

Riparian Grazing Guidelines for the Intermountain Region

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Riparian areas in the western United States often constitute important sources of livestock forage. One acre of meadow has the potential grazing capacity of 10 to 15 acres of surrounding forested range. In the Pacific Northwest, riparian meadows often cover only 1 to 2% of the summer range area but produce about 20% of the summer range forage. In some areas, 80% of the forage consumed may come from these meadows (Kauffman and Krueger 1984). Livestock are attracted to riparian areas because of succulent forage, easy accessibility, shade, a generally reliable water supply, and a microclimate more favorable than that of surrounding terrain (Skovlin 1984).

Excessive livestock impacts, through heavy grazing and trampling, affect riparian-stream habitats by reducing or eliminating riparian vegetation, changing streambank and channel morphology, and increasing stream sediment transport (Fig. 1). Often there is a lowering of the surrounding water tables (Platts 1986). Thus, livestock are perceived as a major cause of habitat disturbance in many Western riparian areas. This perception has resulted in accelerated concerns from various resource users because riparian areas generally represent the epitome of multiple use. In addition to the livestock forage, riparian areas and the associated streams often have high to very high values for fisheries habitat, wildlife habitat, recreation, production of wood fiber, transportation routes, precious metals, water quality, and timing of water flows.

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Review of Grazing Information

The most obvious benefit of a grazing system is to help provide the necessary livestock control to do a good management job (Clary and Webster 1989). Grazing systems typically used for riparian areas are similar to those developed for upland vegetation types. However, no grazing system has been devised for ensuring proper use of small riparian meadows within extensive arid or semiarid upland range. Various studies and experience of a number of people suggest that no grazing system has proven universally successful.

Managers of rangelands are accustomed to giving primary consideration to herbaceous plant physiological vigor. Major additional needs in most riparian areas are to maintain appropriate woody plant communities and to maintain streambank structure and channel form. These are significant factors in fisheries habitat and stream function (Platts 1982, Swanson 1989). One key is the maintenance of adequate vegetation cover and biomass to provide streambank protection during high streamflow periods. Residual streamside vegetation biomass encourages trapping and deposition of sediments for maintaining or rebuilding streambanks (Fig. 2). Careful control of grazing results in maintenance of streambank vegetation and limits the trampling, hoof slide, and accelerated streambank cave-in.

Few guidelines are available on the allowable use of riparian plant communities to maintain ecosystem integrity. Suggestions of allowable use have varied from 20 to 70% depending upon the situation and management goals (Ratliff et al. 1987, Bryant 1985). Others have

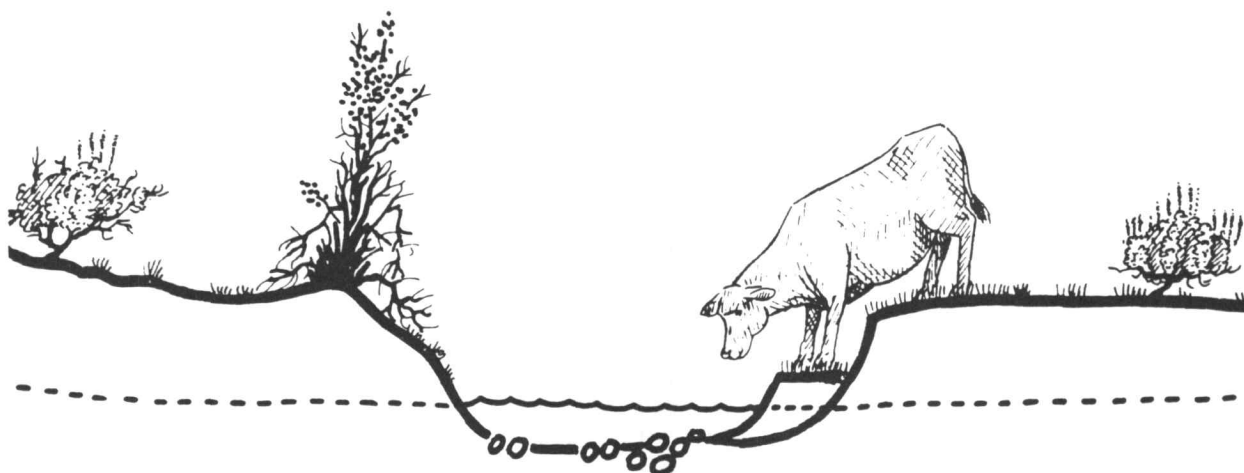


Fig. 1. Unrestrained livestock use often resulted in depleted riparian plant communities and eroded stream channels.

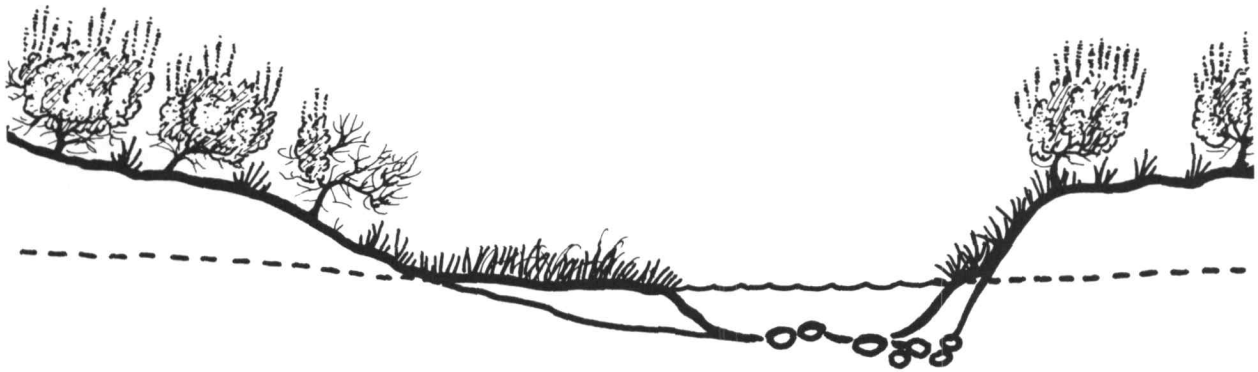


Fig. 2. Residual streamside vegetation encourages trapping and deposition of sediments for rebuilding of streambanks.

emphasized a residual stubble height criterion. The strategy of some riparian managers is to retain sufficient stubble height and its associated plant biomass to maintain forage plant vigor, avoid a strong shift of late season grazing to woody riparian plants, provide streambank protection, and aid in sediment entrapment as a basis for natural rebuilding of streambanks. Most stubble height recommendations fall within the range of 4 inches to 6 inches (Kauffman et al. 1983, Myers 1989).

Season of use is an important factor. Spring grazing of riparian areas has several advantages. Early season grazing usually provides better use distribution between the riparian area and adjacent uplands. There is greater similarity in vegetation succulence between riparian and upland areas, cooler temperatures encourage animal mobility, and, in some cases, livestock avoid streamside areas that are wet in the spring (Clary and Webster 1989). Early grazing, followed by complete livestock removal, allows riparian plant regrowth to occur before the fall dormant period. The ability of most streamside species to reproduce vegetatively reduces concerns about effects of early season grazing on seed production.

Fall grazing is a second choice in many areas. It is probably acceptable if use levels are carefully controlled to leave protective vegetative cover for the following winter-spring high streamflow periods. Grazing riparian areas during mid- to late-summer should be approached cautiously because of the strong tendency of cattle to concentrate along stream courses during the hot and often dry months.

Recommended Grazing Management Practices

If careful review shows that livestock grazing can and should continue on a particular riparian area, grazing management practices must provide for regrowth of riparian plants after use, or should leave sufficient vegetation at the time of grazing for maintenance of plant vigor and streambank protection. We recommend that a minimum herbage stubble height (4-6 inches) be present on all streamside areas at the end of the growing season, or at the end of the grazing season if grazing occurs after frost in the fall. To help achieve this stubble height goal:

1. On pastures grazed spring only, use of streamside herbaceous forage should be limited to about 65%, and

cattle should be removed when the primary forage plants are still in a vegetative state. The appropriate spring removal date will vary substantially depending upon moisture conditions, plant phenology, elevation, etc.

2. Streamside use of herbaceous forage in summer-grazed pastures should be approached cautiously as livestock concentrate in riparian areas during the hot months. In addition, Intermountain riparian plant communities have limited regrowth potential after mid-summer. Suggested use rates are about 50%.

3. Fall grazing of streamside vegetation should be carefully monitored because little or no regrowth potential remains at that time of year. In some northern Intermountain riparian areas retaining a 6-inch down to 4-inch stubble height would be equivalent to a use rate of about 30 to 40% (Clary and Webster 1989).

4. Season-long grazing should be limited to those situations where animal use and distribution can be strictly controlled and where the stubble height requirements can be met.

5. Special situations such as critical fisheries habitats or easily eroded streambanks may require stubble heights of greater than 6 inches.

The length of rest to initiate the recovery process in degraded riparian areas will depend upon vegetative composition and streambank condition. It may be as short as 1 year or it may be 15 years or longer. Degraded streambank recovery usually requires more time than plant community composition recovery, particularly if the channel has become incised and confined (Swanson 1989). Once an area has improved to a mid- or high-seral status (Winward 1989), rotation grazing systems may allow the habitats to remain in good condition while still being grazed. However, recovery or maintenance of riparian ecosystems is not likely unless all livestock are removed from the area after the specified use periods.

Riparian area managers must have a commitment to do whatever is necessary to control livestock use and distribution. A wide variety of management techniques are available. Establishment of special use riparian pastures, development of alternate water sources away from riparian areas, location of stock driveways outside of these areas, periodic herding of livestock away from the areas,

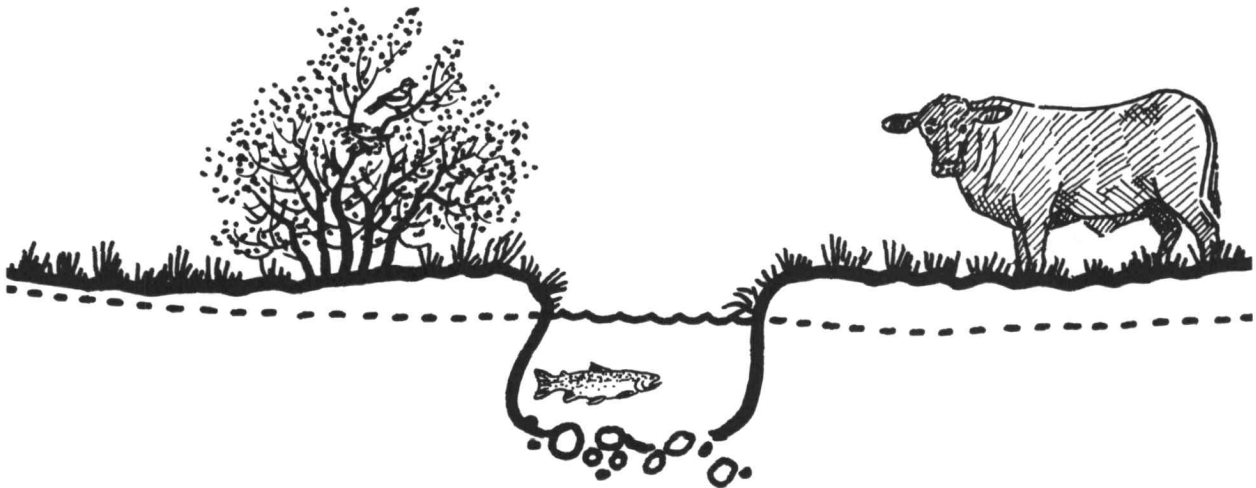


Fig. 3. Recovery of riparian systems can occur when careful grazing management is practiced.

salting outside of riparian areas, installation of drift fences, and other common range management practices help reduce livestock concentration.

Suggested Initial Actions

Riparian areas vary greatly in productive potential, sensitivity to management, and current condition. The following are possible starting points for determining if a management change should be initiated.

For conditions of:

1. Essentially stable coarse-textured stream channel types
 - A. Plant communities in mid- to late-seral ecological status: continue current management or apply recommended riparian grazing practices.
 - B. Plant communities in early seral ecological status: apply rest or the recommended practices.
2. Erodible fine-textured stream channel types
 - A. Plant communities in late-seral ecological status: continue current management or apply recommended practices.
 - B. Plant communities in mid-seral status: apply recommended practices.
 - C. Plant communities in early seral status: apply rest.
3. Environmentally sensitive areas
 - A. Where high spring soil moisture and fine soil texture result in streambanks susceptible to trampling damage: delay grazing until late in the season. Stubble height criterion would still apply.
 - B. Where threatened, endangered, or sensitive species occur, or where streambanks are highly erodible: additional management considerations should be given, such as to increase stubble height criterion to greater than 6 inches or perhaps to remove from grazing.

Monitoring should be an integral part of any management change. When recovery does not occur or is progressing too slowly, further changes in management practices are warranted.

Summary

Our primary concerns in grazing riparian areas are

impacts on the herbaceous plant community, the woody plant community, and streambank morphology. Of these, the streambank morphology and the woody plant community are most susceptible to long-term damage by improper grazing. Our criteria of minimum season-end stubble heights and an emphasis on early grazing are aimed at the maintenance and improvement of streambank morphology and the woody plant component, although streamside herbaceous plants should respond favorably as well (Fig. 3). Most moist site perennial forage plants have a strong vegetative reproductive ability, therefore early season grazing is not as much a concern as for many upland forage plants.

Epilogue

These recommendations are part of a guidance document by Clary and Webster (1989) for planning riparian grazing procedures on National Forests of the Intermountain Region. The recommendations were developed, in part, as an aid in reducing nonpoint source pollution in Western streams and as suggested material for State Best Management Practices. Designation of Best Management Practices to protect water quality requires approval by the Water Quality Management Agencies of individual States. The Forest Service's Intermountain Region and the Intermountain Research Station are coordinating with the States within their respective boundaries to incorporate appropriate management practices into the State's Best Management Practices.

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