

G-C Griffiths

Sediment Removal as a Means of Stream Habitat Improvement¹

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Jack Griffith and Scott Grunder
Department of Biology
Idaho State University
Pocatello, ID 83209
(208) 236-2116

INTRODUCTION

Some consequences of the presence of substantial quantities of deposited sediment in streams have been well documented, especially the effects on reproductive success of salmonids. However, accumulated sediment may be equally detrimental in some streams by reducing both the amount of living space available for trout and the production of aquatic invertebrates. The resulting reduction in water depth may render the habitat unsuitable for fish, especially for larger individuals and for those species primarily relying upon water depth as cover. Fish populations potentially could be affected during both summer and winter.

Using a suction dredge, we sought to remove sediment from short segments of a stream choked with sediment to evaluate the response of fish, aquatic invertebrates, and aquatic vegetation. This technique has recently been used to improve trout habitat in Hot Creek, California (Parker 1981), but to our knowledge no previous study has systematically evaluated the response of the aquatic community to sediment removal from streams.

We worked on a tributary of Silver Creek (Blaine County, Idaho) holding rainbow and brook trout. The Silver Creek system has received large quantities of sediment from agricultural activities in the watershed (Manuel et al. 1979) but at present an active program of The Nature Conservancy to acquire land and secure riparian easements is reducing sediment inputs to the stream. It is largely a spring-fed system, and spring season flows are not great enough to naturally flush sediment. Because of a desire by The Nature Conservancy to maintain the stream in as natural a state as possible, sediment removal, if feasible, is preferable to the construction of in-stream structures to enhance trout habitat.

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Table 1. Numbers of trout > 13 cm found in study sections of Mud Creek before and after sediment removal.

Date	test		upper control		lower control	
	brook	rainbow	brook	rainbow	brook	rainbow
17 Oct. 1981	16	3	12	4	18	3
15 Mar. 1982	1	0	0	1	0	2
8 June 1982	6	0	2	0	4	0
..... sediment removal						
25 June	7	0	0	0	2	0
13 July	10	0	1	0	2	0
29 July	8	0	0	0	4	4
9 Aug.	7	1	0	0	1	0
20 Aug.	5	1	0	0	0	0

Following sediment removal, numbers of trout > 13 cm increased in the test section to numbers several times greater than those found in either control section but not appreciably greater than in the test section before dredging.

Numbers of young-of-the-year (nearly all brook trout) declined in the test section following dredging. Immediately before dredging there were 24 present and this number dropped to 6^{±2} throughout the summer. Young-of-the-year numbers remained relatively constant at about 20 and 10 in the upper and lower control sections, respectively.

Invertebrates in the area before dredging were low in abundance and diversity, with chironomids and oligochaetes heavily dominating. Analysis of post-dredging samples is not yet complete, but recolonization appears very slow.

All study areas are normally heavily vegetated with dense beds of *Chara* with scattered *Potamogeton*. After dredging, *Chara* was very slow to reestablish, reaching a height of 1-2 cm at the end of August.