Detrimental Effects of Highway Construction on a Montana Stream

In 1955, it was learned that plans for highway improvement in Granite County, Montana would involve some channel changes on Flint Creek. This stream is a tributary of the Clark Fork of the Columbia River. The fish population in several sections of Flint Creek had been inventoried annually each spring by electric shock census as part of a federal aid investigations project (Montana F-13-R) initiated in 1954.

Flint Creek averages about 20 feet in width, six inches in depth. It has holes up to four feet deep, and has an average flow of about 15 cubic feet per second. In its original condition good trout cover was provided by overhanging willows and undercut banks (Figure 1). Rainbow trout (*Salmo gairdneri*), cutthroat trout (*Salmo clarki*), eastern brook trout (*Salvelinus fontinalis*) and mountain whitefish (*Prosopium williamsoni*) are the game fishes in this study area.

A 230-volt D. C. portable generator, used for fish population census, was efficient at capturing approximately 90 percent of the large sized (six inches total length and over) game fish present in Flint Creek, as indicated by recaptures of tagged trout. Sections of the stream to be shocked were blocked off with ½-inch mesh seines placed a measured distance (usually 300 feet) apart.

The new highway construction was begun in the fall of 1956 and continued through the summer of 1957. A bulldozer was used to remove brush, scour the stream bed and straighten approximately 350 feet of the channel of Flint Creek (Figure 2). Such channel changes are common along new highway construction in mountainous terrain and affect many miles of stream each year in Montana.

Nearly the same 300 foot section of stream at the highway construction site was sampled each spring, from 1955 through 1957. Fish taken in 1955 and 1957 were enumerated, weighed, measured and recorded (Table 1). Those taken in 1956 were counted and recorded only as over or under six inches in total length. All fish captured were returned alive to the study area. Numbers of large sized trout captured were 75 and 69 in 1955 and 1956 respectively. Only six large sized trout were found in this section in 1957, after the

FIGURE 1.—Flint Creek study area untouched by highway construction.

FIGURE 2.—Flint Creek study area after channel changing by highway construction.

Reprinted from Volume 88 (1959), Transactions of the American Fisheries Society
Published 1959 Printed in U.S.A.

TABLE 1.—*Game fish captured by electric shocker from 300 foot section of Flint Creek, Montana, 1955 and 1957*

Species	1955 Number	1955 Lbs.	1957 Number	1957 Lbs.
		Large-sized fish		
Rainbow and cutthroat trout	68	12.63	6	1.19
Eastern brook trout	7	3.86	0	0.00
Mountain whitefish	16	2.25	0	0.00
Total large sized fish	91	18.74	6	1.19
		Small-sized fish		
Rainbow and cutthroat trout	46	1.32	6	0.26
Eastern brook trout	6	0.17	2	0.10
Mountain whitefish	1	0.04	0	0.00
Total small-sized fish	53	1.53	8	0.26
Total fish, all sizes	144	20.27	14	1.55

channel changing phase of the highway construction had been completed.

The reductions shown in Table 1 were 94 percent in both numbers and weight of large sized game fish. In small sized game fish (under six inches total length) these reductions were 85 percent in number and 76 percent in weight.

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