be an indicator of a mindset that fosters ongoing assessment and improvement in an operation. A thorough approach includes setting educational/ training goals, scheduling periodic assessment of goals, and then setting new educational/ training goals.

Protection of special values - This requires identification by the family or operator of special values that may be non-economic or perhaps even costly to maintain. Goals must be set, including periodic review and evaluation of results.



Wildlife habitat provides alternative income opportunities for ranchers through hunting leases and fee for access wildlife viewing. Photo courtesy of NPS.

Alternative Income Sources: Rangeland Ecosystem Goods and Services

Managing for multiple social, economic, and ecological goals, such as cattle production, wildlife habitat, recreation and rare plant conservation, can be beneficial to ranchers and communities, increasing income and conservation. With these multiple goals in mind, SRR proposed a consistent set of questions to help ranchers evaluate rangeland ecosystem goods and services (EGS) as alternative income sources. While the responses to the questions are important, the evaluation and discussion process provide the most useful information.

The first two questions (Must Haves) determine if the EGS is rangeland-related and whether it is a good or service that society cares about. The second set of questions (Wants) evaluates the potential goods and services. A rancher, perhaps in consultation with an agency conservationist or consultant, must interpret answers to these questions and decide how to use the information in conservation planning, prioritizing and making investments. Answers to these questions, combined with the landowner's goals, will eliminate some options and highlight others for further examination.

Must Haves (Yes / No)

- Does the EGS exist on or is derived from rangelands?
 - Is the EGS important to rangeland ecosystem processes and/or human well-being?
- Both questions must be answered YES to continue.*

Wants (High/ Medium/ Low/ NA)

High Importance

- Does the EGS provide a basic human need? Is it important to society?
- What is the current level of demand for the EGS?
- How responsive is the EGS to management?

Moderate Importance

- How easily is the EGS measured?
- How important is the EGS over local, regional, & national spatial scales?
- How important is the EGS over different temporal scales?
- How resilient is the EGS?
- How much does human activity impact the EGS?
- How important are rangelands to this EGS?
- How unique is the EGS to rangelands?

Low Importance

- For this good, are there no potential substitutes?

Consequences

- Is the EGS impacted by local, state or federal regulations?

While the EGS list below is not comprehensive, it does contain many of the EGS that could be produced from rangelands to provide economic value to landowners. The EGS are listed according to whether they are derived from biological, hydrological/atmospheric, or miscellaneous processes merely as a way to organize the information. Used in combination with the questions above, these lists will assist ranchers in evaluation of EGS their ranches may provide.

Biological	Hydrological/ Atmospheric	Miscellaneous
Domestic Livestock	Drinking Water	Views and Scenes
Other Food for Human Consumption	Floods for Channel & Riparian Area Rejuvenation	Cultural or Spiritual Resources
Forage for Livestock	Water for Economic Benefit	Scientifically Significant Sites
Fishing, Hunting and Viewing Wildlife	Water bodies for recreation and tourism	Historical/ Archeological Sites
Biofuels	Minimizes Chemicals and Particulates	Recreation and Tourism Sites
Fiber	Contributes to Clean Air	Ornamental Resources
Biochemicals	Hydrologic Energy Potential	Ceremonial Resources
Genetic Material	Solar Energy Potential	
	Wind Energy Potential	
	Flood Mitigation	