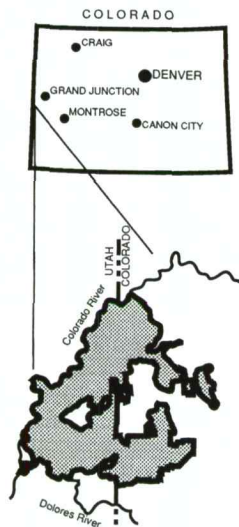


"Livestock" The Key to Resource Improvement on Public Lands

Al Tohill and Jim Dollerschell

Since the Taylor Grazing Act was set in motion in the mid-1930's, improving public rangelands has been perceived as a need to eliminate overgrazing by reducing livestock numbers. After 50 years of livestock reductions, along with the development of high dollar rangeland improvements and implementation of elaborate academic grazing systems, there continues to be undesirable plant encroachment (annual and perennial), lack of perennial grass seedlings, and absence of plant and animal complexity and diversity. This fuels a concerted effort by the environmental community to promote the complete removal of livestock from public lands.



The Mountain Island Ranch and Bureau of Land Management (BLM) offices in Grand Junction, Colorado, and Moab, Utah, have initiated a management process to improve the rangeland condition using techniques that are economically and environmentally sound. The management

process involves both human interaction and collaboration coupled with non-traditional tools of grazing and animal impact. Livestock are recognized as a necessary component of the ecosystem rather than a deterrent to range improvement.

Setting and Background

The Mountain Island Ranch is situated between the Colorado River and the Dolores River southwest of Grand Junction, Colorado. The ranch straddles the Colorado-Utah state border and encompasses more than 163,000 acres. Within the ranch boundary is Bureau of Land Management Public Land administered by both Colorado and Utah (126,824 acres), Utah state land (8,491 acres), and ranch-owned property (27,851 acres). Large portions of both the Black Ridge Canyons and Westwater Canyon BLM Wilderness Study Areas are located within the ranch boundary.

Elevations range from 4,100 feet at the junction of the Dolores and Colorado Rivers to 8,833 feet on Pinon Mesa. Rocky canyon lands in the lower elevations receive about 8 inches of precipitation, progressing up to 16 inches in the higher terrain. Approximately 40 percent of the precipitation occurs during the growing season. There are 20 vegetation types present within these elevation differences. The lower and middle elevations are a combination of sagebrush, saltbush and/or blackbrush dominated grasslands. Oakbrush dominated mountain woodland types occupy the upper elevations. The pinyon/juniper type is prominent throughout the lower and middle elevations.

The owner purchased the ranch to capture a piece of the West and to enhance wildlife and natural ecosystem processes. These interests were

influential in selection of management personnel and goals for the ranch.

Livestock grazing is the primary tool used to achieve the ranch goals which include improvement of the wildlife habitat. In the past five years the ranch has changed from a yearling cattle operation to a cow/calf operation, and recently included sheep. The following is a summary of the ranch operation since 1985:

1985- 1023 Yearlings
 1986- 2005 Yearlings
 1987- 3000 Yearlings, 244 Cows, 50 Bulls
 1988- 1022 Cows, 50 Bulls
 1989- 743 Cows, 49 Bulls, 1600 Sheep

Converting from a yearling operation to a cow/calf operation allowed for greater economic stability by avoiding the erratic market. Sheep were added to the operation to utilize areas not used by cattle. The sheep breeding program goal is to produce both red meat and high quality wool.

Upland Successes

This type of management has been practiced on the ranch since 1985, while the Allotment Management Plan (AMP) has been in effect since 1988. The land is healing itself, and at the same time is producing income from red meat in the form of livestock and wildlife.

The BLM uplands are characterized by low precipitation which is unreliable and erratic. Historic improper grazing in these brittle environments has increased the amount of bare ground and caused a problem of rapid soil crusting. Now, animals in the area at the proper time break or disturb the soil crust, allowing water to enter the soil. The animals also assist in incorporating organic matter into the soil surface either by trampling or in the form of

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urine and dung. The organic matter improves precipitation infiltration, allowing the water to percolate into the ground rather than be lost as surface runoff. Organic matter on the soil surface reduces evaporation and increases the duration that moisture is available to vegetation. The final production of animal impact is soil compaction, a necessary requirement for proper seedbed preparation of grass plants.

Perennial grass seedlings are proliferating, particularly in areas that have received heavy animal impact. Photograph 1a shows the area of a salt block placed the spring of 1987, which resulted in heavy animal impact. Photograph 1b is a plot that was established the following spring where the salt block had been placed, now covered with the perennial grass seedlings. Photograph 1c was taken during the spring of 1989, a drought year, from approximately the same photo point. Although 1989 was a drought year in western Colorado, a number of the seedlings (sand dropseed) in this plot reached sexual maturity and produced fruiting bodies. Animal impact and time-controlled grazing created the necessary conditions for seedling establishment in this area. The health and vigor of existing plants remain good (Photograph 2b).

Photograph 2a shows yearling steers present in June of 1987 at a fenced water point that serves three pastures. The animals impacted existing vegetation through utilization and trampling. Photograph 2b shows recovery of the same area in September of 1987 (note: spring 2a was taken with a standard lens and fall picture 2b with a wide angle lens). When grazing and animal impact are employed as tools, the element of time must be considered. Overgrazing is a function of time, note livestock numbers.

The roots of grass plants are the store house of their reserves. A grazed plant draws reserves from the roots to put on new growth. Once new growth is fully functional, producing carbohydrates through photosynthesis, the plant slowly restores root



Photo 1a. Area of intentional salt block placement—1987.



Photo 1b. Plot showing establishment of perennial grass seedlings—1988.



Photo 1c. 1989 aspect photo of area shown in September 1988.



Photo 2a. Yearling steers at water point—1987.

reserves to pre-grazing levels. Animals seek out succulent regrowth over ungrazed plants which are comparably coarser and less palatable.

Overgrazing occurs when grazing is grazed before root reserves have been replenished, further depleting the root system. This commonly occurs when livestock are present too long during periods of rapid plant growth (when moisture and temperature conditions are optimum). If present long enough, one animal or a thousand animals will seek out succulent regrowth over ungrazed plants.

Whenever there has been a perceived overgrazing problem on public lands the standard prescription has been to reduce livestock numbers. Grazing duration, the major cause of overgrazing, is unaffected by livestock reductions. Remaining livestock continue to seek out regrowth (overgrazing individual plants) while the number of ungrazed plants increases (overrest).

The ranch has minimized overgrazing and overrest through high animal stock densities for short periods of time. Grazing periods range from several days to several weeks, depending on the plant growth rate. Livestock are then removed for a period of time sufficient for complete plant recovery. This process may then be repeated following full plant recovery. A constant vigil of monitoring both plant growth and animal performance is required. Commitment to monitoring by the livestock operator is paramount.

Riparian Successes

As the uplands are considered brittle environments, riparian areas are considered non-brittle environments. This is due to the presence and influence of water. Unlike a brittle environment, the water cycle and mineral cycle will function properly under non-grazing conditions (rest). Plant material that remains intact through rest will rapidly return to the soil allowing the mineral cycle to function properly. Individual plants remain healthy and unobstructed which ultimately leads to tighter ground cover and species complexity.



Photo 2b. Recovery of water point—1989.

Rest applied in non-brittle environments can be a useful tool for obtaining healthy riparian areas. The problem is demonstrating that livestock and a healthy riparian area can exist together. The Mountain Island Ranch is using livestock as a tool to improve riparian areas. Proper upland management is essential for obtaining a healthy riparian area, the two go hand in hand. Improving water and mineral cycles in the uplands has allowed precipitation to enter the soil, from there it travels underground and is slowly released into the riparian areas. This helps restore the natural watershed function through underground flow, rather than surface runoff.

Photograph 3a is a picture of the riparian area along the Little Dolores River in the Upper Files paddock. A quarter-mile of this stream, situated in the corner of this 2,000 acre paddock, is the sole water source. Grazing use in this paddock for 1988 was 667 cow/calf pairs for 14 days in June. This picture, taken shortly after livestock were removed, depicts the animal impact and associated heavy utilization that occurred. A cowboy stays with the livestock preventing them from lounging along the stream.

Photograph 3b, taken in early September of the same year, shows the tremendous regrowth of willows. These willow populations are stable and show no signs of decline.

The AMP provides a management guideline to assure two processes are being accomplished:

1. bank protection during high energy flood events; and

2. trapping of sediment for the bank building process.

Regrowth in riparian areas serve both purposes. The guideline separates growing season grazing and dormant season grazing as it relates to riparian areas.

The guideline for the growing season grazing period specifies that time be allowed for sufficient vegetative regrowth to provide adequate plant cover for bank protection and sediment trapping. Photograph 4a was taken along the same quarter mile section of the Little Dolores River immediately following removal of livestock in June of 1989. Growing season grazing use had been 387 cow/

calf pairs for 19 days. Note the animal impact and heavy utilization. Photograph 4b is the same site taken in September of 1989 after regrowth had occurred. Overhanging banks have remained intact through maintenance of healthy root systems ensured by time-controlled grazing.

The beaver dam was built following cattle removal in June. This activity will aid in expanding the riparian zone by raising the water table and increasing water storage in the area.

In the riparian areas, regrowth will not occur prior to spring runoff if grazing occurs during the dormant season. Therefore, the guidelines call for utilization levels of herbaceous vegetation such that a minimum stubble height of 5 inches remains. This remaining stubble encourages adequate vegetative cover for bank protection and sediment trapping.

Photograph 5a shows Coates Creek in the Humphrey Springs paddock which was grazed for 12 days by 48 bulls in April of 1989. The photograph, taken shortly after livestock were removed and prior to spring runoff, shows the stubble that will be present when runoff occurs.

Photograph 5b shows the same location in September of 1989 and the regrowth that occurred. Bank building is evident by the sediment trapping of the vegetation and narrowing of the stream channel.

The tool of animal impact provides a means of breaking down existing cut banks that are devoid of vegetation and susceptible to further erosion. Steep-walled cutbanks are trampled to an angle of repose which allows establishment of vegetation which in turn begins the bank building process. Another result of animal impact has been the removal of old, tall sagebrush which invaded and now dominates areas adjacent to some streams. Removal of sagebrush and application of time controlled grazing has allowed succession to move forward, increasing species diversity and complexity, resulting in greater productivity for wildlife and livestock.



Photo 3a. Riparian area on Little Dolores River after intensive grazing—June 1987.

Wildlife

Big game populations appear to be thriving as evidenced by the ranch's guide and outfitting business. The last three years the ranch has averaged a harvest success of 100% for deer and 90% for trophy bull elk. This has contributed an average of 19% to the total gross ranch income during this period. All types of wildlife receive

priority in relation to livestock grazing. Livestock moves are planned to avoid conflicts with wildlife use. Examples are livestock avoidance in certain areas during periods crucial to bird courting and nesting, elk calving and deer fawning.

Livestock Production

The first three years the ranch ran



Photo 3b. Little Dolores River riparian area—September 1988.



Photo 4a. Little Dolores River following intensive grazing—June 1989.



Photo 4b. Same area in September 1989.

yearlings and averaged 1.55 pounds per day rate of gain. In 1988, the first year under a cow/calf operation, weaning weights averaged 502 pounds. Livestock production has benefitted from the daily involvement of ranch personnel. Diseases are detected early, allowing effective treatment and rapid recovery of diseased or injured animals, lowering the percentage of death by 10%. In 1989 there was a total death loss of 3 cows and a calf

crop mortality of 5%. The practice of herding livestock has improved the percentage of cows being bred back. In 1989, they had a breedback success of 91%.

Time-control grazing requires frequent movement of livestock and initially can be stressful to the animals. Mountain Island Ranch is presently training the cattle to come to a call (whistle).

Development of the HRM Grazing Plan

The accomplishments achieved to date have been the result of implementing Holistic Resource Management (HRM), a process developed by Allan Savory. HRM was chosen as the preferred management for the Mountain Island Ranch based on the owners' concern for wildlife and natural ecosystem processes.

In 1985 the Grand Junction and Moab BLM offices granted the Mountain Island Ranch a one-year trial period to run livestock on BLM Public Land using HRM principles. At the end of the trial period, the allotments were evaluated to determine potential for long-term commitment to the development of a HRM allotment management plan. The plan combined these allotments into one unit to be managed as a whole. The evaluation was favorable and the development of a long-term plan began in late 1986 by then Grand Junction District range conservationist Gene Kinch.

The development of the HRM plan was accomplished through meetings with ranch personnel and BLM staff members from both the Grand Junction and Moab offices. The BLM specialists involved were wildlife biologists, range conservationists, planners, and recreation and wilderness specialists—resource interests which have historically had different opinions about resource management.

Through development of trust and collaboration the meetings produced the following three-part goal:

Quality of Life

Manage the land to maintain a rural character, free of pollution, with a peaceful family setting. Minimize the use of chemicals.

Production

Realize a profit from the production of wildlife, crops, and livestock.

Landscape

Allow fire to assume its natural role in plant succession.

In Wilderness Study Areas—Manage the land within the wilderness study



Photo 5a. Coates Creek intensively grazed—June 1989.



Photo 5b. Coates Creek recovery—September 1989.

area to:

- 1) allow for development of the variety of landscapes present,
- 2) emphasize wilderness values,
- 3) avoid damage to cryptogamic soils as a result of livestock grazing in portions of the area, and
- 4) minimize visual impacts from livestock.

Outside the Wilderness Study Areas maintain an uninhabited natural appearance, unroaded with few structures

or improvements and with minimum disturbance by humans. Protect cultural resources and aesthetic values.

Develop good water and mineral cycles as well as energy flow on the range.

1) Retain and build soil in place and insure the land is as productive as feasible.

2) Restore natural watershed function and improve water quality.

Optimize production of a diverse,

stable wildlife population including but not limited to big game, fish, and threatened and endangered species.

Goals for riparian areas were further delineated in the landscape description. A number of riparian areas in the allotment were recognized as being in degraded stages evidenced by steep, barren stream banks, wide and shallow stream profiles, minimal stream shading, and lack of overhanging banks. The emphasis of the goals was to allow riparian areas to perform their natural functions of bank building through sediment trapping, water storage and timely release, and aquifer recharge.

The next step in working toward the three-part goal was selecting the proper tools to manipulate the four ecosystem blocks. The four ecosystem blocks are water cycle, mineral cycle, energy flow and succession. All the tools known to mankind are rest, fire, grazing, animal impact, living organisms and technology (HRM Model Figure 1).

Tools selected in the uplands were: *grazing, animal impact, rest, fire, organisms and technology*. *Grazing and animal impact* were automatically chosen because a large part of the ranch falls within a brittle environment. *Rest* was chosen in partial form because plans are to graze each pasture only once during the course of each year. *Fire* would assume its natural role where feasible. There are sites with dense stands of sagebrush 8 to 10 feet tall where animal impact can not be used successfully to induce succession toward the three-part goal. *Fire* was selected to open up these areas so *animal impact* could be applied.

Living organisms would be utilized in an indirect manner to promote soil fertility (earthworms, microorganisms, etc.) and aid in the mineral cycle (dung beetles, ants, etc.). *Technology* would be applied in the form of control (fencing) and water developments (spring developments, wells, pipelines and troughs, etc.).

Tools selected to achieve the riparian goals were: *rest, technology, grazing, and animal impact*. *Rest* was used to move succession toward the

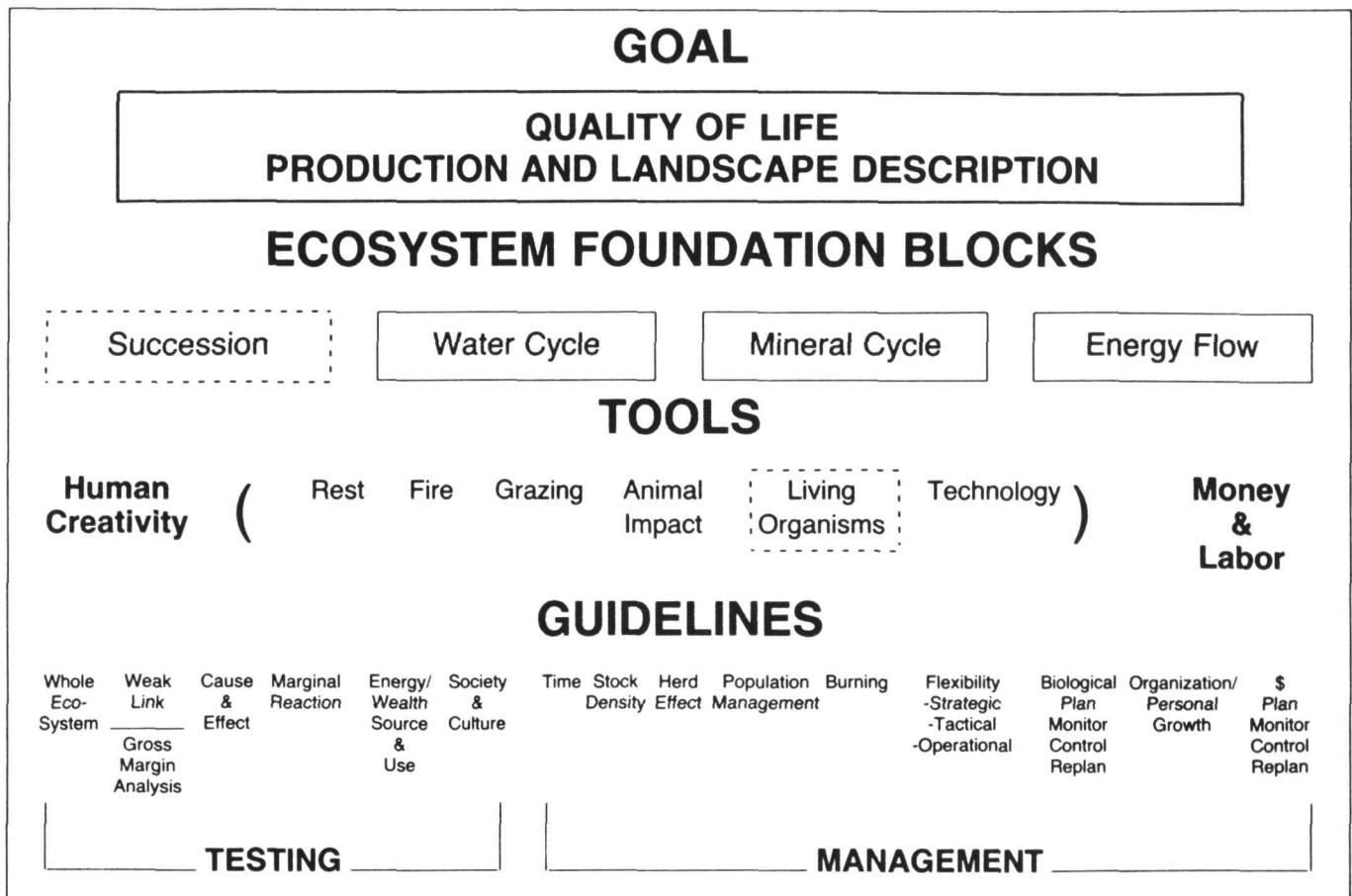


Figure 1. Holistic Resource Management Model. Copyright 1980 Center for Holistic Resource Management.

goals. It was also deemed necessary in some areas to achieve diversity in canopy heights. This would involve rest for a year or two to allow woody vegetation to attain a height exceeding the reach of livestock. *Technology* was selected in the form of control (fencing) to eliminate small areas of excessive animal impact. *Grazing* and *animal impact* were selected for the same reasons they were chosen for the uplands, to improve water and mineral cycles. As in the uplands, time control of grazing is the key. Livestock grazing occurs in the riparian area for a short period (several days to several weeks.) Livestock are then removed, allowing for complete woody and herbaceous vegetative recovery before grazing again.

A vast majority of the ranch-owned property and associated BLM and Utah state lands were previously divided into use areas. These use areas were further defined into 54 paddocks or pastures. A biological plan was constructed for the ranch. Each paddock was charted, showing any livestock conflict and when during the year it occurred. Once all paddocks and their conflicts were charted, livestock moves were planned to avoid conflicts. The biological plan focused attention on these situations and stimulated an appropriate monitoring level to help minimize the conflict.

The biological plan is prepared twice a year, one for growing season grazing and one for dormant season grazing. Both plans, especially the growing season plan, are altered as necessary from monitoring information. This part of the process is what is known as PLAN-MONITOR-CONTROL-REPLAN and serves as the heart-beat of the entire plan. HRM is not a "grazing system" but a highly dynamic process that changes with the "ebb and flow" of nature.

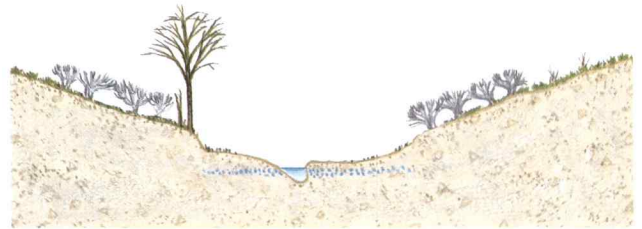
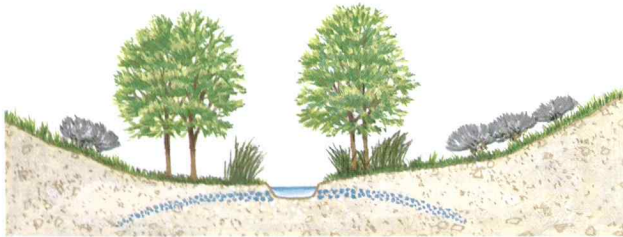
Once the Mountain Island HRM allotment management plan, associated biological plan, and environmental assessment report were completed, a comprehensive review process was initiated. The review process included wilderness and environmental interests groups, Colorado and Utah state wildlife agencies, and BLM specialists from both Grand Junction and Moab offices. Tours were conducted for any group that had questions and/or concerns. The review went extremely well due in large part to the collaboration established at the onset of the process.

Conclusion

HRM is not a quick fix solution. Successes enjoyed to date have been the result of cooperation, time, and support of the Mountain Island Ranch and BLM management in Colorado and Utah. This type of management requires

commitment, intensity, and risk taking. With risk taking come mistakes, but through the PLAN-MONITOR-CONTROL-REPLAN process, problems have been detected early and resolved before becoming catastrophic.

Human creativity used to resolve these problems has served as the foundation for this continuous learning and building process called Holistic Resource Management.



PROPERLY MANAGED RIPARIAN AREAS:

Reduce Flood Damage and Decrease Soil Erosion: Trees, shrubs, and grasses dissipate energy by slowing the speed of flood waters. This results in lowered flood heights and reduces the water's erosive potential.

Protect Water Quality: Riparian vegetation functions as a "living filter" to trap sediment, nutrients, and chemical and organic waste that are carried from the surrounding land during and following storms.

Maintain Stream Flows: Stable riparian systems and wetlands function like sponges to hold water. This increased streambank storage capacity helps maintain year-round stream flow.

Maintain Water Temperature; The riparian zone maintains stream water temperature by providing shade. Shade is particularly important for preventing loss of water through evaporation.

Provide Recreational and Aesthetic Qualities; Riparian areas are focal points for recreational use such as fishing, hunting, camping, and hiking.

Improve Fish and Wildlife Habitat; Riparian areas provide food, cover, water, migration routes, shade, etc.

Improve Livestock Forage; Healthy riparian areas can periodically provide better quality and quantity of forage for livestock.