

MONTANA DEPARTMENT OF FISH AND GAME
FEDERAL AID IN FISH RESTORATION SECTION
HELENA, MONTANA

JOB COMPLETION REPORT
INVESTIGATIONS PROJECTS

State of Montana

Project No. F-21-R-3

Job No. I

Period Covered May 1, 1958 - April, 1959

Name Evaluation of DDT Spraying

Title Investigations of the Effects of

Forest Spraying Operations on Fish

Populations

Abstract:

Sampling of Sheep Creek and North Fork Musselshell River revealed the trout and whitefish populations had made good recoveries in numbers but were comprised of smaller fish in 1958.

Studies of the effects of spidermite spray were discontinued after initial sampling indicated little spray reached the stream and consequently there was little effect on the insect population.

Objectives:

To complete the sampling of fish and aquatic insect populations conducted during 1956 and 1957 in conjunction with forest spraying of DDT and to observe the effects on fish and aquatic organisms of a pesticide to be used with DDT on a test area to control the spruce spidermite.

Techniques and Results:

During 1958 the U. S. Forest Service spray program was limited to 15,000 acres in Broadwater County. This was an experimental program for spruce spidermite as well as spruce budworm. The area was divided into plots which were sprayed with various amounts of DDT and Genite, a miticide. This area was in the Big Belt mountains, several miles east of Townsend, and the only important stream affected was Canyon Creek. Bottom samples were collected from eight stations in the stream, within and below the spray area. Sampling was done two weeks prior to spraying and one month following (early July).

Observations on spray day showed that little spray reached the stream. Drift samples showed a slight increase in drifting small mayflies at the lowest station. Gross observations of the bottom samples showed little quantitative or qualitative change between sampling periods. As a result observations of the stream were discontinued.

During 1958 the fish population in Sheep Creek and North Fork Musselshell Rivers were sampled by shocking the stations established in 1956 and shocked again in 1957.

The 1958 samples indicated good recovery of the fish populations although the average size of the fish was smaller. Results of the 1956, 1957 and 1958 sampling are shown in Tables I and II.

In Sheep Creek the eastern brook trout population decreased 92 per cent in the sprayed sections by 1957 and were still down 16 per cent in 1958. The average size of the fish decreased from 6.3 inches to 4.6 inches as the population was predominantly young fish in 1958. Whitefish numbers dropped 85 per cent following the spraying but made good recovery by 1958 (still down 10 per cent). The average size decreased from 8.8 to 5.1 inches.

Rainbow trout decreased 60 per cent following spraying. No comparison may be made with the 1958 data for a plant of legal size rainbow was made into one of the sections just prior to the 1958 sample period.

Fresh water sculpins which were abundant before spraying, had not re-appeared in the sprayed sections of Sheep Creek by 1958.

Unsprayed sections of Sheep Creek showed no decrease in the fish population following spraying and there was a general increase in numbers while the average size of the fish did not show such a marked decrease.

The North Fork Musselshell River had only brook trout. The 1957 sample showed a 70 per cent decline while by 1958 the population was up 11 per cent above the pre-spray population. This 1958 sample contained mostly smaller, young fish with the average size decreasing from 5.1 inches in 1956 to 4.1 in 1958.

Discussion and Recommendations:

Sampling in 1958 indicated the trout and whitefish made a rapid recovery in Sheep Creek and Musselshell River following the spraying in 1956. However, the quality of the fishing had not returned to prespray areas as the average size of the fish was smaller in 1958.

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Table I - Fish collections^{1/} from Sheep Creek made during the summer of 1956, 1957 and 1958 (300-foot section).

Year	Section	Eb ^{2/}	Ave. Size in Inches	Rb	Ave. Size in Inches	Wf	Ave. Size in Inches
1956 Sprayed	I	19	6.8	2	7.2	0	
	II	30	6.2	14	7.4	78	9.2
	III	11	5.8	10	7.1	16	6.6
		61	6.3	26	7.3	94	8.8
Below Spray Area	IV	0		41	6.4	0	
	V	0		43	6.0	32	8.0
1957	I	4	8.4	0		0	
	II	1	9.5	0		14	10.4
	III	0		10	8.9	0	
		5	8.6	10	8.9	14	10.4
	IV	0		56	6.6	10	8.5
	V	0		31	6.3	56	7.0
1958	I	16	5.1	1	3.7	0	
	II	28	4.1	3	8.2	76	5.1
	III	7	5.6	47	8.0	5	5.0
		51	4.6	51 ^{3/}	7.9	81	5.1
	IV	3	3.2	92	6.3	8	6.8
	V	4	5.7	23	6.5	49	7.1

^{1/} Only fish three inches or longer were tabulated due to ineffective sampling of smaller fish.

^{2/} Eb-Eastern brook Rb-Rainbow trout Wf-Whitefish

^{3/} Not comparable with data from previous years since rainbow were planted just prior to the 1958 sample period.

Table II - Fish collections from North Fork Musselshell River made during the summers of 1956, 1957 and 1958.

Year	Section	Eb	Ave. Size in Inches
1956	I	119	5.3
	II	134	4.9
		253	5.1
1957	I	54	5.2
	II	21	5.5
		75	5.3
1958	I	208	3.9
	II	73	4.8
		281	4.1