Riparian Grazing Management That Worked II. Rotation With and Without Rest and Riparian Pastures

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Rest rotation grazing has been considered the answer for temperate bunchgrass rangelands including riparian areas. However, Kovalchik and Elmore (1992) suggest that rest-rotation grazing does not increase willows. Furthermore, the effects of any grazing strategy or set of management techniques vary with the setting and management objectives. Variations in stream type, elevation, precipitation, and topography must be evaluated for each setting before selecting a strategy uniquely designed for the specific conditions and goals of that allotment. This article compares and contrasts rotation strategies with and without rest on three different streams and riparian pastures on two streams.

Strawberry Creek

Three-pasture rest-rotation grazing is working well on Strawberry Creek, located along the northern boundary of Great Basin National Park in eastern Nevada (Fig. 1). Goals on the allotment are to maintain healthy streamside vegetation, stable stream channel conditions and suitable fish habitat. Both sheep and cattle grazed the allotment until the early 1960s when use changed to cattle only. The records show ongoing cooperation since 1986 between the permittee and federal agencies (Forest Service, Bureau of Land Management and National Park Service). The current system has been in place since 1969. It allows grazing in the Strawberry Pasture from mid June to early August the first year and from early August to mid September the second year. The third year it is rested. The permittee also places salt and herds livestock to improve livestock distribution. Other watershed influences include road crossings, primitive campsites, and many beaver dams.

Strawberry Creek varies considerably as it flows from higher elevation forested settings (Photo A), through meadow areas (Photo B) and on to well armored, shrub-lined, alluvial fan sites (Photo C). Inherently stable stream channel conditions, long term attention to resource conditions, and herd management practices promote continuing success.

Wildcat Creek

Three-pasture rest-rotation may not work where past management resulted in unstable, erodible banks. Managers must recognize that removal of one pasture for rest each year decreases the available annual forage by approximately one-third. At some locations, three-pasture rest-rotation gets applied without adjusting livestock num-



Photo A. Strawberry Creek 1991.



Photo B. Strawberry Creek 1991.



Photo C. Strawberry Creek 1991.



Fig. 1. Locations of study streams.

bers. Then, two pastures may get overgrazed each year and one year of rest does not allow system recovery.

A three-pasture rest-rotation plan failed for riparian recovery at a site on Wildcat Creek (Fig. 1) in O'Neil Basin (Photo D). The grazing strategy at this location was not appropriate for the impaired riparian conditions and desired future goals. Specified herd management practices were not followed; water developments had failed and salt blocks were placed near the stream channel. The three-pasture rest-rotation did not provide for rehabilitation of eroded sites. The following examples show two alternatives that provided the proper requirements for recovery.

Immediately downstream on Wildcat Creek is an allotment where four-pasture deferred-rotation grazing and appropriate herd management led to increased riparian



Photo E. Wildcat Creek 1991.

vegetation and streambank building (Photo E). Under the plan, two pastures are used early and two pastures are used late. The pasture with Wildcat Creek is grazed during the spring for two years and then during the fall for two years. Other pastures in the allotment also responded well, as shown by the comparison photos (F and G) on T Creek. Innovative water developments and attention to salt block placement combined with riding and herding helped guarantee success. In the four-pasture strategy, each pasture is used at some time each year. Spring and fall use is appropriate given the foothill elevation and semiarid precipitation zone. During hot summer months, livestock graze higher elevation pastures more appropriate for summer grazing. Increasing the number of pastures and using each of them every year, reduces the time spent in any one pasture. This benefits riparian and nearby upland vegetation and the stream by better distributing livestock without reducing the number of animals.

Van Duzer Creek

Rotation systems can be designed with more than three or four pastures under suitable topography and fencing situations. In the Van Duzer Allotment (Fig. 1) livestock rotate



Photo D. Wildcat Creek 1991.



Photo F. T-Creek 1978.



Photo G. T-Creek 1991.

through five pastures each year. The entire Van Duzer drainage underwent many disruptions including placer mining during the last century. Photo H shows conditions at one site circa 1912. By 1982, conditions had improved dramatically even without a plan designed for riparian recovery (Photo I). A five-pasture deferred-rotation grazing plan was initiated in the early 1980's to address riparian and other concerns. Since then both woody and herbaceous vegetation cover increased (Photo J). With this plan, cattle graze all five pastures for up to six weeks each season. The pasture including Van Duzer Creek is grazed for about three weeks from mid June to early July two years in a row. The following two years, the pasture is grazed for four to five weeks from early August until mid September. This is a higher elevation and precipitation area with a late growing season. Therefore, grazing during the summer months meets streamside vegetation goals.

Goosey Lake Flat Creek

Sometimes, riparian pastures can be created for specialized grazing treatments designed to meet stream and riparian management goals. Conditions along Goosey Lake Flat Creek (Fig. 1) show resource recovery from a prescribed



Photo I. Van Duzer Creek 1982.

riparian pasture grazing strategy. The historical absence of an allotment boundary fence resulted in serious unauthorized livestock use along Goosey Lake Flat Creek. Substantial stream channel downcutting resulted from a catastrophic storm in 1962 (Photo K). In 1966, a riparian pasture was created to increase stream-side vegetation, decrease stream channel width, and improve fish habitat through pool formation.

The Goosey Lake Flat pasture has generally been used as a gather or turnout pasture for the last fifteen years. The plan calls for early use in June one year out of three and two weeks for gathering livestock in September the remaining two years. Vegetation along Goosey Lake Flat Creek increased dramatically (Photo L). It trapped abundant supplies of sediment and built new more stable streambanks, well protected by a mat of dense herbaceous plants. Woody plants also increased. Removal of livestock and several labor intensive projects were proposed to achieve the rehabilitation objectives. However, Goosey Lake Flat Creek shows the resilience of some of these systems. With proper livestock and multiple use management, streams often improve without expensive rehabilitation projects or unnecessary impacts to the livestock operator.



Photo H. Van Duzer Creek circa 1912.



Photo J. Van Duzer Creek 1991.



Photo K. Goosey Lake Flat Creek circa 1965.

Pie Creek

Another example of a riparian pasture was successful though it combined two strategies that often fail ecologically or socially for large pastures with small riparian areas. Season long use has often been linked to bad effects along streams (Platts 1991 and Elmore and Beschta 1987). Without rotation, that is with season-long use year after year, successful management requires severe limits to stocking rate. To effect this, agencies sometimes set low or moderate use limits. In a large pasture, this may cause substantial loss of income.

Managers built a riparian pasture in the Eagle Rock Allotment to limit grazing along part of Pie Creek. About thirty horses use the pasture from mid April through October. Goals were to increase stream bank vegetation and stability and to improve fish habitat. Other goals include protecting sage grouse strutting areas and providing browse for deer. An overview (Photo M) shows the forage, cover and water source this pasture provides. In recent years, beavers constructed many dams within the pasture expanding the riparian zone. Both herbaceous and woody vegetation established and thrive under the prescribed use. This strategy succeeds with low utilization and easy, cost-effective livestock management.



Photo L. Goosey Lake Flat Creek 1991.



Photo M. Pie Creek 1991.

Conclusions

To assure success, rotation or rest-rotation grazing strategies must be specifically designed for the unique conditions of an allotment or watershed. Three-pasture restrotation can succeed with moderate stocking rates, seasons of use matched to the climate, and woody and herbaceous vegetation to maintain rather than dramatically improve. Four-pasture, five-pasture (or more) rotation schemes with no rested pasture may be more suitable to areas that require increased streambank vegetation. The additional pastures or smaller riparian pastures allow for a shorter grazing season and greater flexibility in rotation schedules.

Choosing the season of use for a pasture encompassing a riparian zone should consider the elevation of the site, average annual precipitation, precipitation timing and aspect. Higher elevation, cool mesic sites can respond well to summer grazing (Van Duzer Creek example). Whereas, low elevation, hot dry sites may respond better to early or late seasons within the rotation schedule. Long seasons of use usually lead to riparian concentration. However, even this strategy can work for many streams if managers keep stocking rate, or use on key plants in critical areas, low enough.

Utilization standards can be used to guarantee conservative management if they are set and monitored for the right plants in the right places (for example, recovering stream banks) at the right levels. However, ranchers frequently pay a high price for the reduced harvest. In spite of the cost, this may be the most economical alternative if other strategies are too expensive. Keeping the size of riparian pastures small or using them for special purposes, such as for horses or bulls, improves the economic feasibility of severely limiting harvest.

Managing agencies and permittees need to work together to design and apply grazing strategies, range improvements, and herd management techniques. Water developments, when properly constructed and located in a pasture can lessen the impacts to riparian areas. Salt blocks must be placed away from sensitive water sources to encourage movement away from these sites. Some method (rider, pickup) to periodically move livestock out of sensitive areas can also improve distribution during critical periods.

There is no easy "cookbook" answer to riparian management. Designing a grazing strategy should come after a thorough evaluation of all features of an allotment. Ranchers need to be involved in this planning process as they can provide valuable information on allotment features and livestock behavior. Their own desire for new fences or pastures and management strategies often proves crucial. With cooperation and understanding between the involved parties, many grazing plans can work for riparian and other management objectives.

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