SURVEY OF NATIVE FOOD FISHERIES FOR STEELHEAD IN THE SKEENA RIVER SYSTEM, 1989

by

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c. 1 mm

INTRODUCTION

Skeena River steelhead *(Oncorhynchus mykiss)* are subjected to commercial, native and sport fisheries as they migrate to their spawning areas. Standardized surveys are conducted to estimate fishing effort and catch in the commercial fishery (hail data, sales slips) and the sport fishery (eg. Billings 1988). In contrast, little is known about impacts of the native food fishery. Limited unpublished data from Department of Fisheries and Oceans (DFO) and Ministry of Environment files, along with cursory surveys by Morrel et al. (1985) and Lough (M.S. 1988) form the extent of our present understanding of this fishery.

Further study of the native food fishery and of steelhead catches in particular was conducted during 1989. The study involved two distinctly different areas and types of fisheries; part of the study focused on gillnetting on the mainstem Skeena, while the remainder was directed at the Moricetown Canyon gaff/dipnet fishery on the Bulkley River. The objectives of the investigations were:

1. to provide information on the spatial and temporal distribution of fishing effort;
2. to document catch with special reference to steelhead.

METHODS

SKEENA RIVER GILLNET FISHERY

Logistical constraints prevented examination of the entire mainstem Skeena food fishery. As a result, only that part of the Skeena which has traditionally supported the bulk of native fishing effort (Lough M.S. 1988) was selected as the focus of the survey. The study area was divided into 4 zones (Fig. 1):

Zone 1. Kitwanga;
Zone 2. Kitwanga to Kitseguecla;

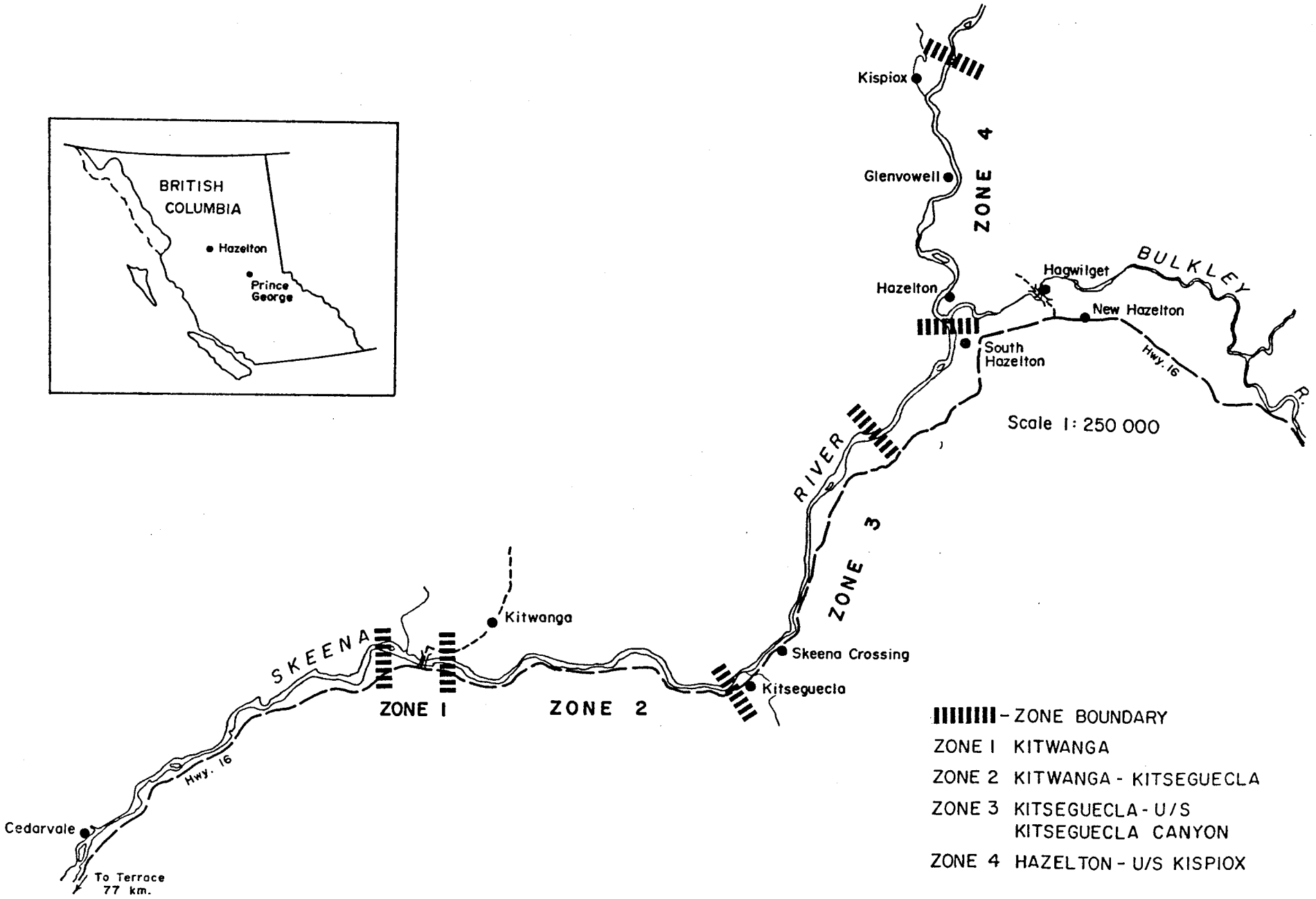

Fig. 1 Skeena River System, Showing 1989 Net Survey Zones.

Zone 3. Kitseguecla to above Kitseguecla canyon;
Zone 4. Hazelton to above Kispiox.

The area between Zones 3 and 4 does not support significant native fishing effort and was therefore excluded from the analysis.

The survey was undertaken from a power boat, commencing at Kitwanga and working upstream. All operating nets were counted as the survey crew progressed upstream. A net fishing any part of one day was considered as one “net day” in the determination of effort. Catch data was determined by lifting nets and counting the number of fish by species. This was only possible where examinations could be conducted discretely since cooperation by native fishermen was poor when they were questioned directly.

The survey was partitioned into six sample periods of one week each, beginning September 5 and ending October 13, 1989. The river was surveyed a total of eight times, and most zones were checked at least one day per week. The area of the highest expected effort (Zone 3) was surveyed more frequently than the other three. Zone 4, which was expected to support the lowest level of effort, was checked only twice during the survey.

The mean daily net count per week was calculated and then multiplied by the number of weeks in the survey to determine the total netting effort for each zone and each period. We assumed netting effort was the same at night as during the day and the same on weekdays as on weekends.

Catch per net was determined by dividing the total number of fish by the total number of nets checked. These figures did not provide an estimate of catch per unit effort because the period between the start of the set and time of inspection was unknown. As a result, we developed a rough estimate of the average catch per day based on observations of nets which appeared to have been checked daily. This figure was then multiplied by the estimate of total effort to provide an indication of total catch.

Effort and catches associated with drifted gillnets in the immediate vicinity of Kitwanga Village were also difficult to assess. However, catches were kept in the river on “stringers” and could be removed from the water and counted. These appeared to be catches from one day of fishing and thereby provided an indication of the catch per day. Although no concrete information on effort was obtained, we speculated on a range of values for effort over the study period to assist in providing some indication of the overall catch.

MORICETOWN CANYON GAFF/DIPNET FISHERY

The Moricetown canyon gaff/dipnet fishery on the Bulkley River was monitored on a casual basis by crews en route to or returning from the Skeena River net survey. To facilitate information exchange, native fishermen were questioned informally and were not advised that we were government representatives. Notes were taken on the time of day, number of fishermen, method used, length of time fished and catch by species. The survey was conducted between September 8 and October 15.

RESULTS AND DISCUSSION

SKEENA RIVER GILLNET FISHERY

Set Gillnets

Mean net counts and estimated total netting effort associated with set gillnets are summarized in Table 1. Exclusion of Zone 4 from the survey on most dates prevented the development of complete estimates of effort. Using available data, the area immediately above Kitseguecla (Zone 3) received 60% of the estimated total netting effort during the six week survey. The most intensive netting effort was observed during the week of September 10 - 16.

Many natives had completed fishing before the 1989 survey began. In 1987, the highest intensity of food fishing effort on the Skeena River mainstem occurred from July 26 to August 8 (Lough M.S. 1988). Effort during that week was nearly three times more than the most active week documented in the present study. The area between Kitwanga and Kispiox Village received nearly 80% of the total netting pressure during the 14 week 1987 survey (1,113 net days).

The present survey did not include sampling on weekend days. However, we believe effort may have been higher on the weekends as a result of fishing by individuals who worked during the week. Such differences would be an important consideration in the design of future surveys.

Observations of set gillnets indicated pink salmon dominated the catch, followed by steelhead and coho (Table 2). However, pink salmon catches typically consisted of either carcasses which had been drifting downstream or very mature essentially inedible fish. Steelhead and coho were the obvious target of fishermen during the period covered by the present study. Overall catches of steelhead and coho were greatest in Zone 3.

Estimates of catch per unit effort could not be readily developed because the length of time between the start of the sets and our observations was generally unknown. Set durations appeared to vary between 1 day and 2 weeks. However, we were unable to accurately assess set lengths because the frequency with which fishermen checked their nets was highly variable and unpredictable. An estimate of the catch per net day was nevertheless attempted based on observations of nets that appeared to have been checked more or less daily and where steelhead appeared to have been freshly caught. Under these circumstances, the average catch was likely in the order of 1 steelhead per net per day.

At a catch of 1 steelhead per net per day, the estimated 245 net days expended over the

Table 1. Mean daily net counts and estimates of total weekly netting effort by zone during the Skeena River native food fishery survey, 1989.

Sample Period	ZONE 1 Net Days Mean/Day	ZONE 1 Net Days Est.Tot.	ZONE 2 Net Days Mean/Day	ZONE 2 Net Days Est.Tot.	ZONE 3 Net Days Mean/Day	ZONE 3 Net Days Est.Tot.	ZONE 4 Net Days Mean/Day	ZONE 4 Net Days Est.Tot.	ALL Net Days Mean/Day	ALL Net Days Est.Tot.
Sept 3-9	0	0	2	14	5	35	N.S.	N.S.	7	49
Sept 10-16	1	7	3	21	6	42	4	28	14	98
Sept 17-23	0	0	0	0	3	21	N.S.	N.S.	3	21
Sept 24-30	0	0	0	0	3	21	4	28	7	49
Oct 1-7	0	0	0	0	3	21	N.S.	N.S.	3	21
Oct 8-14	0	0	0	0	1	7	N.S.	N.S.	1	7
Total (n)		7		35		147		56		245
(%)		2.8		14.3		60.0		22.8		100.0

N.S. = Not surveyed.

course of the present study would have produced a catch of 245 steelhead. Note that this represents only a part of the 1989 catch for set gillnets within the study area. Considerable fishing effort took place prior to initiation of the survey, when steelhead were already in the study area in significant numbers. Catches were also likely far lower than might be expected in other years because the return of summer steelhead to the Skeena River in 1989 was among the lowest on record (M.O.E., data on file).

The catch estimate provided above should be viewed with caution as it is based on a season long estimate for average catch per net day for the entire study area. Catch success likely varied from net site to net site as well as from week to week as the season progressed but the present study was not sufficiently detailed to detect such differences.

Of particular interest with regard to set duration were our observations of poorly attended nets. A number of nets were left unattended for periods long enough to allow

Table 2. Catch and catch per net data from gillnets observed during the Skeena River native net survey, 1989.

Zone	No. of nets		Steelhead		Coho		Pink		Sockeye		Chum		Other	
	Counted	Checked	No.	Per Net	No.	Per Net	No.	Per Net	No.	Per Net	No.	Per Net	No.	Per Net
1	1	1	1	1.0	8	8.0	24	24.0	5	5.0	2	2.0	0	0
2	5	1	1	1.0	2	2.0	24	24.0	0	0	0	0	0	0
3	21	9	30	3.3	13	1.4	14	1.5	1	0.1	0	0	0	0
4	8	3	2	0.6	4	1.3	4	1.3	1	0.3	1	0.3	1 DV	0.3
													1 CT	0.3
ALL	35	14	34	2.4	27	1.9	66	4.7	7	0.5	3	0.2	1 DV	0.1
													1 CT	0.1

the catch to begin to decompose. Although these nets no longer fished effectively once they were filled with carcasses and debris, it was clear that significant waste occurred before this point was reached.

Considerable danger was involved in pulling and checking native nets without permission. In previous years, DFO fishery officers involved in similar activities were threatened by overhead rifle shots.

Drift Nets

Although drift net fishing was not observed directly, clear evidence of such activity was found on the mainstem Skeena at Kitwanga Village. Boats with recently used nets were observed at the launch site on every occasion crews were in the area. In addition, fresh catches were found on ropes in the river beside boats at Kitwanga on two occasions (Fig. 2). Since set nets were never observed in this area, it can only be assumed these fish were a result of drift netting. We believe that drift nets were used early in the morning or evening.

Although effort and catch in this part of the fishery were difficult to assess, catches can apparently be substantial. Counts of fish stored in the river on stringers suggest that one boat and net caught 13 steelhead and 5 coho on September 22, and 5 steelhead on September 27. Each of these observations probably represented one day of drift netting activity, suggesting an average catch of 9 steelhead per net day. Daily activity of this nature would therefore have produced catches of nearly 400 steelhead over the study period. However, if this activity occurred 1 - 2 days per week, a total catch in the order of 50 - 100 steelhead would have taken place. The latter estimate is likely more realistic. As in the case of gillnet catches described in section 2.2.1, the abbreviated study period and low abundance of steelhead resulted in catch estimates being lower than would be the case over the entire season in a year of more typical run strength.

The steelhead described above were probably caught in the Skeena River mainstem near the Kitwanga River confluence. The Kitwanga steelhead stock was most likely disproportionately represented in the harvest since steelhead destined for the Kitwanga generally do not ascend that stream until ready to spawn (Lough 1981). These fish typically overwinter in the mainstem Skeena near the mouth of the Kitwanga thus making them highly vulnerable to drift net fishing. The stock is relatively small and unable to support intensive harvests.

MORICETOWN CANYON GAFF/DIPNET FISHERY

Observations of the 1989 Moricetown native food fishery are summarized in Table 3. Fishermen were observed on only 3 of 12 survey days. The fishery targets primarily on chinook during July and August (Turnbull, pers. comm.) and had slowed substantially by the time the present survey began. No fishing was observed after September 20.

Figure 2. Photograph of steelhead coho assumed to have been caught by drift gillnetting in the Skeena River near Kitwanga.

Table 3. Summary of observations of the Native food fishery at Moricetown Canyon on the Bulkley River, September 8 - October 15, 1989.

Date	Number of Fishermen	Observation Times: Start Time	Observation Times: Duration Hrs : Min	Method	Catch: Co	Catch: St
Sept 8	5	14:45	0 : 50	5 Gaffs, 1 Jjg*	0	0
Sept 8	4	16:30	0 : 15	3 Gaffs, 1 Dipnet	6	0
Sept 19	1	16:00	0 : 20	1 Dipnet	2	0
Sept 19	1	9:45	2 : 15	1 Dipnet	4	3
Sept 20	1	15:25	2 : 30	1 Dipnet	4	2
Sept 25	0	15:00	0 : 00	0	0	0
Sept 26	0	10:30	0 : 00	0	0	0
Sept 30	0	9:30	0 : 00	0	0	0
Oct 1	0	8:30	0 : 00	0	0	0
Oct 1	0	17:30	0 : 00	0	0	0
Oct 2	0	8:30	0 : 00	0	0	0
Oct 2	0	13:30	0 : 00	0	0	0
Oct 2	0	16:55	0 : 00	0	0	0
Oct 4	0	15:00	0 : 00	0	0	0
Oct 11	0	12:30	0 : 00	0	0	0
Oct 14	0	14:00	0 : 00	0	0	0
Oct 15	0	12:00	0 : 00	0	0	0
All	12		6 : 10	8 Gaffs, 4 Dipnets, 1 Jig	16	5

* one fisherman alternating between a gaff and jig

Out of a total of 12 native fishermen observed, 8 used gaffs, 4 employed dipnets and 1 was using a jig (snagging with a weighted treble hook). In 1989, DFO attempted to ban the use of gaffs for 3 days per week to encourage the use of dipnets and the release of coho. However, our observations indicated this restriction was not adhered to and that coho harvest was unaltered.

Fishermen typically provided catch information freely until they became suspicious of the level of questioning or saw the government vehicle. The total catch was inestimable since the fishery was observed on only 3 days for a total of 7 hours 15 minutes.

However, for the period over which observations were made, the catch consisted exclusively of coho (76.1%) and steelhead (23.8%). Natives questioned about the best time of day for fishing suggested the greatest success occurred around mid-morning and after 6 pm.

A small falls on the side channel directly below the fishway and on the west side of the Bulkley accommodated nearly all the fishing effort observed during the survey. Fishing skill varied considerably between natives. Although quantitative data on catch by gear type could not be collected, dipnets appeared at times to be more effective than gaffs.

CONCLUSIONS

1. Approximately 245 gillnet days were expended between September 3 and October 14, 1989 by the native fishermen on the Skeena River in the area between Kitwanga and Kispiox. Accurate catch per unit effort data were difficult to obtain because of reluctance on the part of native fishermen to disclose information to government representatives. The catch over the period of study averaged roughly 1 steelhead per net day, for an estimated total catch of about 245 fish.

2. Drift netting near the mouth of the Kitwanga River was likely responsible for harvests in the order of 50 - 100 steelhead during the 6 week study. This fishery is a major conservation concern because it targets primarily the impoverished Kitwanga stock.

3. The Moricetown Canyon fishery was very near completion by the time the present study was initiated and thus the extent of harvests could not be assessed.

RECOMMENDATIONS

1. Future studies should commence in mid-July to ensure the entire steelhead migration

and harvest is examined.

2. More frequent net tending should be required to reduce fish spoilage and waste.

3. The conservation of small, highly vulnerable fish populations such as Kitwanga steelhead must be addressed by reducing fishing effort.

4. A means of encouraging native fishermen to provide catch data should be developed.

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Appendix I. Numbers of nets counted, checked, and catch per set in each zone during the Skeena net survey, 1989.

Area	Date	No. of nets		Steelhead		Coho		Pinks		Sockeye		Chum		Other
		Counted	Checked	No.	Per Set	No.	Per Set	No.	Per Set	No.	Per Set	No.	Per Set	
1	Sept 13	1	1	1	1	8	8	24	24	5	5	2	2	
2	Sept 5	2	0	0		0		0		0		0		
	Sept 13	3	1	1		2		24		0		0		
	Total	5	1	1	1	2	2	24	24	5		2		
3	Sept 5	5	0	0		0		0		0		0		
	Sept 13	6	2	3		4		0		0		0		
	Sept 22	3	0	0		0		0		0		0		
	Sept 27	3	3	18		5		0		0		0		
	Oct 3	3	3	9		4		12		1		0		
	Oct 13	1	1	0		0		2		0		0		
	Total	21	9	30	3.3	13	1.4	14	1.5	1	.1			
4	Sept 15	4	0	0		0		0		0		0		
	Sept 27	2	2	1		2		4		1		1		1 DV 1 Cutt
	Sept 28	2	1	1		2		0		0		0		
	Total	8	3	2	.6	4	1.3	4	1.3	1	.3	1	.3	