

Strategies for Livestock Management in Riparian Areas in New Mexico

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Riparian areas are the transition zones between aquatic and upland habitats. Their proximity to water in arid states like New Mexico means they are important both ecologically and economically. Riparian areas serve numerous important ecological functions such as filtering sediments and pollutants, slowing the velocity of water during high flow events, recharging groundwater, maintaining the stability of streambanks and reducing erosion, and providing valuable habitat for wildlife. Economically, riparian areas are important to livestock producers not only because they are often associated with sources of water for livestock, but also because the quantity and quality of forage tends to be greater than in adjacent upland areas.

The ecological and economic values associated with riparian areas are often viewed as conflicting with one another. This may be due to the fact that, historically, riparian areas were viewed as sacrifice areas, and the resultant livestock use was often quite heavy. However, the ecological importance of riparian areas has been increasingly recognized in recent years, and a number of management strategies have been developed that can maintain or improve their ecological condition and, simultaneously, improve their forage supplies. The critical first step toward achieving this goal requires that the livestock producer include maintaining or improving riparian condition as a management objective.

The steps that need to be taken to improve riparian condition are site-specific and largely depend on the existing condition of the system. Because riparian areas differ in terms of their hydrologic and soil characteristics, their vegetation potential differs. For instance, some riparian areas do not support woody vegetation such as cottonwoods and willows, but instead may be dominated by sedges, rushes, and grasses. Other riparian systems may have the potential to support woody vegetation. Therefore, different grazing strategies may have to be used to help improve these different types of riparian systems. The livestock producer's experience and knowledge

of the terrain, pasture, animal behavior, and vegetation will be invaluable in determining the appropriate grazing strategy.

To decide whether the condition of riparian vegetation is suitable, a producer needs to assess if the stream and riparian area would be able to withstand the disturbances associated with high runoff events with no significant erosion or stream channel alteration. If so, then that is the condition, at a minimum, that should be maintained for that riparian area. High runoff or flow events may be defined as those that are expected to occur every 25 years or so. Certainly, there will be the highly abnormal flood events (for example, a 100-year flood event) that will create significant disturbance, regardless of the condition of the riparian area.

While producers may not be able to protect against such drastic occurrences, they can try to maintain a condition that protects the stream channel and its banks from more frequent flows and flood events. Maintaining this level of condition will not only increase the likelihood that the stream and riparian area are protected, but also the likelihood that the riparian area begins to capture sediment and increase in size.

GRAZING SYSTEMS

Although riparian grazing plans must be tailored for site-specific conditions, there are a number of general grazing strategies that can help producers meet their specific riparian management objectives. These grazing systems have been researched and tested in the Pacific and Interior Northwest. This publication covers these systems and how they can be interpreted for use in the Southwest. It should be noted that virtually all grazing systems should include *distribution aids* that move livestock away from recovering riparian areas and reduce the amount of time the animals spend in healthy riparian areas.

Corridor Fencing

A severely degraded riparian area with little riparian vegetation may require total rest, at least for a few years. Fencing selected portions of the riparian corridor may be the best alternative for rapid improvement in these instances. However, fences are expensive to build, and maintenance can be particularly challenging in southwestern riparian areas, which are subject to seasonal, high-velocity floods. Fences also may interfere with wildlife access to water and affect the aesthetic properties of riparian systems. In addition, in some cases they may not be practical depending on such factors as topography.

If a producer decides that fencing is the best approach for recovering a severely degraded riparian area, creative designs should be considered that would permit the area to be included in future grazing systems and pasture rotations. Riparian pastures are one example of how this may be accomplished.

Riparian Pasture

Riparian pastures are rangeland pastures, containing both upland and riparian vegetation, that are managed together to obtain specific management objectives. Riparian pastures can be grazed or rested depending on current riparian conditions. Therefore, the objective of riparian pastures is not to exclude livestock from the riparian areas, but to provide for closer management and control of their use.

Riparian pastures can be used seasonally, in conjunction with rotation strategies, or as special use pastures. However, a variety of factors such as terrain, the size of the riparian area, and fence construction and maintenance costs may limit the practicality of a riparian pasture system.

Potential benefits of riparian pasture systems, versus exclusion of livestock grazing indefinitely, includes strengthened plant vigor, increased nutritional quality of autumn/winter forage, a shift in species composition to more desirable plants, increased vegetative cover, and improved ecological status of the plant community.

Early Growing Season Grazing

In the arid Southwest, early growing season grazing occurs when sufficient rainfall or snowmelt coincides with warmer temperatures and longer days to spur plant growth. This typically occurs sometime during mid- to late summer depending on elevation, precipitation, and the amount of cool- versus warm-season grasses. Riparian vegetation often benefits from a greater availability of moisture than upland

vegetation. Therefore, in some areas, riparian vegetation can begin growing much earlier than upland vegetation. The beginning of the growing season is site-specific, and grazing strategies should be tailored to those conditions. It should be kept in mind that suitable alternative forage such as grasses and forbs in the uplands will minimize livestock use of riparian vegetation.

In years of good rainfall, early growing season grazing can encourage cattle to graze in uplands, where forage palatability and climate are more favorable than in the riparian zone. The availability of succulent upland vegetation and cold-air ponding in the riparian zone may induce livestock to spend time out of the riparian area, reducing their use of riparian plants and reducing the amount of soil compaction and bank trampling.

In addition, early growing season grazing allows for more regrowth and plant recovery than summer or fall grazing, and the response of riparian vegetation can be positive, even on sites in poor condition. In fact, early growing season grazing has been shown to be helpful in establishing woody plants, although the effect of grazing on willows during flowering and early seedling establishment has not been quantified.

Growing Season Grazing

Repeated or extended grazing during the summer season generally is considered to have negative impacts on riparian areas. When temperatures are high and water distribution is limited, livestock tend to concentrate in riparian areas during the summer, when the desire for shade and water is more intense. If growing season grazing strategies are used, using distribution aids liberally will help discourage livestock from loafing in the riparian area. Techniques to use to affect livestock distribution include herding, location of water in upland areas, controlled access to stream water, salt and mineral block placement, improved upland forage, drift fences, and shading structures in the uplands. Also, if growing season grazing strategies must be used, periodic rest (grazing the pasture every other year) is recommended.

Late Growing Season Grazing

Late growing season grazing is similar to season-long or deferred grazing in its effects on woody riparian vegetation. Livestock are more likely to browse woody species during this period and less likely to move away from riparian areas, because of the lack of palatable forage in the uplands.

Season-Long Grazing

In season-long grazing systems, livestock are released into an allotment in the early spring and removed in the fall of the same year. Early use of the range often is acceptable for the reasons outlined under early season grazing. Late-season grazing systems also may be appropriate, if forage utilization is closely monitored. However, cattle may begin to congregate in riparian areas during the hot summer months and overuse of riparian forage can occur rapidly. Once overuse of alternative forage occurs, livestock may switch to woody riparian vegetation such as willows. Once again, distribution aids are important tools in this grazing system and periodic rest is recommended.

Dormant Season Grazing

Winter grazing can be compatible with riparian habitat needs and has been successfully implemented on lower elevation ranges. In fact, winter use may be one of the least detrimental grazing systems to riparian areas and may benefit both range and riparian conditions by improving livestock distribution and plant response. Because herbaceous riparian vegetation is not very palatable during winter, it may not receive extensive use. In some higher elevations, livestock also avoid riparian areas, which tend to be colder than surrounding uplands.

However, some evidence suggests that livestock may browse woody species more during the winter because they retain greater nutritive value than herbaceous vegetation when dormant. Livestock use of woody vegetation during winter also depends on temperatures, snow depth and duration, availability of upland forage, animal concentration and distribution, forage/browse preference, and the extent of the woody plant community.

Under certain conditions, continued dormant season grazing may exert selective pressure on the same vegetation species, thereby favoring those species that are less palatable during the dormant season. A number of successes have been observed when late dormant and early growing season grazing systems were merged.

Early Growing Season/ Late Growing Season Strategies

This type of grazing system allows pastures to be used for a short period in the early growing season before summer pastures are ready and again in the fall or late growing season before cattle are moved to winter pasture. To be effective, this grazing system requires close monitoring of forage and browse use dur-

ing the late-season period, especially for woody riparian species like willows and cottonwoods, which can receive excessive use.

This grazing system is acceptable in healthy riparian zones if much of the woody vegetation has matured beyond the reach of livestock and if early use ends before the critical growing period. Late growing season use may have to be delayed or deferred until there is adequate forage in the uplands and on adjacent hillsides. Special care should be taken to leave adequate residual vegetation after fall grazing to help protect against high flows if spring runoff is expected.

SUMMARY

The impact of cattle grazing on riparian ecosystems depends largely on the grazing management practices. It is important to remember that there is not one, simple, grazing system because each situation is unique and requires its own management system. In addition, the only way to know if a particular management system is meeting the goals for a particular site is to monitor the effect of management activities. Therefore, riparian grazing plans should be site-specific and based upon available research and current monitoring.

Some of the important riparian site-specific variables include hydrology, soil moisture, soil permeability, plant phenology, weather conditions, plant palatability, plant regrowth potential, and plant species composition. Important livestock grazing management variables include distribution aids; stocking rates; stocking density; type, breed, and age of livestock; livestock physiological condition; grazing season; and livestock behavior.

If not properly managed, overgrazing by livestock can significantly alter plant community structure and species composition as well as degrade habitat quality for a variety of wildlife species. However, rather than excluding grazing indefinitely, creative and adaptive management allows the riparian forage resource to be used while simultaneously preserving the integrity of the riparian ecosystem.

Further studies are needed to better refine grazing levels and to create monitoring and management plans suitable for protecting and enhancing endangered species habitat. The grazing systems described above should not be interpreted as blanket prescriptions for livestock grazing, but rather general guidelines that must be tailored for specific sites and conditions.

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