

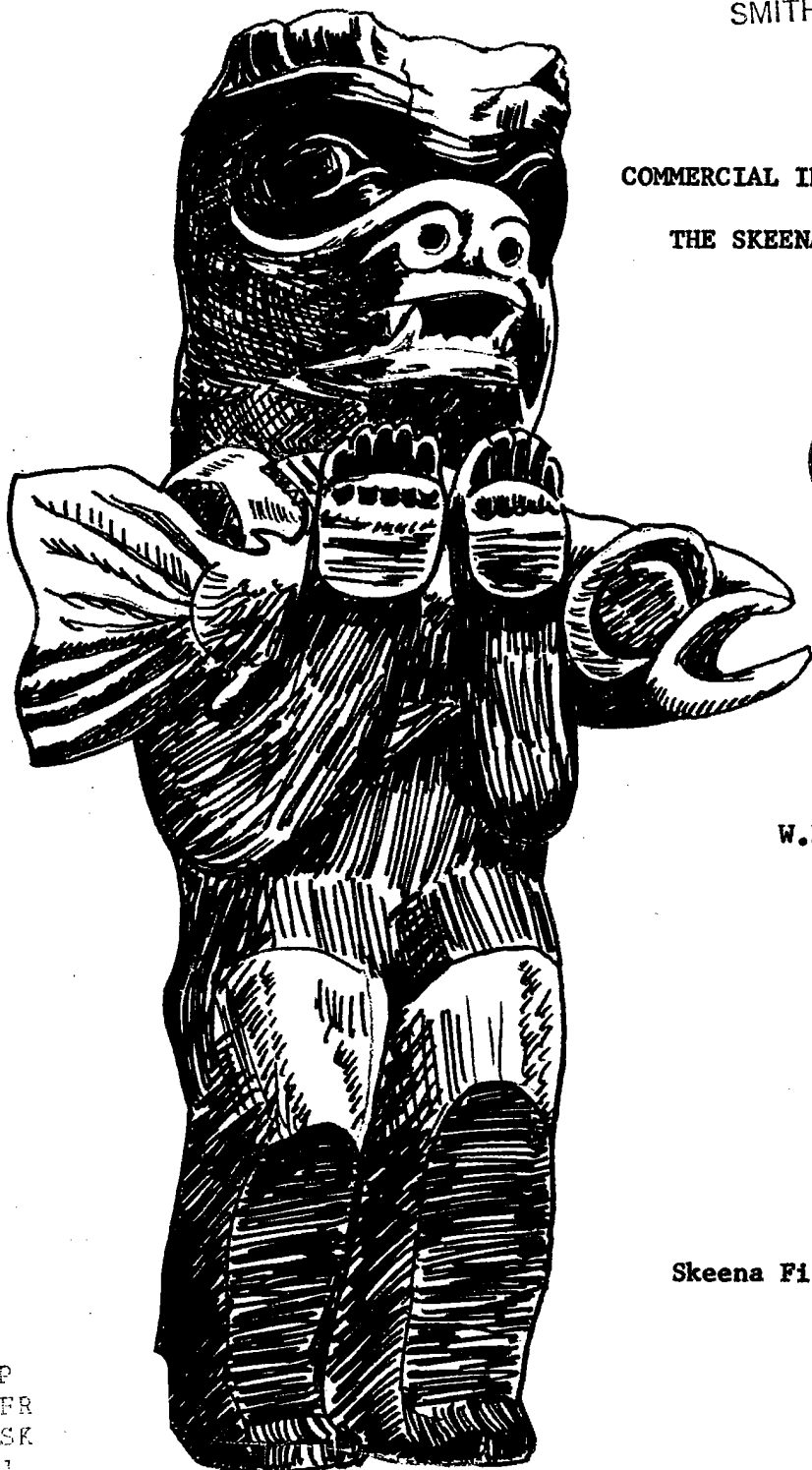
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COMMERCIAL INTERCEPTIONS OF STEELHEAD TROUT IN
THE SKEENA RIVER -- A PRELIMINARY REVIEW



SK-1

BY

W.E. CHUDYK AND D.W. NARVER

Skeena Fisheries Report #76-1 (S.E.P.)
May, 1976

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THE STEELHEAD FISHERIES

SPORT FISHERY

Estimates of Skeena River Steelhead catch, angler effort and catch per angler over the last eight years indicate an average annual catch of 6,955 steelhead for 6,896 anglers (1.01 steelhead per angler (Table 1). Angler success in the system has been fairly consistent ranging from .84 to 1.18 with no overall trend evident. However reduced angler success has been experienced in some Skeena summer steelhead streams (Morice River) while other winter steelhead tributaries have shown improved angler success (Kitsumkalum River). Overall Skeena river steelhead catch shows a steady decline except for the 1972 - 1973 season while angler effort fluctuates from a peak of 8,240 anglers in 1970 - 1971 to a low of 5,546 anglers in 1974 - 1975. Annual variations in number of anglers, steelhead catch and angler success are subject to the following influences. First, the weather...an early freeze will reduce number of anglers and angler days hence catch. Second, increased angler restriction on Skeena tributaries with declining summer steelhead returns. For example, bag limits have been reduced from three steelhead per day and six in possession to two and four (Morice, Bulkley, Zymoetz, and Sustut) and one and one (Babine, Kispiox and Lakelse) with further angling restrictions proposed for the Kispiox and Babine to create catch and release fisheries. Many anglers feel that the entire burden of conserving steelhead should not rest solely on them.

Third, angler enthusiasm (Number of anglers) may relate, for a segment of the angling public directly to fewer steelhead in the Creel.

Finally, the increased cost of travel, angling fees and special river restrictions are ^{increased} ^{decreased} reflected by reduced numbers of anglers fishing.

Table 1. Steelhead Sport Catch Data for The Skeena River from 1968 to 1975

Year	Steelhead Total Catch	Total Anglers	Steelhead Catch/Angler
1967 - 1968	7,714	6,611	1.17
1968 - 1969	7,361	6,237	1.18
1969 - 1970	7,761	8,026	0.97
1970 - 1971	6,911	8,240	0.84
1971 - 1972	6,713	6,684	1.00
1972 - 1973	7,677	6,910	1.11
1973 - 1974	6,608	6,911	0.96
1974 - 1975	4,897	5,546	0.88

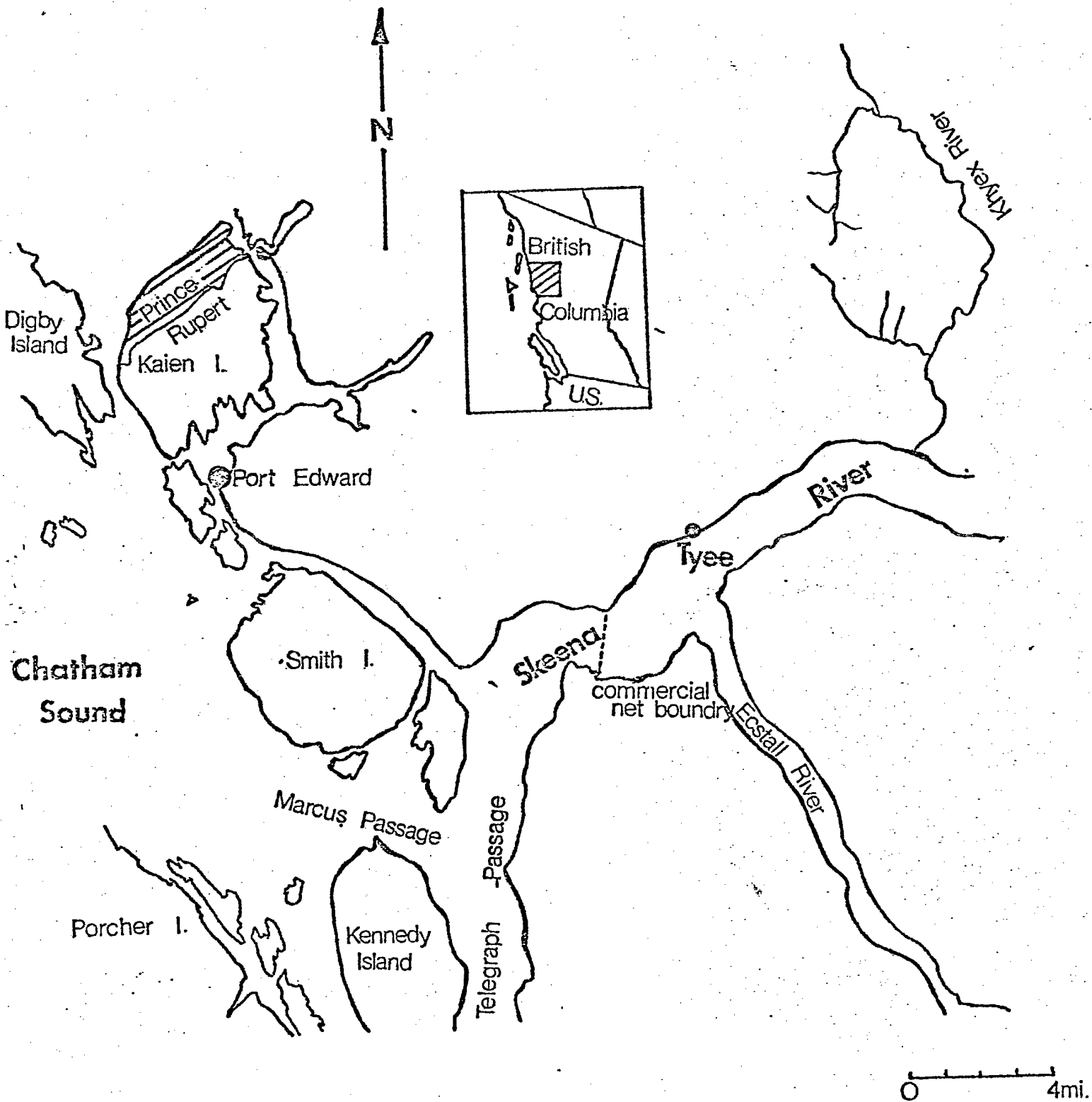
Native Food Fishery

Historically, native people have harvested salmon as part of their aboriginal rights, under a permit system administered by Fisheries and Marine Service. Accurate records of number and species involved are not available, but historical estimates of native steelhead harvest range from approximately 4% to 11% of the total steelhead catch (Chudyk and Pinsent, 1972). More recently, there is some suggestion that the native catch may be as high as 15%. Improved catch records of the native food fishery are essential to management of steelhead in the Skeena River. This appears to be a Federal responsibility which must be pursued with more enthusiasm. (Records on the native food fishery catches of salmon in the Skeena River are similarly sketchy.)

Commercial Fishery

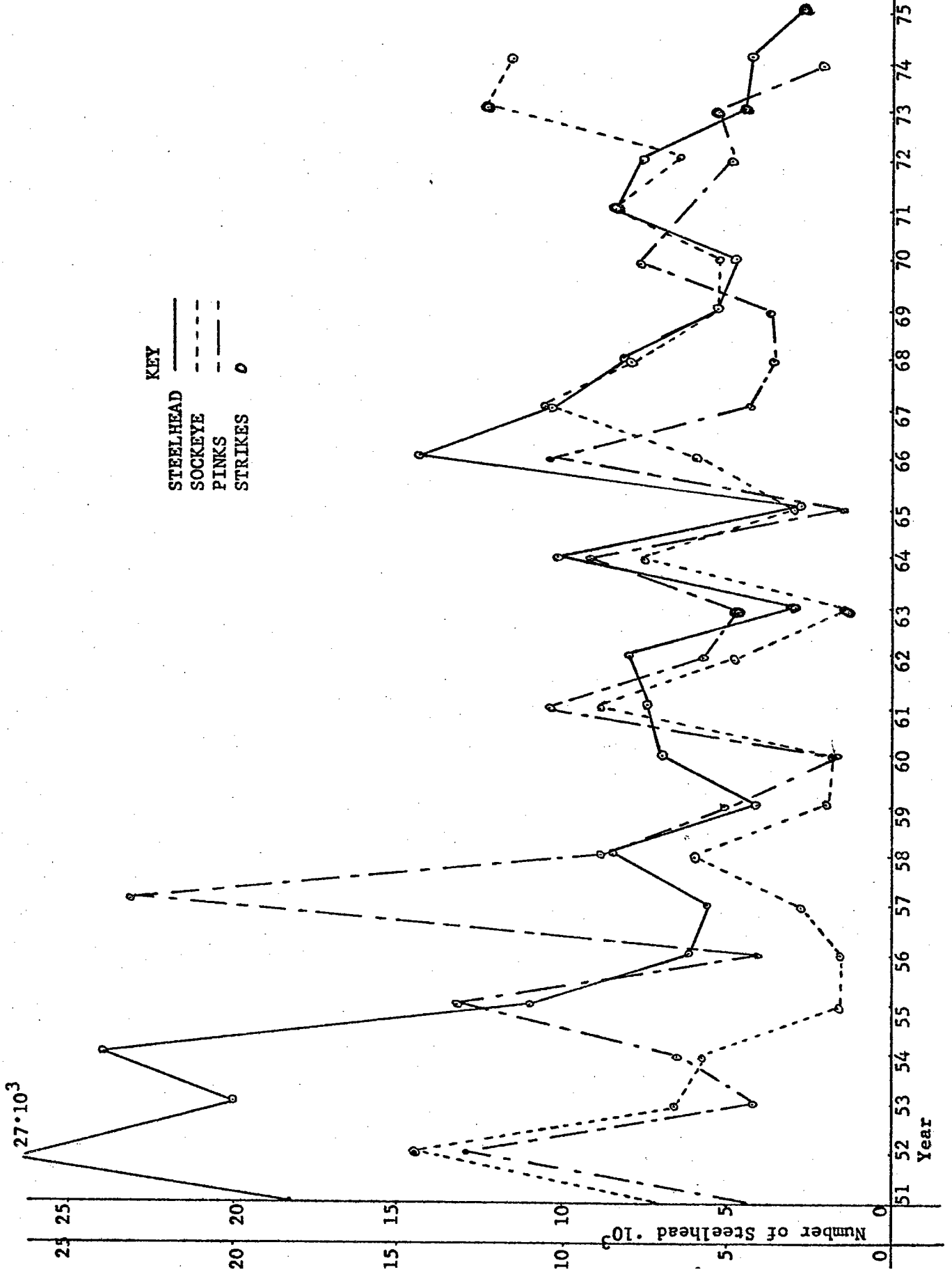
The Skeena River gillnet season for salmon usually begins in June and continues into September. The fishery utilized catch data collected from the Tyee test fishery (five miles upstream from the commercial fishery boundary (Fig. 1) and reported salmon landings from fish processing plants to allow optimum spawning escapements for major salmon stocks. Exploitation by gillnet includes an incidental harvest of steelhead, but, neither stock-specific escapements nor stock-specific incidental catch of steelhead is known. While stock-specific sports catch estimates are available, optimum harvest levels are not established. Without stock-specific escapement data, the incidental harvest records for steelhead in the gillnet fishery represent only crude indicators of steelhead populations trends.

Steelhead landings in the gillnet fishery have declined from 27,000 in 1952 to 3,018 in 1975; this decline is particularly apparent and consistent since 1966 when about 14,000 steelhead were taken (Fig. 2). Conversely, sockeye salmon catch has increased substantially since 1970, apparently as a result of the Babine Development Program. Pink salmon stocks in both odd and even year show substantial variability with marked declines in the last two cycles of both odd and even-year stocks (Fig. 2).



Figure; I The Skeena River estuary showing Tyee

Fig. 2 Annual commercial catch of sockeye and steelhead trout from 1951 to 1975.



In the following sections, four aspects of the Skeena River gill net fishery are examined.

1. Test Fishing at Tyee

Test fishing at Tyee conducted by Fisheries and Marine Service from the first week in June until the last week in August, uses standardized drift gillnet sets to monitor the timing and abundance of salmon. Day to day records at Tyee, current landings, optimum escapement estimates, and predicted returns of sockeye and pink salmon form the basis of management decisions for the gillnet fishery.

Steelhead have been monitored since 1962. (For purposes of comparison the operational weeks at Tyee and those of the commercial harvest have been standardized so that they all commence on the same day).

The Tyee test fishing data for steelhead were grouped as 1963-1966, 1967-1975 and 1973-1975 (Fig. 3; Table 3). Groups were used to show the gradual change between historic steelhead catches and present harvest levels.

The period 1962 - 1966 is the period prior to the inception of the currently used fish ticket system, hence a period of questionable data recording (Fig. 3; Table 3). The period 1967 - 1975 presents steelhead test fishery data during the recent years of decline.

The period 1973 - 1975 represents the period of recent sockeye returns to Babine spawning channels. It is clear that the peak catches of steelhead in the Tyee test fishery have, on average, occurred progressively later: the average peak catch in the period of 1967 - 1975 occurred three weeks later than in 1962 - 1966 and, in the period of 1973 - 1975 peak catch occurred the third week of August -- almost one month later (Table 3 and Fig. 3). In addition, steelhead catches in the test fishery have progressively declined but not in close parallel with commercial landings (Table 2).

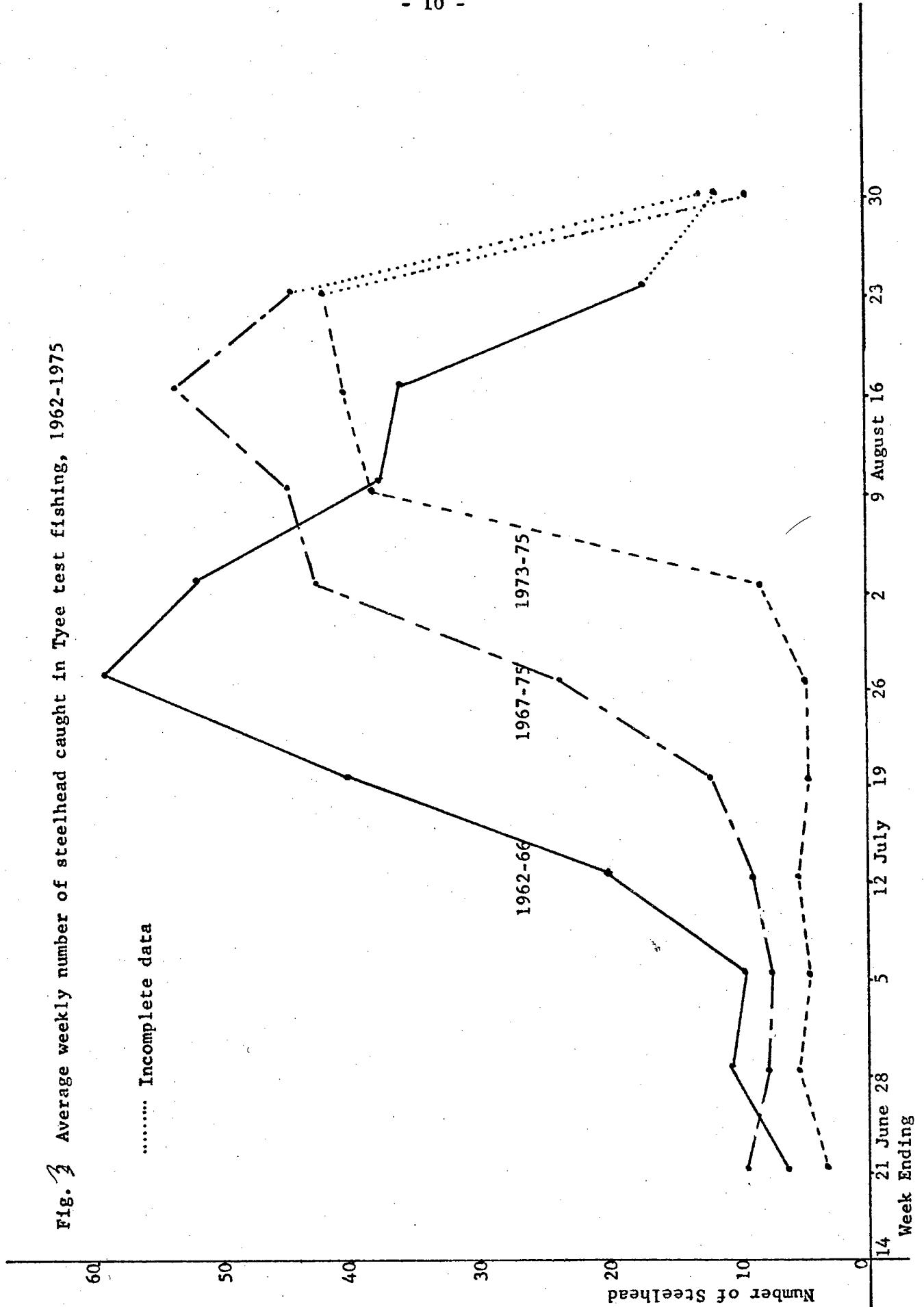
TABLE 2. Skeena River steelhead catch from the commercial fishery Area 4, the angler and the Tyee test fishery.

Year	Angler (n)	Tyee Test (n)	Commercial G.N.(n)
1967 - 1968	7,714	258	8,175
1968 - 1969	7,361	323	5,324
1969 - 1970	7,761	356	4,732
1970 - 1971	6,911	353	8,378
1971 - 1972	6,713	215	7,582
1972 - 1973	7,677	185	4,399
1973 - 1974	6,608	156	4,035
1974 - 1975	4,897	159	3,018

Table 3. Tyee test fishing: Average weekly number of steelhead caught and percent of yearly catch.

Week Ending	Total Average 1962 - 1966		Total Average 1967 - 1975		Total Average 1973 - 1975	
	n	%	n	%	n	%
6/15 - 6/21	6	2	8.7	4	2.6	2
6/22 - 6/28	10.6	4	7.5	3	5.3	
6/29 - 7/5	9.4	3	7.0	3	4.3	3
7/6 - 7/12	20	7	8.4	3	5.3	3
7/13 - 7/19	40.4	13	11.55	5	4.3	3
7/20 - 7/26	59	<u>20</u>	23.3	9	4.6	3
7/27 - 8/2	52	17	42.2	17	10.6	7
8/3 - 8/9	37.6	13	44.8	18	38	24
8/10 - 8/16	36	12	53.8	<u>21</u>	40.3	26
8/17 - 8/23	17.4	6	44.4	18	42.0	<u>27</u>
	<u>288.4</u>		<u>251.5</u>		<u>157</u>	

Fig. 3 Average weekly number of steelhead caught in Tyee test fishing, 1962-1975



2. Sockeye Salmon Fishery

Sockeye salmon are the most important species economically in the Skeena River gillnet fishery. Skeena sockeye are therefore intensely managed both in allocating catch and escapement and in natural and artificial enhancement --- the latter is mainly spawning channels at Babine Lake. Present effort expended on the commercial harvest of salmon is almost totally geared to Babine River sockeye (E. Zyblut, Fisheries and Marine Service, pers. comm.).

Gill net effort was first recorded in 1969. In recent years (1973 - 1975) gill net effort has polarized around the week ending July 26, the period of peak influx for Babine sockeye into the Skeena. The number of gill net vessels fishing during the week ending July 26 ranges from 289 boats in 1975 a U.F.A.W.U. strike year to 882 boats in 1974 while net ^{per} gains vary from 1.5 to six days per week (Fig. 4, Table 4). Weekly net openings are dependant on, Tyee test fishing results, the previous weeks commercial landings and the annual forecast on strength of stock year class.

Unfortunately, current harvest techniques are unable to differentiate between enhanced Babine sockeye and other lesser stocks of sockeye, steelhead and other salmonids entering the commercial fishery at the same time.

Table 4. The number of commercial gill net vessels and days fished per week for the Skeena River from 1969 to 1975.

Week Ending	YEAR													
	1969		1970		1971		1972		1973		1974		1975	
	B	D	B	D	B	D	B	D	B	D	B	D	B	D
June 28	300	2.0	250	1.5	-	2.0	-	2.0	-	2.0	-	-	-	-
July 5	317	2.0	433	1.5	22	2.0	284	2.5	214*	2.0	409	2.0	589	2.0
12	423	2.0	382	2.0	40*	1.0	335	2.5	140*	6.0	422	3.0	-	0
19	549	2.0	438	2.0	387*	2.0	418	1.0	311	6.0	778	3.0	790	4.0
26	665	1.5	460	-	623*	3.0	538	3.0	555	5.0	882	6.0	289*	4.0
Aug 2	554	1.0	-	.5	563*	2.0	571	2.0	532	3.0	862	5.0	236*	4.0
9	525	5.0	-	3.0	639	4.0	664	4.0	488	3.0	623	3.0	137*	4.0
16	465	1.5	524	2.0	650	2.0	-	4.0	357	2.0	-	-	95*	2.0
23	-	-	318	-	574	5.25	485	3.0	281	-	90	2.0	81*	2.0
Total	3798		2805		3498		3295		2878	2.0	4066		2711	
Total Average	475		401		437		471		360		581		376	

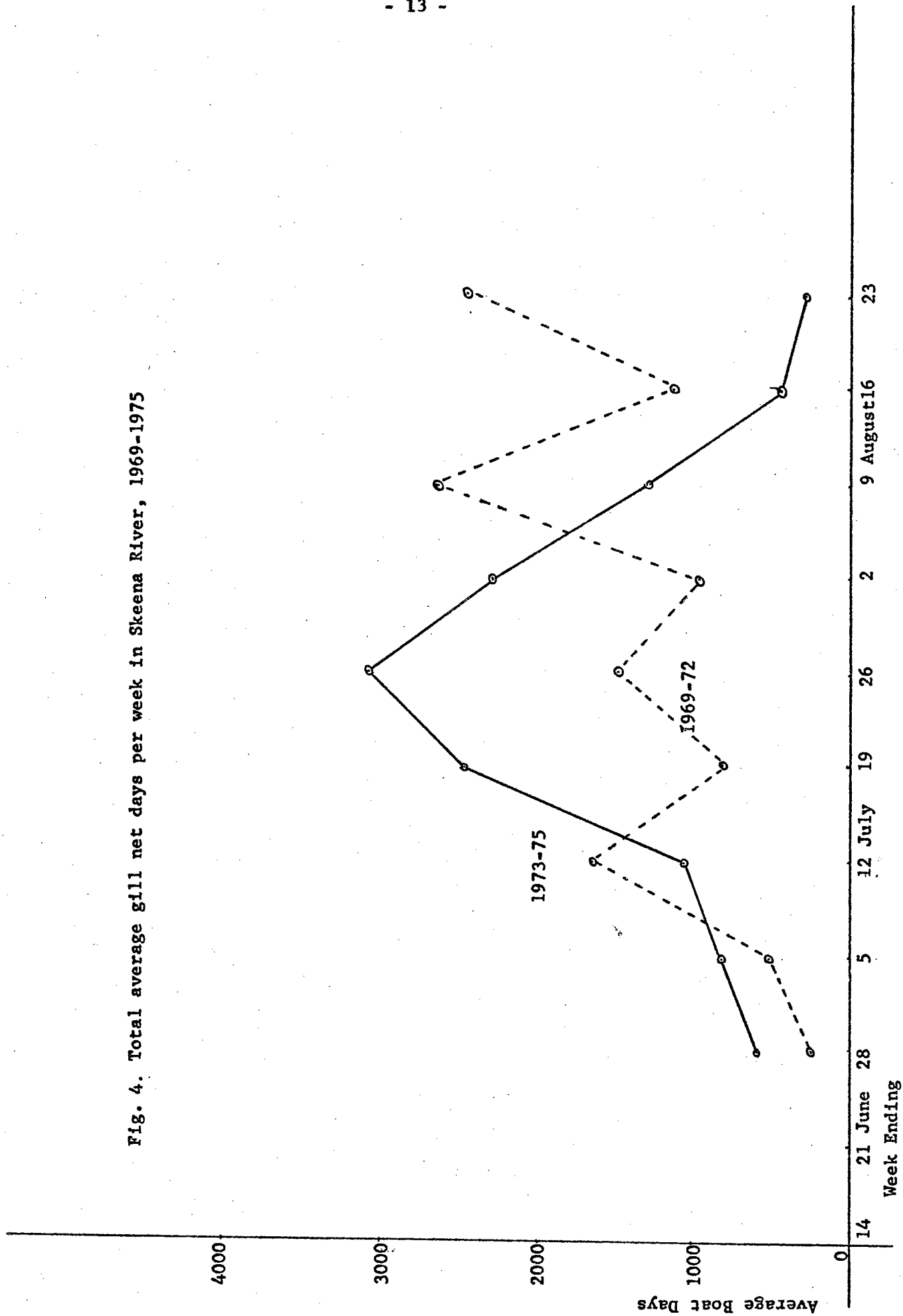
*U.F.A.W.U. gill net vessel strike

B = boats

D = Days

(Note that pressure in "boat days" is calculated by multiplying boats times days for weekly intervals)

Fig. 4. Total average gill net days in Skeena River, 1969-1975



Hence these smaller stocks are caught incidental to the heavy net fishery on Babine sockeye. Commercial sockeye landings in 1973 - 1975 have increased as a result of enhancement of Babine sockeye (Fig. 5). The mean peak of sockeye catch has changed in character in two ways: it is narrower and one week earlier than in the mid-1960's (Table 5, Fig. 5). This suggests a fishery in recent years based on one main stock and/or sharply curtailed fishing after July 26.

3. Pink Salmon

Pink salmon in the Skeena River have not been artificially enhanced and both odd and even year stocks have declined in recent years (Fig. 2, 6, Table 6). Pink salmon catches peak ^{on the average} August 9.

4. The Commercial Catch of Steelhead

The commercial catch of steelhead in the Skeena gillnet fishery is incidental to salmon. The time of entry of steelhead and the target species of the fishery, sockeye and pink salmon, completely overlap. Most of the steelhead catch occurs between the weeks ending July 19 and August 23 (Fig. 7, Table 7). This overlaps the time of the sockeye catch that peaks July 26 and with virtually all of the pink salmon which peak August 9, (Fig. 5,6).

TABLE 5. Gill net catch statistics for sockeye salmon in Area #4 1962 - 1975

Week Ending	Total Average 62 - 66	Total Average 67 - 75	Total Average 73 - 75
6/15 - 6/21	3,535	333	106
6/22 - 6/28	14,447	8,671	5,038
6/29 - 7/5	35,932	36,075	34,759
7/6 - 7/12	69,887	59,019	80,997
7/13 - 7/19	90,975	130,655	145,083
7/20 - 7/26	147,410	<u>230,101</u>	<u>308,441</u>
7/27 - 8/2	<u>160,023</u>	159,242	231,352
8/3 - 8/9	157,283	101,439	95,607
8/10 - 8/16	108,342	52,548	31,837
8/17 - 8/23	102,166	13,162	6,643
8/24 - 8/30	97,799	2,369	274
8/31 - 9/6	97,091	403	58

Fig. 5. Average weekly catch of sockeye salmon in Skeena River gill net fishery, 1962-75

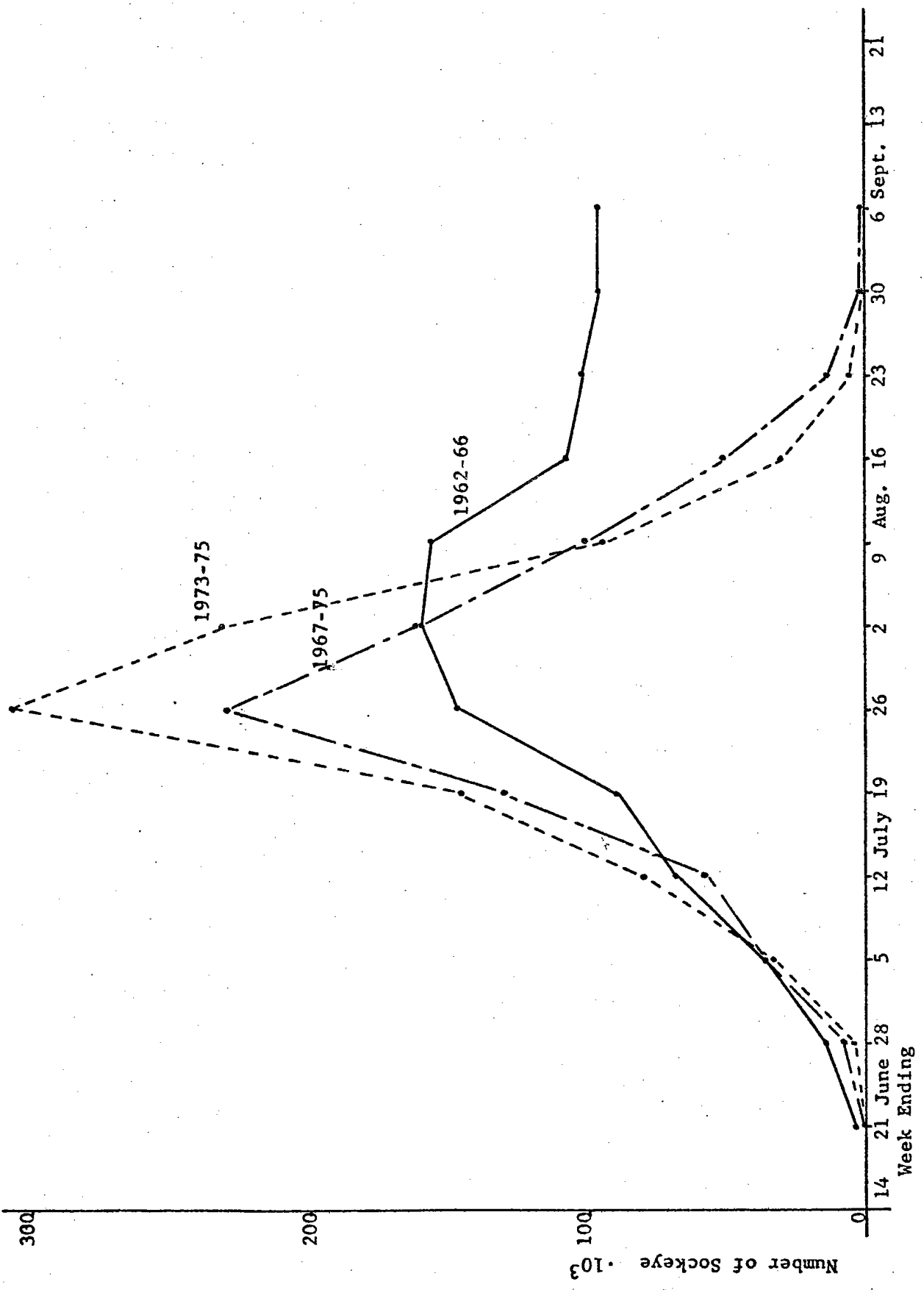


TABLE 6. Gill net catch statistics for pink salmon in Area #4 1962 - 1975

Week Ending	Total Average 62 - 66	Total Average 67 - 75	Total Average 73 - 75
6/15 - 6/21	598	58	-
6/22 - 6/28	1,947	495	9
6/29 - 7/5	4,554	2,438	430
7/6 - 7/12	6,312	1,852	1,757
7/13 - 7/19	12,124	10,948	10,429
7/20 - 7/26	39,006	52,875	66,847
7/27 - 8/2	99,746	57,923	57,937
8/3 - 8/9	<u>220,381</u>	<u>138,219</u>	<u>117,435</u>
8/10 - 8/16	196,467	112,450	97,178
8/17 - 8/23	195,218	60,731	30,126
8/24 - 8/30	145,825	40,352	5,144
8/31 - 9/6	118,870	8,278	713
9/7 - 9/13	114,414	1,705	471
9/14 - 9/21	297	153	19

Fig. 6. Average weekly catch of pink salmon in Skeena River gill net fishery, 1962-75

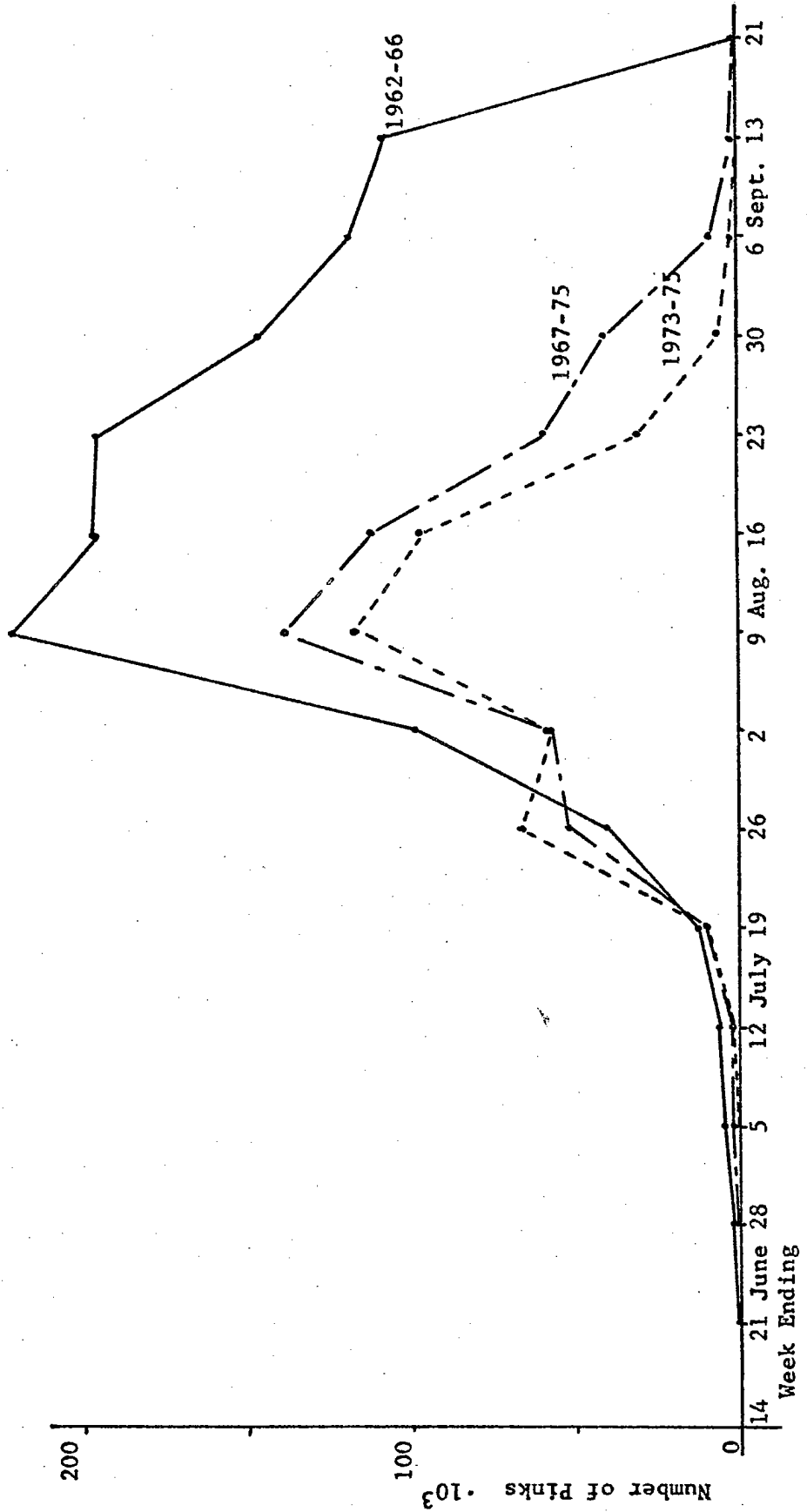
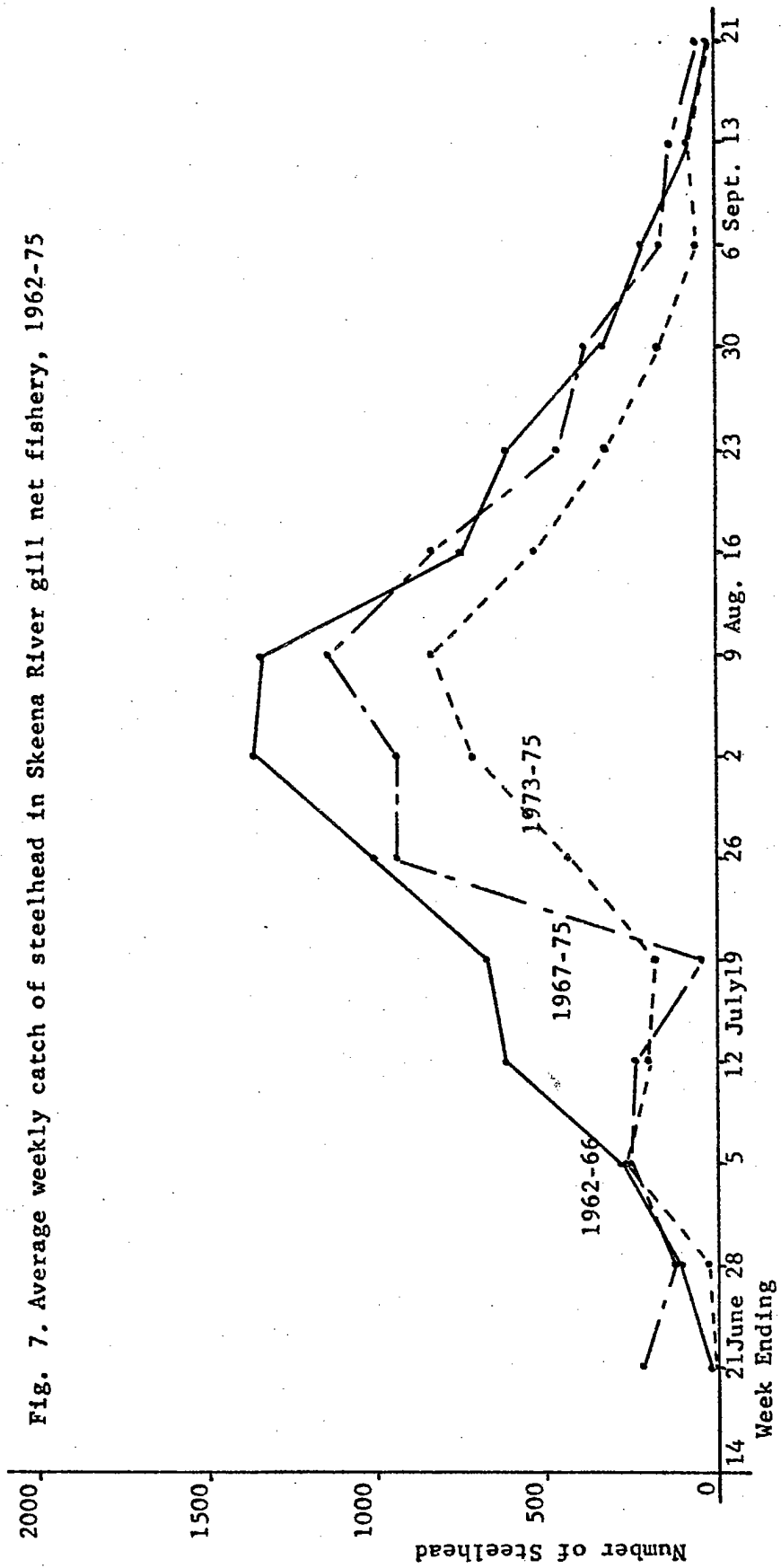


TABLE 7. Gill net catch statistics for steelhead trout in Area #4 1962 - 1975

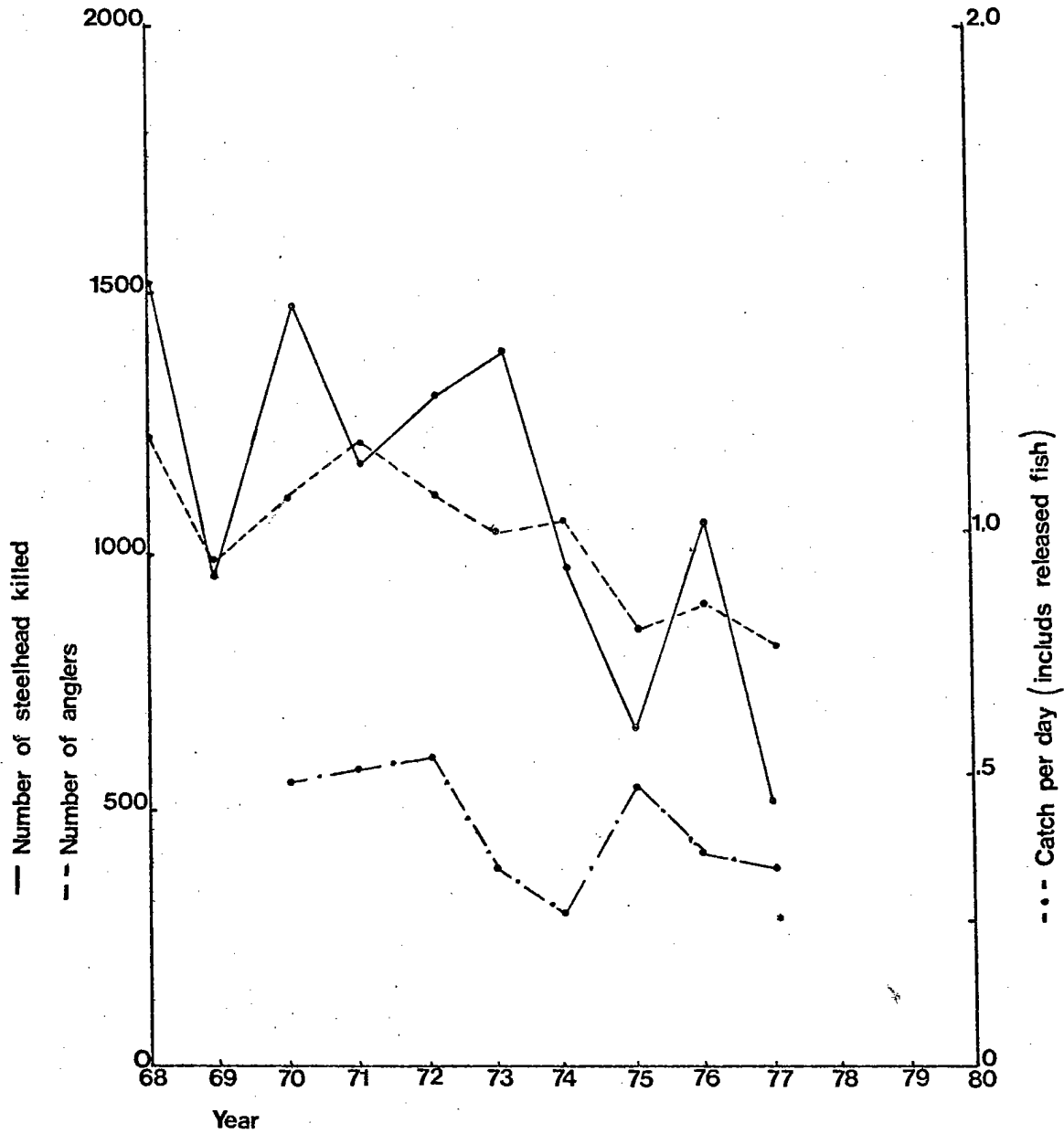
Week Ending	1962 - 1966		1967 - 1975		1973 - 1975	
	Total Average	% Accumulative	Total Average	% Accumulative	Total Average	% Accumulative
6/15 - 6/21	12	0	219	3	1	0
6/22 - 6/28	103	1	128	2	29	1
6/29 - 7/5	293	4	256	4	257	7
7/6 - 7/12	618	8	236	4	207	5
7/13 - 7/19	697	9	457	7	194	5
7/20 - 7/26	1,034	14	943	15	438	11
7/27 - 8/2	<u>1,372</u>	18	962	15	708	18
8/3 - 8/9	1,342	18	<u>1,143</u>	18	<u>839</u>	22
8/10 - 8/16	752	10	827	13	535	14
8/17 - 8/23	615	8	476	8	312	8
8/24 - 8/30	330	4	390	6	165	4
8/31 - 9/6	204	3	160	3	59	2
9/7 - 9/13	91	1	133	2	82	2
9/14 - 9/21	27	0	51	1	23	1

Fig. 7. Average weekly catch of steelhead in Skeena River gill net fishery, 1962-75



A shift in average peak catch of steelhead of one week, from August 2 to August 9, is apparent (Fig. 7). Such a shift in the peak steelhead catch is even more marked in the Tyee test fishing: from July 26 in the 1962-1966 period to mid or late August peak in 1973-1975 (Figures 3 and 4). July 26 corresponded to nearly the peak weekly average catch of sockeye in 1962-1966. This displacement of peak steelhead catch in the test fishery may be at least partially explained by the increased net pressure peaking about July 26 and apparently associated with Babine sockeye (Fig. 4).

Steelhead angler harvest data is an indicator of stock status. The Morice River is a Skeena tributary which is showing a decline in catch and catch per unit effort but essentially constant effort (Fig. 8). It seems likely that some of the other up-river stocks such as Kispiox and Babine have the same time of entry as do the Morice steelhead. Since the other up-river stocks such as Kispiox and Babine are also declining (although not as rapidly as Morice) they may enter the commercial fishery at the same time as Babine sockeye and are represented by the portion of the curve that peaked in late July until the last few years (Fig. 3, 7). This suggests that the commercial fishery is selecting for later run steelhead and/or severely reducing the earlier fish. In fact, sport fisheries formerly in full swing in early September, are no longer occurring until mid-October. This situation holds for the Morice as well as the Babine and Kispiox Rivers. It is also possible that sport and Indian fishing has (and is) contributed to these declines.



* steelhead killed 1976 creel survey

Fig.8 Steelhead harvest data for Morice River 1968-77

CONCLUSIONS

This preliminary review of the relationship between steelhead population trends in the Skeena River and steelhead landings in the gill net fishery emphasizes several points.

1. By all indices (commercial gill net, test fishing, and sport catches) the steelhead population continues to decline and is a small portion of its former abundance.
2. The peak catch of steelhead in the commercial fishery is about one week later than it was ten years ago.
3. The peak catch of steelhead in the Tyee test fishery (the escapement) is three to four weeks later than ten years ago.
4. In general, steelhead sport fisheries on the upriver stocks now start three to four weeks later than in earlier years.
5. The intensified sockeye gillnet fishery now peaks July 26 which is when relatively large commercial steelhead catches and the peak steelhead catch at Tyee occurred ten years ago. Apparently the early portion (late July) of the steelhead run is being largely removed by the intensive gillnet fishery for sockeye that occurs at that time.

6. Steelhead anglers on the major Skeena River tributaries have been progressively restricted in bag limit as the abundance of steelhead had declined. It is not clear that either the commercial fishery or the native food fishery has been restricted in any proportional way to maintain steelhead stocks.

RECOMMENDATIONS

An immediate need for more specific and improved data collection on the Skeena River steelhead fisheries was identified. The following would substantially improve the steelhead data base and provide for more rational management.

- a) Improvement of angler catch and effort data in the form of mandatory punch card returns with provision for date of capture for each fish and intensified creel census program.
- b) Reliable data on the number and location of steelhead (and salmon) caught in the native food fishery. In addition, the Fish and Wildlife Branch should have a greater role in allocating Indian net permits where steelhead are available.
- c) Increase the Tye test fishing in both the period of time covered and possibly the intensity of effort to improve the estimate of steelhead (and salmon) escapement.

ACKNOWLEDGEMENTS

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