



Figure 10. Wickiup Creek, 1991.

5. Spring Grazing

Cool-season vegetation growth begins and peaks in spring. Warm-season plants begin growing during mid- to late spring. Spring use normally results in better live-stock distribution between riparian and upland areas due to flooding of riparian areas and presence of highly palatable forage (including many annuals) on the uplands.

In the spring, seed and litter can be trampled into wet soil by hoof action. However, on some moist or saturated soils, grazing animals more easily uproot plants and compact soils or shear streambanks. Subsequent rest is often required to encourage root growth and other biological activity, which offsets the effects of soil compaction prevalent during the spring season. In a southwestern Montana study, most bank damage resulted when soil moisture was in excess of 10 percent, which normally occurs prior to late July/early August in arid/semiarid areas of the West (Marlow and Pogacnik 1985). The soil moisture content that minimizes bank damage may vary with differences in soil texture.

Spring use provides more opportunity for regrowth and plant recovery than summer or fall use. Regrowth is important for sustaining the important physical functions of a riparian system (e.g., shading, insulation, sediment filtering), as well as for buffering the effects of peak runoffs on streambanks. For example, in the BLM's Prineville District, which is in Oregon's sagebrush- and juniper-dominated high desert, spring grazing has been used to improve riparian conditions on Bear Creek. Prior to 1976, the area was a single pasture licensed for 72 animal unit months (AUMs) from April to September. This strategy depleted streamside vegetation (low diversity and productivity) and deeply incised the stream channel, causing it to be unstable and actively eroding. Summer streamflow was often intermittent and low in quality.

In 1976, the BLM decided to rest the area to restore the productivity of the riparian zone (Figure 11). After 3 years of attempted rest, the area was used for 1 week in September in 1979 and 1980. In 1983, juniper trees were removed from the uplands to improve range condition and watershed health. In 1985, a grazing treatment was designed authorizing use from the time of spring runoff (mid-February) until April 15 in a three-pasture system. In 1988, permitted AUMs were nearly five times the forage obtained from the area under season-long use. Furthermore, the permittee has reportedly cut his annual hay bill by \$10,000. The riparian zone continues to improve (Figure 12). The resulting improvement in quality and quantity of streamflow has allowed the reestablishment of rainbow trout. Though this early season riparian grazing treatment works well on this site's sandy loam soils, it might not work as well on soils with high moisture content.



Figure 11. Bear Creek, 1976.



Figure 12. Bear Creek, 1996, after continued spring use.

Additional examples where spring grazing has worked well include allotments on Bully Creek and the South Fork of the Crooked River in Oregon (Elmore pers. comm.) and T-Creek, Tabor Creek, and Pie Creek in Nevada (Evans pers. comm.).

6. Hot-Season Grazing

Summer is usually the period of greatest photosynthetic activity, especially for riparian and warm-season plants. Upland and cool-season plant growth diminishes due to reduced soil moisture content. Summer use is generally regarded as the most critical. During the hot season, livestock concentrate in or near the riparian area when upland forage becomes rank or dry, water distribution is more limited, and the desire for shade is more intense. Where free-choice grazing is allowed, summer use usually results in greater utilization of riparian vegetation. Summer is also when grazing causes the greatest stress in most plant communities. There is less time for regrowth and replenishment of carbohydrate reserves than with spring use, and more need for leaf area than later in the growing season.

Annually repeated grazing throughout the hot season is nearly always detrimental to riparian vegetation (essentially the same as season-long use), especially in large pastures with small riparian areas that are not managed as riparian pastures. Therefore, some form of deferred rotation, rest-rotation, short-duration rotation, utilization or bank trampling limits, or exclusion is needed to reduce frequency, intensity, and/or duration of riparian use. Deferring use in a riparian pasture until the hot season extends the green feed period of nutritious forage and may provide an economic incentive for better riparian management. However, duration of use needs to be restricted to avoid repeat defoliation, overuse, and streambank trampling.