SURVEY OF TWO NATIVE FISHERIES IN THE SKEENA RIVER SYSTEM, 1991

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INTRODUCTION

Skeena River summer steelhead (Oncorhynchus mykiss) are harvested in commercial, Native and sport fisheries as they return from the Pacific Ocean to their spawning areas each summer/fall. Although standardized surveys are conducted to estimate fishing effort and catch in the commercial (hail data on file, Department of Fisheries and Oceans (DFO), Prince Rupert; sales slip data, British Columbia Commercial Catch Statistics, DFO, Pacific Region) and sport fisheries (eg. Billings 1989), little data pertaining to the Native fishery has been compiled. Unpublished data from the DFO and Ministry of Environment (MOE) files, and cursory surveys by Morrel et al. (1985), Lough (M.S. 1988), Tetreau et al. (M.S. 1990) and Beere (M.S. 1990) describe some elements of the fishery.

Further study of the Native fishery and of steelhead catches in particular was conducted during 1991. The study involved two distinctly different areas and types of fisheries; part of the study focused on set and drift gillnetting on the mainstem Skeena, while the remainder was directed at the Moricetown Canyon gaff/jig/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.

The Skeena River Native set gillnet fishery begins intermittently

in late May or early June. Fishermen targeting on chinook salmon (Oncorhynchus tshawytscha) work around the high water events of spring and the debris that accompanies these flows. By early July, the first sockeye salmon (Oncorhynchus nerka) enter the Skeena, and gillnetting effort increases. Early run summer steelhead (Oncorhynchus mykiss) and kelts also enter the fishery at this time, followed by pink (Oncorhynchus gorbuscha) and coho salmon (Oncorhynchus kisutch) in late July and early August. Few chum salmon (Oncorhynchus keta) are caught in this fishery beginning mid July. Set gillnet effort usually decreases rapidly in mid September, weather conditions dependent, and few fishermen set nets into October.

Drift gillnet fisheries begin in late April or early May near Kitwanga and Glen Vowell. Steelhead that have overwintered in the Skeena River mainstem are the primary target of these fisheries, followed by early run chinook salmon, et cetera, as described above. Drift fishermen, unlike set gillnet fishermen, will often continue fishing into October and November. These late fisheries are weather dependent.

The Moricetown Canyon Native fishery begins with the arrival of chinook and sockeye salmon in early to mid July. Coho, pink salmon and steelhead catches commence in late July. Chum salmon catches are a rare occurrence during August and September. Fishing effort decreases rapidly in early September, and those fishermen remaining in the Canyon target on coho and steelhead.

METHODS

SKEENA RIVER SET GILLNET FISHERY

Logistic constraints prevented examination of the entire mainstem Skeena Native fishery. As a result, only that part of the Skeena River which has traditionally supported the bulk of Native fishing effort during the known steelhead migration (Lough, M.S. 1988) was selected as the focus of the survey; this was the area between Kitwanga and Kispiox (Figure 1).

The survey was undertaken from a power boat. Access was available at the Bulkley—Skeena confluence area and all operating nets were counted on each survey day. A net fishing any part of one day was considered as one "net day" in the determination of effort. Catch data was obtained by interviewing net fishermen encountered on the river.

The survey was partitioned into three monthly sample periods beginning July 15 and ending September 30, 1991. The river was surveyed twice weekly a total of twenty one times. Examination dates were chosen at random (Scheaffer et al., 1979).

The mean daily net count for each month was calculated and combined to estimate a total effort figure for the survey period (Procedures

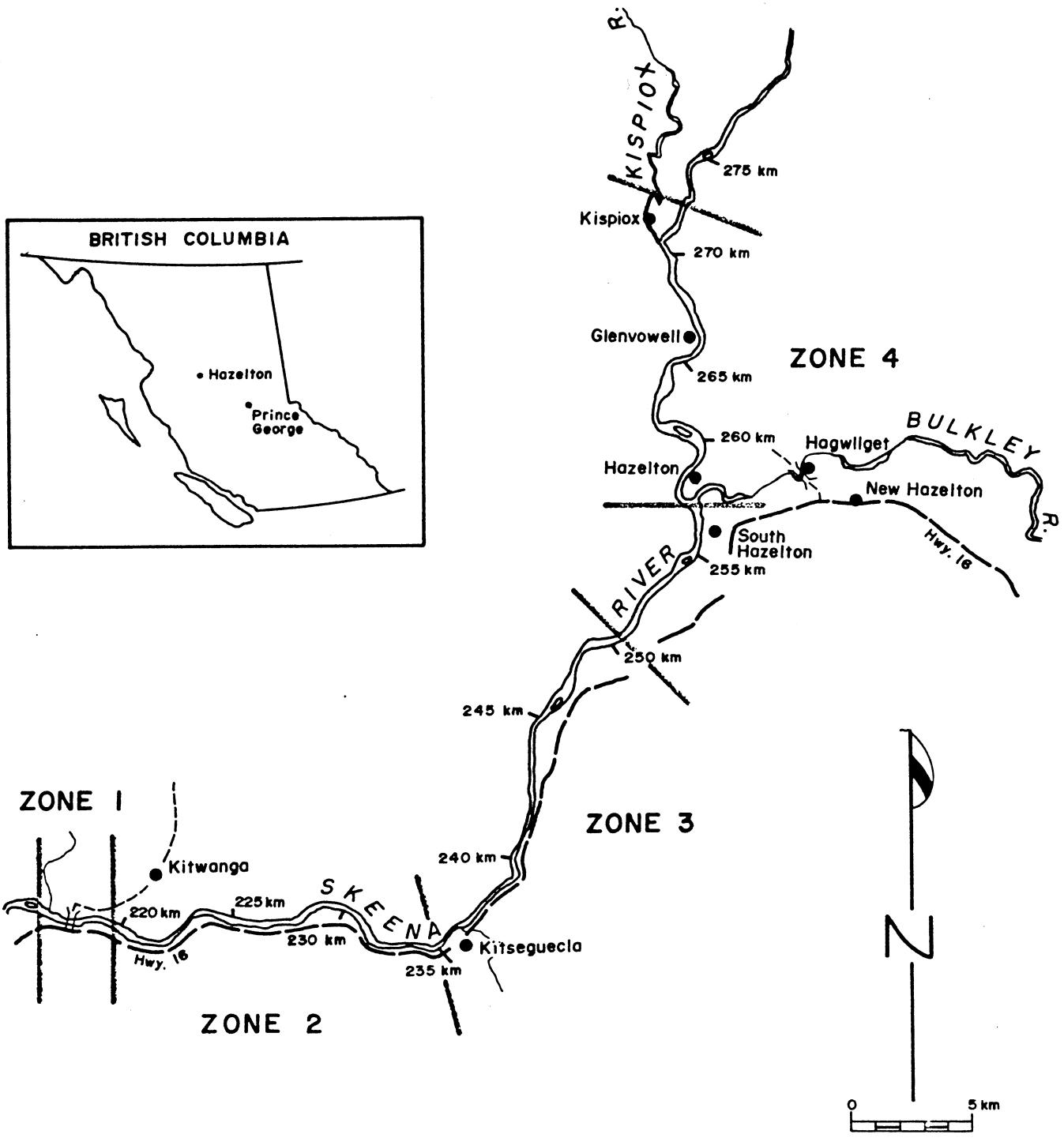

Figure 1. Native netting survey area, showing native villages and kilometers from the Skeena River estuary.

For Coded Wire Tagging Pacific Salmonids). It was assumed that the netting effort was the same at night as during the day and the same on weekdays as on weekends.

Catch per net day was determined by interviewing fishermen. As this survey was stratified by month, a daily catch per unit effort (CPUE) figure was determined for each month. Effort was then multiplied by CPUE to give the total estimated catch for each of the three months of the survey.

DRIFT GILLNETS

The drift gillnet fishery was surveyed along with set gillnet fisheries, between July 15 and September 30, 1991. Effort and catches associated with drifted gillnets in the vicinity of Kitwanga and Glen Vowell were difficult to assess because of the sporadic nature of that fishery. Interviews conducted with drift fishermen encountered during the study provided the basis for effort and catch estimations.

THE MORICETOWN CANYON GAFF/JIG/DIPNET FISHERY

The Moricetown Canyon gaff/jig/dipnet fishery on the Bulkley River was monitored by B.C. Environment staff between August 1 and September 25, 1991. One hour observation periods were randomly scheduled for each day of the study period; the survey was divided

into morning and afternoon strata. These strata were considered five and nine hours duration, respectively, for extrapolation purposes. Recorded observations included time of day, number of fishermen, fishing method used, catch by species during the observation period as well as the species specific harvest prior to our arrival. In many instances native fishermen were questioned informally regarding their activities and the fishery in general. The majority of fishermen freely volunteered information regarding the fishery and their fishing practices.

Both steelhead and coho catches were estimated for the study period. A catch per hour figure was calculated as a result of direct observations. This figure was extrapolated over the available fishing hours in a given day.

A second estimate of fish catches in the Moricetown Canyon Native fishery was provided by Skeena Fisheries Commission technician, Adam Gagnon. Mr. Gagnon employed surveyors to monitor the fishery daily, from 6:00 am to 10:00 pm, between August 9, and September 3, 1991. All fish caught and lost/released were recorded.

RESULTS AND DISCUSSION

SKEENA RIVER GILLNET FISHERY

SET GILLNETS

The 60 km section of the Skeena River between Kitwanga and Kispiox

was surveyed randomly a total of 21 times between July 15 and September 30, 1991. The number of net days by zone is illustrated in Figure 2. Mean daily net counts and the corresponding percentages of total weekly netting effort are recorded in Appendix I. The total effort for the study period was estimated at 1284 (95% CL +/— 190) net days. A direct comparison of total effort in the 1991 fishery with the previous two seasons was not possible as survey periods did not coincide. However, Tetreau and Spence (M.S. 1990) estimated approximately 217 gillnet days were expended in the same area during the month of September, 1989; in comparison, during the same period, Beere (M.S. 1991) estimated a total effort of 368 net days during 1990. This study estimated a total effort of 252 days for the month of September, 1991. Less effort was also recorded for the month of August, 1991, compared to August, 1990; Beere (M.S. 1991) estimated 527 net days for 1990 while this study estimated 506 net days for the same period.

The area where the highest effort figure was recorded was zone 4 (Figure 1) at a mean total of 93 net days or 47.1% of the total effort for the study area; the lowest effort was expended in zone 1 at 5 net days or 2.5% of the total effort. In 1990, the highest effort figure was recorded in zone 3 at a mean total of 58 net days or 43.6% of the total effort; the lowest effort in 1990 was also noted in zone 1 at 5 net days or 3.8% of the total effort. The number of Native nets encountered on survey dates and computation of estimated total netting effort is summarized in Appendix II.

The most intensive period of netting effort was observed during the week of July 28—August 3 at 36 nets per day. In comparison, 25 nets per day were observed during the week of August 1-August 7, 1990 (Beere, M.S. 1991).

Throughout the study period 41 interviews were conducted with set gillnet fishermen. Catch data was obtained for 24 separate gillnet sets. From interview data the average catch was calculated at 0.21 steelhead for a single net over a twenty four hour period, considerably less than the 1.4 steelhead per net day recorded in 1990 (Beere, M.S. 1991). The total steelhead catch extrapolated from interview data was 252 (95% CL +/— 1064) for the study period. No more than one steelhead was reported caught in a single net day.

Table 1 shows the catch by species and the catch per net as determined from interviews. Pink salmon catches were not recorded as fishermen discarded them without enumeration; as pinks are the most numerous of the salmon species in the Skeena this number is considerable. Surveys conducted by Tetreau and Spence (M.S. 1989) and Beere (M.S. 1991) both estimate pink salmon catches based on net inspections. Appendix III shows the number of set gillnets, number of steelhead caught based on interviews with fishermen, computation of estimated steelhead catch per unit effort and total steelhead catch.

Table 1. Catch by species and per net by zone from interviews conducted during the Skeena River (Kitwanga to Kispiox) Native net survey, 1991.

Zone	No. of nets counted	Interviews	Steelhead		Coho		Pink*		Sockeye		Chum		Chinook	
			No.	Per Net	No.	Per Net	No.	Per Net	No.	Per Net	No.	Per Net	No.	Per Net
1	8	1	0	0.00	0	0.00			20	20.00	0	0.00	0	0.00
2	70	5	1	0.20	5	1.00			86	17.20	0	0.00	1	0.20
3	119	5	1	0.20	7	1.40			127	25.40	0	0.00	2	0.40
4	168	13	3	0.23	8	0.62			317	24.38	1	0.08	11	0.85

* No catch data is provided as pink salmon were discarded and not enumerated

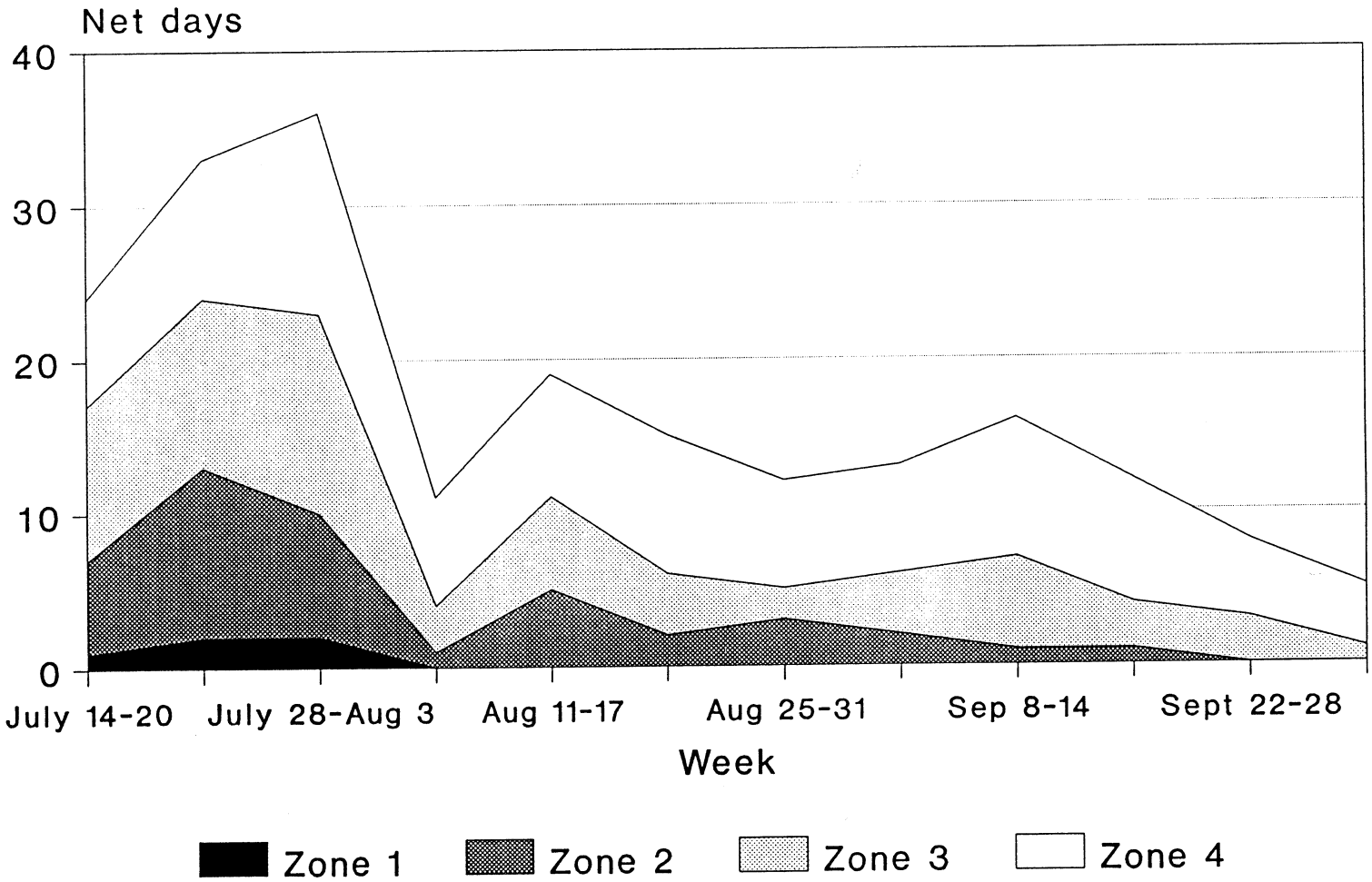

Figure 2. Mean number of net days by zone for the Skeena River (Kitwanga to Kispiox) Native gillnet fishery, 1991.

The estimated steelhead catch for August and September of 1991 was considerably less than in 1990. This survey estimated a total of 51 and 202 steelhead for August and September compared to 527 and 735 steelhead, respectively, for 1990. Differences in catch between years is obviously correlated to a reduction in netting effort in 1991, but may also be partially attributed to the change in catch estimation methods; less data was obtained from interviews in 1991 than from direct observations in 1990. Also, the estimated steelhead escapement to the Skeena River was only 34% of the most recent ten year average and 41% of the 1990 figure (data on file).

Evidence of discarded pink salmon was noted frequently at or near fishing sites (Appendix IV). A small number of salmon along with a single steelhead were discovered decomposing on the river bank near Carnaby, kilometer 243 of the Skeena River, on one occasion (September 20, 1991).

Algae growth on net material was a ready indication of neglect. On the last survey date, September 30, 2 gillnets appeared to be unattended. These were a net upstream of Old Hazelton (Zone 4), at kilometer 259 of the Skeena River and a net upstream of the Shegunia River (Zone 4), at kilometer 272 of the Skeena River. There was less evidence of neglect during this survey than in 1990. However, as nets were not handled during the 1991 survey it was difficult to accurately assess this concern.

DRIFT GILLNETS

Drift fishermen were observed near Glen Vowell and Kitwanga. Fishermen were interviewed on sixteen separate occasions. Steelhead were not observed in this fishery until August 25, 1991, and only a total of three were recorded for the entire study period; fishermen averaged only 0.19 steelhead per drift based on interview data. A standard length drift gillnet was approximately 30 meters in length. A single drift lasted approximately 15 minutes and covered between 500 and 750 meters of the river in a single pass. Pink salmon caught in observed drift fisheries were discarded. Table 2 documents information obtained from interviews with drift fishermen. Appendix IV includes a photograph of the first drift net caught steelhead observed.

MORICETOWN CANYON GAFF/JIG/DIPNET FISHERY

Observations of the Moricetown Canyon fishery for the period of August 1 through September 25, 1991 are summarized in Appendix V. Appendix VI shows the computation of estimated catch of steelhead and coho salmon per hour at Moricetown for the study period. An estimated 87 (95% CL +/— 1972) steelhead and 712 (95% CL +/— 13470) coho were caught during this time. As it was not always possible to determine the species of fish wounded and lost, no estimate of this number was provided in our survey.

Table 2. Interviews conducted with drift gillnet fishermen on the Skeena River, 1991.

Date	Species					Location
	Steelhead	Coho	Sockeye	Chinook	Pink*	
July 15	0	0	0	2		Kitwanga area
July 15	0	0	8	2		Glen Vowell
August 7	0	0	15	1		Kitwanga area
August 7	0	0	10	1		Glen Vowell
August 7	0	0	27	1		Glen Vowell
August 12	0	1	10	0		Kitwanga area
August 20	0	0	41	0		Glen Vowell
August 25	0	1	30	0		Glen Vowell
August 25	1	1	10	0		Kitwanga area
August 25	0	0	10	0		Kitwanga area
August 25	0	0	10	0		Kitwanga area
August 25	0	0	1	0		Kitwanga area
August 30	0	0	1	0		Kitwanga area
August 30	1	1	6	0		Kitwanga area
Sept 2	1	1	6	0		Kitwanga area
Sept 2	0	0	6	0		Glen Vowell
Total	3	5	191	7		
# per drift	0.19	0.31	11.94	0.44		

*No catch data is provided as pink salmon were discarded and not enumerated

Adam Gagnon's census enumerated 239 steelhead in the canyon fishery between August 9 and September 3, 1991; 174 of these were landed and retained, approximately 65 were gaffed/jigged and lost and 38 were released. The same census enumerated 1030 coho for the same period; of these fish 985 were landed and retained while approximately 45 were gaffed/jigged and lost. Only two dipnetted coho were observed being released. Appendix VII graphically illustrates the catch of fish by species and date from this census.

As many as six fishermen participated in the fishery at any one time; the number of fishing sites within the canyon is limited. The small falls on the west side of the canyon was the most frequented area and was the most often utilized by gaff or dipnet fishermen. Fishermen on the east side of the canyon caught fish by jigging with large, weighted treble hooks. Similarly, jig fishermen dominated the area at the base of the main falls on the west side of the canyon. Less frequently gaff fishermen used this area, particularly earlier in the season during the chinook migration. Dipnetting was observed downstream of both fish ladders on either side of the canyon.

The fishery proceeded without any discernable pattern. Appendix VIII includes a photograph of the fishery on the west side of the canyon. Fishermen would randomly change locations, fishing method and time of day fished. Fishermen interviewed stated that early morning (between 7:00 am and 9:00 am) and late afternoon (after

4:00 pm) were the best times to intercept fish moving through the canyon.

During this survey more fishermen employed dipnets in the canyon fishery than had been noted in the past two years. During our observation periods, 20 per cent of fishermen used jigs, 23 per cent gaffs while 57 per cent used dipnets. In comparison, between August 12 and September 12, 1990, 40 per cent of fishermen used jigs, 45 per cent gaffs while only 15 per cent used dipnets. Appendix VIII includes a photograph of a dipnet full of salmon that were caught immediately downstream of the fish ladder at the west side of the canyon. The catch was held in the net while fish selected for harvest were killed with a club. The undesired portion of the catch, usually pink salmon, was then returned to the river.

Pink salmon were observed being retained in only two instances. All other jigged, gaffed or dipnetted pink salmon were returned to the river and often in mortally wounded condition.

The total steelhead catch estimate assumes that fishing activity during observation periods accurately represents the Moricetown Canyon fishery for the study period. The census conducted by Adam Gagnon provided an opportunity to evaluate our catch estimate. Relative to Mr. Gagnon’s data our survey underestimated the steelhead harvest by 50 per cent and coho harvest by 72 per cent for the August 9 to September 3, 1991, period.

CONCLUSIONS

1. An estimated 1284 (95% CL +/- 190) net days were expended on the 60 km section of the Skeena River between Kitwanga and Kispiox between July 14 and September 30, 1991. Based on 41 interviews, data was obtained for 24 net sets; the steelhead catch is estimated at 252 (95% CL +1— 1064) during this period.

2. An estimated 87 (95% CL +/— 1972) steelhead were captured and retained in the Moricetown fishery between August 1 and September 25, 1991. A census conducted between August 9 and September 3, 1991, documented a harvest of 174 steelhead in the fishery.

RECOMMENDATIONS

1. Set gillnets must be regularly monitored to reduce unnecessary waste of fish through decomposition.

2. Set gillnet fishermen on the Skeena River should be requested to complete a fishing log documenting length of time fished and catch by species at their particular netting sites to gain accurate effort and catch data.

3. Gaff and jig fisheries in the Moricetown Canyon and gillnet fisheries on the Skeena River should be replaced by more selective fishing methods to avoid unnecessary waste of fish injured and lost or discarded. Selective fishing techniques will also allow the release of undesirable fish species and the rebuilding of threatened stocks.

ACKNOWLEDGEMENTS

Field studies were only possible due to the assistance of Ron Tetreau and Jeff Lough. Their limitless enthusiasm and pleasant manner allowed this project to progress smoothly. Tom Johnston was extremely patient and instructive with regards to the statistical analysis of data. Adam Gagnon graciously shared his knowledge of both Skeena River gillnet and Moricetown Canyon Native fisheries and volunteered census data that appears herein. Bob Hooton

directed this study and reviewed the manuscript. The final paper is entirely the responsibility of the author.

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Appendix I. Mean daily set gillnet counts and corresponding percentages of total weekly netting effort by zone during the Skeena River Native food fishery survey, 1991

	ZONE 1		ZONE 2		ZONE3		ZONE 4		ALL	
Sample	Net Days		Net Days		Net Days		Net Days		Net Days	
Period	Mean/Day	Percent	Mean/Day	Percent	Mean/Day	Percent	Mean/Day	Percent	Total	Percent
July 14-20	1	4.2	6	25.0	10	41.7	7	29.2	24	11.8
July 21-27	2	6.1	11	33.3	11	33.3	9	27.3	33	16.2
July 28-Aug 3	2	5.6	8	22.2	13	36.1	13	36.1	36	17.6
Aug 4-10	0	0.0	1	9.1	3	27.3	7	63.6	11	5.4
Aug 11-17	0	0.0	5	26.3	6	40.0	8	42.1	19	9.3
Aug 18-24	0	0.0	2	13.3	4	27.7	9	60.0	15	7.4
Aug 25-31	0	0.0	3	25.0	2	16.7	7	58.3	12	5.9
Sep 1-7	0	0.0	2	15.4	4	30.8	7	53.8	13	6.4
Sep 8-14	0	0.0	1	6.3	6	37.5	9	56.3	16	7.8
Sep 15-21	0	0.0	1	8.3	3	25.0	8	66.7	12	5.9
Sep 22-28	0	0.0	0	0.0	3	37.5	5	62.5	8	3.9
Sep 29-Oct 5	0	0.0	0	0.0	1	20.0	4	80.0	5	2.5
Total of Means (%)	5	(2.5)	40	(19.6)	66	(32.4)	93	(47.1)	204	(100.0)

Appendix II. Number of Native set gillnets per monthly strata and computation of stratum and total set gillnet effort for the Skeena River, Kitwanga to Kispiox, July 14 to September 30, 1991.

SKEENA RIVER NATIVE NET FISHERY: MOE NET EFFORT ESTIMATES, 1991

MONTHLY STRATA:	JULY 14-31	AUGUST 01-31	SEPTEMBER 01-30
	22.0	34.0	8.0
	23.0	11.0	17.0
	35.0	23.0	16.0
	31.0	15.0	14.0
	35.0	18.0	9.0
		11.0	9.0
		17.0	6.0
		6.0	5.0
AVERAGE:	29.2	16.9	10.5
SD:	6.3	8.6	4.6
SE:	2.8	3.1	1.6
NO. SAMPLING UNITS:	18.0	30.0	24.0
NO. SAMPLED:	5.0	8.0	8.0
STRATUM EFFORT:	525.6	506.3	252.0
VARIANCE:	1881.4	6162.5	1001.1
SD:	43.4	78.5	31.6
TOTAL NETS:	1284		
SD:	95		
LOW CL:	1094		
UP CL:	1474		

Appendix III. Number of Native set gillnets surveyed by interview, number of steelhead captured, computation of estimated steelhead catch per unit effort by monthly strata and total steelhead catch for the Skeena River, Kitwanga to Kispiox, July 14 to September 30, 1991.

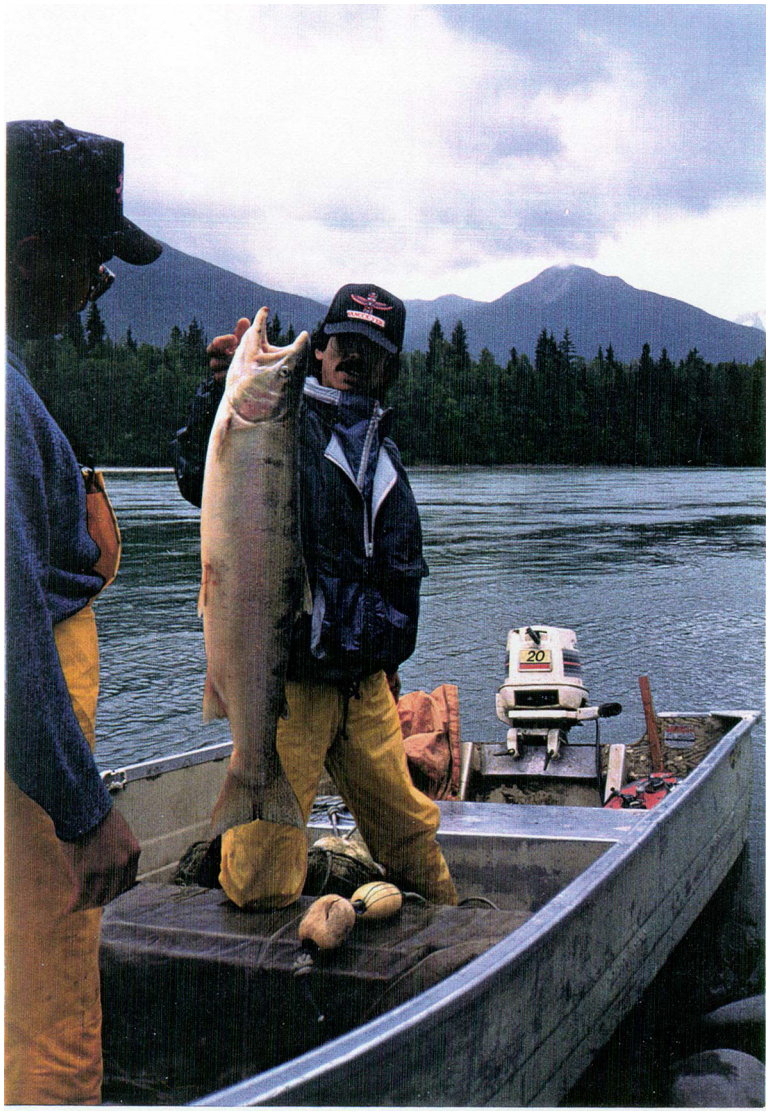
SKEENA RIVER NATIVE FISHERY 14 JULY - 30 SEPTEMBER 1991 MOE INTERVIEWS

MONTHLY	JULY		AUGUST		SEPTEMBER	
STRATA:	14-31		01-31		01-30	
	NETS	STHD	NETS	STHD	NETS	SHEDS
	1.0	0.0	1.0	0.0	1.0	0.0
	2.0	0.0	1.0	0.0	1.0	1.0
	1.0	0.0	1.0	0.0	1.0	1.0
	2.0	0.0	1.0	0.0	2.0	2.0
	3.0	0.0	2.0	1.0		
			2.0	0.0		
			2.0	0.0		
TOTAL:	9.0	0.0	10.0	1.0	5.0	4.0
AVERAGE:	1.8	0.0	1.4	0.1	1.3	1.0
SD:	0.8	0.0	0.5	0.4	0.5	0.8
SE:	0.4	0.0	0.2	0.1	0.3	0.4
NO. SAMPLING UNITS:	18.0	18.0	30.0	30.0	24.0	24.0
SAMPLED:	5.0	5.0	7.0	7.0	4.0	4.0
STRATUM TOTAL:	32.4	0.00	42.9	4.3	30.0	24.0
VARIANCE:	803.9	0.00	1093.5	546.7	858.0	2288.0
STRATUM CPUE:	0.00		0.10		0.80	
VARIANCE:	#DIV/0!		0.30		3.15	
SD:	#DIV/0!		0.55		1.78	
STRATUM STHD CATCH:		0		51		202
STRATUM VARIANCE:		0		78797		203832

TOTAL STHD CATCH:	252
VARIANCE:	282629
SD:	532
LOWCL:	-811
UPCL:	1315

(ASSUMES THAT NETS AND CATCHES ARE UNCORRELATED)

Appendix IV. Photographs of discarded pink salmon from a set gillnet near Andimaul, kilometer 224 of the Skeena River, August 7, 1991; and, a large male steelhead caught by a drift gillnet fisherman near Kitwanga, August 25, 1991.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Appendix V. Summary of observations of the Native food fishery at Moricetown Canyon, August 1 through September 25, 1991.

- MORICETOWN FALLS NATIVE FISHERY. 1991.

Date	Time Start	Total (min)	Number of Fishermen	Method *(g,j,d)	Catch Species	Catch Number	Pink Salmon Kept	Pink Salmon Injured	Dead Pool Species	Dead Pool Number
Aug 1	17:00	60	3	2d,lg	sockeye	75	0	0		
Aug 2	08:55	30	4	2d,lj,lg	sockeye	30	0	?		
					chinook	4				
Aug 6	08:00	60	5	2j,2d.lg	sockeye	50	0	165		
					chinook	4				
Aug 7	08:30	65	3	2d,lj	sockeye	75	0	?	Steelhead	1
					chinook	4				
					steelhead	1				
	17:50	30	2	ld,lg	sockeye	12	0	?	sockeye	350
					chinook	1			chinook	40
									steelhead	6
									coho	6
Aug 8	08:00	60		4 2j,ld,1g	sockeye	31	0	?	sockeye	65
					chinook	5			chinook	2
					coho	4				
	15:30	60	4	2g,2d	sockeye	20	0	?	sockeye	40
					chinook	6			chinook	15
					steelhead	1			coho	10
					coho	5			steelhead	3
Aug 9	08:00	60	2	lj,ld	sockeye	11	0	?	sockeye	8
					chinook	12			chinook	2
									coho	2
	12:00	30		3 lj,2g	sockeye	8	0	?		
					chinook	4	(lost)			
	14:10	30	4	2g,2j	sockeye	8	4	?	sockeye	50
					chinook	4			chinook	7
					pink	4				
Aug 13	08:00	60	4	2j,2d	sockeye	10	0	?	sockeye	12
					chinook	2			chinook	4
					coho	1			coho	2
Aug 14	08:00	60	5	4d,lg	sockeye	13	0	?	sockeye	21
					chinook	2			coho	2
					steethead	1			chinook	1
Aug 15	08:00	60	5	3d,2g	sockeye	6	0	?	sockeye	16
					chinook	3			chinook	5
									coho	1
Aug 16	08:30	60	4	2d,2g	sockeye	16	0	?	sockeye	29
					chinook	1			chinook	2
					coho	1				
	14:00	30	4	2d,1g,1j	sockeye	6	0	?	sockeye	54
									chinook	4

Date	Time Start	Total (min)	Number of Fishermen	Method *(g,j,d)	Catch Species	Number	Pink Salmon Kept	Pink Salmon Injured	Dead Pool Species	Dead Pool Number
Aug 19	09:15	20	4	3d,1g	sockeye	6	0	?	sockeye	4
					chinook	1			coho	2
					steelhead	1				
Aug 20	08:00	60	5	4d,1j	sockeye	11	0	?	sockeye	20
					coho	6			coho	9
					steelhead	1			steelhead	1 (released)
Aug 21	08:00	60	4	2d,1j,1g	sockeye	9	0	?	sockeye	7
					coho	1			coho	7
									chinook	1
									steelhead	1
Aug 22	15:25	60	5	3d,1g,1j	sockeye	13	0	?		
					coho	6				
Aug 23	08:00	60	5	3d,2j	sockeye	4	0	?	sockeye	7
					coho	1			coho	5
					chinook	1			chinook	1
									steelhead	2 (1 released)
Aug 26	08:00	30	2	1j,1d				?	chinook	1
									sockeye	1
									pink	1
Aug 27	08:00	30	0						steelhead	2
	15:30	60	6	2g,2j,2d	coho	6	0	?	coho	16
					chinook	3			steelhead	6
					sockeye	2			chinook	2
					steelhead	1				
Aug 28	08:00	60	2	1g,1d	sockeye	2	0	?	chinook	3
					coho	2			sockeye	2
					steelhead	1			coho	1
Aug 29	08:00	60	2	2d	sockeye	8	0	0	coho	16
					coho	1			sockeye	2
									steelhead	1
Sept 4	15:30	60	2	2d	coho	2	0	0	coho	17
									steelhead	4
									sockeye	1
Sept 6	08:00	60	4	4d	coho	9	0	0	coho	8
Sept 11	12:15	20	3	3d				0	coho	2
									steelhead	1
Sept 12	09:20	60	1	1g	Coho (lost)	4	0	0	coho	7
					pink	2				
Sept 13	09:14	60	2	1g,1d	Coho	9	0	10	coho	2 (2 released)
					steelhead	1			chinook	1

Date	Time Start	Total (min)	Number of Fishermen	Method *(g,j,d)	Catch Species	Catch Number	Pink Salmon Kept	Pink Salmon Injured	Dead Pool Species	Dead Pool Number
Sept 16	08:00	5	0							
	16:00	60	1	1d	coho	2	0	0	coho	7
Sept 18	08:00	5	0							
	16:00	60	1	1d			0	0	coho	10
									steelhead	1
Sept 19	08:00	5	0							
Sept 20	10:00	5	2	2d	coho	2	0	0	coho	6
Sept 23	08:00	5	0							
	16:00	30	1	1d			0	0	coho	2
Sept 24	09:15	15	0							
	19:00	5	0							
Sept 25	08:00	5	0							
	16:30	15	0							
TOTAL:		1730								

Actual steelhead observed within survey period: catch=8 (2 released), dead pool=30
* g,j,d indicates gaff, jig or dipnet

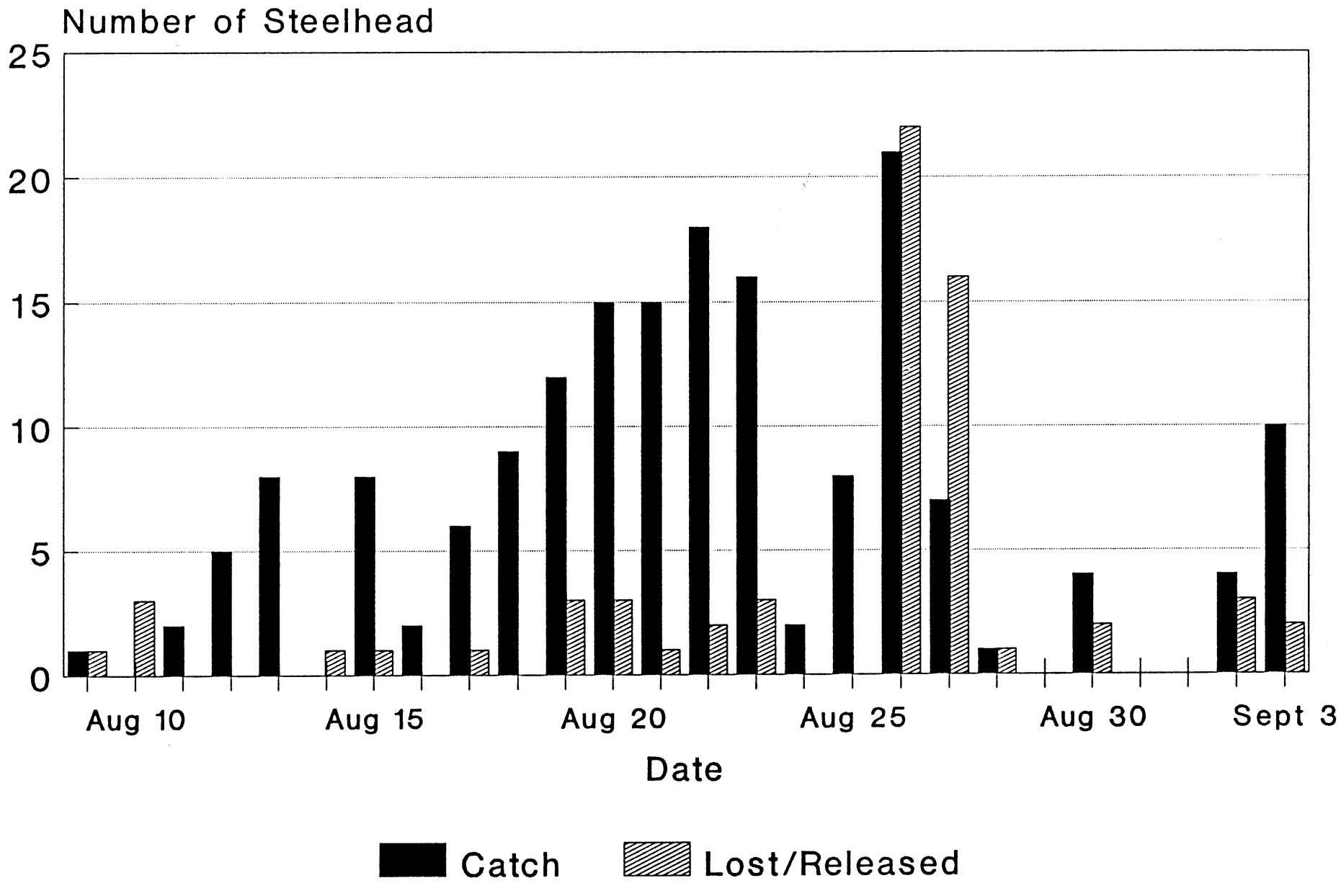
Appendix VI. Computation of estimated catch per hour of steelhead and coho in the Moricetown Canyon Native fishery, August 1 to September 25, 1991.

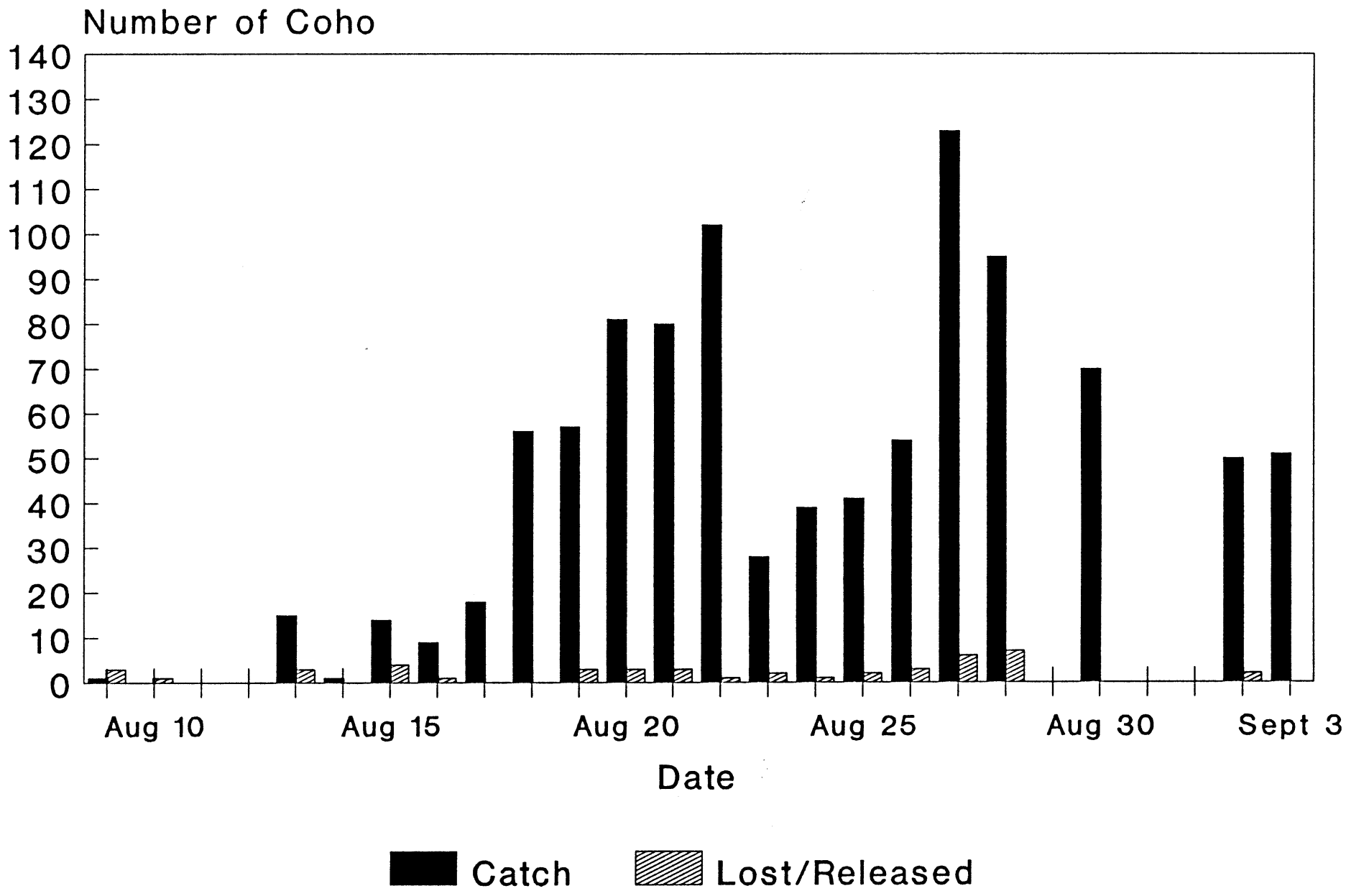
MORICETOWN FALLS NATIVE FISHERY CATCH - AUGUST 1-SEPTEMBER 25, 1991

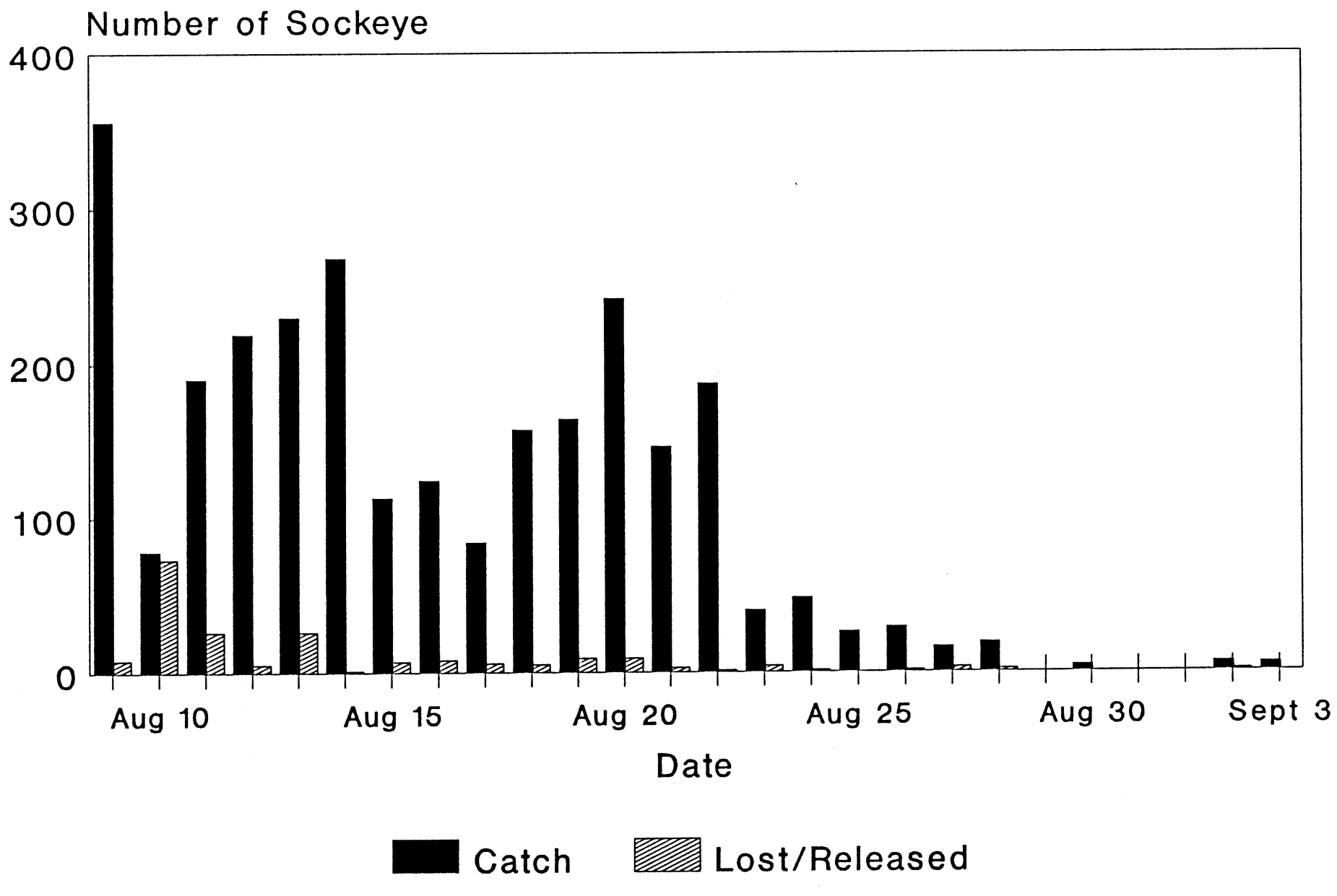
		STEELHEAD CATCHES/H		COHO CATCHES/H	
	DATE	MORNING	AFTERNOON	MORNING	AFTERNOON
AUGUST	1	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0
	7	1.0	0.0	0.0	0.0
	8	0.0	1.0	4.0	5.0
	9	0.0	0.0	0.0	0.0
	13	0.0	0.0	1.0	0.0
	14	1.0	0.0	0.0	0.0
	15	0.0	0.0	0.0	0.0
	16	0.0	0.0	1.0	0.0
	19	1.0	0.0	0.0	0.0
	20	1.0	0.0	6.0	0.0
	21	0.0	0.0	1.0	0.0
	22	0.0	0.0	0.0	6.0
	23	0.0	0.0	1.0	0.0
	26	0.0	0.0	0.0	0.0
	27	0.0	1.0	0.0	6.0
	28	1.0	0.0	2.0	0.0
	29	0.0	0.0	1.0	0.0
SEPT	4	0.0	0.0	0.0	2.0
	6	0.0	0.0	9.0	0.0
	11	0.0	0.0	0.0	0.0
	12	0.0	0.0	4.0	0.0
	13	1.0	0.0	9.0	0.0
	16	0.0	0.0	0.0	2.0
	18	0.0	0.0	0.0	0.0
	19	0.0	0.0	0.0	0.0
	20	0.0	0.0	2.0	0.0
	23	0.0	0.0	0.0	0.0
	24	0.0	0.0	0.0	0.0
	25	0.0	0.0	0.0	0.0
AVERAGE:		0.2	0.1	1.3	0.7
SD:		0.4	0.2	2.5	1.7
SE:		0.09	0.08	0.58	0.54
SAMPLED:		18.7	10.2	18.7	10.2
POSSIBLE:		280.0	504.0	280.0	504.0
STRATA TOTAL:		54.2	32.5	370.3	341.4
SE-SQUARED:		189294.2	782742.7	7384995.9	37976518.0
TOTAL:		86.7		711.7	
SD:		985.9		6735.1	

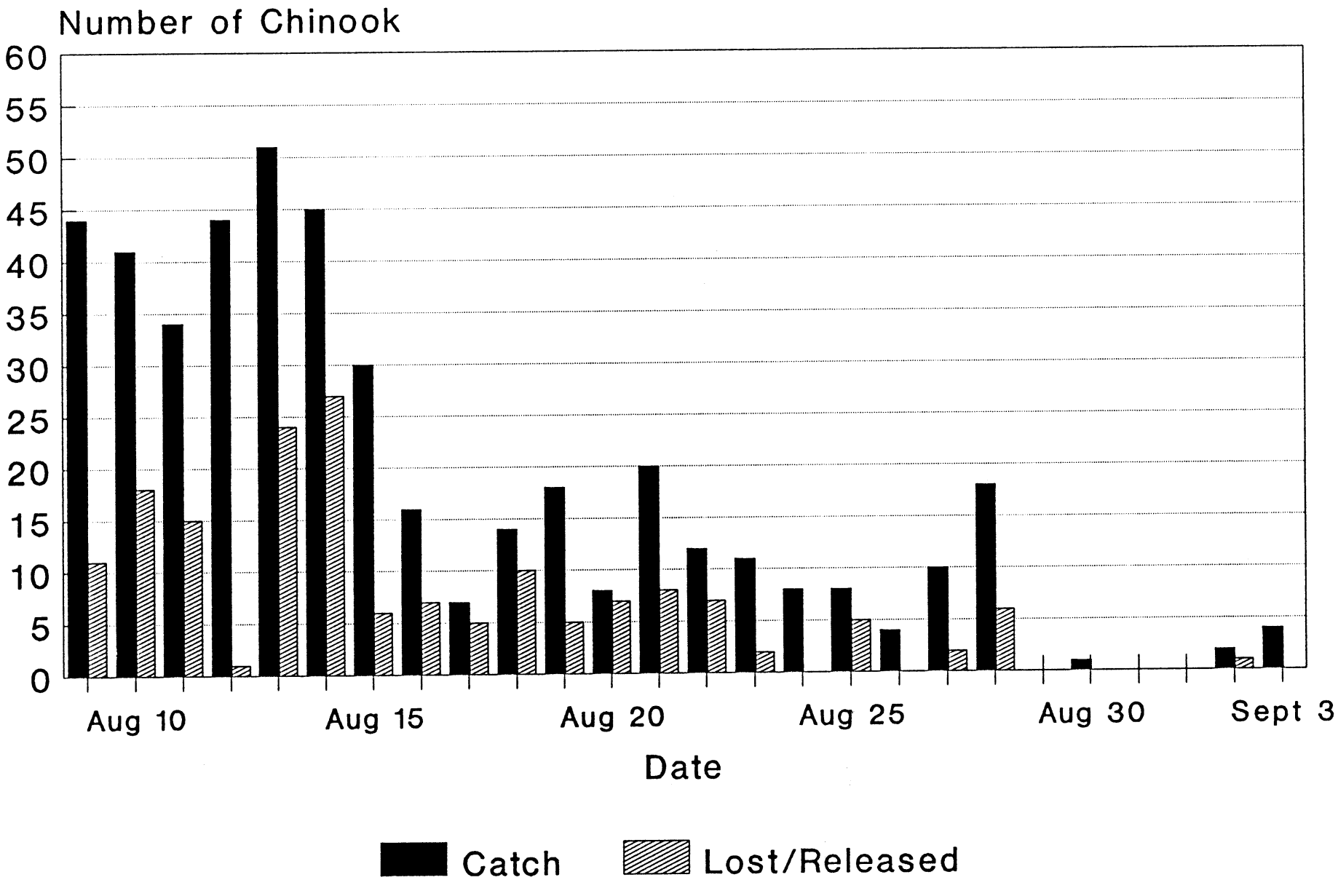
Appendix VII. Photographs of fishing activity at the west side of Moricetown Canyon, August, 1991. The photograph above shows jig, gaff and dipnet fishermen (from right to left) in action, while below, a dipnet fishermen sorts through a net full of salmon caught immediately downstream of the fishway.

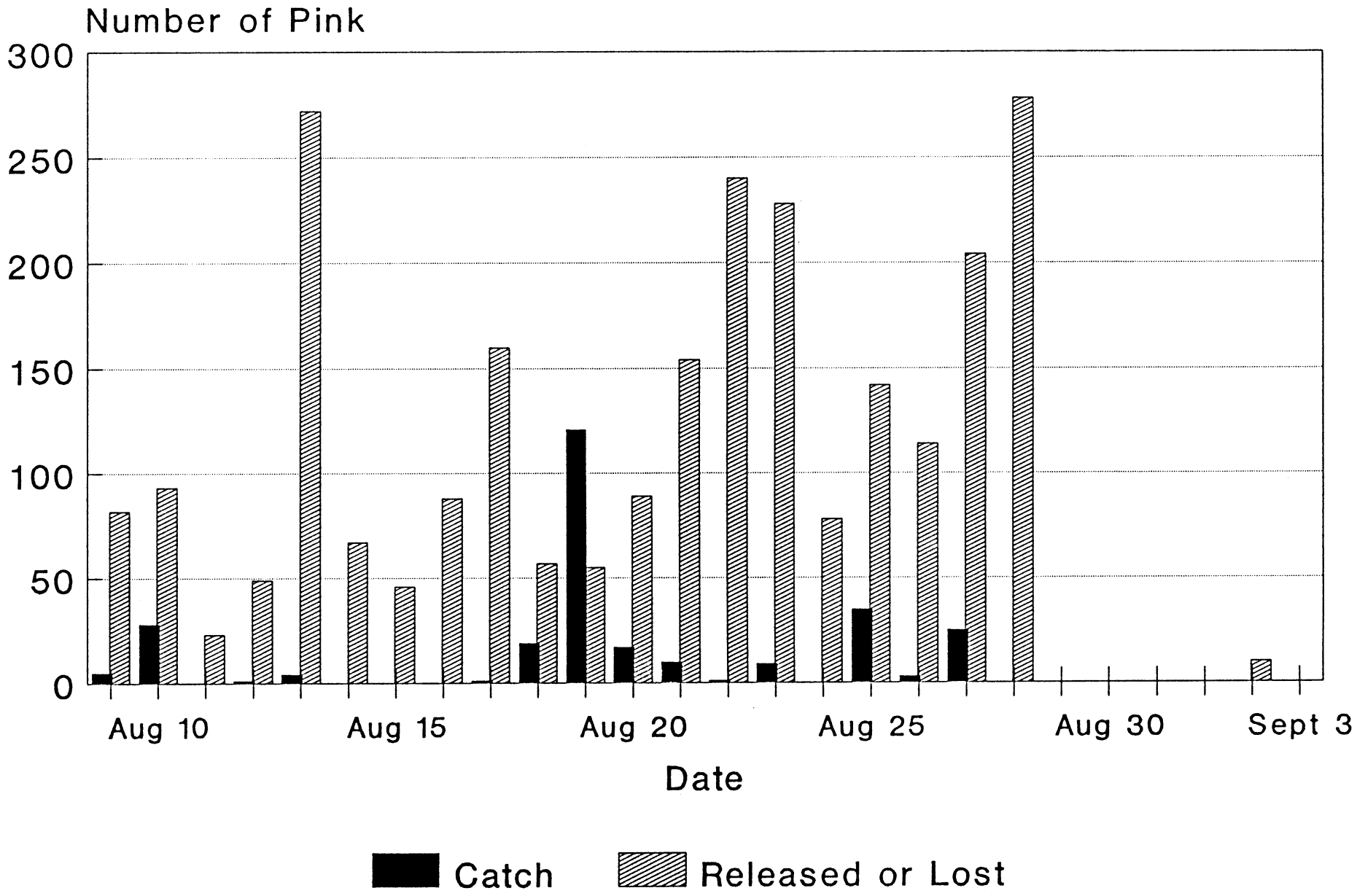
Appendix VIII. Catch of fish by species and date from Adam Gagnon's census of the Moricetown Canyon Native fishery, August 9 to September 3, 1991.


Number of Steelhead
25
20
15
10
5
0
Aug 10
Aug 15
Aug 20
Aug 25
Aug 30
Sept 3
Date
Catch
Lost/Released


Number of Coho
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Aug 10
Aug 15
Aug 20
Aug 25
Aug 30
Sept 3
Date
Catch
Lost/Released


Number of Sockeye
400
300
200
100
0
Aug 10
Aug 15
Aug 20
Aug 25
Aug 30
Sept 3
Date
Catch
Lost/Released


Number of Chinook
60
55
50
45
40
35
30
25
20
15
10
5
0
Aug 10
Aug 15
Aug 20
Aug 25
Aug 30
Sept 3
Date
Catch
Lost/Released


Number of Pink
300
250
200
150
100
50
0
Aug 10
Aug 15
Aug 20
Aug 25
Aug 30
Sept 3
Date
Catch
Released or Lost