

EFFECTS OF LAND MANAGEMENT DISTURBANCE ON HEADWATER
RIPARIAN ECOSYSTEMS WITHIN THE UNIVERSITY OF IDAHO
EXPERIMENTAL FOREST

A Thesis

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By

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Abstract

Riparian habitats in forest and meadow zones were examined on six northern Idaho headwater streams within the University of Idaho Experimental Forest. Timber harvesting, domestic livestock grazing and transportation systems have influenced these watersheds for nearly a century. Representative cross-sectional transects were established to characterize morphological, vegetative, and edaphic features for comparisons of reference and disturbed riparian ecosystems. Assessments of current riparian conditions and management alternatives were formulated through riparian-wetland guides designed by the United States Bureau of Land Management and Forest Service. Streams in grazed meadow and forest areas were 32% wider than ungrazed reaches. Mean bank angles for stream banks exposed to grazing were 15 degrees wider than undisturbed stream banks, exhibited poor bank stability, and had greater potential for erosion. High concentrations of fine sediments were found throughout, or immediately below, all grazed sections. Streams within grazed meadow areas contained an average of 76% fine sediments. In contrast, undisturbed forested reaches had 10% more bank undercuts, fewer fine sediments, stable banks, significantly greater shore water depth, and longer seasonal water flow. Evaluations of current stream conditions suggest that continuously disturbed riparian ecosystems may reduce natural functional processes such as sediment filtration and stream bank aggradations and increase flooding potential. Ecosystem-based management strategies that focus on all resource values are needed to restore riparian areas to stable and self-regulating ecosystems.

Study Site

The research was conducted in northern Idaho on the University of Idaho Experimental Forest (46°47' N lat. 116°47' W long.) located in Latah County, approximately 19 km northeast of Moscow, Idaho (Figure 1). Current land-use activities include various annual timber harvesting practices, new road construction, and cow/calf grazing operation employing a rest-rotation strategy. Livestock grazing occurs throughout all management units except Big Meadow Creek. The University of Idaho Experimental Forest is characterized by rounded granodiorite and basalt ridges with numerous sloped sites over

and elevational range of 670 m to 1067m above sea level. The mean degree of slope on the study site ranged from 16% to 35%. Soil types varied with slope and stream reach locations.



Location of Complete Research:

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Other Sources: