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LIFE HISTORY OF STEELHEAD
TROUT (SALMO GAIIRDNERI) IN THE
SEYMOUR RIVER - BASED ON
ANGLER CATCH BETWEEN 1950 AND 1977

by

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December 1977

900-0661-000

ACKNOWLEDGEMENTS

Thanks is due to several persons that assisted in the completion of this report. Vic Swiatkiewicz and Peter Caverhill reviewed the draft and made many helpful suggestions. Kanji Tsumura, at U. B. C. Fisheries Research provided the scale press and 3m"500" READER-PRINTER. And finally, Carol Davišon, Joanne Katanchik and Robbie Clement had terrific patience in typing all the tables, graphs and final report.

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ABSTRACT

In total about 160 scale samples were examined from steelhead caught by angler's in the Seymour river. Most of the samples were from 1950 to 1959 but some were as recent as 1977. There were about 109 samples for winter run fish (Dec - Apr) and 46 for summer run (April - October). The overlap in April was generally separated by angler remarks on the scale envelopes. All scale envelopes were numbered and filed chronologically and all scale information is on sample record sheets in the file, master report, and report appendix.

For summer run steelhead the most common age class was 3.2 with 25 fish (61%). Next most common age was 3.3 with 6 fish (14.6%). The most frequent freshwater age group was 3. with 36 fish (78.3%) and the most frequent saltwater age was .2 with 33 fish (71.7%). Repeat spawners made up 10% (5 fish) of the total summer run. This may be a slightly high figure due to the small sample size. The overall sex ratio for summer run fish was 1.6:1 favoring females. The timing of the run peaked in June for summer fish. The best two weeks were June 1-14 with 38.1% of the total catch. Summer runs from the Seymour river were compared to Capilano stock as reported by Caverly (1977) Report III. The age class structure was very similiar for the two populations although sample sizes were both small.

For winter run steelhead the most common age was 3.2+ with 50% (54 fish) of the total. The age class 3.1+ was also common with 31.5% (34 fish). The most frequent freshwater age was 3. with 85.3% (93 fish) and the most common saltwater age .2+ with (59.1% (62 fish). Repeat spawners made up only 4.2% of the total winter run sample. The overall sex ratio was 1.4:1 favoring females. Timing of the run showed the peak month to be April, but this may overlap with summer fish. The next best winter run month was February. The best week was April 8 - 14 with 15.5% of the total catch.

Seymour river steelhead can be caught any month of the year. The summer run stock has a very similiar age class structure to the Capilano summer runs. A larger sample size for summer runs should be obtained to confirm this, possibly through the BCIT rearing channel operation.

Low summer flows and high water temperatures in the Seymour may have a detrimental effect on steelhead rearing in the stream for three years. Enhancement plans should investigate this.

INTRODUCTION

The Seymour River drains a 68 square mile watershed north of Burrard Inlet (Fig. 1). Historically the river was 28 miles long, and maintained large runs of salmon and steelhead. The placement of a dam 8 miles from the Seymour estuary reduced the areas accessible to anadromous fish and created a reservoir for the Vancouver City water supply. The runs of anadromous fish have declined as a result of this structure and other industrial and residential encroachments on the lower river and estuary.

In spite of these changes the Seymour still supports fair runs of coho salmon and both summer and winter steelhead. Most of the river is accessible to anglers, the upper 6 miles requiring a watershed pass and foot access only, but providing an aesthetically appealing, uncrowded fishing area near Vancouver. The Seymour River is also now the site of a coho and steelhead rearing channel, under the direction of C.W. Chestnut of the Fish, Wildlife and Recreation program at BCIT. This is primarily an educational facility but may have production possibilities in the future.

The interest in the Seymour River has made it essential to obtain baseline life history information on its fish stocks. The Fish and Wildlife Branch has many scale samples collected from steelhead between 1950 and 1977. This report discusses the results of scale reading to determine life histories of summer and winter run fish. The results are categorized into age class structure, freshwater and saltwater ages, repeat spawners, sex ratio and timing of the runs. Results are compared to the Capilano steelhead stocks which have been drastically depleted and may be supplemented with Seymour stock.

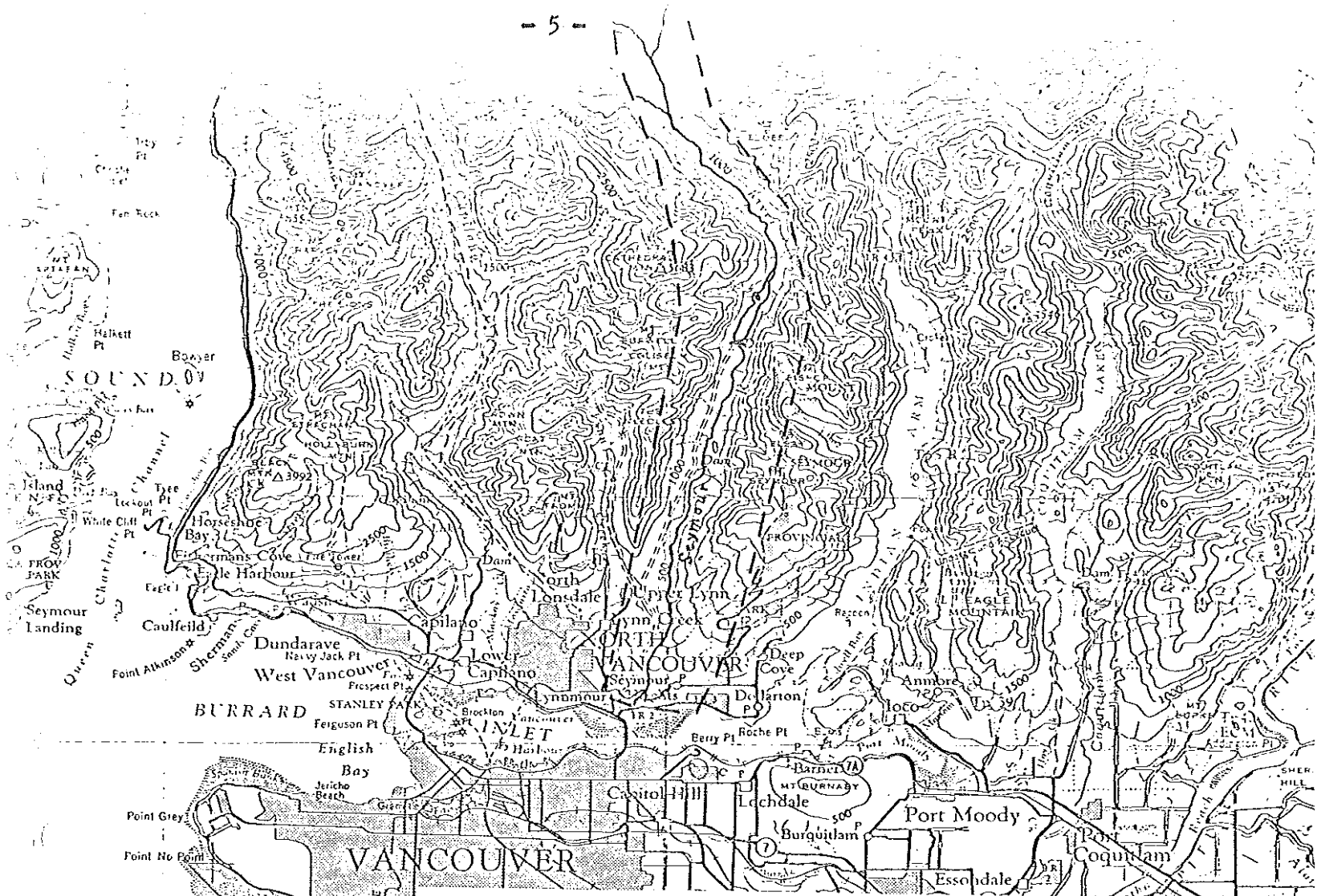
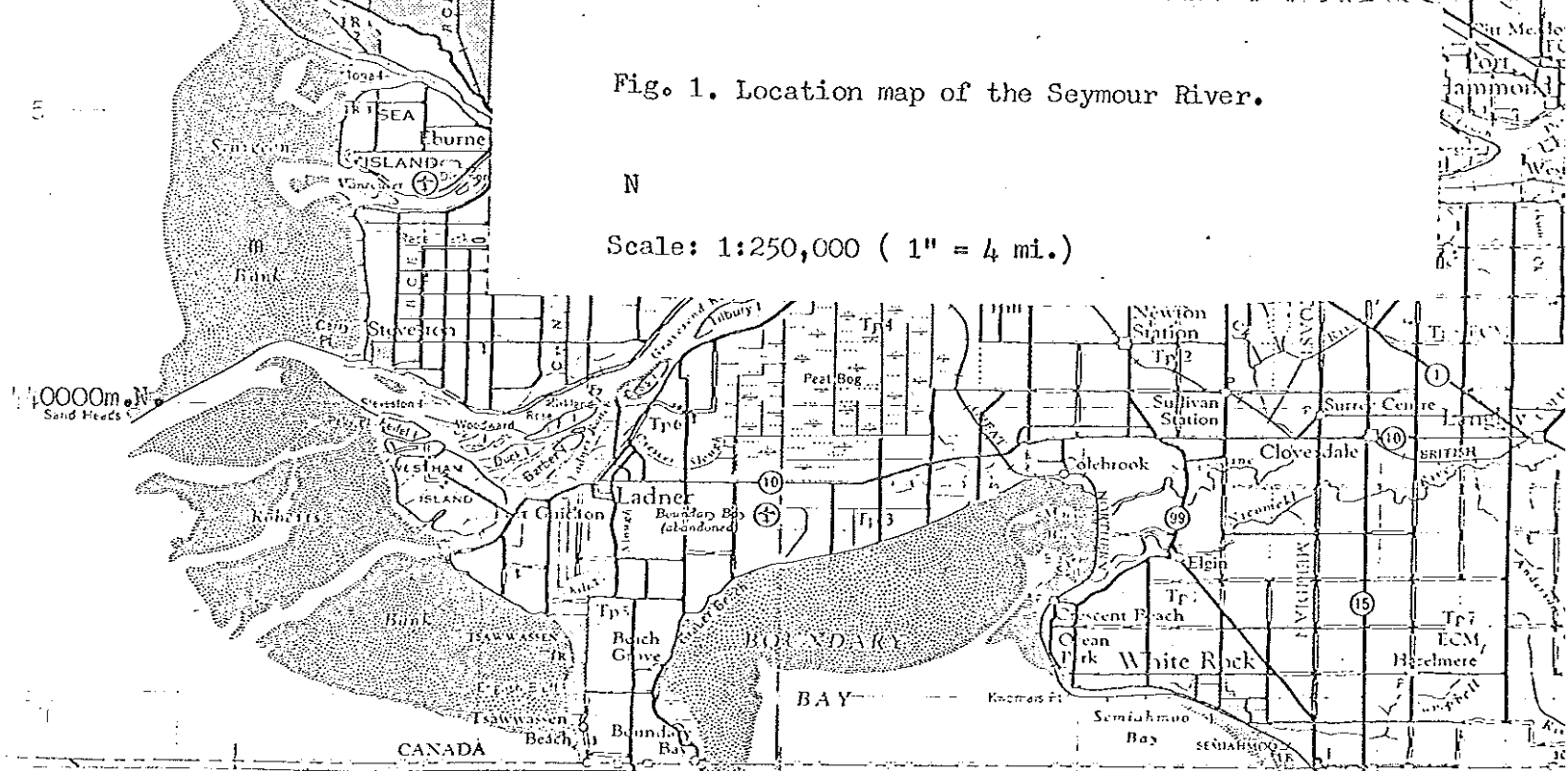


Fig. 1. Location map of the Seymour River.

N

Scale: 1:250,000 (1" = 4 mi.)



4 15' UNITED STATES OF AMERICA
4 0000m N. 9

123° 00' 0

1

45' 2

Point Roberts 2m

To Bellingham Blaine 1m

MATERIALS AND METHODS

The materials and methods in this report are virtually the same as those outlined by Caverly (1977) Reports I and II. The age designation used for steelhead in this report is as outlined by Narver and Withler (1974) where a fish aged 3.2+ has spent three full years (winter) in freshwater before smolting, then spending two full years in the ocean. This fish returned to the river in its sixth year of growth, as indicated by the + sign which represents a partial year's growth. An S designation indicates a spawning check and one year of growth.

Scale samples were collected by anglers, the majority between 1950 and 1959. Summer and winter steelhead were separated by timing. Winter runs were assumed to be those fish caught from December to April of the following year, summer runs from April to October of the same year. Angler comment on scale envelopes separated the April fish.

All scales were heat pressed onto cellulose acetate for a permanent impression and all samples were photomicrographed. Scales were read at a magnification of 48X with additional magnification provided by a Luxo Magnifier for difficult fresh water zones.

RESULTS

I. Summer Run

The sample size for summer runs was small, only 50 fish. Five of these were repeat spawners and four had regenerated freshwater growth zones.

Total Age

There were 41 scales read for total age from summer run fish. The most common age class was 3.2 with 25 fish (61%). The next most common age class was 3.3 with 6 fish (14.6%), followed by 2.2 with 4 fish (9.8%). Four other age classes made up the other 15%.

Freshwater Age (Table II) (Fig. 3)

Samples from 46 summer steelhead were examined for freshwater age. The most common age was 3. with 36 fish (78.3%). The next most common age was 2. with 8 fish (17.4%), followed by 4. with only 2 fish (4.3%).

Saltwater Age (Table III) (Fig. 3)

Samples from 46 fish were examined for saltwater age. The .2 age group had 33 fish (71.7%) followed by the .3 age group with 10 fish (21.7%) and the .1 age group with only 3 fish (6.5%).

Repeat Spawners (Table IV)

Of 50 summer run steelhead, 5 fish (10%) were repeat spawners. Four of these were females and one was a male. The single male was aged at 2.2S1. Three females were aged 3.1S1 and one was aged at 4.1S1.

Sex Ratio Table V

There were 44 fish compared for a female to male ratio. There were 27 females to 17 males giving a ratio of 1.6:1. The yearly variation was from 1.3:1 to 4:1.

II. Timing of the Run (Table VI) (Fig. 4)

Overall the peak fishing month on the Seymour appears to be April with 23% of the total yearly catch of summer and winter steelhead. The peak month for summer runs appeared to be June with 17.5% of the total yearly catch. The peak for winter run was April followed by February.

Timing For Summer Run -- Weekly (Table VIII) (Fig. 5)

The best month for summer runs was June. The two best weeks for angler catch of summer runs was June 1 - 14 with 38.1% of the total summer run catch. The week of April 15-21 was also productive with 16.7% of the total catch and the week of June 22 - 31 with 16.7%.

TABLE I. AGE CLASS STRUCTURE OF SUMMER RUN STEELHEAD
IN THE SEYMOUR RIVER

		AGE CLASS							
YEAR	SEX	2.1	2.2	2.3	3.1	3.2	3.3	4.2	TOTAL
1950	M	-	-	-	-	-	- ⁸	-	-
	F	-	-	1	-	-	-	-	1
	TOTAL	-	-	1	-	-	-	-	1
1951	M	-	-	-	-	1	2	-	3
	F	-	-	-	-	-	-	-	-
	TOTAL	-	-	-	-	1	2	-	3
1952	M	-	1	-	-	4	1	-	6
	F	-	-	-	-	8	-	-	8
	TOTAL	-	1	-	-	12	1	-	14
1953	M	-	1	-	-	1	1	-	3
	F	-	-	-	-	3	-	1	4
	TOTAL	-	1	-	-	4	1	1	7
1954	M	-	-	1	-	1	-	-	2
	F	1	-	-	-	2	1	-	4
	TOTAL	1	-	1	-	3	1	-	6
1956	M	-	-	-	-	-	-	-	-
	F	1	1	-	-	2	1	-	5
	TOTAL	1	1	-	-	2	1	-	5
1957	M	-	-	-	-	-(1?)	-	-	-
	F	-	-	-	-	-	-	-	-
	TOTAL	-	-	-	-	1	-	-	1
1958	M	-	-	-	1	1	-	-	2
	F	-	-	-	-	-	-	-	-
	TOTAL	-	-	-	1	1	-	-	2

YEAR	SEX	2.1	2.2	2.3	3.1	3.2	3.3	4.2	TOTAL
1971	M	-	-	-	-	-	-	-	-
	F	-	-	-	-	1	-	-	1
	TOTAL	-	-	-	-	1	-	-	1
1972	M	-	-	-	-	-	-	-	-
	F	-	1	-	-	-	-	-	1
	TOTAL	-	1	-	-	-	-	-	1
TOTAL	M	-	2	1	1	8	4	-	16
	F	2	2	1	-	16	2	1	24
	UNKN.	-	-	-	-	1	-	-	1
	TOTAL	2	4	2	1	25	6	1	41
% OF TOTAL		4.8%	9.8%	4.8%	2.5%	61%	14.6%	2.5%	

- 4 SAMPLES FROM SUMMER RUN HAD REGENERATED FRESHWATER ZONES

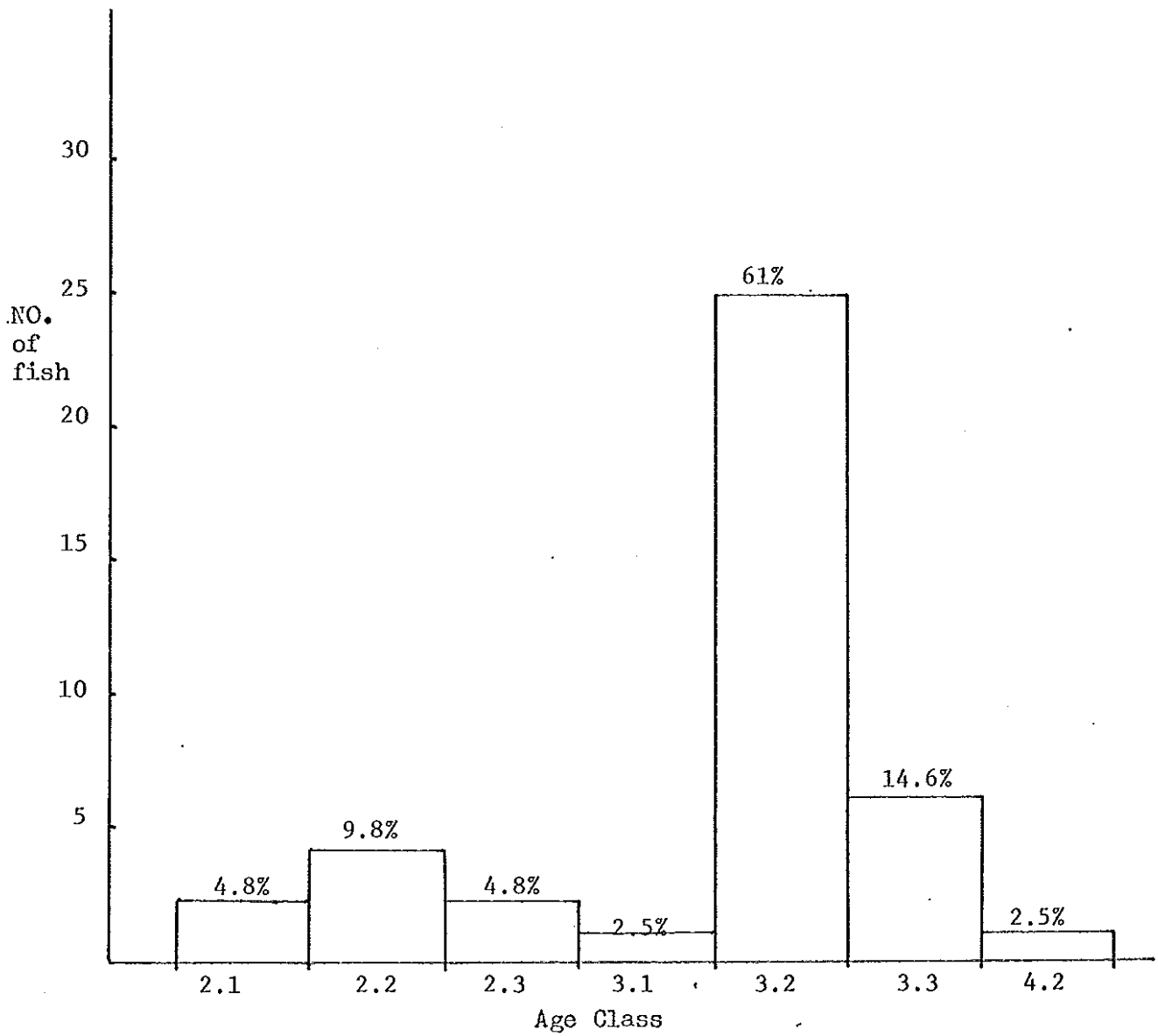


FIG. 2 AGE CLASS STRUCTURE OF SUMMER RUN STEELHEAD IN THE SEYMOUR RIVER.

TABLE II. FRESHWATER AGES OF SUMMER STEELHEAD.

FRESHWATER AGE					
YEAR	SEX	2.	3.	4.	TOTAL
1950	M	1	-	-	1
	F	-	-	-	-
	TOTAL	1	-	-	1
1951	M	-	3	-	3
	F	-	-	-	-
	TOTAL	-	3	-	3
1952	M	1	5	-	6
	F	-	8	-	8
	TOTAL	1	13	-	14
1953	M	1	2	-	3
	F	-	4	1	5
	TOTAL	1	6	1	8
1954	M	1	1	-	2
	F	1	3	-	4
	TOTAL	2	4	-	6
1956	M	-	-	-	-
	F	2	3	1	6
	TOTAL	2	3	1	6
1957	M	-	(1?)	-	(1?)
	F	-	1	-	1
	TOTAL	-	2	-	2
1958	M	-	2	-	2
	F	-	-	-	-
	TOTAL	-	2	-	2

YEAR	SEX	2.	3.	4.	TOTAL
1962	M	-	-	-	-
	F	-	1	-	1
	TOTAL	-	1	-	1
1971	M	-	-	-	-
	F	-	1	-	1
	TOTAL	-	1	-	1
1972	M	-	-	-	-
	F	1	-	-	1
	TOTAL	1	-	-	1
1977	M	-	-	-	-
	F	-	1	-	1
	TOTAL	-	1	-	1
TOTAL	M	4	13	-	17
	F	4	22	2	28
	?	-	1	-	1
	TOTAL	8	36	2	46
	%	17.4%	78.3%	4.3%	

TABLE III. - SALTWATER AGES OF SUMMER STEELHEAD

Saltwater Age					
Year	Sex	.1	.2	.3	Total
1950	M	-	-	1	1
	F	-	-	-	-
	Total	-	-	1	1
1951	M	-	1	3	4
	F	-	-	-	-
	Total	-	1	3	4
1952	M	-	5	1	6
	F	-	8	-	8
	Total	-	13	1	14
1953	M	-	1	3	4
	F	-	6	-	6
	Total	-	7	3	10
1954	M	-	-	1	1
	F	1	2	-	3
	Total	1	2	1	4
1956	M	-	-	-	-
	F	1	3	1	5
	Total	1	3	1	5
1957	M	-	-	-	-
	F	-	1(1?)	-	1(1?)
	Total	-	1(1?)	-	2
1958	M	1	1	-	2
	F	-	-	-	-
	Total	1	1	-	2
1971	M	-	-	-	-
	F	-	1	-	1
	Total	-	1	-	1
1972	M	-	-	-	-
	F	-	1	-	1
	Total	-	1	-	1
1977	M	-	1	-	1
	F	-	1	-	1
	Total	-	2	-	2
TOTAL	M	1	9	9	19
	F	2	23	1	26
	UN.	-	1	-	1
	Total	3	33	10	46
	%	6.5%	71.7%	21.7%	

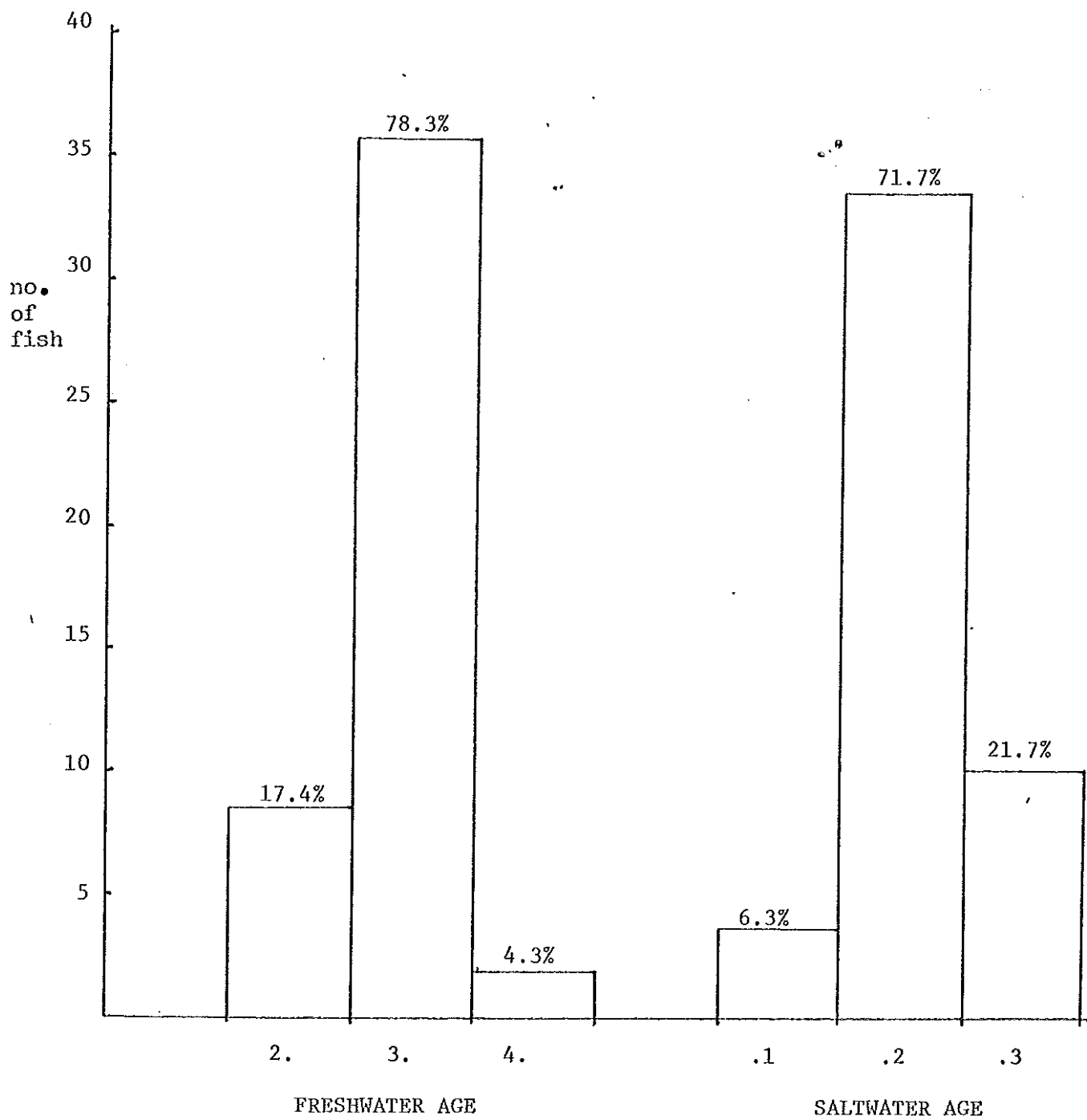


FIG. 3. FRESHWATER AND SALTWATER AGES OF SUMMER RUN STEELHEAD.

TABLE IV. - AGE CLASS OF REPEAT SPAWNING SUMMER STEELHEAD IN THE SEYMOUR RIVER

Year	Sex	Age Class			Total
		2.2S1	3.1S1	4.1S1	
1956	M	-	-	-	-
	F	-	-	1	1
	Total	-	-	1	1
1959	M	-	-	-	-
	F	-	1	-	1
	Total	-	1	-	1
1962	M	-	-	-	-
	F	-	1	-	1
	Total	-	1	-	1
1973	M	1	-	-	1
	F	-	-	-	-
	Total	1	-	-	1
1977	M	-	-	-	-
	F	-	1	-	1
	Total	-	1	-	1
TOTAL	M	-	-	-	1
	F	-	3	1	4
	Total	1	3	1	5

- Repeat spawners made up 10% of the total number of summer run scales examined.

TABLE V. - SEX RATIO OF SUMMER STEELHEAD CAUGHT BY ANGLERS

Year	Sex		
	Male	Female	Female:Male Ratio
1950	1	-	-
1951	4	-	-
1952	6	8	1.3:1
1953	1	4	4:1
1954	2	4	2:1
1956	-	6	-
1957	-	1	-
1958	2	-	-
1959	-	1	-
1962	-	1	-
1971	-	1	-
1972	-	1	-
1973	1	-	-
TOTAL	17	27	1.6:1

MONTH

YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
1950	-	6	-	-	-	1	-	-	-	-	-	-	7
1951	-	4	-	4	1	3	-	-	-	-	-	2	15
1952	3	8	3	8	3	11	1	-	-	-	-	-	37.
1953	8	2	2	9	2	3	-	-	-	-	-	2	28
1954	-	-	-	-	-	5	-	-	-	1	-	-	6
1955	4	-	-	-	-	-	-	-	-	-	-	-	4
1956	3	1	7	1	1	3	3	-	-	-	-	-	19
1957	1	-	5	3	-	1	1	-	-	-	-	1	12
1958	-	-	1	1	2	1	1	-	-	-	-	-	6
1959	-	-	-	2	-	1	-	-	-	-	-	-	3
1960	-	-	-	2	-	-	-	-	-	-	-	-	2
1961	-	1	-	-	-	-	-	-	-	-	1	-	2
1962	-	1	-	-	-	-	1	-	-	-	-	-	2
1970	-	3	-	-	-	-	-	-	-	-	-	-	3
1971	-	-	-	-	1	-	-	-	-	-	-	-	1
1972	-	-	-	-	-	-	-	-	1	-	-	-	1
1973	-	1	1	-	-	-	-	1	-	-	-	-	3
1975	1	-	2	3	-	-	-	-	-	-	-	-	6
1976	-	-	2	2	-	-	-	-	-	-	-	1	5
1977	-	-	1	3	-	-	-	-	-	-	-	-	4
TOTAL	20	27	25	38	10	29	7	1	1	1	1	6	166
%	12%	16.3%	15%	23%	6%	17.5%	4.2%	0.6%	0.6%	0.6%	0.6%	3.6%	

TABLE VI TIMING OF THE RUN - BASED ON ANGLER CATCH PER MONTH (1950 - 1977).

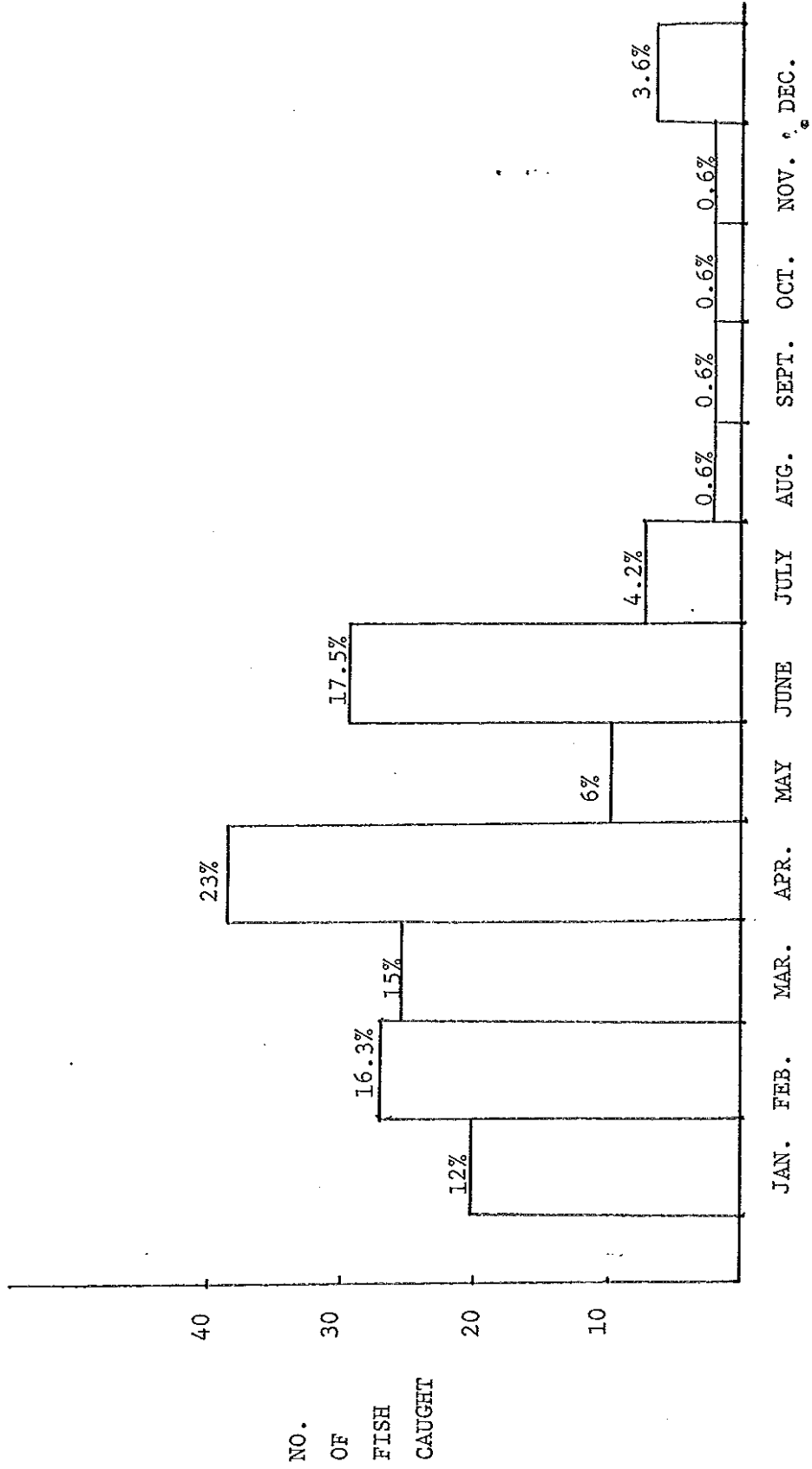


FIG. 4 . TIMING OF THE RUN -- BASED ON ANGLER CATCH PER MONTH.

DATE OF CATCH													
YEAR	APRIL			MAY			JUNE			JULY			TOTAL
	15-21	22-31	1-7	8-14	15-21	22-31	1-7	8-14	15-21	22-31	1-7	8-14	
1950	-	-	-	-	1	-	-	-	-	-	-	-	1
1951	1	-	2	-	1	-	-	-	-	-	-	-	4
1952	1	-	1	-	-	-	3	5	1	2	-	-	13
1953	5	-	-	-	-	1	2	2	-	-	-	-	10
1954	-	-	-	-	-	-	2	-	1	2	-	-	5
1956	-	-	-	-	-	-	-	-	-	3	-	1	4
1957	-	-	-	-	-	-	-	1	-	-	-	1	2
1958	-	-	-	-	-	-	1	-	-	-	-	1	2
1959	-	-	-	-	-	-	-	1	-	-	-	-	1
1971	-	-	1	-	-	-	-	-	-	-	-	-	1
TOTAL	7	-	4	-	2	1	8	8	2	7	-	3	42
PERCENT	16.7%	-	9.5%	-	4.8%	2.4%	19.1%	19.1%	4.8%	16.7%	-	7.1%	

TABLE VII. TIMING OF THE RUN (SUMMER) - BASED ON ANGLER CATCH PER WEEK.

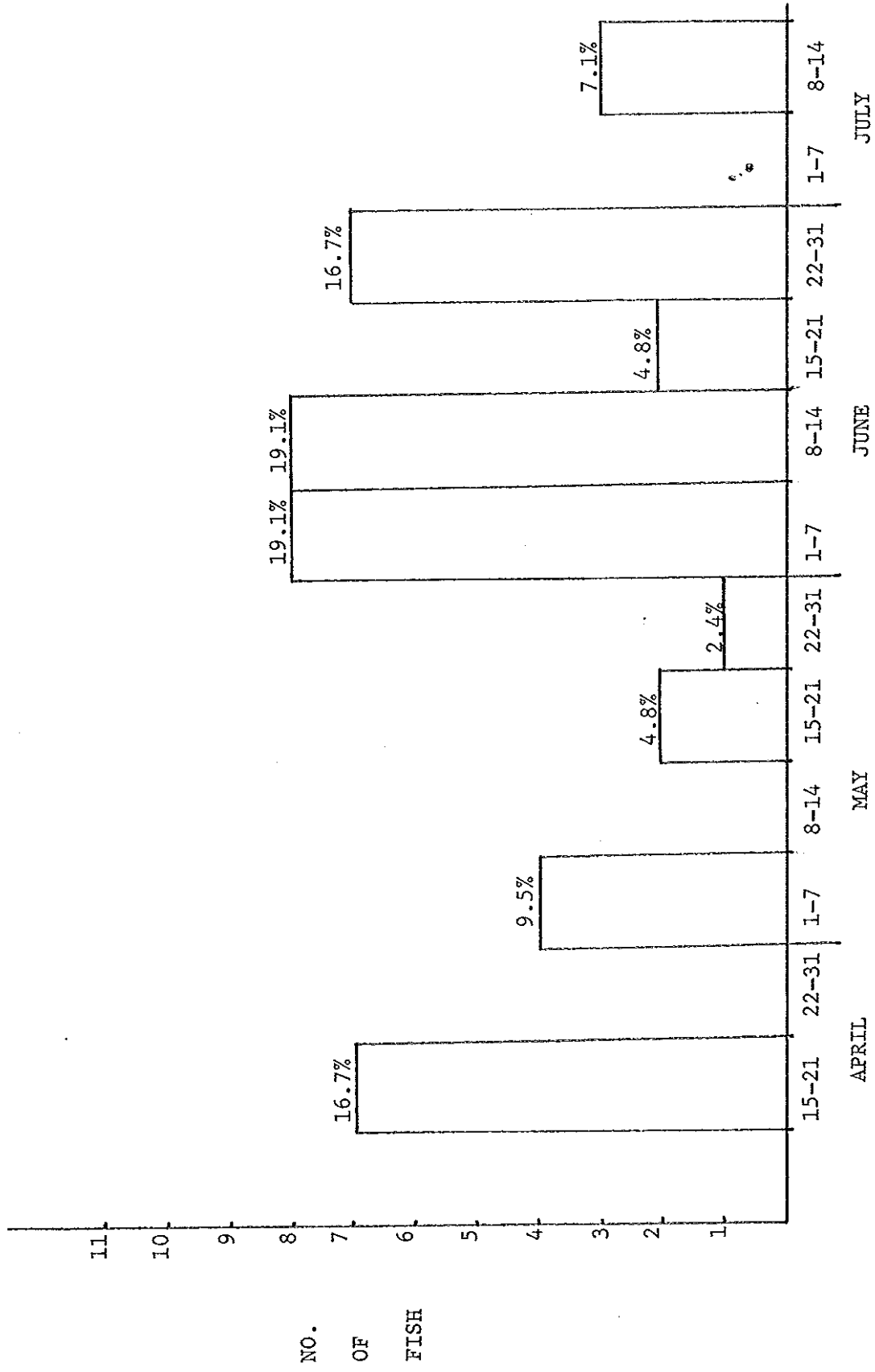


FIG. 4. TIMING OF THE RUN (SUMMER) - BASED ON ANGLER CATCH PER WEEK.

III. Winter Run

In total 121 scales were examined from winter run steelhead caught in the Seymour River. Of these 8 had regenerated freshwater zones and 5 were repeat spawners. Samples were from 1950 until the present.

Age Class (Table VIII) (Fig. 6)

The most common age class for 108 winter run steelhead was 3.2+ with 50% of the total. Another 34 fish (31.5%) were in the second most common class, 3.1+. Seven other age classes made up the other 18.5%.

Freshwater Age (Table IX) (Fig. 7)

The most common freshwater age of 109 winter steelhead was 3. with 85.3% of the total (93 fish). Another 13 fish (12%) were 2. and only 3 fish (2.8%) were in the 4. group.

Saltwater Age (Table X) (Fig. 7)

Four saltwater ages appeared in the samples examined. The most common was .2+ with 62 fish (59.1%). Also common was the .1+ group with 37 fish (35.2%). Only 4 fish (3.8%) were age .3+ and only 2 fish (1.9%) were .+. There were 105 steelhead in total.

Repeat Spawners (Table XI)

Only 4.2% of the total number of winter runs examined were second spawners (5 fish). Of these four were females and one was a male. One female was aged at 2.1S+, two at 3.1S+ and one at 3.2S+. The single male was aged 3.1S+.

Sex Ratio (Table XII) (Fig. 8)

The overall female to male ratio for winter steelhead caught by anglers was 1.4:1. Yearly variation was from 0.3:1 to 2.3:1.

Timing of the Run (Table VI) (Fig. 4) (Table XIII) (Fig. 9)

The peak month for angler catch was April with 23% of the total catch of all steelhead. This may have some overlap with summer runs. The next best month

was February with 16.3% of the total yearly catch.

The best week was April 8 - 14 with 15.5% of the total winter run catch. Two smaller peaks were February 8 - 14 and March 15 - 21, with 10.7% each with 10.7% of the catch.

TABLE VIII. AGE CLASS STRUCTURE OF WINTER RUN STEELHEAD
IN THE SEYMOUR RIVER

YEAR	SEX	AGE CLASS									TOTAL
		2.+	2.1+	2.2+	3.+	3.1+	3.2+	3.3+	4.1+	4.2+	
1950	M	-	-	-	-	1	-	-	-	-	1
	F	-	-	-	-	1	3	-	-	-	4
	TOTAL	-	-	-	-	2	3	-	-	-	5
1951	M	-	-	-	1	1	4	-	-	-	6
	F	-	1	1	-	2	-	-	-	-	4
	TOTAL	-	1	1	1	3	4	-	-	-	10
1952	M	-	-	1	-	1	4	1	-	-	7
	F	-	-	3	-	5	6	1	-	-	15
	TOTAL	-	-	4	-	6	10	2	-	-	22
1953	M	1	1	-	-	3	3	-	-	1	9
	F	-	-	-	-	3	7	-	-	-	10
	TOTAL	1	1	-	-	6	10	-	-	1	19
1955	M	-	-	-	-	-	3	-	-	-	3
	F	-	-	-	-	-	-	-	-	-	-
	TOTAL	-	-	-	-	-	3	-	-	-	3
1956	M	-	1	-	-	2	1	-	1(1?)	-	5
	F	-	-	-	-	3	3	-	-	-	6(1?)
	TOTAL	-	1	-	-	5	4	-	2	-	12
1957	M	-	-	-	-	1	2	-	-	-	3
	F	1	-	1	-	2	2	-	-	-	6
	TOTAL	1	-	1	-	3	4	-	-	-	9
1958	M	-	-	-	-	-	2	-	-	-	2
	F	-	-	-	-	1	-	-	-	-	1
	TOTAL	-	-	-	-	1	2	-	-	-	3
1959	M	-	-	-	-	-	1	-	-	-	1
	F	-	1	-	-	-	-	-	-	-	1
	TOTAL	-	1	-	-	-	1	-	-	-	2

YEAR	SEX	2.+	2.1+	2.2+	3.+	3.1+	3.2+	3.3+	4.1+	4.2+	TOTAL
1960	M	-	1	-	-	-	-	-	-	-	1
	F	-	-	-	-	1	1	-	-	-	2
	TOTAL	-	1	-	-	1	1	-	-	-	3
1961	M	-	-	-	-	-	-	-	-	-	-
	F	-	-	-	-	1	-	-	-	-	1
	TOTAL	-	-	-	-	1	-	-	-	-	1
1970	M	-	-	-	-	-	-	-	-	-	-
	F	-	-	-	-	1	2	-	-	-	3
	TOTAL	-	-	-	-	1	2	-	-	-	3
1973	M	-	-	-	-	-	-	1	-	-	1
	F	-	-	-	-	1	1	-	-	-	2
	TOTAL	-	-	-	-	1	1	1	-	-	3
1975	M	-	-	-	-	1	1	-	-	-	2
	F	-	-	-	-	-	3	-	-	-	3
	TOTAL	-	-	-	-	1	4	-	-	-	5
1976	M	-	-	-	-	-	2	-	-	-	2
	F	-	-	-	-	2	1	-	-	-	3
	TOTAL	-	-	-	-	2	3	-	-	-	5
1977	M	-	-	-	-	1	1	-	-	-	2
	F	-	-	-	-	-	1	-	-	-	1
	TOTAL	-	-	-	-	1	2	-	-	-	3
TOTAL	M	1	3	1	1	11	24	2	1	1	45
	F	1	2	5	-	23	30	1	-	-	62
	UNK.	-	-	-	-	-	-	-	1	-	1
	TOTAL	2	5	6	1	34	54	3	2	1	108
% OF TOTAL		1.9%	4.6%	5.6%	0.9%	31.5%	50%	2.8%	1.9%	0.9%	

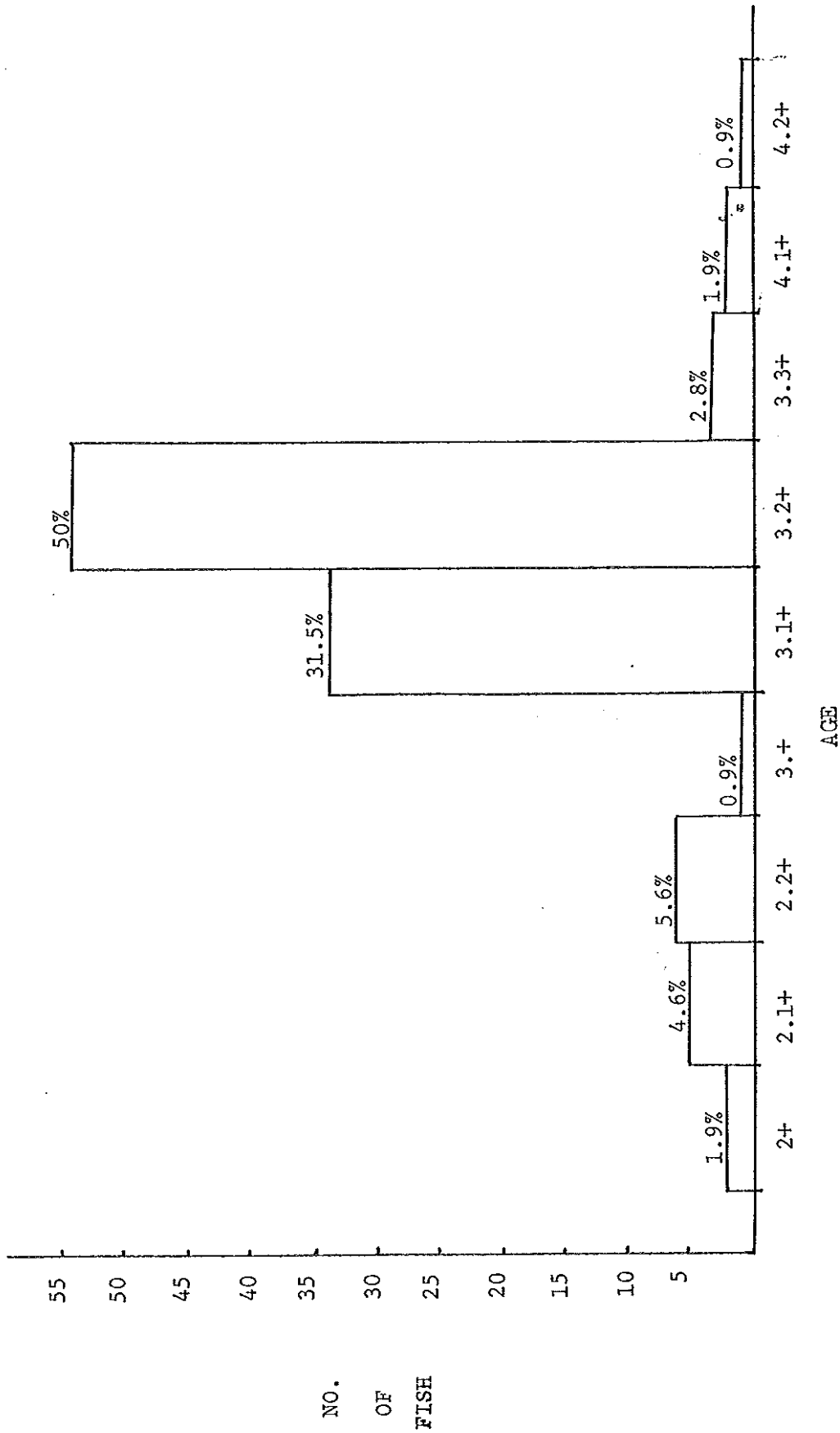


FIG. 6 . AGE CLASS STRUCTURE OF WINTER RUN STEELHEAD

TABLE IX. FRESHWATER AGES OF WINTER RUN STEELHEAD

FRESHWATER AGE					
YEAR	SEX	2.	3.	4.	TOTAL
1950	M	1	2	-	3
	F	-	4	-	4
	TOTAL	1	6	-	7
1951	M	-	7	-	7
	F	2	2	-	4
	TOTAL	2	9	-	11
1952	M	1	6	-	7
	F	3	12	-	15
	TOTAL	4	18	-	22
1953	M	1	6	1	8
	F	-	10	-	10
	TOTAL	1	16	1	18
1955	M	-	3	-	3
	F	-	1	-	1
	TOTAL	-	4	-	4
1956	M	1	6	1	8
	F	-	6	-(1?)	6(1?)
	TOTAL	1	12	2	15
1957	M	-	3	-	3
	F	2	4	-	6
	TOTAL	2	7	-	9
1958	M	-	2	-	2
	F	-	2	-	2
	TOTAL	-	4	-	4
1959	M	-	1	-	1
	F	1	-	-	1
	TOTAL	1	1	-	2

YEAR	SEX	2.	3.	4.	TOTAL
1973	M	-	2	-	2
	F	-	1	-	1
	TOTAL	-	3	-	3
1975	M	-	2	-	2
	F	1	3	-	4
	TOTAL	1	5	-	6
1976	M	-	1	-	1
	F	-	3	-	3
	TOTAL	-	4	-	4
1977	M	-	3	-	3
	F	-	1	-	1
	TOTAL	-	4	-	4
TOTAL	M	4	44	2	50
	F	9	49	-(1?)	59
	TOTAL	13	93	3	109
	%	12%	85.3%	2.8%	

TABLE X. SALTWATER AGES OF WINTER RUN STEELHEAD
IN THE SEYMOUR RIVER

SALTWATER AGE							
YEAR	SEX	.+	.1+	.2+	.3+	TOTAL	
1950	M	-	1	1	1	3	
	F	-	1	3	0	4	
	TOTAL	-	2	4	1	7	
1951	M	1	-	5	-	6	
	F	-	4	1	-	5	
	TOTAL	1	4	6	-	11	
1952	M	-	1	5	1	7	
	F	-	5	9	1	15	
	TOTAL	-	6	14	2	22	
1953	M	1	3	4	-	8	
	F	-	4	7	-	11	
	TOTAL	1	7	11	-	19	
1955	M	-	-	3	-	3	
	F	-	-	-	-	-	
	TOTAL	-	-	3	-	3	
1956	M	-	4 ^(1?)	1	-	5	
	F	-	3	5	-	8 ^(1?)	
	TOTAL	-	8	6	-	14	
1957	M	-	1	1	-	2	
	F	-	2	5	-	7	
	TOTAL	-	3	6	-	9	
1958	M	-	-	2	-	2	
	F	-	1	-	-	1	
	TOTAL	-	1	2	-	3	

YEAR	SEX	.+	.1+	.2+	.3+	TOTAL
1959	M	-	-	1	-	1
	F	-	1	-	-	1
	TOTAL	-	1	1	-	2
1973	M	-	-	-	1	1
	F	-	1	1	-	2
	TOTAL	-	1	1	1	3
1975	M	-	1	1	-	2
	F	-	-	3	-	3
	TOTAL	-	1	4	-	5
1976	M	-	-	1	-	1
	F	-	2	1	-	3
	TOTAL	-	2	2	-	4
1977	M	-	1	1	-	2
	F	-	-	1	-	1
	TOTAL	-	1	2	-	3
	M	2	12 (1?)	26	3	43 (1?)
	F	-	24	36	1	61
	TOTAL	2	37	62	4	105
	%	1.9%	35.2%	59.1%	3.8%	

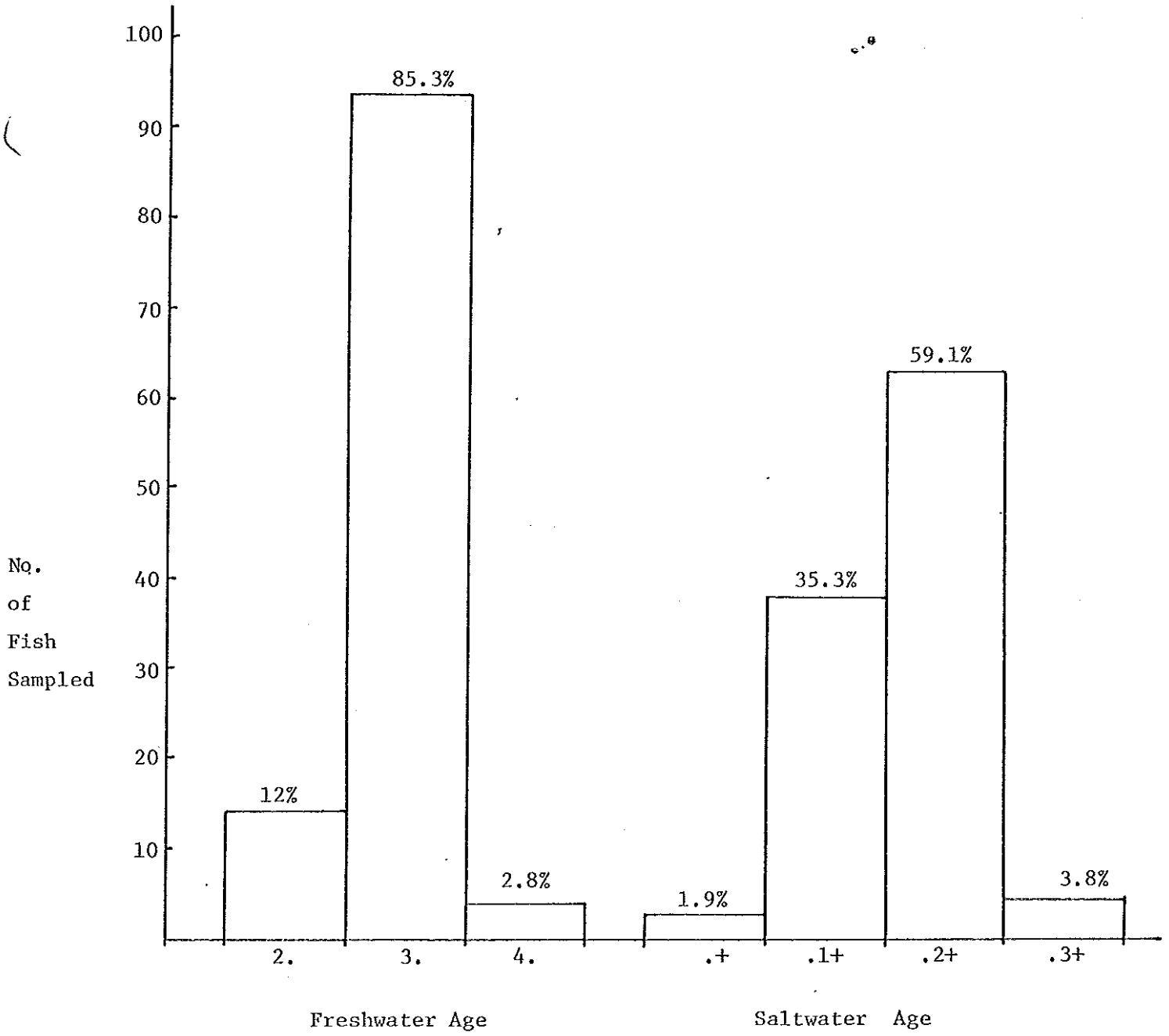


Fig. 7 Freshwater and Saltwater Ages of Winter Steelhead

TABLE XI, AGE CLASS OF REPEAT SPAWNING WINTER RUN
STEELHEAD IN THE SEYMOUR RIVER

YEAR	SEX	AGE CLASS			TOTAL
		2.1S+	3.1S+	3.2S+	
1952	M	-	-	-	-
	F	-	1	-	1
	TOTAL	-	1	-	1
1955	M	-	-	-	-
	F	-	-	1	1
	TOTAL	-	-	1	1
1958	M	-	-	-	-
	F	-	1	-	1
	TOTAL	1	1	-	1
1975	M	-	-	-	-
	F	1	-	-	1
	TOTAL	1	-	-	1
1977	M	-	1	-	1
	F	-	-	-	-
	TOTAL	-	1	-	1
	M	-	1	-	1
	F	1	2	1	4
	TOTAL	1	3	1	5

- Repeat Spawners Made Up 4.2% Of The Total Number
Of Winter Run Scales Examined.

TABLE XII. SEX RATIO OF WINTER STEELHEAD CAUGHT BY ANGLERS.

SEX			
YEAR	MALE	FEMALE	FEMALE:MALE RATIO
1950	3	4	1.3:1
1951	8	4	0.5:1
1952	7	16	2.3:1
1953	8	11	1.8:1
1955	3	1	0.3:1
1956	5	8	1.6:1
1957	3	7	2.3:1
1958	2	2	1:1
1959	1	1	1:1
1960	-	1	-
1961	1	1	1:1
1962	1	-	-
1970	-	3	-
1973	2	2	1:1
1975	2	4	2:1
1976	2	3	1.5:1
TOTAL	48	69	1.4:1

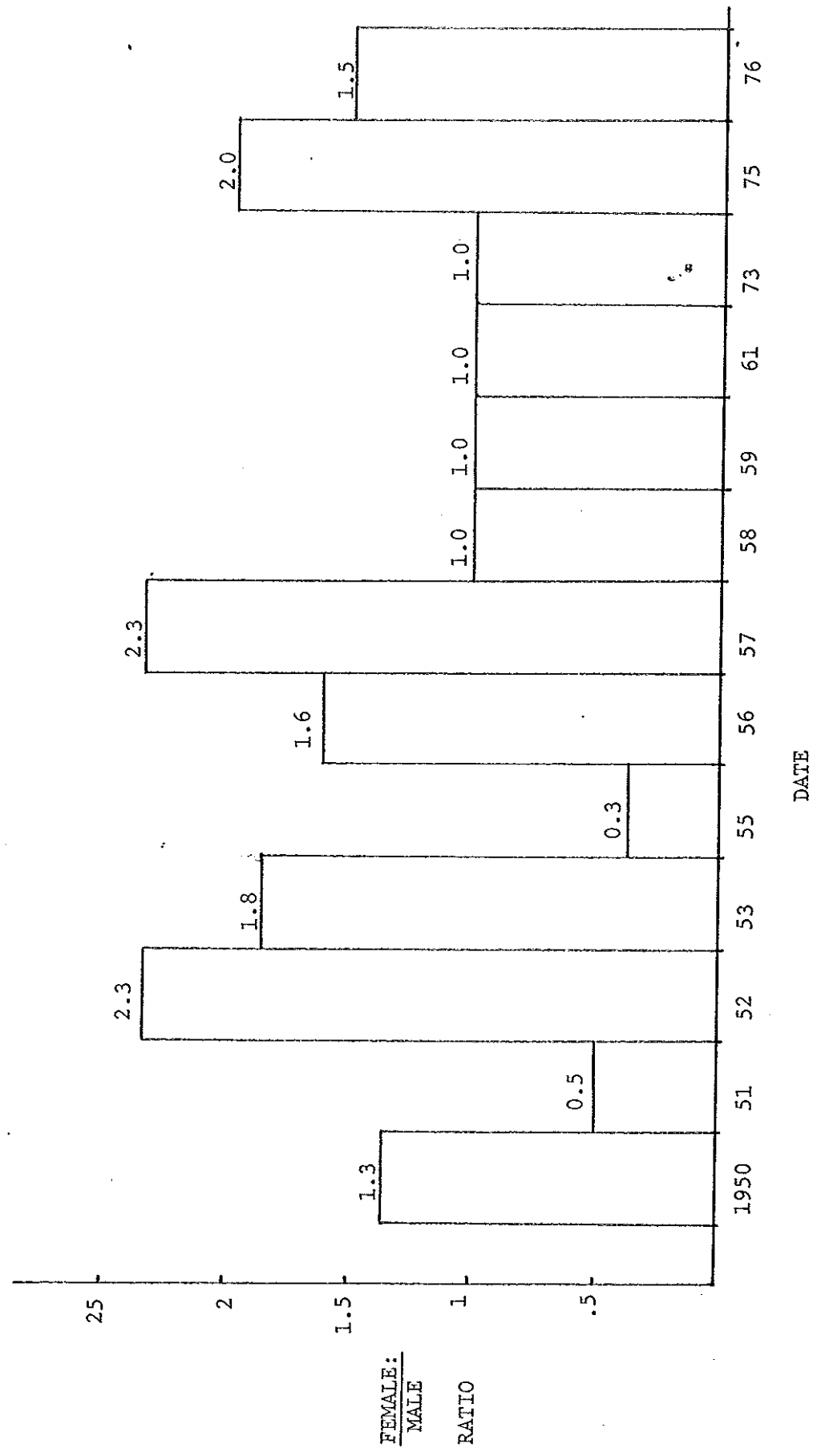


FIG. 8. SEX RATIOS OF WINTER RUN STEELHEAD.

DATE OF CATCH

YEAR	JANUARY			FEBRUARY			MARCH			APRIL			TOTAL	
	8-14	15-21	22-31	1-7	8-14	15-21	22-28	1-7	8-14	15-21	22-31	1-7		8-14
1950	-	-	-	-	2	4	-	-	-	-	-	-	-	-
1951	-	-	-	1	3	-	-	-	-	1	-	1	2	-
1952	1	-	2	4	3	1	-	-	-	1	1	3	4	-
1953	2	1	1	2	-	-	-	-	1	1	-	-	1	3
1955	1	2	1	-	-	-	-	-	-	-	-	-	-	-
1956	2	-	-	-	1	-	-	3	1	-	4	-	-	-
1957	-	-	-	-	-	-	-	1	-	3	1	1	-	1
1958	-	-	-	-	-	-	-	-	-	-	1	-	1	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	2	-
1973	-	-	-	-	-	-	1	-	-	-	-	-	-	-
1975	1	-	-	-	-	-	-	-	1	1	-	-	2	-
1976	-	-	-	-	-	-	-	-	-	-	2	1	1	-
TOTAL	7	3	4	7	0	5	1	4	5	7	0	6	13	4
%	8.3%	3.6%	4.8%	8.3%	10.7%	6%	1.2%	4.8%	6%	8.3%	10.7%	7%	15.5%	4.8%

TABLE XIII. TIMING OF THE RUN (WINTER) - BASED ON ANGLER CATCH PER WEEK.

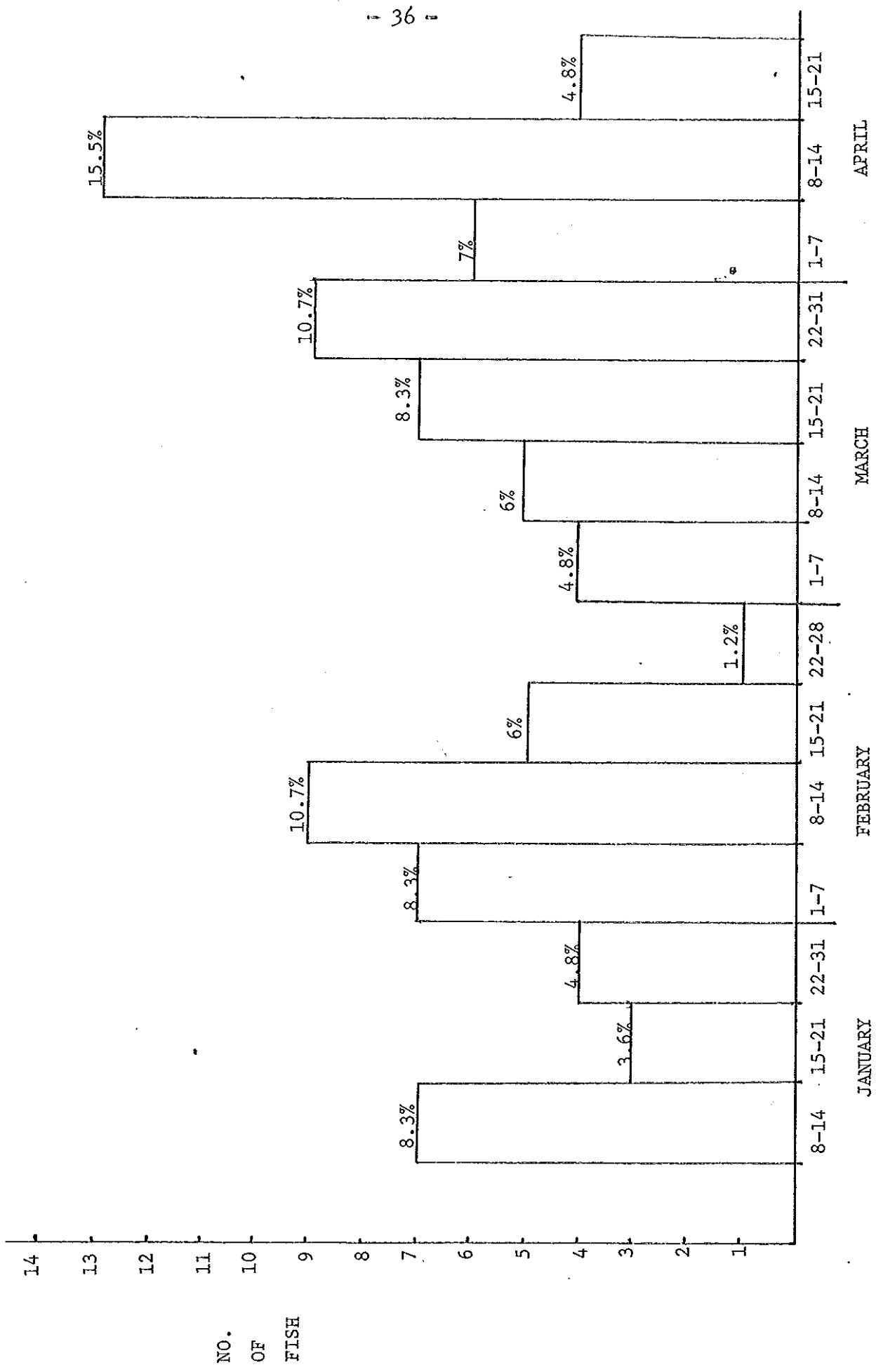


FIG. 9 . TIMING OF THE RUN (WINTER) - BASED ON ANGLER CATCH PER WEEK.

DISCUSSION

The accuracy of the results in this report may be affected by two factors. The first is the fact that all of the steelhead sampled were caught by angling, which may introduce a bias of angler or gear selectivity. This may make the results non-representative of the total population. Nevertheless, they should provide some indications of Seymour steelhead life histories and be useful in comparison to steelhead populations in other streams that have also been sampled by angling.

The second factor is the relatively small sample size for summer run fish. Summer runs are far less numerous than winter runs in the Seymour River. The small sample size may result in certain uncommon age classes not being included, and may affect the timing of the run, due to the small number of fish caught in any particular week.

I. AGE CLASS

(i) Summer Run

For summer run fish 41 samples were examined for total age. The most common age was 3.2 (61%) with 25 fish, followed by 3.3 with 14.6% and 2.2 with 9.8%. This compares with results from Withler (1966). His Seymour studies found the most common age class also to be 3/2 with 48%, followed by 2/3 with 24% and 2/2 with 16%. Withler had 25 fish in his sample. Overall the results are similar between the two studies. In comparison to the Capilano River summer steelhead, as reported by Caverly (1977) Report III, the results are also very similar. In the Capilano the most common age class was also 3.2 (61%) with 25 fish followed by 3.3 with 12.2% and 4.2 with 12.2%.

For the Seymour the most common freshwater age for summer runs was 3. (78.3%) with 36 fish. The most common saltwater age was .2 (71.7%) with 33 fish. This compares to the Capilano where the most common freshwater age was also 3. (76.7%) with 33 fish and the most common saltwater age .2 (83%) with 39 fish. The Capilano and Seymour summer run stock appear to spend a similar amount of time in freshwater and in saltwater. This suggests that transplants of Seymour stock to the Capilano would probably not significantly change the age characteristics of the native population.

(ii) Winter Run

There were 108 samples examined for total age from winter run steelhead in the Seymour River. The most common age was 3.2+ (50%) with 54 fish, followed

by 3.1+ (31.5%) with 34 fish. This compares to Withler (1966), also finding the most common age to be 3/2 (37.9%) with 22 fish, followed by 3/3 (22.4%) with 13 fish. There were 58 samples in Withler's study. In general most steelhead in the Seymour River, winter or summer, appear to have three years freshwater growth. Flow control by the GVWD reduces summer flows to a very low level (Fig. 10). These low flows probably result in high water temperatures and may have a detrimental effect on juvenile steelhead, which are exposed to this for each of their three freshwater years. This was suggested by Hartman (1968) for the South Alouette River near Haney.

II REPEAT SPAWNERS

Repeat spawners made up 10% of the summer run sample. For winter run only 4.2% were second spawners. Withler (1966) found only 4.4% of summer runs to be repeat spawners and 5% of the winter run returning to the streams for a second time. In both studies females made up a higher percentage of second spawners than males. For this report the repeat spawner female to male ratio was 4:1 for both winter and summer fish. Similar results were found by Caverly (1977), Reports I - III.

III SEX RATIO

The overall sex ratio for summer run steelhead was 1.6:1 favoring females. The female to male ratio for winter runs was similiarly 1.4:1. This high incidence of females in angler catch is probably not representative of the actual population but demonstrates selectivity of angling sampling technique. Similar results are discussed in Withler (1966) and Caverly (1977) Reports I - III.

IV. TIMING OF THE RUN

Timing of the run for the Seymour River, was difficult to break down into summer and winter run due to an overlap of catch of both races during April and May. Most of the fish could be separated by angler comments on the scale envelopes. Some fish may be incorrectly noted and contribute to the high winter run catch in April (Fig. 9).

Generally speaking, the best months for angler catch of steelhead was April, with 23% of the total catch, followed by June (summer run) with 17.5% and February (winter run) with 16.3%. The months of August to November had the smallest catches of steelhead with 0.6% of the total catch, each of the three months. These catches coincide with the lowest flows in the Seymour (Fig. 10). The peak catches coincide with moderate flows from 500 - 900 cfs. The Seymour has a fishery for steelhead that can produce a catch any month of the year. Its close proximity to Vancouver makes this resource invaluable and we can only hope it is never lost.

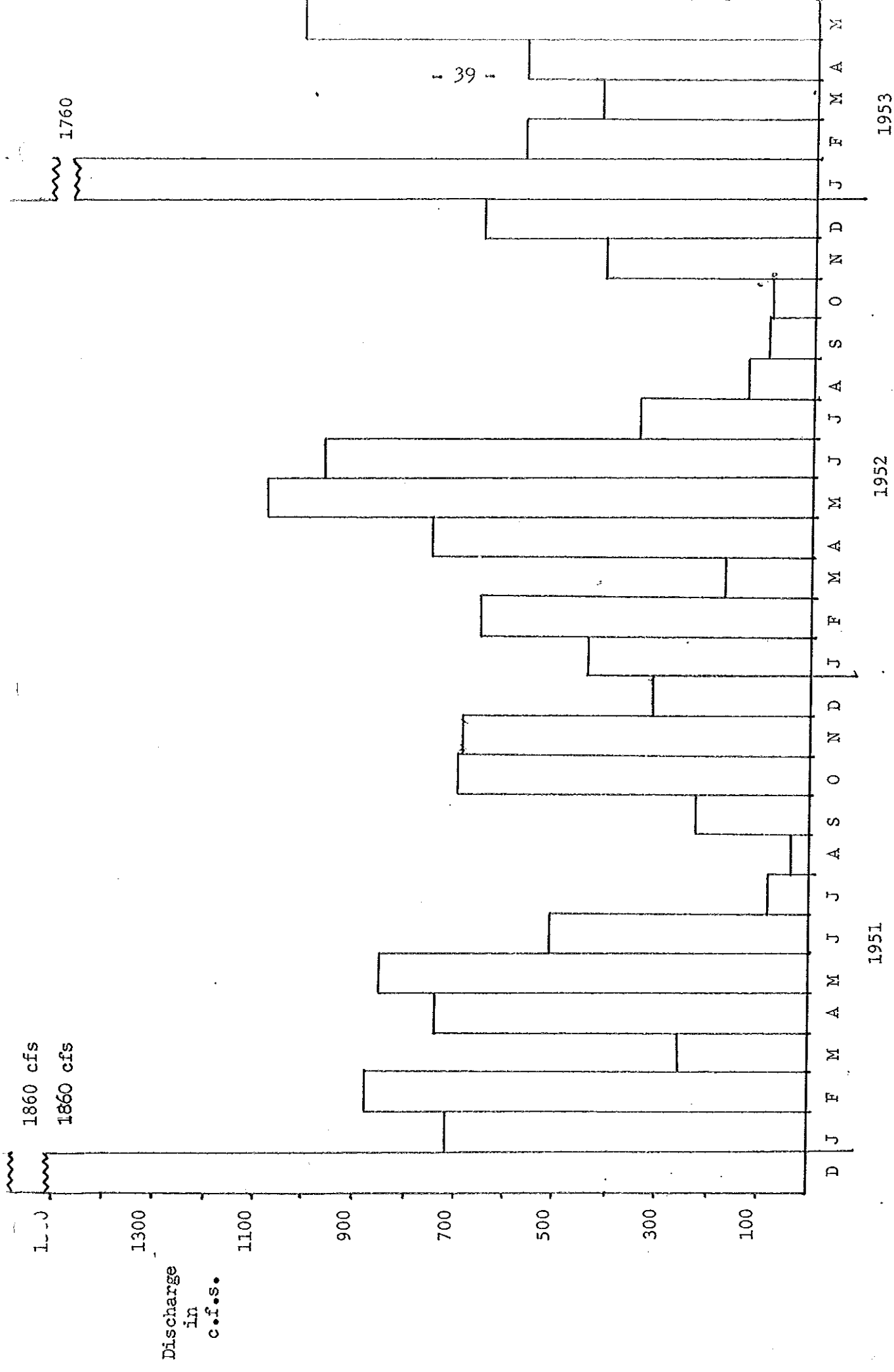


FIG.10 MONTHLY DISCHARGE OF THE SEYMOUR RIVER.

CONCLUSIONS

- (1) Capilano and Seymour river summer run stocks have very similar age class structure.
- (2) Transplanting Seymour river summer run stock to the Capilano river would not significantly alter the age class structure of the native stock.
- (3) Capilano and Seymour river winter run stocks have different age class structure, but the difference is relatively insignificant.
- (4) Low summer flows and high water temperatures may be a limiting factor in juvenile steelhead production, considering the long period of freshwater residency.

RECOMMENDATIONS

1. An exchange of information should be maintained with the B.C.I.T. rearing channel operation. This could be a source of more scale samples.
2. A larger sample size should be obtained for summer run steelhead.
3. Future scale sampling on the Seymour and other streams supporting both summer and winter steelhead, should inform anglers of the importance of recording on the scale envelope whether the fish is a summer or winter run.
4. Enhancement investigations should consider negotiating a higher minimum flow requirement from GVWD, if low flows are proven to be a detrimental factor in juvenile steelhead production of the Seymour.

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