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ANALYSIS OF THE STEELHEAD
SPORT FISHERY ON THE
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An Analysis of the
Steelhead Sport Fishery on
Morice River

Autumn, 1976

by

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INTRODUCTION

A creel census was conducted on the Morice River steelhead fishery during Autumn, 1976. Objectives of the study were two-fold:

- 1) To collect detailed information on angler origin, angler distribution in the fishery, effort, success, and tackle preferences.
- 2) To collect and analyze data concerning the biology of the Morice steelhead, including basic life histories.

The program is a two-year study which will be completed in 1977. This report is intended only as a means of presenting the 1976 creel data (item (1) above) in a logical fashion; a more complete report with discussion and comparisons with other work will be forthcoming following the 1977 fishery.

DESCRIPTION OF THE STUDY AREA

Morice River is a lake-headed system that enters the Bulkley River approximately six kilometers north of Houston, B.C. $54^{\circ}20'N$. $126^{\circ}50'W$. (Fig. 1 & 2). The mainstem runs for 88 kilometers (55 miles) from Morice Lake to its confluence with the Bulkley.

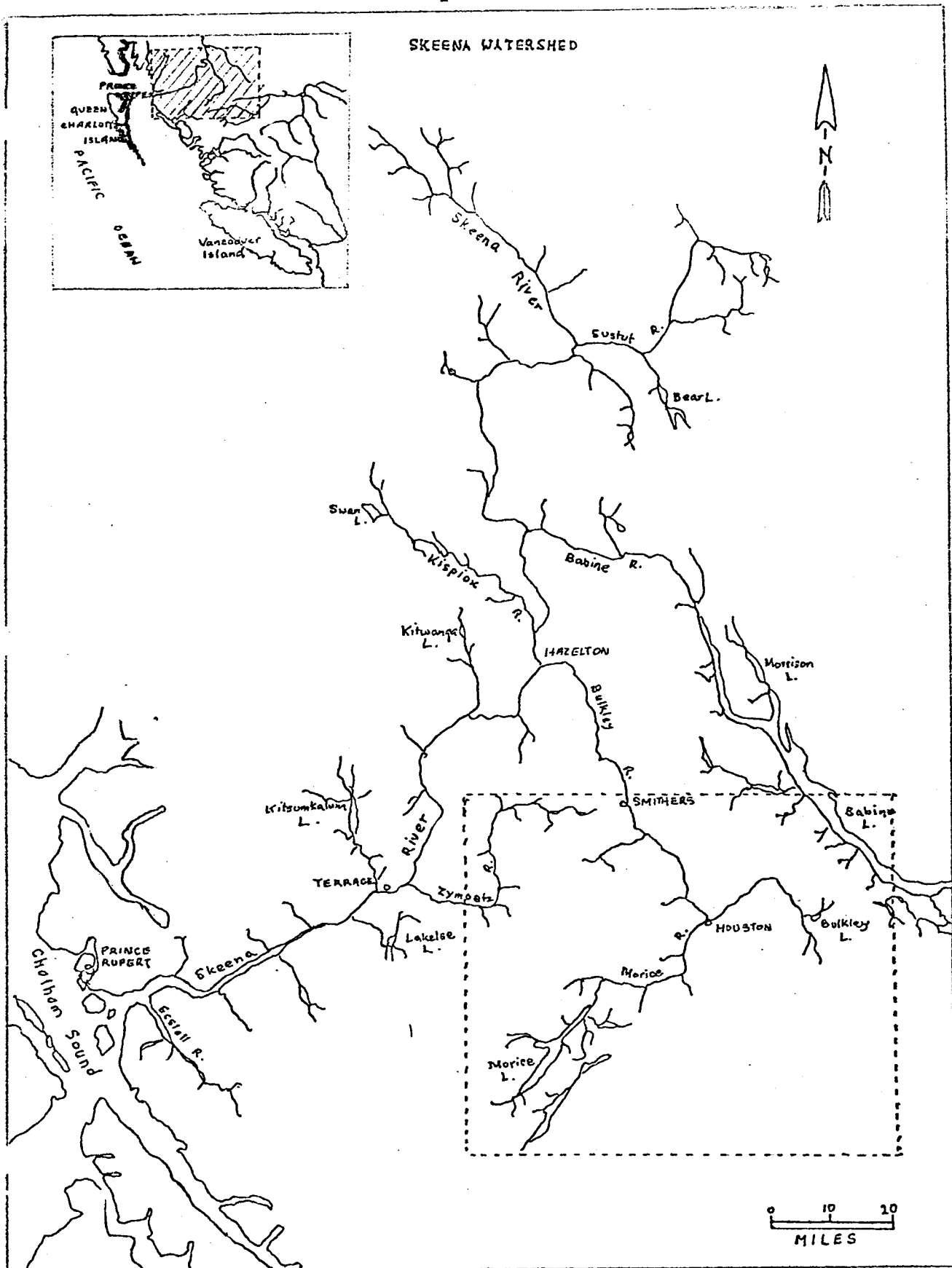


Fig. 1 Skeena Watershed

Tributaries that enter along its course are small and many are lake or swampheaded. The largest tributary system, Thautil River-Gosnell Creek, is a glacial, highly silt-laden system which joins the Morice fifteen kilometers (9.5 miles) downstream from the lake. Upstream of the Thautil-Morice confluence, the Morice runs clean throughout the year, but downstream the river is almost always tinted, and often highly colored.

The river is made accessible for approximately 35 miles by a paralleling forest access road originating near Houston. The remaining 20 miles of river are accessible only by boat from Morice Lake downstream or Mile 35 upstream. Access to the river is also gained from Francois Lake via Owen Lake (Fig. 2).

A major camp ground (unorganized) and boat launching ramp exist at Barrett Station on the Bulkley River (Fig. 2). The lower 2 - 3 miles of the Morice are traditionally fished by boat upstream from this location or downstream from Mile 3 on the Morice, and therefore the portion of Bulkley River between Barrett and the confluence (4 miles) is considered to be Morice River for the purposes of this study.

British Columbia sport fishing regulations for the Morice River in 1976 were as follows:

- 1) Angling closure from January 15 to June 30.
- 2) Salmon closure between Morice Lake and Lamprey Creek from August 15 to September 30.

- 3) Fish roe prohibition.
- 3) "Special River" i.e. Non-residents of Canada are required to pay an additional \$25.00 for their angling licence.
- 5) Steelhead daily limit 2, possession limit 4.
- 6) Rainbow trout minimum legal size 12 inches.

METHODS

A permanent angler check station was established on the Morice Road, four kilometers (2.5 miles) from the junction with Highway 16, five kilometers southwest of Houston, B.C. The station was manned by two fisheries technicians from 11:00 a.m. to 1 hour after sunset each day, for the duration of the study (September 4 to December 13). A roving assistant also interviewed anglers daily at Barrett Station, the "Forks" (Bulkley - Morice confluence) and the campsites at Mile 3 and Mile 11 (Fig. 2). On heavily fished (holiday) weekends, an additional check point was set up at the Owen Lake Road turn-off to intercept anglers leaving the valley via the Francois Lake route. At each road check, signs were set up to direct anglers off the road and onto a siding, away from traffic. Each group of anglers was then interviewed and the information recorded on creel census

forms. Scale samples, length and sex information were taken from all steelhead checked. At the end of each day, the information was transferred from the creel census form to a permanent record book kept at the trailer.

RESULTS

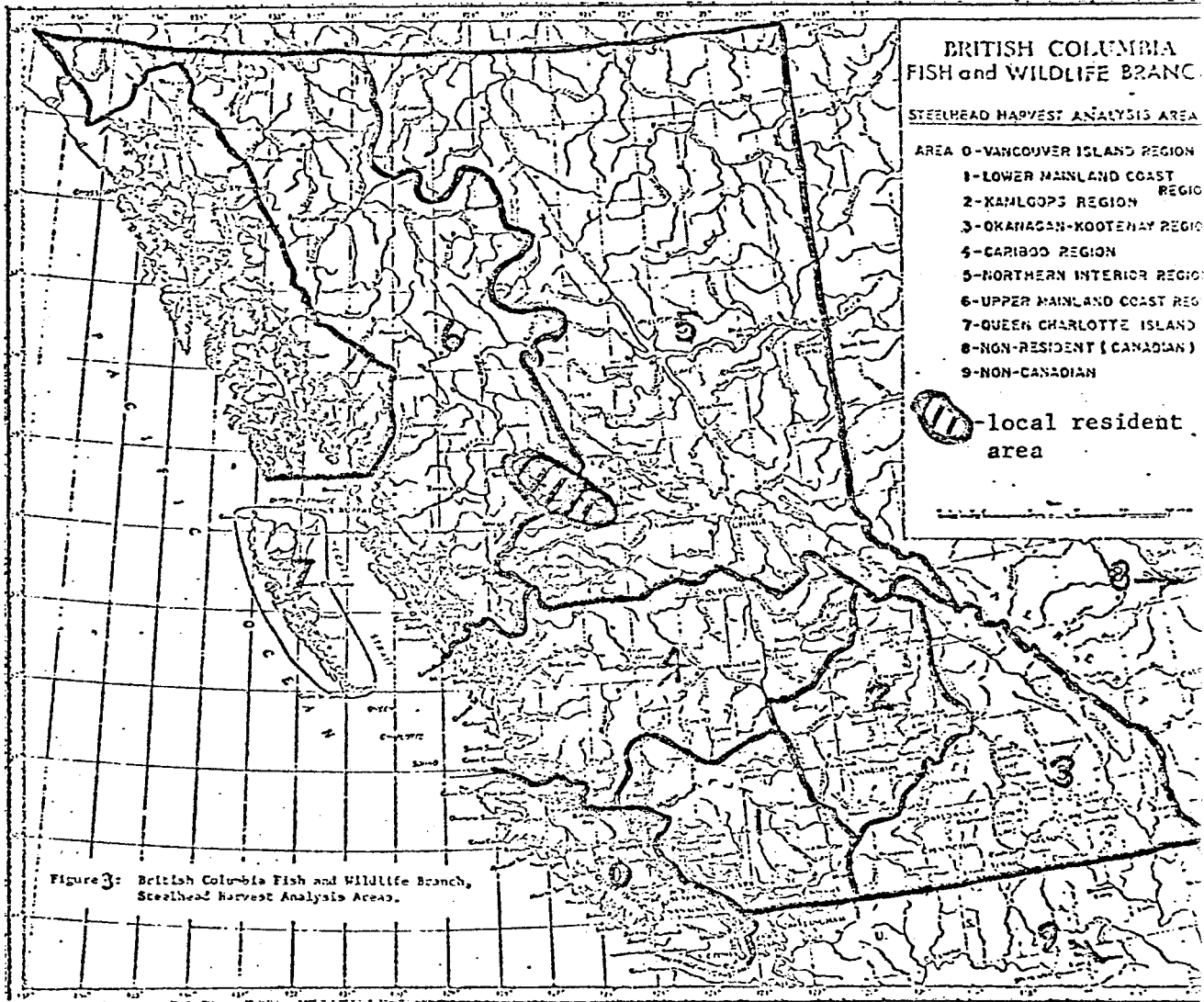
Angler Origin

In recording angler residence data on the census forms, no effort was made to identify individual anglers who were checked more than once. Therefore, it was not possible to determine the number of anglers from any one town, only the number of angler-trips. For example, one angler from Smithers who was checked on five separate days would appear in the data as five anglers from Smithers, or five angler-trips originating from Smithers.

Anglers were separated into four groups (Fig. 3)

- 1) Local residents - Highway 16 - Burns Lake to Smithers
 - 2) B.C. Residents - Areas 0 - 7)
 - 3) Non-resident Canadians - Area 8)
 - 4) Non - Canadians - Area 9)
-) - Steelhead Harvest Analysis

Angler-trips originating from the Northern Interior and Upper Mainland Coast areas outnumbered all other areas combined (Table 1). In fact, angler-trips originating from Prince George (420) were the largest single group among the data, outnumbering even those from Houston (347) (Table 2). Among non-locals other than Prince George, the largest number of angler trips originated from the



lower Mainland Region (136 - 9.0% of total), followed by Alberta (103 - 6.8% of total), and the U.S.A. Northwest (54 - 3.6% of total) (Table 1).

The number of anglers from west of Houston was quite small (150) when compared with the number of anglers from Burns Lake east to Prince George (459). Prince George anglers were apparently more inclined to make the 320 km drive to the Morice than Terrace or Kitimat anglers.

Table 1. Number of steelhead angler-trips by residents, Non resident Canadians and Non-Canadians to Morice River, 1976.

<u>Angler Residence</u>	<u>Number of Angler-trips</u>	<u>Percent of Total</u>
<u>B.C. Residents</u> <u>(S.H.A. Regions)</u>		
Vancouver Island	16	1.1
Lower Mainland	136	9.0
Kamloops Region	19	1.3
Okanagan-Kootenay Region	18	1.2
Cariboo Region	18	1.2
Northern Interior Region ¹	597	39.7
Upper Mainland Coast Region ¹	497	33.1
Queen Charlotte Islands	<u>0</u>	<u>0</u>
	1301	86.6
<u>Non-Resident Canadians</u>		
Alberta	103	6.8
Ontario	<u>2</u>	<u>0.1</u>
	105	6.9
<u>Non-Canadians</u>		
U.S.A. Northwest	54	3.6
U.S.A. Southwest	16	1.1
U.S.A. Central	20	1.3
U.S.A. East	1	0.1
U.S.A. Unknown	3	0.2
Germany	<u>3</u>	<u>0.2</u>
	97	6.5
	<u> </u>	<u> </u>
Total Angler-trips	1503	100%

¹includes "Local Residents" (Table 2)

Table 2. Number of angler-trips by Local Residents and by Residents of Prince George to Morice River, Autumn, 1976.

Angler Residence	Number of Angler-trips	Percent of Total (1503)
a) <u>Local</u>		
Smithers	91	6.1
Telkwa	6	0.4
Houston	347	23.1
Tropley	5	0.3
Granisle	10	0.7
Francois Lake	13	0.9
Decker Lake	30	1.9
Burns Lake	<u>80</u>	<u>5.3</u>
	582	38.7
b) <u>Prince George</u>		
	420	27.9

Angler Effort and Success

The 1503 anglers interviewed on the Morice expanded a total of 1971 angler days during the census period (Table 3). A total of 394 steelhead were caught, of which 115 (29%) were released. Local Residents caught the most fish (43.6%) and in terms of catch per day, were most successful (four days per fish). Non-Canadian anglers were most successful in terms of fish per angler (0.39) although the effort in terms of time (5 days per fish) was higher.

Table 3. Morice steelhead angler effort and success, Autumn 1976.

Angler Category	Number of Anglers	Angler Days	Fish Killed	Fish Released	Catch per day ¹	Catch per angler ¹
<u>Creel Census-Fall 1976:</u>						
Local Residents	582	650	130	42	0.26	0.29
B.C. Residents	719	959	117	51	0.18	0.23
Non-Resident	105	142	15	1	0.11	0.15
Canadians	97	220	17	21	0.17	0.39
Non Canadians						
Totals:	1503	1971	279	115	0.20	0.26

¹Catch per unit effort (C.U.E.) is computed by combining killed and released fish and dividing by the number of anglers or number of angler days.

Steelhead Catch Distribution

Timing

Though the first steelhead were caught in the Morice late in August, the fishery didn't reach its peak until mid-October (Fig. 4). The large drop in numbers of fish caught for the week of October 30 to November 6 corresponded to a heavy rainstorm on October 27 which raised the river about 0.3 meters overnight and left it dirty and unfishable for several days.

Angler Distribution

As mentioned earlier, Barrett was considered the farthest downstream point of the Morice though it is technically on the Bulkley River. The

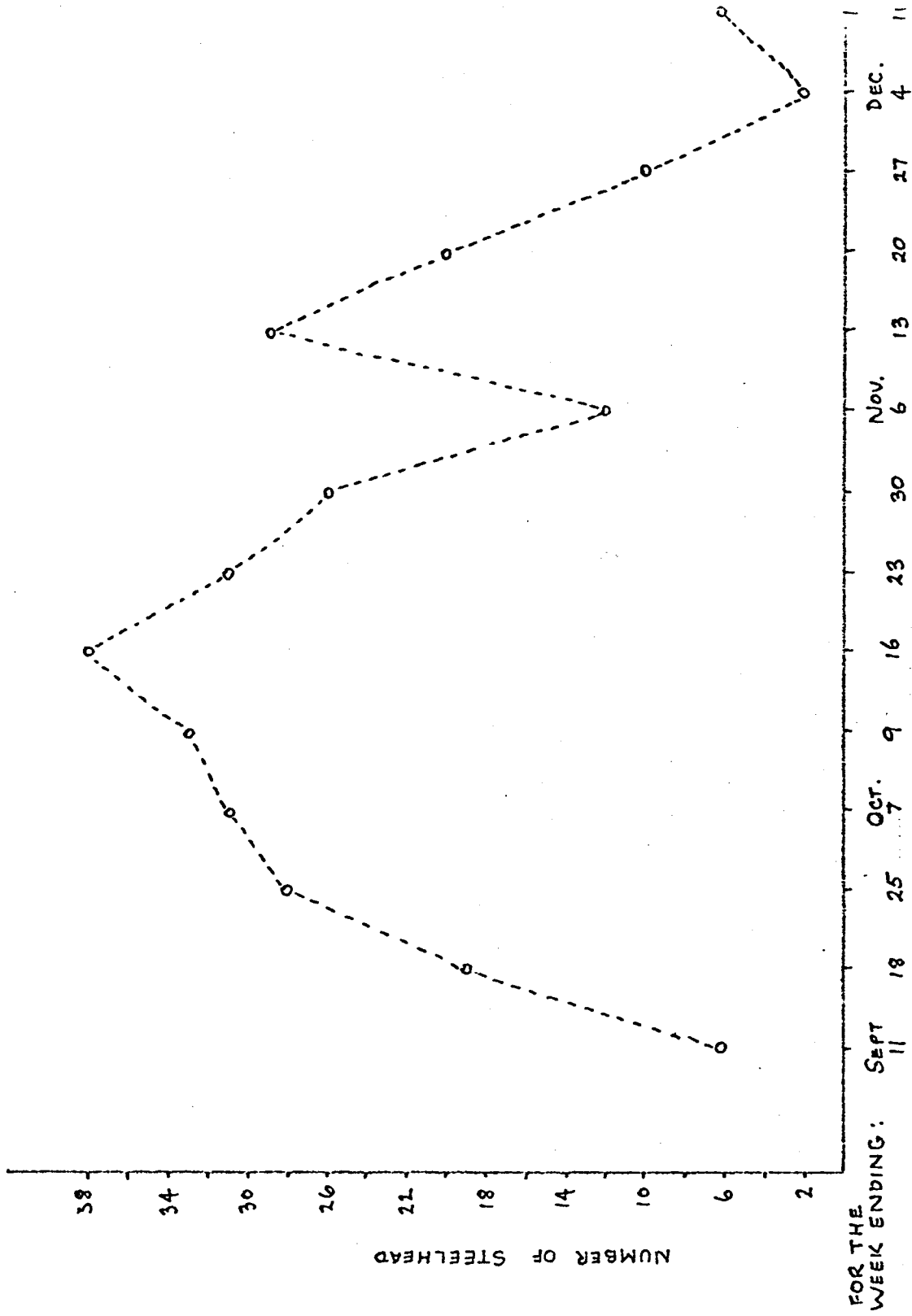


Fig. 4 Weekly steelhead harvest (kills plus releases)
Morice River, Autumn 1976

campsite at Barrett was used mainly by experienced "professional" steel-headers, most of whom were fly fishermen (Table 4). Barrett anglers, although comprising only 7% of the total number of anglers, caught 13% of the total fish in 1976 (Table 4).

The "Forks" was another spot fished by experienced steelheaders as indicated by the relatively high success rate of 0.48 fish/angler (Table 5). All runs and holes between Mile 3 on the Morice and Barrett other than the "Forks" were reached by boat. The float from Mile 3 to Barrett was popular but the catch per angler was only average (0.24) (Table 5).

Mile 3 attracted the greatest number of anglers (410) (Table 4). The well-maintained campsite at Mile 3 attracted the casual weekend angler as well as the avid steelheader. The boat launch at Mile 3 provided a route upstream to Miles 6 to 10 where there is no road access, and downstream to Barrett. At Mile 11, a B.C.F.S. campsite was also heavily used by casual anglers- probably reflected by the low success (0.12 fish/angler) (Table 5). There is easy launch of light boats at Mile 11 and many people drifted Mile 11 to Mile 3.

The holes between Mile 12½ and Mile 34 are all accessible from the road. There were concentrations of anglers at the campsites at Owen Creek (Mile 17) and Lamprey Creek (Mile 28). The boat launch at Lamprey Creek provided riverboat access to the upper river. Above Mile 28, lack of road access resulted in low numbers of anglers (Table 4), but C.U.E. was generally higher (Table 5).

Table 4. Numbers of anglers and their steelhead harvest by tackle type and by river location, Morice River, Fall, 1976.

River Location	LURE		FLY		Total	
	Number of Anglers	Catch (Kill & Rel)	Number of Anglers	Catch (Kill & Rel)	Number of Anglers ¹	Total Catch (Kill & Rel)
Barrett & Upper Barrett	47 (3%)	15 (5%)	80 (20%)	35 (29%)	127 (7%)	50 (13%)
Mi 3 to Barrett Drift ²	27 (2%)	4 (1%)	31 (7%)	10 (8%)	58 (3%)	14 (4%)
Forks (Confi. of Bulkley & Morice) ²	99 (7%)	40 (15%)	24 (6%)	19 (16%)	123 (7%)	59 (15%)
Mi 3, 4, 5 ³	309 (21%)	54 (20%)	101 (25%)	30 (24%)	410 (22%)	84 (21%)
Mi 6 to 10 ⁴	55 (4%)	7 (3%)	20 (5%)	5 (4%)	75 (4%)	12 (3%)
Mi 11 (B.C.F.S. Campsite)	173 (12%)	18 (7%)	14 (3%)	4 (3%)	187 (10%)	22 (6%)
Mi 11 to 3 Drift	41 (3%)	7 (3%)	14 (3%)	1 (1%)	55 (3%)	8 (2%)
Mi 12½	31 (2%)	4 (1%)	10 (3%)	0 (0%)	41 (2%)	4 (1%)
Mi 13½	28 (2%)	8 (3%)	0 (0%)	0 (0%)	28 (1%)	8 (2%)
Mi 14	73 (5%)	2 (1%)	21 (5%)	0 (0%)	94 (5%)	2 (1%)
Mi 15, 15½	43 (3%)	5 (2%)	7 (2%)	0 (0%)	50 (3%)	5 (1%)
Mi 16	38 (3%)	1 (1%)	10 (3%)	0 (0%)	48 (3%)	1 (1%)
Mi 17, 18 (Mouth of Owen Creek)	105 (7%)	11 (4%)	9 (2%)	5 (4%)	114 (6%)	16 (4%)
Mi 17 to 40 (to Gosnell Creek) ⁵	20 (1%)	15 (5%)	0 (0%)	0 (0%)	20 (1%)	15 (4%)
Mi 20 to 23	73 (5%)	5 (2%)	20 (5%)	0 (0%)	93 (5%)	5 (1%)
Mi 24 to 28 (Mouth of Lamprey Cr.)	180 (12%)	37 (14%)	11 (3%)	0 (0%)	191 (10%)	37 (9%)
Mi 30, 31½	28 (2%)	10 (4%)	8 (2%)	0 (0%)	36 (2%)	10 (2%)
Mi 34 (end of Morice Road)	11 (1%)	3 (1%)	5 (1%)	4 (3%)	16 (1%)	7 (2%)
Mi 40 (Mouth of Gosnell Creek) ⁵	14 (1%)	8 (3%)	8 (2%)	6 (5%)	22 (1%)	14 (4%)
Mi 40 to Lake Outflow ⁵	56 (4%)	18 (7%)	13 (3%)	3 (3%)	69 (4%)	21 (5%)
Totals:	1451 (100%)	272 (100%)	406 (100%)	122 (100%)	1857 (100%)	394 (100%)

¹ Combined total of lure and fly fishermen will not tally with total angler numbers (1503) mentioned previously, as several anglers used both methods.

² Includes Henry's Hole, Strawberry Run. Reached by boat only except for the Forks.

³ Includes Canoe Pool, Bridge Pool, Ed's Hole, Rush Pool, Corner Pool, Lightening Strike.

⁴ Includes Bear Riffle, Hot Hole. Reached by boat only.

⁵ Reached by boat only.

Table 5. Catch per angler for lure and fly tackle per river location, Morice River, Fall, 1976.

River Location	Catch/ Lure	Anglers Fly	Catch Angler ¹ Total
Barrett	0.32	0.44	0.39
Mile 3 to Barrett Drift	0.15	0.32	0.24
Forks	0.40	0.79	0.48
Mile 3,4,5	0.17	0.30	0.21
Mile 6 to 10 ²	0.13	0.25	0.16
Mile 11	0.10	0.29	0.12
Mile 11 to 3 Drift ²	0.17	0.07	0.15
Mile 12½	0.13	0.00	0.10
Mile 13½	0.29	0.00	0.29
Mile 14	0.03	0.00	0.02
Mile 0.12	0.00	0.00	0.10
Mile 16	0.03	0.00	0.02
Mile 17,18 (Owen Creek)	0.10	0.56	0.14
Mile 17 to 40 ²	0.75	0.00	0.75
Mile 20 to 23	0.07	0.00	0.05
Mile 24 to 28 (Lamprey Cr.)	0.21	0.00	0.19
Mile 30, 31½	0.36	0.00	0.28
Mile 34 (End of Morice West Road)	0.27	0.80	0.44
Mile 40 (Gosnell Creek)	0.57	0.75	0.64
Mile 40 to Lake	0.32	0.23	0.30
Averages:	0.23	0.24	0.24

¹Includes killed and released fish.

²Reached by boat only.

Though the upper river can be difficult to navigate, it is usually passable to the lake. The campsite and boat launch at Morice Lake accounted for the relatively large number of people fishing the lake outflow and extreme upper river (Table 4).

Generally, over half (56%) of the anglers were concentrated at or below Mile 11. The fly fishermen in particular were confined to the river below Mile 11 (85%). At the runs where the 'professional' steelheaders concentrated - Barrett and the Forks - the catch per angler was much higher than the rest of the river (0.44 to 0.17). The greatest catch was recorded at Mile 3 simply because more people fished there. That is, the catch per angler at Mile 3 (0.21) was about average (0.24) (Table 5).

Tackle

Most (78%) of the anglers on the Morice River used lures. However, a comparison of success rates between lure anglers and fly anglers shows that the fly fishermen were more successful than lure anglers for most of the season and actually caught more fish in September (64 to 59) (Table 6). The decrease in fly fishing in November can be attributed to the colder weather and ice conditions.

The most frequently used lures were kitimats, size 45 to 65, small spin and glos often with a float, gooey-bobs, krocodiles and paravans. The most successful of the lures was the paravan with spin and glos and kitmats as the second and third most effective.

Table 6. Effort expended and catch by fly fishermen and lure anglers on Morice River, Fall, 1976.

	September		October		November		December ¹	
	Lure	Fly	Lure	Fly	Lure	Fly	Lure	Fly
Anglers	394	178	461	133	183	17	19	2
Angler Days	556	222	659	153	200	17	19	2
Total Catch ²	59	64	109	53	73	2	7	1
Catch/Angler	0.15	0.36	0.24	0.40	0.40	0.12	0.37	0.5
Catch/Angler Day	0.11	0.29	0.17	0.35	0.37	0.12	0.37	0.5

¹Census stopped December 13 by adverse weather conditions.

²Includes kill and release.

Fly fishermen used mainly dark-bodied wet flies though a few fish were caught on a dry fly. Most fly patterns were originals by the angler (Woodall Special, Redheaded Squaw) but one of the most successful 'standard' patterns was the red-tailed wooly worm. The

majority of fly anglers were from the Lower Mainland or the U.S.A. (Table 7).

Table 7. Residence areas of lure anglers and fly anglers on Morice River, Fall, 1976.

Region	Lure	Fly
Vancouver and Lower Mainland	51%	49%
U.S.A.	40%	60%
Prince George and west to Houston	87%	13%
Houston and west to Prince Rupert	72%	28%

Sex Ratio and Kill vs. Release in Angler's Catches

The sex ratio of the steelhead killed was 53% females to 47% males. Because the sex of released fish was often not recorded, it was not possible to establish the sex ratio of kill versus released fish. However, it was possible to calculate the kill versus release by the fly angler and the lure angler (Table 8).

Table 8. Number and percent of fish killed and released by lure anglers and by fly fishermen, Morice River, Fall, 1976.

	Lure			Fly	
	Kill	Release		Kill	Release
#	230	43	#	49	72
%	84%	16%	%	40%	60%

Lure anglers killed 84% of their catch, whereas fly anglers killed only 40%

SUMMARY

1. A survey of the Morice River steelhead fishery was conducted during the period September 4 through December 13, 1976. Data collected included angler numbers, origin, effort, success, distribution and tackle preference.
2. Local Residents (Burns Lake, Smithers) made 582 trips to the Morice during the census period, accounting for 38.7% of total number of trips (1503). Prince George residents made 420 trips (27.9%). B.C. residents as a whole accounted for 1301 trips (86.6%) whereas non residents accounted for only 202 trips (13.4%)
3. The 1503 anglers expended a total of 1971 angler days. A total of 394 steelhead were caught, of which 115 (29%) were released. Local anglers caught the most fish (43.6%) and were the most successful.

4. The fishery commenced during the first week of September, peaked during mid October, and was virtually finished by the beginning of December.
5. The majority of steelhead anglers fished at Barrett (7%), the "Forks" (7%), Mile 3 (22%), Mile 11 (10%), Owen Creek (6%), and at Lamprey Creek (10%). Over 52% (207) of the total steelhead harvest was recorded from Mile 3 to Barrett.
6. Seventy-eight per cent of Morice steelheaders used lures when angling. Fly fishermen, however, were generally more successful than lure anglers. Catch per angler during September and October was 0.36 and 0.40 for fly fishermen, and 0.15 and 0.24 for lure anglers. Catch per day was 0.29 and 0.35 for fly fishermen, and 0.11 and 0.17 for lure anglers.
7. Sex ratio of steelhead killed by Morice anglers was 53% females to 47% males. Lure anglers killed 84% of their catch; fly fishermen killed only 40%