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Streamside Vegetation Regrowth After Clipping

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In recent years, the interest in management of riparian zones has increased dramatically. Nearly 20 years ago, Meehan and Platts (1978) called for more comprehensive research on riparian zones and grazing. To quote, "Further research is needed on both the physical/chemical and biological aspects of livestock grazing and aquatic habitat interrelationships. The resource manager needs this type of quantitative information to make sound land use planning decisions". Unfortunately, we are still asking relatively fundamental questions about how riparian systems function. There is considerable debate about the amount of regrowth that can be expected after a summer grazing period. The assumption is often made that riparian areas, because of the moisture regime, will experience considerable regrowth during the summer and early fall (Clary 1996).

This study was designed to quantify the amount of regrowth occurring on a stream-associated riparian zone in southeastern Oregon following defoliation.

Site Description

The study was conducted on Rattlesnake Creek, 15 miles northeast of Burns in southeastern Oregon. Elevation of the study site was 4,600 feet, and the creek orientation was roughly north-south. On the reach we studied, the creek was about 4 feet wide, occupies a V-shaped valley, and has an associated riparian zone about 100 feet across (Fig. 1). Much of the creek length has a road associated with it, but the road does not have a major impact on the riparian area. The riparian vegetation is predominantly redtop, dagger leaf rush, Baltic rush, creeping spike rush, and Douglas sedge. The primary woody riparian species in the vicinity are thin-leafed alder and willows. The uplands are dominated by low-elevation ponderosa pine communities.

Soils on the study site were formed from mixed alluvial sediments derived from mixed igneous rock. The surface 10 inches is a loam to sand loam, and at 10 to 15 inches the soil is a gravelly to sandy loam. The subsoil is an extremely gravelly loamy sand. The water table was generally within 20 inches of the surface. Sometime after mid October of 1993 and before spring 1994, a beaver dam was built below the study area, increasing the water table depth.

Prior to 1979 there was some form of nearly season-long grazing on the study area. After 1979, spring and early summer became the primary season of grazing use. Range analysis indicates the condition of the riparian zones along Rattlesnake Creek have substantially improved with spring and early summer use (Burns District BLM files).

During the 3 years of the study (1993 through 1995) the weather varied tremendously. Precipitation was an all-time high during 1993, a record low in 1994, and was above average in 1995. Crop year (Sept. to June) precipitation was 16.8, 5.6, and 14.3 inches, during 1993, 1994, and 1995, respectively. The average for 1952 to 1995 was 10.0 inches. Temperatures were well below normal during late spring and summer of 1993.

Approach

A 0.25 acre exclosure was constructed in a graminoid-dominated community adjacent to Rattlesnake Creek. Four treatments (a non-clipped control, and 3 clipping treatments) were randomly assigned to each of 10 replicates in a randomized block design. During 1993 and 1994, the three clipping treatments were clipped once during the growing season,

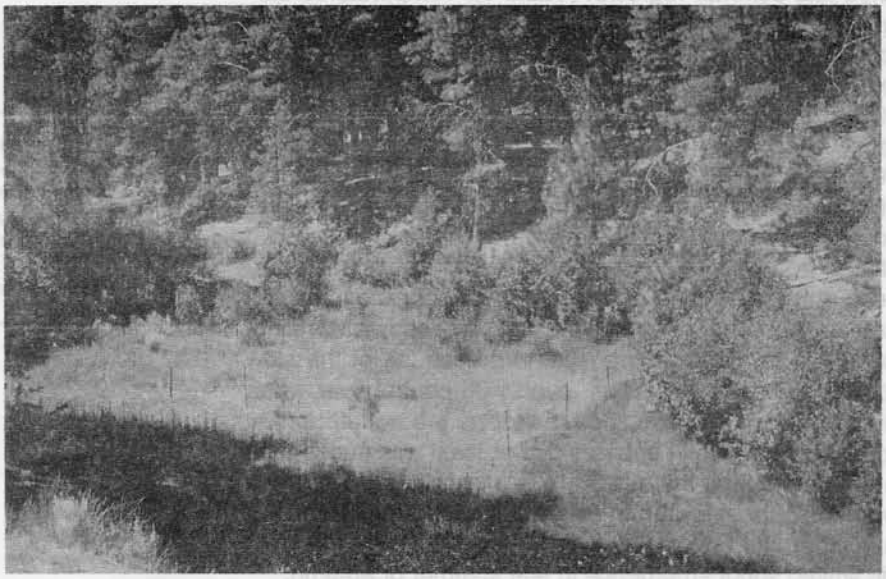

Fig. 1. *General view of the study area.*

Table 1. Aboveground standing crop (at the time of clipping), regrowth (clipped in mid-October, and total standing crop and regrowth) for riparian vegetation clipped 4 times during each of 3 years. Treatments were clipped in the middle of the month.

	1993			1994			1995		
Month Clipped	Clipped Standing Crop	Regrowth	Total	Clipped Standing Crop	Regrowth	Total	Clipped Standing Crop	Regrowth	Total
-	(lbs/ac)								
June							760[b]	840[a]	1600
July	1480[b]	150[a]	1630[ab]	1710	210[a]	1920	1930[a]	330[b]	2260
August	2100[a]	26[b]	2120[a]	1660	84[b]	1740	1970[a]	32[c]	2000
September	1490[b]	6[b]	1500[ab]	1320	0	1320			
October	1100[b]		1100[b]	1560		1560	2030[a]		2030

Values within a column followed by different letters are statistically different at P< 0.05.

either mid-July, mid-August, or mid-September. It became clear that there was limited late season regrowth, so in 1995 we added a mid-June clipping to assess regrowth from an earlier date. Given the limited regrowth in the September treatment during the first 2 years, we dropped this treatment during 1995. The two other treatments were clipped at the same times as in previous years. All treatments were also clipped in mid-October to assess standing crop of the unclipped control or regrowth of previously clipped treatments. The standing crop was clipped to a 1.0 inch stubble height, placed in paper bags, dried at 60°C for 48 hours, and weighted. We analyzed the data using standard statistical procedures.

Findings

There was very little regrowth of the riparian community if clipping occurred after mid-July (Table 1). For example, regrowth in September was less than 1% of total standing crop, and regrowth in August and September combined contributed less than 5% to total standing crop. Our study included a year that set the all-time recorded high for yearly precipitation and snowpack (1993), and yet there was still limited late summer regrowth (Table 1). Temperatures during 1993 were well below normal, which is reflected in the fact that total standing crop peaked with the August treatment, rather than with the July treatment as in 1994 and 1995. The beaver dam may explain the relatively high total production in 1994 (a drought year) and 1995, compared to 1993. Clary (1996) also found that sedge communities did not exhibit appreciable regrowth after mid-summer defoliation. Rumburg (1963) studied the possibility of taking two cuttings from native flood meadows that traditionally produced only one cutting of hay. Even with irrigation and fertilization, he concluded that the flood meadows were not well-suited to two-crop management because of the slow recovery after harvest. Thus, even with control over water and soil nutrients, native flood meadows are not efficient at producing regrowth. It appears that at least with sedge-rush dominated communities, there is very limited regrowth potential after mid-summer. Ratliff and Westfall (1992) found that Nebraska sedge emerged primarily in spring, with limited shoot emergence in late summer or autumn.

Managers should be cautious in their assumptions about regrowth in riparian areas. We have often assumed that because riparian areas are relatively wet, they will regrow vigorously. The amount of regrowth will undoubtedly depend on the plant community (e.g., Clary 1996), elevation, and the hydrology of the site. However, under the conditions of this study significant regrowth after mid-summer would not be expected.

Literature Cited

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