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MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION
HELENA, MONTANA

JOB COMPLETION REPORT
INVESTIGATIONS PROJECTS

State of Montana

Project No. F-27-R-6

Name Rock Creek Creel Census

Job No. I

Title Summer Census

Period Covered July 1, 1964 - June 30, 1965

Abstract:

A creel census study to determine the contribution to the fishing by stocks of catchable-size rainbow trout was continued for the seventh year on a 40-mile section of Rock Creek near Missoula, Montana.

Estimates of pressure and catch are obtained by a regression analysis of complete car counter data and data from checking station contacts on randomly selected dates during the summer.

An estimated 9,258 anglers fished 34,887 hours and caught 21,637 fish during the summer of 1964.

The catch per man hour during the three years of stocking ranged from 0.94 to 0.91 and in the following four years without stocking it ranged from 0.75 to 0.62.

Six species of fish have been creeled since 1958. In most years over 50 percent of the fish caught are rainbow trout. Brook trout, whitefish, cutthroat trout, Dolly Varden and brown trout are caught in lesser amounts and in that order.

Recommendations:

To fulfill the basic objectives of the study the following is recommended:

1. The study be continued for at least two years.
2. Stocking be resumed, for purposes of the study, and that 5,000 fish be stocked in 1965 and an increased number in 1966.
3. Information relating to the catch rate of individual fishermen should be retrieved from the I.B.M. cards from previous years and the collection of these data continued. This should be done by continuing the practice of making note of the name and number of as many of the same fishermen who fished Rock Creek since 1963.

4. Lengths, weights (dressed and round) and scale samples should be taken from a random selection of fish in sufficient quantities to permit accurate description of the catch.

Objectives:

The long-range objective of the Rock Creek Study is to obtain the necessary harvest and pressure information for an evaluation of the trout stocking program of catchable-sized fish in Rock Creek. This report covers the seventh year of the study, a time when the catch rate and fishing pressure have been quite stable.

The objective of the next few years of the study should be a determination of the return of hatchery fish from Rock Creek at varied stocking levels and the effect of these variances on the overall catch rate and the catch rate of anglers who have a known catch history on Rock Creek.

Techniques Used:

All techniques are the same as in previous years with the following exceptions. The fishing season began on May 24, and 81 days of the season were censused at the lower station and 52 days censused at the upper station. At the lower station the season is regarded as 191 days from the opening date to November 30, and 174 days at the upper station from the opening date until September 13. The days censused are shown in Appendix A.

Findings:

Six species of game fish were taken by anglers in 1964. They were rainbow trout, (Rb), Salmo gairdneri Richardson; brown trout, (IL), Salmo trutta Linnaeus; cutthroat trout, (Ct), Salmo clarki Richardson; Dolly Varden, (Dv), Salvelinus malma (Waubaum); brook trout, (Eb), Salvelinus fontinalis (Mitchell); mountain whitefish, (Wf), Prosopium williamsoni, Girard.

The species composition of the catch from 1958 through 1964 is shown in Table I.

After the rapid decline of the hatchery rainbows from 1960-61, the composition of the catch during the past three years has been quite stable. Figure I. Some trend is noted by an increase in brown trout. To determine the trends in the catch of natural fish the hatchery fish were deleted and additional trends are apparent. Table II.

Table 1. Species composition of the anglers catch, in percent, from both sections of Rock Creek in the years 1958-1964.

Year	LL	DV	Ct	Wf	Eb	Hatchery Rb	Natural Rb
1958	1.2	5.0	7.3	7.0	15	26	38
1959	1.4	4.7	5.8	11.0	14	24	39
1960	1.9	5.2	8.0	13	13	25	34
1961	4.3	6.9	12.0	16	13	2.9	46
1962	4.9	5.5	8.6	15	12	1.3	53
1963	7.3	6.6	12.0	14	11	1.3	48
1964	7.2	4.8	10.0	14	11	tr.	53

Table 2. Species composition of the anglers catch, in percent, exclusive of the hatchery rainbows, from both sections of Rock Creek during the years 1958-1964.

Year	S p e c i e s					
	Rb	Ct	Eb	DV	LL	Wf
1958	52	10	20	6.8	0.2	9.5
1959	52	7.6	18	6.2	0.2	14
1960	45	11	17	7.0	0.2	17
1961	46	12	13	6.9	4.3	16
1962	53	8.6	12	5.5	4.9	15
1963	48	12	11	6.6	7.3	14
1964	53	10	11	4.8	7.2	14

Brook trout declined from 20 percent of the anglers catch in 1958 to 11 percent in 1964. During the same period brown trout increased in the catch from 0.2 percent to 7.2 percent. Similar trends are noted in the catch rate. The catch rate of brook trout decreased from 0.13 fish per man-hour in 1958 to 0.07 in 1964. Brown trout in the same period increased from 0.01 fish per man-hour to 0.05. The catch of rainbow trout has ranged from 0.38 fish per man-hour in 1959

to 0.30 fish per man-hour in 1963 but no trends are evident.

The estimates of harvest in numbers of fish, pressure in man-hours and man-trips are found in Appendix B. Confidence limits at the 95 percent level have been applied to these estimates. Trends in the catch per hour, catch per angler and average length of trip since 1958 are shown in Table 3.

Table 3. Average catch per hour and per trip and the average length of trip Rock Creek in the period 1958 to 1964 for both stations.

Year	Catch per angler	Catch per hour	Average length of trip (hours)
1958	3.39	0.91	3.7
1959	3.07	0.94	3.5
1960	3.13	0.93	3.3
1961	2.23	0.75	2.9
1962	2.05	0.70	3.0
1963	2.04	0.64	3.2
1964	2.34	0.62	3.8

The catch per hour in 1963 and 1964 was nearly the same. However, the catch per angler (per trip) was 2.34 in 1964, as compared with 2.04 in 1963. The change was due to an increased average length of trip from 3.2 hours in 1963 to 3.8 hours in 1964. The average length of trip in 1964 is the longest recorded during the study.

The distribution of fishing pressure in terms of man-hours by various periods since the beginning of the project are noted in Table 4.

Table 4. Percentage of fishing pressure by periods -- lower Rock Creek section from 1958-1964.

	Period - Opening Day To:					
	May 31	July 4	July 31	Aug. 30	Sept. 30	Oct. 31
Median percentage	11	48	65	85	96	98
Range in percentage	8-19	37-52	57-71	79-88	93-97	97-99

Nearly 50 percent of the fishing pressure occurs by July 4 each year, and in most years 95 percent has taken place by the end of September. Variations which occur are probably caused by the fluctuations in water flows or other stream conditions.

Prepared by Keith Seaburg

Date November 15, 1965

Approved by George D. Holton

Appendix A

Rock Creek creel census schedule - 1964
(Dates shown are census days)

Upper Station

May

- - - - - 24 -- 26 -- 28 -- -- 31

June

1 2 3 - 5 - 7 - - -- 11 -- 13 -- 15 16 -- -- -- 21 -- -- 24 -- 26 27 -- 29 --

July

- 2 - - 5 - 7 8 - 10 11 -- 13 -- -- -- 18 19 -- 21 -- 23 24 25 -- 27 -- 29 -- --

August

- 2 - - - 6 7 8 - 10 11 -- -- -- 16 -- -- 19 20 -- 22 -- -- 25 -- -- 28 -- 30 --

September

- 2 - - 5 6 7 - - -- -- 12 13 -- -- -- -- --

Appendix A

Rock Creek creel census schedule - 1964
(Dates shown are census days)

Lower Station

May

- - - - - 24 25 26 -- -- 29 -- 31

June

1 - 3 4 - 6 - - 9 10 -- 12 -- 14 15 -- -- 18 -- 20 -- 22 23 -- 25 -- -- 28 -- --

July

1 - 3 4 - 6 - - 9 10 -- 12 13 14 15 -- -- 18 -- 20 21 22 -- -- -- 26 -- -- -- 30 31

August

1 - 3 - 5 6 - - 9 -- 11 -- -- 14 15 -- 17 18 -- 20 -- -- 23 -- -- 26 -- 28 29 -- 31

September

- - 3 4 - 6 7 8 9 -- -- 12 -- -- -- -- 18 19 -- 21 -- -- -- -- 27 -- -- 30

October

- - - - - 9 10 -- -- -- -- 15 -- -- 18 -- -- -- -- 23 -- -- -- 27 -- -- -- 31

November

1 - - - - - 7 8 - -- 11 -- -- 14 15 -- -- -- -- 21 22 -- -- -- -- 29 --

Appendix B

Estimates of harvest, hours fished and angler trips with
confidence intervals at the 95 percent level, for Rock
Creek, Station I, 1964.

	<u>Lower limit</u>	<u>Point estimate</u>	<u>Upper limit</u>
Harvest:			
Regression estimate (5/24 - 9/6)	5186	7164	9142
Known	7816	7816	7816
Ratio estimate (9/7 - 11/30)	<u>3311</u>	<u>3789</u>	<u>4267</u>
T o t a l	15683	18769	21225

Hours:			
Regression estimate (5/24 - 9/6)	9867	13579	17291
Known	14644	14644	14644
Ratio estimate (9/7 - 11/30)	<u>3210</u>	<u>3770</u>	<u>4330</u>
T o t a l	27721	31993	36265

Anglers:			
Regression estimate (5/24 - 9/6)	2599	3587	4575
Known	3829	3829	3829
Ratio estimate (9/7 - 11/30)	<u>884</u>	<u>1022</u>	<u>1160</u>
T o t a l	7312	8438	9564

Appendix B

Estimates of harvest, hours fished and angler trips with confidence intervals at the 95 per cent level for Rock Creek, Station 2, for the period May 24 to September 13, 1964.

	<u>Lower limit</u>	<u>Point estimate</u>	<u>Upper limit</u>
Harvest:			
Regression estimate	1005	1391	1777
Known	<u>1477</u>	<u>1477</u>	<u>1477</u>
T o t a l	2482	2868	3254
Hours:			
Regression estimate	1038	1434	1830
Known	<u>1460</u>	<u>1460</u>	<u>1460</u>
T o t a l	2498	2894	3290
Anglers:			
Regression estimate	281	395	509
Known	<u>425</u>	<u>425</u>	<u>425</u>
T o t a l	706	820	934

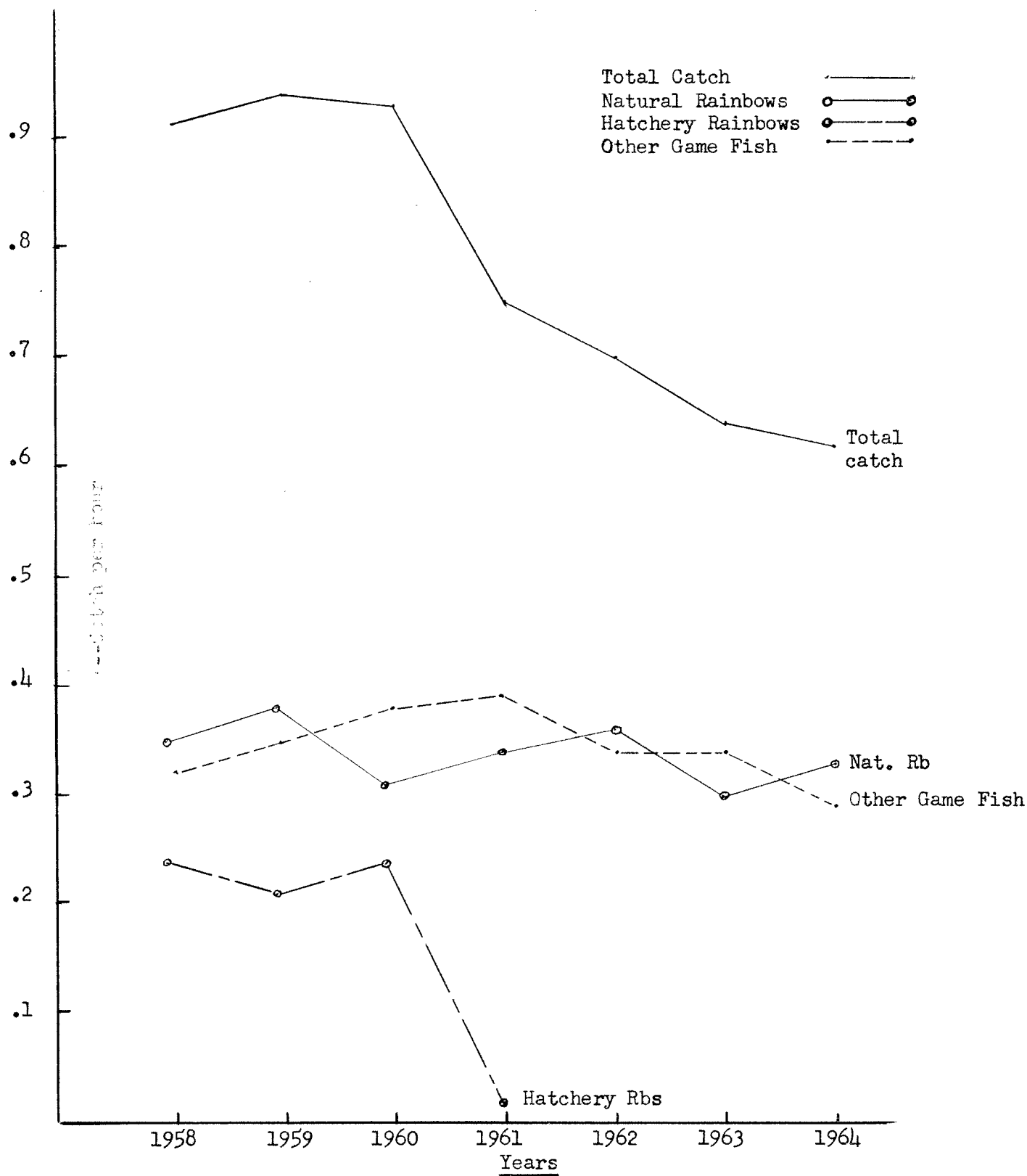


Figure 1. - Rate of catch in numbers of fish per man-hour for both sections of Rock Creek during the years 1958 through 1964.