GITKSAN AND WET'SUWET'EN WATERSHED AUTHORITIES

1995 SEASON END REPORT

JUNE 1996

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1. Overview

April 1996

1.1. Introduction

The Gitksan and Wet'suwet'en Watershed Authorities' primary responsibility is to administer the short and long term agreements signed between the Gitksan and Wet'suwet'en and the Government of Canada. The Gitksan and Wet'suwet'en have five agreements signed with the Department of Fisheries and Oceans, collectively known as the Interim Fisheries Measures Agreement.

1.1.1. The agreements are:

The Framework Agreement,which determines management strategy.
The Contribution Agreement, which sets out financial arrangements for the programme.
The Watershed Agreement which relates to management cooperation with the other Skeena River Watershed First Nations.

The Guardian Agreement which relates to fisheries enforcement arrangements.
The Allocation Agreement which provides for a selective commercial fishery targeted on surplus sockeye from the Lake Babine runs.

The Framework, Contribution and Watershed Agreements cover the period from 1993 to 1999. The Guardian and Allocation Agreements are annual agreements, but we are currently working to establish long term agreements for the future. Other agreements the GWWA are working on cover habitat protection provisions, and Stock Identification research.

We see our central task as carrying out the mandate of these agreements and making them work for us.

Under the terms of the agreements there is a Policy and Implementation Committee and two sub-committees; the Technical and Planning Sub-committee, and the Monitoring and Enforcement Sub-committee. These committees meet regularly.

The management activities outlined in the agreements are run by a co-ordinator. Management activities in the Gitksan territories are areas of the Skeena drainage between Legate Creek the Gisgagaas on the Babine River, lower Bulkley River and north to Meziadin Lake in the Nass River drainage. The Wet'suwet'en area is that on the Bulkley-Morice drainage from the Suskwa through to the Francois Lake and Ootsa Lake systems.

The four technical managers sit on the Technical and Planning Sub-Committee. Activities in each region include: developing annual and quarterly work plans, preparation of periodic reports, monitoring fishing and collecting catch data, fishing gear research and development, fish habitat studies, and community education.

1.2. The GWWA Management System

Within the large territorial base of the Gitksan and Wet'suwet'en, all sites for fishing, on the main stems and on the tributaries are owned by a House. They are viewed as extremely valuable commodities and are thus closely guarded and regulated. By traditional law all the fish taken from a particular site belong to the House that owns the site, and can be disposed of as the House sees fit.

Also within traditional law are provisions for the regulation of catch, whether by any single House or by all Houses, to what the resource can yield without harm. Traditional law strictly prohibits waste.

This results in all Houses being bound together in a network of laws and regulations in relation to the resource that, as their foundation, ensure the health and continuance of the salmon stocks. The challenge for the GWWA is to make these shared traditional principles workable in the modern context, with modern fishing pressures at the Coast and within a cash driven industry that promotes sharp business practices.

The Houses as a community have decided that the traditional ways must be followed and that traditional law is the basis of administration of their business in relation to all resources. This is manifested in GWWA policies that require a controlled and monitored catch of all fish and a controlled commercial sale. This is viewed as ensuring the continued survival of the resource.

It is important to remember that the aboriginal right to the resource is a collective right; it is not individual. In Gitksan and Wet'suwet'en society, all persons fish only by the virtue of their membership in a House. All Gitksan and Wet'suwet'en are House members. Thus individuals fish under the collective auspices of their House. The House has a covenant with all other Houses. Those that attempt to work outside of this system break traditional law and are also in violation of GWWA regulations. This extends all the way through the system, from catch to brokering to processing. The GWWA acts as the regulatory and monitoring agent for the Houses. Enforcement is carried out by a Ranger group, there are presently eleven GWWA Rangers.

1.3. The 1995 Annual Report

This annual report for 1995 consists of sections on:

Harvest Monitoring:

A data report on the 1995 aboriginal fisheries of the Gitksan and Wet'suwet'en including commercial harvest made under the Allocation Agreement.

Gear Development:

A report on selective fishing gear development including river seine nets and a fish wheel, and a report of the 1995 Imprinting Project.

1.3.1. Tagging

A report detailing the tagging of salmon and the results of analysis of tag recoveries of these fish.

1.3.2. Enforcement Report

A report on the training and other activities of the GWWA rangers.

Habitat Assessment:

Reports on habitat assessment of the 1995 Kispiox River Coho and Sockeye Escapements.

1.4. Wet'suwet'en Report

A report of activities carried out by the Wet'suwet'en Fisheries Department.

2. Gitksan and Wet'suwet'en Harvest Monitoring and Fisheries Data Report 1995

February 1995

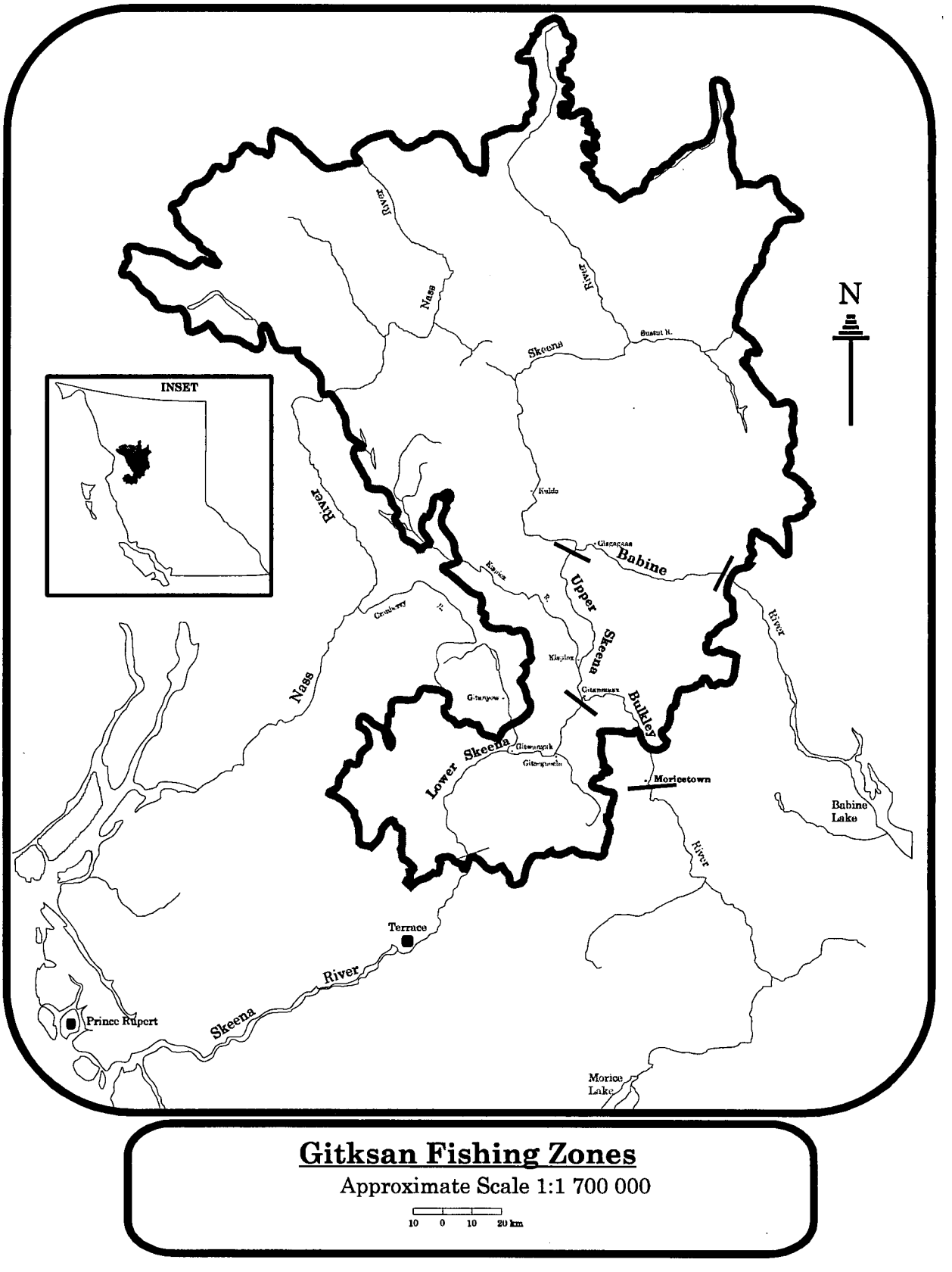
2.1. Introduction

The Gitksan territories are within the Skeena River watershed with territories extending into the upper Nass River drainage. The Wet'suwet'en territories include the drainage of the Bulkley River, a major tributary of the Skeena River which joins at Hazelton and extends into the western headwaters of the Nechako River.

This report is prepared as part of the activities funded by a 1993 Interim Fisheries Measures Agreement between the Gitksan and Wet'suwet'en Watershed Authorities and the Department of Fisheries and Oceans. This report describes fishing activities and aboriginal harvest levels within the Gitksan and Wet'suwet'en territories of the Skeena River Drainage.

Traditional Gitksan and Wet'suwet'en fishing technology relied heavily on weirs and traps (Morrell 1985). In the late nineteenth century gill nets were introduced. Their use was enforced by federal Fisheries officers in 1904 to 1906. Recent fishing in the Skeena River has relied heavily on gill nets. In the Bulkley River, gaffs, dip nets, and jigs provided the bulk of the catch to native fishers.

Mixed stock fisheries in the coastal region and in river have depleted all but a few fish stocks of the Skeena system. It appears likely that a return to selective fishing technology will have beneficial effects on reduced fish stocks. The Gitksan and Wet'suwet'en Watershed Authority is reintroducing selective fishing technology to the Skeena River watershed and effecting a change away from non-selective gear such as gill nets and jigs. In 1992 to 1995 commercial sales took place of selectively fished sockeye salmon from the Skeena River.



Gitksan Fishing Zones

Approximate Scale 1:1 700 000

FIGURE 1. MAP OF FISHING ZONES.

2.2. The Gitksan and Wet'suwet'en Fishery

The Gitksan and Wet'suwet'en Fishery is divided into several components for the 1995 analysis. The components are:

2.2.1. Skeena River Fishery

Gill Net Fishery

Upper and Lower Skeena

2.2.1.1. Skeena River Drift Net Fishery

Skeena River Selective Fishery

2.2.2. Babine River Fishery

2.2.2.1. Gisgagaas Canyon Gill Net Fishery

2.2.2.2. Babine River Selective Fishery

Shedin Fish Wheel
Gisgagaas Dip Net Fishery

2.2.3. Bulkley River Fishery

2.2.3.1. Bulkley River Gill Net Fishery

2.2.3.2. Moricetown Canyon Fishery

Gaff
Jig
Dip net

The division of the Skeena, Bulkley and Babine Rivers into fishing zones is shown in Figure 1.

The 1995 annual catches for the four major fisheries are shown in Figure 2 and Table 1. In the Lower and Upper Skeena fisheries, gill nets and beach seines account for the all of the catch. On the Bulkley River, gill nets, dip nets, and gaffs are used, with the majority of the catch originating from the Moricetown Canyon fishery. On the Babine River dip nets were used at Gisgagaas and a fish wheel harvested sockeye lower down river at Shedin Creek. The techniques of sampling these fisheries are discussed separately.

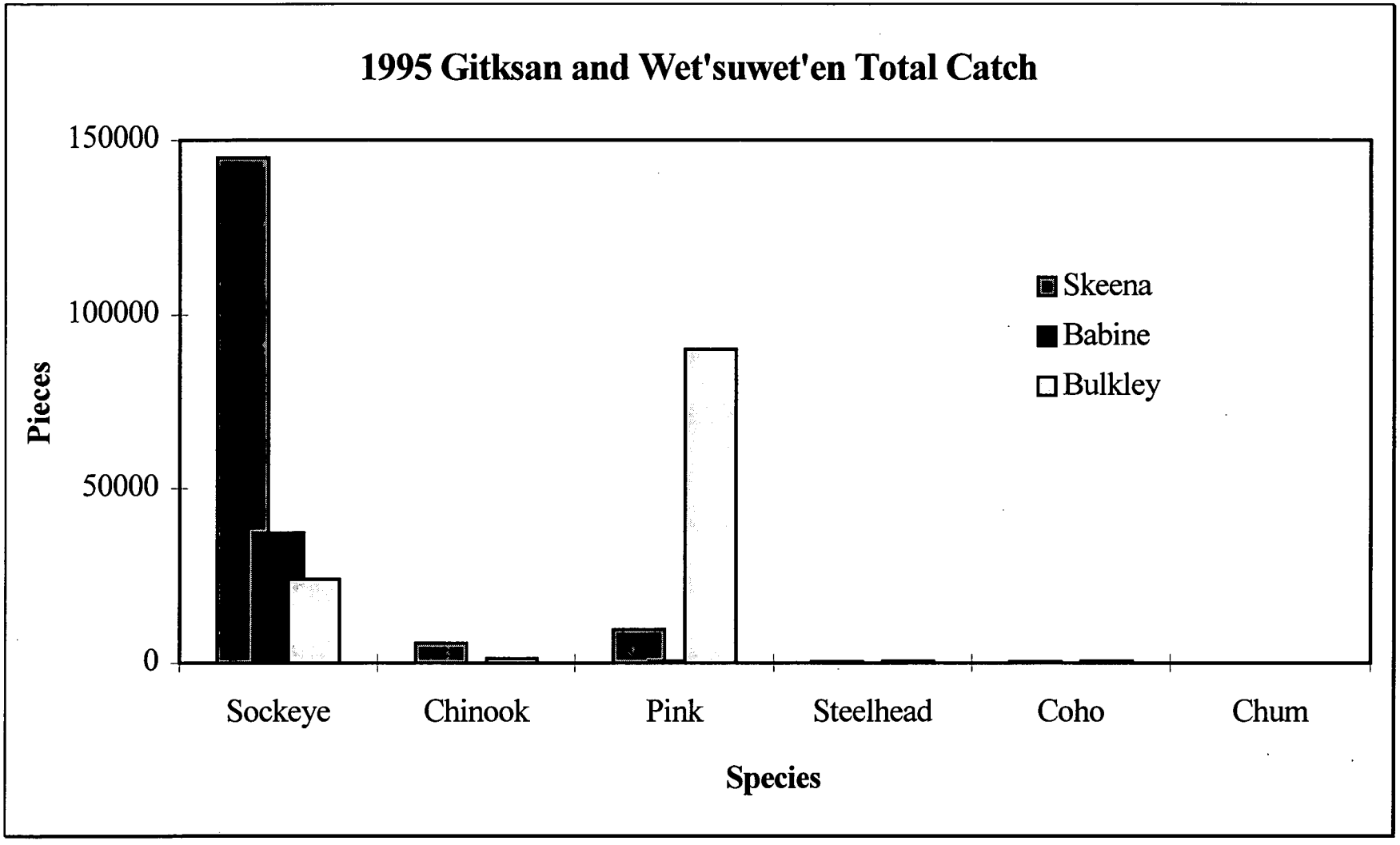


FIGURE 2. 1995 GITKSAN AND WET'SUWET'EN CATCH BY FISHING ZONES.

1995 Gitksan and Wet'suwet'en Total Catch				
	Skeena	Babine	Bulkley	Total
Sockeye	144995	37265	24625	**206885**
Chinook	5660	0	1281	**6941**
Pink	9568	444	0	**10012**
Steelhead	353	0	90028	**90381**
Coho	335	0	448	**783**
Chum	4	0	575	**579**
Total	**160914**	**37709**	**116958**	**315581**

Table 1. 1995 Gitksan and Wet'suwet'en Catch Summary Table.

1995 Gitksan and Wet'suwet'en Total Catch Summary Table									
	Skeena				Babine		Bulkley		
	Upper	Lower	Drift Net	Selective	Gill Net	Selective	Gill Net	Dip Net	Gaff
Sockeye	28351	27954	5837	82853	92	37173	713	23466	446
Chinook	1234	2590	451	0	0	0	69	545	667
J. Chinook	353	905	127	0	0	0			
Pink	3714	5116	623	114	0	444	5	89980	43
Steelhead	65	210	77	0	0	0	0	432	17
Coho	103	212	20	0	0	0	1	537	38
Chum	4	0	0	0	0	0	0	0	0
Total	**33825**	**36988**	**7134**	**82967**	**92**	**37617**	**788**	**114959**	**1211**

Table. 2. 1995 Gitksan and Wet'suwet'en Catch by Fishery.

2.3. The 1995 Skeena River Fishery

2.3.1. The Skeena River Gill Net Fishery

The Skeena gill net fisheries of the Upper and Lower Skeena are the major non-selective aboriginal fisheries within the study area. The extent of the fishery is estimated by determining the number of sets and the catch per unit effort (CPUE). The procedure followed is that of Morrell 1985, which records the 1979 through 1982 fishery, and Morrell, Barnes, and Harris 1985, which deals with the 1985 fishery. Morrell 1985 discusses the theory and strategy for sampling the Skeena Gill net fisheries. The GWWA continues to use this technique to ensure comparability and continuity with ongoing Gitksan and Wet'suwet'en studies and catch estimations. The explicit assumptions of this technique permit assigning confidence limits to catch estimates and represent a significant improvement over earlier techniques of aboriginal fisheries harvest monitoring.

Data on all of the Skeena, Babine and Bulkley River fisheries were analyzed by dividing the fishing season into statistical weeks. Since 1994 each statistical week used by the GWWA starts on a Sunday and ends on a Saturday to correspond with statistical weeks used by the Department of Fisheries and Oceans and other user groups on the Skeena River. The 1995 dates corresponding to these statistical weeks are given on Table 3.

Statistical Week	1995 Dates
18	April 30 - May 6
19	May 7 - May 13
20	May 14 - May 20
21	May 21 - May 27
22	May 28 - June 3
23	June 4 - June 10
24	June 11 - June 17
25	June 18 - June 24
26	June 25 - July 1
27	July 2 - July 8
28	July 9 - July 15
29	July 16 - July 22
30	July 23 - July 29
31	July 30 - August 5
32	August 6 - August 12
33	August 13 - August 19
34	August 20 - August 26
35	August 27 - September 2
36	September 3 - September 9
37	September 10 - September 16
38	September 17 - September 23
39	September 24 - September 30

Table 3. Statistical Weeks in 1995.

A gill net set is used as the unit of fishing effort. A set is defined as a period in excess of two hours during which a net is fishing. The number of sets was determined by river boat surveys two or three times per week, supplemented by interviews, direct samples and set net logs books collected by GWWA Rangers. GWWA field staff are familiar with all of the gill net sites and in almost all cases know the fishers each site. This results in accurate effort estimates from riverboat surveys. In many cases interview and log book data provide information on the number of sets per day.

The uncertainty in fishing effort is assigned a low limit by assuming that nets are fished continuously between observations of days in which the net is observed fishing and not fished all days between observations of days not fishing. The low number of sets per day is assumed to be one and the high number of sets per day is assumed to be two where no interviews, log books or direct observation are recorded.. If interview, logbook, or direct observation data is available, these data are used for both the low and high estimates.

Estimates of the fishing effort were made for each week of the fishery. The best estimate of fishing effort used was the weekly median of the high estimate and the low estimate. Table 4 shows the estimates of the number of sets and the high and low estimates.

1995 Weekly Estimate of Gill Net Sets on the Skeena River									
		Upper Skeena Estimated Sets				Lower Skeena Estimated Sets			
Statistical Dates and Weeks		Lo Est.	Hi Est.	Best Est.	Error	Lo Est.	Hi Est.	Best Est.	Error
April 30 - May 6	17	0	0	0	0	2	5	4	2
May 7 - May 13	18	0	0	0	0	0	0	0	0
May 14 - May 20	19	0	0	0	0	0	0	0	0
May 21 - May 27	20	0	0	0	0	0	14	7	7
May 28 - June 3	21	2	4	3	1	16	28	22	6
June 4 - June 10	22	7	7	7	0	25	32	29	4
June 11 - June 17	23	2	4	3	1	58	84	71	13
June 18 - June 24	24	3	3	3	0	42	70	56	14
June 25 - July 1	25	35	60	48	13	94	127	111	17
July 2 - July 8	26	90	116	103	13	116	158	137	21
July 9 - July 15	27	78	95	87	9	130	191	161	31
July 16 - July 22	28	93	138	116	23	97	191	144	47
July 23 - July 29	29	131	218	175	44	103	269	186	83
July 30 - August 5	30	125	247	186	61	87	247	167	80
August 6 - August 12	31	130	218	174	44	85	233	159	74
August 13 - August 19	32	51	99	75	24	15	102	59	44
August 20 - August 26	33	64	111	88	24	42	133	88	46
August 27 - September 2	34	20	41	31	11	7	64	36	29
September 3 - September 9	35	2	14	8	6	23	38	31	8
September 10 - September 16	36	1	13	7	6	21	38	30	9
September 17 - September 23	37	0	0	0	0	0	0	0	0
September 24 - September 30	38	0	0	0	0	0	0	0	0
October 1- October 7	39	0	0	0	0	0	0	0	0
		Lo Est.	Hi Est.	Best Est.	Err	Lo Est.	Hi Est.	Best Est.	Err
Total		834	1388	1111	277	963	2024	1494	531

Table 4. 1995 Skeena River gill net sets.

The catch per unit effort is estimated on the basis of log book entries of cooperating fishers, direct counts taken during observation of the river fishery and interviews with fishers about the days catch. Estimates of the Skeena River set net fishery are based on data from 204 sets for the Lower Skeena and 321 sets for the Upper Skeena (Table 5). Log book records comprise most of the samples.

Where direct samples duplicate log book entries or interview data, the direct sample numbers were used. In general data from log books and interviews correspond closely with data duplicated in direct samples. This good correspondence demonstrates the good rapport which GWWA Rangers were able to establish with fishers. Catch data were collected for 29 % of the Upper Skeena gill net sets and 14% of the Lower Skeena gill net sets. These sampling ratios are similar to those of 1992 through 1994.

	Upper Skeena	Lower Skeena
Direct Sample	21	21
Interview	12	29
Set Net Log	288	154
Total	321	204

Table 5. 1995 Skeena Gill Net Source of set net catch data.

	Upper Skeena	Lower Skeena
Estimated Sets	1111	1494
Sampled Sets	321	204
% Sets Sample	28.89%	13.65%

Table 6. 1995 Skeena Gill Net Sample Rates.

Catch data are analyzed assuming random distribution to calculate a mean and standard error. Catch per unit effort data for the Upper Skeena and Lower Skeena gill net fishery are presented as Tables 7 and 8.

The best estimate of the catch level is calculated by multiplying the best estimate of effort times the mean catch per unit effort. Confidence limits on catch estimates were assigned errors around the best estimate based on either: the assumption of good catch per unit effort and variable effort data or good effort data and variable catch per unit effort.

In the first case, the low estimate of the catch is derived by multiplying the low estimate of the fishing effort by the mean of the catch per unit effort. The high estimate is derived by multiplying the high estimate of fishing effort by the mean of the CPUE.

In the second case, the low estimate of the catch is derived by multiplying the low estimate of CPUE, which is two standard errors below the mean, by the best estimate of the fishing effort. The high estimate of the catch is derived by multiplying the high estimate of CPUE, which is two standard errors above the mean, by the best estimate of the fishing effort.

These two sets of assumptions provide similar error estimates for the Skeena River gill net fishery. The low estimates used for our weekly and season catch estimates is the lower of the two estimates and the high estimates used for weekly and season catch estimates is the higher of the two estimates Thus we used the more conservative estimates.

In the Upper Skeena fishing started during week 21 and ended in week 36. Catch per set data was not collected for weeks 21 through 24 and weeks 35 and 36. However, there was little fishing activity in these weeks.

In the Lower Skeena fishing started during week 17 and ended in week 36. Catch per set data was not collected for weeks 18 to 20, weeks 29 and 30, and week 34. In weeks 18 to 20 there was little fishing activity due to high water stage of the river. In weeks 29 and 30 in the Lower Skeena Region, few data were collected due to the fishers misunderstanding of the objectives of the GWWA in gathering the catch data. In week 34 there was little fishing effort.

Estimates of the missing CPUE values were obtained by assigning the CPUE of the other region for the same statistical weeks. With the exception of weeks 29 and 30 in the Lower Skeena, inaccuracies in these estimates have little effect on the catch totals because of the low fishing effort. Estimated values have been highlighted in Tables 7 and 8.

1995 Upper Skeena Catch Per Unit Effort

Week	N	SY		CN		JCN		PK		STHD		CO		CM	
		CPUE	Error	CPUE	Error	CPUE	Error	CPUE	Error	CPUE	Error	CPUE	Error	CPUE	Error
17	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.58	0.00	0.00	0.00	0.00
22	0	0.00	0.00	1.50	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0	0.05	0.10	2.19	0.63	0.24	0.34	0.00	0.00	0.19	0.26	0.00	0.00	0.00	0.00
24	0	0.18	0.24	2.36	0.53	1.27	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	21	0.38	0.48	2.05	1.90	0.10	0.17	0.00	0.00	0.05	0.13	0.00	0.00	0.00	0.00
26	36	0.69	0.71	2.44	1.24	0.69	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	64	10.20	3.53	2.02	1.22	0.45	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	64	25.61	4.23	0.84	0.46	0.64	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	37	29.68	5.51	1.05	0.84	0.41	0.30	0.30	0.22	0.00	0.00	0.03	0.05	0.00	0.00
30	26	31.96	7.18	1.19	0.78	0.35	0.28	2.73	3.48	0.15	0.15	0.00	0.00	0.00	0.00
31	26	31.77	8.83	0.77	0.66	0.12	0.17	0.58	0.93	0.00	0.00	0.04	0.08	0.00	0.00
32	19	46.00	7.35	0.16	0.23	0.05	0.11	10.05	5.16	0.16	0.17	0.32	0.53	0.05	0.11
33	15	33.00	5.30	0.40	0.38	0.00	0.00	21.27	14.05	0.20	0.21	0.00	0.00	0.00	0.00
34	2	35.50	15.00	0.00	0.00	0.00	0.00	7.50	9.00	0.00	0.00	1.00	2.00	0.00	0.00
35	0	43.67	7.33	0.33	0.67	0.00	0.00	26.33	28.99	0.00	0.00	4.67	3.53	0.00	0.00
36	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 7. 1995 Upper Skeena Set Gill Net Catch Per Unit Effort Calculations.
Shaded numbers are estimates derived from the Lower Skeena fishery.

1995 Lower Skeena Catch Per Unit Effort

Week	N	SY		CN		JCN		PK		STHD		CO		CM	
		CPUE	Error	CPUE	Error	CPUE	Error	CPUE	Error	CPUE	Error	CPUE	Error	CPUE	Error
17	1	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
18	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.58	0.00	0.00	0.00	0.00
22	2	0.00	0.00	1.50	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	21	0.05	0.10	2.19	0.63	0.24	0.34	0.00	0.00	0.19	0.26	0.00	0.00	0.00	0.00
24	11	0.18	0.24	2.36	0.53	1.27	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	26	1.50	1.09	2.54	0.97	2.38	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	28	5.57	2.91	1.93	0.67	0.86	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	49	21.41	3.89	2.53	1.51	0.98	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	22	28.82	11.01	2.41	1.44	0.68	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0	29.68	5.51	1.05	0.84	0.41	0.30	0.30	0.22	0.00	0.00	0.03	0.05	0.00	0.00
30	0	31.96	7.18	1.19	0.78	0.35	0.28	2.73	3.48	0.15	0.15	0.00	0.00	0.00	0.00
31	9	9.78	8.06	3.22	4.20	0.00	0.00	9.89	8.01	0.00	0.00	0.00	0.00	0.00	0.00
32	4	17.25	9.91	0.00	0.00	0.00	0.00	1.75	2.06	0.00	0.00	0.50	1.00	0.00	0.00
33	2	39.00	42.00	0.50	1.00	0.50	1.00	0.00	0.00	1.50	3.00	0.00	0.00	0.00	0.00
34	0	35.50	15.00	0.00	0.00	0.00	0.00	7.50	9.00	0.00	0.00	1.00	2.00	0.00	0.00
35	3	43.67	7.33	0.33	0.67	0.00	0.00	26.33	28.99	0.00	0.00	4.67	3.53	0.00	0.00
36	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 8. 1995 Lower Skeena Set Gill Net Catch Per Unit Effort Calculations.
Shaded numbers are estimates derived from the Upper Skeena fishery.

1995 Upper Skeena River Set Gill Net Catch Estimates

Week	Est. Sets	Sampled Sets	SY		CN		JCN		PK		STHD		CO		CM	
			Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	3	0	0	0	0	0	0	0	0	0	5	2	0	0	0	0
22	7	0	0	0	11	7	0	0	0	0	0	0	0	0	0	0
23	3	0	0	0	7	2	1	1	0	0	1	1	0	0	0	0
24	3	0	1	0	7	2	4	5	0	0	0	0	0	0	0	0
25	48	21	18	23	97	90	5	8	0	0	2	6	0	0	0	0
26	103	36	72	73	252	127	72	86	0	0	0	0	0	0	0	0
27	87	64	883	305	174	106	39	32	0	0	0	0	0	0	0	0
28	116	64	2958	576	97	53	74	46	0	0	0	0	0	0	0	0
29	175	37	5178	1291	184	147	71	53	52	38	0	0	5	9	0	0
30	186	26	5945	1950	222	145	64	52	508	647	29	28	0	0	0	0
31	174	26	5528	1536	134	115	20	29	100	162	0	0	7	13	0	0
32	75	19	3450	1104	12	17	4	8	754	387	12	13	24	40	4	8
33	88	15	2888	776	35	33	0	0	1861	1229	18	19	0	0	0	0
34	31	2	1083	458	0	0	0	0	229	275	0	0	31	61	0	0
35	8	0	349	262	3	5	0	0	211	232	0	0	37	28	0	0
36	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total Catch Estimates

Est. Sets	N	SY		CN		JCN		PK		STHD		CO		CM	
		Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error
1111	310	28351	8353	1234	849	353	321	3714	2970	65	68	103	152	4	8

Table 9. 1995 Upper Skeena Set Gill Net Catch Estimates.

1995 Lower Skeena River Set Gill Net Catch Estimates																
		Sampled	SY		CN		JCN		PK		STHD		CO		CM	
Week	Est. Sets	Sets	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error
17	0	1	0	0	0	0	4	2	0	0	7	3	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	3	4	0	0	0	0	0	0	0	0	33	13	0	0	0	0
22	7	2	0	0	43	29	0	0	0	0	0	0	0	0	0	0
23	3	21	3	7	156	44	17	24	0	0	14	19	0	0	0	0
24	3	11	10	14	132	33	71	93	0	0	0	0	0	0	0	0
25	48	26	166	121	281	107	264	146	0	0	0	0	0	0	0	0
26	103	28	763	399	264	92	117	66	0	0	0	0	0	0	0	0
27	87	49	3436	653	406	243	157	65	0	0	0	0	0	0	0	0
28	116	22	4150	1585	347	207	98	77	0	0	0	0	0	0	0	0
29	175	0	5520	2463	196	157	75	57	55	40	0	0	5	10	0	0
30	186	0	5338	2557	199	130	58	47	456	581	26	25	0	0	0	0
31	174	9	1555	1282	512	668	0	0	1572	1274	0	0	0	0	0	0
32	75	4	1009	750	0	0	0	0	102	121	0	0	29	59	0	0
33	88	2	3413	1775	44	88	44	88	0	0	131	263	0	0	0	0
34	31	0	1260	1012	0	0	0	0	266	320	0	0	36	71	0	0
35	8	3	1332	328	10	20	0	0	803	884	0	0	142	108	0	0
36	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Catch Estimates																
			SY		CN		JCN		PK		STHD		CO		CM	
	Est. Sets	N	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error
	1111	182	27954	12945	2590	1818	905	663	3255	3219	210	322	212	247	0	0

Table 10. 1995 Lower Skeena River Set Gill Net Catch Estimates.

2.3.2. The Skeena River Drift Net Fishery

A small fishery using drifting gill nets takes place on the Skeena River. Drift fishers fish mainly with nets 10 to 15 fathoms long, usually hung with coho gill net web (6 ¼ inch), 15 mesh deep during the chinook fishery, and sockeye gill net web (5 1/8 inch), 20 mesh deep during the sockeye fishery. Depending on the target species of the fisher, chinook gill net web is sometimes used by fishers. Typically drifts are in quiet stretches of the Skeena River over distances of a few hundred to two thousand meters. This fishery in 1995 was directed mainly toward catching early chinook in the Lower Skeena zone and sockeye in the Upper Skeena zone.

The drift net fishery was sampled with the cooperation of the fishers. We obtained data on the start and end time of sets, the number of sets, the catch per day and catch per set. In the Lower Skeena in the vicinity of Kitwanga, there were nine drift fishers and one fisher in the upper Skeena area at Glen Vowell. The GWWA staff collected catch data for 348 sets in the weeks 21 to 36 (Table 11). There were no samples obtained during weeks 22 and 24 due to low abundance of chinook during week 22 and high water during week 24. During week 35 no drift fishers were observed fishing. Only two sets were made in week 36. During the start of the drift net fishery only a few drifters were out drifting, this is normal for a few drifters to test for the start of the chinook runs. Familiarity with the fishery suggests that there was a high level of cooperation with data collection and that there is at least partial data for nearly all of the fishers. The data collected represent nearly 75% of the total sets.

1995 Drift Gill Net fishery has been implemented to include estimates of the total effort and the average catch per unit effort for each statistical week of the 1995 drift net fishery.

A drift net set is used as the unit of fishing effort. A set is defined as a period in which a drift net is fishing, this may be five or more minutes depending on the stretch of the river the fisher is fishing. The number of sets was determined by river boat surveys two or three times per week, drift net log books, interviews and direct samples. GWWA field staff are familiar with all of the drift net areas and know the fishers using them in most cases. In the lower Skeena more than one fisher may drift along the same stretch of river. This makes it possible to obtain relatively accurate effort estimates for the drift net fishery. In many cases interview, log book and direct sample data provide information on the number of sets per day.

To obtain an estimate of the effort put forth by the drift net gill fishery the number of drift net fishers were identified, then estimates were made of the number of days per week that each fisher may have been fishing and of the number of sets that each fisher may have made during each week..

The uncertainty of the number of days per week that a fisher is fishing is assigned high and low limits with a method similar to that used in estimating the set gill net fishery. For the high limit we assumed that the fisher was fishing every day between days he was known to be fishing.. For the low limit we assumed that he was not fishing on days between known fishing days.

The number of sets per day that each fisher may make is derived from the data collected from direct samples, interviews, and drift net log books maintained by fishers. Unknown fishing effort is evaluated as follows: Data on sets per day is organized by the statistical week, then calculated to give an average number of sets per day for all fishers considered fishing for that week with 95% confidence limits set around this mean value. The low number of sets per day is assumed to be the average number of sets minus the confidence limits made by fishers for that particular week, and the high number of sets per day is assumed to be the average number of sets per day plus the confidence limits.

The number of sets per week is assigned by summing the known set information with the high estimates of unknown daily sets and the low estimates of daily sets, yielding a weekly range of fishing effort. .

Estimates of the fishing effort were made for each week of the fishery. The best estimate of fishing effort used was the weekly median of the high estimate and the low estimate. Table 13. shows the estimates of the number of sets and the high and low estimates. Note that for weeks 25 to 28 and 31 to 34 the sample size is larger than the low estimate of sets in this case the sample was used as the low estimate of sets.

Estimates of the confidence limits for the drift net fishery catch were made with a methodology comparable to the method we use for estimating confidence limits for the gill net fishery. The basic formula used was the Mean Effort (# sets per week) x Mean CPUE (Catch per Set) = Best Estimate, with confidence limits applied to the best estimate. Confidence limits were calculated in two separate calculations, effort error which was the calculated effort error times the mean CPUE and the CPUE error was calculated by multiplying the CPUE error times the mean effort estimate. The larger of the two error calculations was used in the catch statistics as the confidence limit. In most cases errors around the median fishing effort were larger than those around the mean CPUE.

1995 Skeena River Drift Net Sets Table					
		Estimated Sets Per Week			
Week	N	Lo Est.	Hi Est.	Best Est.	Error
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0
20	0	0	0	0	0
21	10	10	26	18	8
22	0	5	21	13	8
23	14	18	48	33	15
24	0	9	25	17	8
25	39	39	48	43	7
26	43	43	67	55	14
27	54	54	79	66	17
28	66	66	77	71	14
29	31	42	108	75	33
30	16	20	60	40	20
31	23	23	27	25	6
32	14	14	29	21	8
33	20	20	48	34	18
34	16	16	18	17	6
35	0	0	0	0	0
36	2	2	2	2	0
37	0	0	0	0	0
38	0	0	0	0	0
39	0	0	0	0	0
	N	Lo Est.	Hi Est.	Best Est.	Error
	348	380	682	531	183

Table 11. 1995 Estimated Skeena River Drift Gill Net Sets.

Skeena Drift Net Catch Samples								
WEEK #	**# SETS**	**SY**	**CN**	**JCN**	**PK**	**STHD**	**CO**	**CM**
17	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
21	10	0	0	0	0	10	0	0
22	0	0	0	0	0	0	0	0
23	14	0	2	0	0	8	0	0
24	0	0	0	0	0	0	0	0
25	39	4	40	16	0	1	0	0
26	43	52	83	20	0	0	0	0
27	54	134	93	17	0	2	0	0
28	66	719	106	28	0	0	0	0
29	31	305	15	5	2	0	0	0
30	16	721	9	5	96	0	0	0
31	23	657	3	2	107	3	0	0
32	14	307	1	2	84	2	0	0
33	20	397	1	1	64	10	6	0
34	16	352	1	1	25	9	8	0
35	0	0	0	0	0	0	0	0
36	2	62	0	0	0	4	1	0
37	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0
	# SETS	**SY**	**CN**	**JCN**	**PK**	**STHD**	**CO**	**CM**
Total	**348**	**3710**	**354**	**97**	**378**	**49**	**15**	**0**

Table 12. 1995 Skeena River Drift Net Catch Sampled.

1995 Skeena River Drift Net Catch Estimates	
	Catch Estimate
Sockeye	5837
Chinook	451
J. Chinook	127
Pink	623
Steelhead	77
Coho	20
Chum	0
Total	7134

Table 13. 1995 Skeena River Drift Gill Net Total Catch Estimates.

1995 Skeena River Drift Net Catch Estimates																
		Sampled	SY		CN		JCN		PK		STHD		CO		CM	
Week	Est. Sets	Sets	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	18	10	0	0	0	0	0	0	0	0	18	8	0	0	0	0
22	13	0														
23	33	14	0	0	5	3	0	0	0	0	19	12	0	0	0	0
24	17	0														
25	43	39	4	3	45	13	18	6	0	0	1	2	0	0	0	0
26	55	43	66	30	106	28	26	14	0	0	0	0	0	0	0	0
27	66	54	165	42	114	29	21	5	0	0	2	2	0	0	0	0
28	71	66	778	165	115	33	30	12	0	0	0	0	0	0	0	0
29	75	31	740	327	36	16	12	6	5	4	0	0	0	0	0	0
30	40	16	1793	910	22	12	12	6	239	121	0	0	0	0	0	0
31	25	23	715	171	3	2	2	2	116	28	3	3	0	0	0	0
32	21	14	466	185	2	1	3	2	128	51	3	2	0	0	0	0
33	34	20	672	348	2	1	2	1	108	56	17	9	10	5	0	0
34	17	16	376	134	1	1	1	1	27	18	10	5	9	4	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	2	2	62	0	0	0	0	0	0	0	4	0	1	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Catch Estimates																
			SY		CN		JCN		PK		STHD		CO		CM	
Est. Sets	N		Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error	Best Est.	Error
531	348		5837	2315	451	139	127	55	623	277	77	42	20	9	0	0

Table 14. 1995 Skeena River Drift Net Weekly Catch Table.

2.3.3. The Skeena River Selective Fishery

The Skeena River selective fishery has grown in response to the availability of surplus sockeye returning to the Babine Lake. This fishery is in operation almost exclusively during the Excess to Surplus Spawning Requirements (ESSR) opening. This fishery uses seine nets and is operated as a live capture fishery with releases of non-target fish stocks. Increased knowledge of the sockeye run stock composition, and timing of the non-target stocks, will improve the selectivity of this fishery.

Beach seines with 2 ¼ inch monofilament web are the most common gear. However, some fishers used other web sizes obtained from the coastal seine fisheries. The majority of the effort of the beach seine fishery is concentrated in the Lower Skeena near Gitwangak and Cedarvale and in the upper Skeena near Hazelton and Kispiox. The beach seine catches of the Upper and Lower Skeena are reported together.

The effort estimate for beach seining was derived from total sockeye deliveries for each week made by the fishers to the buying station divided by the calculated sockeye CPUE for the same week.. Table 15 shows the estimated sets for the Skeena River beach seine fleet during the 1995 salmon season.

1995 Skeena Beach Seine Estimated Sets	
Week	**Est. Sets**
29	228
30	191
31	561
32	713
33	202
34	120
35	16
Total	**2031**

Table 15. 1995 Skeena River Beach Seine Estimated Sets.

Estimates of the Skeena River beach seine CPUE for weeks 29, 30, 31, and 34 are based on data from 84 sets, catch data were collected for 7.6% of the estimated beach seine sets for those weeks, and 4.2% of the total estimated sets. No sets were sampled during weeks 32, 33, and 35. It is likely that when the pink salmon runs began to increase, the time and effort it took to sort, count, and tally the sockeye and the by-catch became a problem. As is probable the fishers spent less time counting the fish and more effort in completing their sets as quickly as possible. The non-target species would benefit from this by being returned to the water sooner than if the fishers spent time sorting, counting, and tallying all fish caught in a set.

During weeks 32, 33 and 35 CPUE was calculated by comparing the weeks of beach seine CPUE data to the Lower Skeena set gill net CPUE. To estimate the CPUE during these weeks, weeks 29, 30, 31, and 34 of the beach seine CPUE data was measured against the lower Skeena set gill net CPUE for the same statistical weeks, in most cases the beach seine CPUE was larger. Then the average ratio of all compared weeks was applied to the lower Skeena CPUE for weeks 32, 33, and 35 to estimate the beach seine CPUE for those weeks.

Table 16 shows the 1995 Skeena River beach seine fishery catch per unit effort calculations derived from these methods. Note that the jack sockeye has no value for weeks 32, 33 and week 35, this due to the no CPUE data recorded by the gill net fishery.

1995 Skeena River Beach Seine Catch Per Unit Effort						
Week	**N**	**Sy**	**Sy Rel.**	**J. Sy**	**J.Sy Rel.**	**Cn Rel.**
29	18	35.06	0.11	0.00	0.89	0.00
30	24	71.54	0.96	2.63	1.42	0.04
31	27	28.41	0.00	0.00	0.00	0.15
32	0	28.55	0.00			0.00
33	1	64.54	0.00			0.83
34	15	81.87	0.00	3.33	22.47	0.67
35	0	72.27	0.00			0.55
		Pk	**Pk Rel.**	**Sthd Rel.**	**Co. Rel.**	**Cm Rel.**
29	18	0.22	0.67	0.00	0.00	0.00
30	24	0.29	5.92	0.08	0.13	0.00
31	27	0.00	64.52	0.07	0.37	0.00
32	0	0.00	2.90	0.00	0.83	0.00
33	1	0.00	0.00	2.48	0.00	0.00
34	15	0.07	183.07	2.80	3.93	1.07
35	0	0.00	43.58	0.00	7.72	0.00

Table 16. 1995 Skeena River Beach Seine Catch Per Unit Effort.

During weeks 32, 33 and 35 CPUE was calculated by comparing the weeks of beach seine CPUE data to the Lower Skeena set gill net CPUE. To estimate the CPUE during these weeks, weeks 29, 30, 31, and 34 of the beach seine CPUE data was measured against the lower Skeena set gill net CPUE for the same statistical weeks, in most cases the beach seine CPUE was larger. Then the average ratio of all compared weeks was applied to the lower Skeena CPUE for weeks 32, 33, and 35 to estimate the beach seine CPUE for those weeks.

To fill in the missing data we have assumed that the CPUE of the gill net fishery is directly proportional to the beach seine CPUE. Table 16 shows the 1995 Skeena River beach seine fishery catch per unit effort calculations derived from these methods. Note that the jack sockeye has no value for weeks 32, 33 and week 35, this due to the lack of CPUE data in the gill net fishery.

1995 Skeena River Beach Seine Catch Per Unit Effort						
Week	**N**	**Sy**	**Sy Rel.**	**J. Sy**	**J.Sy Rel.**	**Cn Rel.**
29	18	35.06	0.11	0.00	0.89	0.00
30	24	71.54	0.96	2.63	1.42	0.04
31	27	28.41	0.00	0.00	0.00	0.15
32	0	28.55	0.00			0.00
33	1	64.54	0.00			0.83
34	15	81.87	0.00	3.33	22.47	0.67
35	0	72.27	0.00			0.55
		Pk	**Pk Rel.**	**Sthd Rel.**	**Co. Rel.**	**Cm Rel.**
29	18	0.22	0.67	0.00	0.00	0.00
30	24	0.29	5.92	0.08	0.13	0.00
31	27	0.00	64.52	0.07	0.37	0.00
32	0	0.00	2.90	0.00	0.83	0.00
33	1	0.00	0.00	2.48	0.00	0.00
34	15	0.07	183.07	2.80	3.93	1.07
35	0	0.00	43.58	0.00	7.72	0.00

Table 17.1995 Skeena River Beach Seine Catch Per Unit Effort.

Based on our knowledge of the Skeena River fishery, we believe that the estimates produced by this method are within the range of the catch and releases. The jack sockeye estimates however may be well under the actual catch considering jack and adult sockeye catch ratios of the 1995 Babine River fishery.

Beach seine catch of sockeye is estimated using delivery slips for the ESSR fishery. We have not adjusted these values because we believe that the deliveries to the buying station represent 95% or more of the total sockeye catch. Other catches and releases are calculated using the estimated number of sets and the estimated CPUE. Table 17 shows the catch and release estimates of the Skeena River beach seine during the 1995 salmon season.

1995 Skeena River Beach Seine Total Catch and Release Estimates			
	Harvested	**Released**	**Total**
Sockeye	82853	3369	**86222**
Chinook	0	347	**347**
Pink	114	69240	**69354**
Steelhead	0	895	**895**
Coho	0	1414	**1414**
Chum	0	128	**128**
Total	**82967**	**75392**	**158359**

2.3.4. Table 18. 1995 Skeena River Beach Seine Total Catch and Release Estimates.

1995 Skeena River Beach Seine Catch Table										
Week	**Sockeye**	**Sy Rel.**	**J. Sy**	**J. Sy Rel**	**Cn Rel.**	**Pink**	**Pk Rel.**	**Sthd Rel**	**Co Rel.**	**Cm Rel.**
29	7985	25	0	202	0	51	152	0	0	0
30	13683	183	502	271	8	56	1132	16	24	0
31	15934	0	0	0	83	0	36189	42	208	0
32	20362	0	0	0	0	0	2066	0	590	0
33	13059	0	0	0	167	0	0	502	0	0
34	9791	0	399	2687	80	8	21894	335	470	128
35	1138	0	0	0	9	0	686	0	122	0
Total	**81952**	**209**	**901**	**3160**	**347**	**114**	**62119**	**895**	**1414**	**128**

Table 19. 1995 Skeena River Beach Seine Catch Estimates.

2.4. The 1995 Babine River Fishery

2.4.1. The Gisgagaas Canyon Gill Net Fishery

In recent years the Gisgagaas gill net fishery has been relatively small, harvesting a few thousand sockeye and small numbers of chinook, pink, steelhead, and coho. The extremely low catch in 1995 shows the further reduction of gill net usè on the Babine River accompanying the introduction of selective live capture gear with its capacity to harvest large numbers of fish.

The Gisgagaas Canyon gill net fishery took place during the first three weeks of July, weeks 27, 28, and 29. During this fishery a total of six sets were made by two families. Catch estimates of this fishery are obtained from log book entries on four of these sets made during weeks 27 and 28.

No data was obtained for the two sets made during week 29, but interviews with residents of Gisgagaas indicate that the family fishing harvested no more than fifty sockeye during week 29. Table 17 shows the catch estimates of the 1995 Gisgagaas Canyon gill net fishery.

1995 Gisgagaas Canyon Gill Net Catch Estimates		
Week	Sockeye	Other
27	20	0
28	22	0
29	50	0
Total	92	0

Table 20. 1995 Gisgagaas Canyon Gill Net Catch Estimates.

With the low amount of effort from the gill net fishery catch estimates of the Gisgagaas Canyon gill net fishery is at or near 92 sockeye. From data of the known sets there is no evidence of any non-sockeye by-catch during this fishery.

2.4.2. The Babine River Selective Fishery

The Gitksan Babine River selective fishery is on the lower part of the river within the boundaries of the Gisgagaas Reserve. In 1995 almost all of the fishery at Gisgagaas Canyon was selective, involving live capture by a fish wheel, or dip net. The canyon fishery was targeted on catching Babine Lake enhanced sockeye,. Most of the sockeye caught in the fishery were sold as part of the ESSR fishery. Also on the Babine River in 1995 a fish wheel was in operation during late July and the month of August near the confluence of the Babine River and Shedin Creek.

1995 recorded the highest sockeye catch since the GWWA has been monitoring the Gitksan fishery on the Babine River. The total estimated catch of the Babine River fishery is 80,687 salmon, steelhead, and eels. an estimated 35,100 sockeye, 2,073 jack sockeye, and 444 pink salmon were harvested, 481 sockeye, 32,450 jack sockeye, 5 chinook, 10,065 pink, 3 steelhead, 5 coho, and 61 lamprey eels were released. Table 20 shows the detailed catch and release estimates by species of the 1995 Gitksan Babine River fishery, Table 21 shows the catch and release estimates by the 1995 statistical weeks.

1995 Babine River Selective Fishery Harvest and Release Estimates			
	Harvested	**Released**	**Total**
Sockeye	35100	481	35581
Jack Sockeye	2073	32450	34523
Chinook	0	5	5
Pink	444	10065	10509
Steelhead	0	3	3
Coho	0	5	5
Chum	0	0	0
Eels	0	61	61
Total	**37617**	**43070**	**80687**

Table 21. 1995 Babine River Selective Fishery Total Catch and Release Estimates.

1995 Babine River Selective Fishery Catch and Release Estimates											
Week	**Sy**	**Sy Rel.**	**J. Sy**	**J. Sy Rel.**	**Cn Rel.**	**Pk**	**Pk Rel**	**Sthd Rel**	**Co Rel.**	**Cm Rel**	**Eels**
29	1	0	0	0	0	0	0	0	0	0	0
30	2566	0	230	0	0	0	0	0	0	0	0
31	8757	13	164	5542	0	0	1321	0	0	0	10
32	12008	366	486	15133	3	0	4556	3	0	0	40
33	8539	37	1193	8788	2	444	3237	0	0	0	11
34	3142	66	0	2987	0	0	951	0	5	0	0
35	87	0	0	0	0	0	0	0	0	0	0
Total	**35100**	**481**	**2073**	**32450**	**5**	**444**	**10065**	**3**	**5**	**0**	**61**

Table 22. 1995 Babine River Selective Fishery Catch and Release Estimates by Week.

2.4.2.1. The Babine River Fish Wheel

The Babine River fish wheel was in operation for four weeks, weeks 31 to 34 catching an estimated 26,451 salmon and steelhead and 61 eels for a total catch of 26,512 pieces. Of the total catch 11,077 sockeye, 1,843 jack sockeye and 444 pink salmon were harvested, 168 sockeye, 9,838 jack sockeye, 3080 pink salmon, one steelhead, and 61 lamprey eels were released shown in Tables 22 and 23.

The 1995 release rate for the fish wheel was 49.59% of the total catch. By species 1.49% of the sockeye, 84.22% of the jack sockeye, 87.4% of the pink salmon, 100% of the steelhead, and 100% of the eels were released, shown in Table 20. The fish wheel did not catch any chinook, coho or chum salmon during the 1995 season.

1995 Babine River Fish Wheel
Harvest and Release Estimates

	Harvested	Released	Total	% Harvest	% Release
Sockeye	11077	168	11245	**98.51%**	**1.49%**
Jack Sockeye	1843	9838	11681	**15.78%**	**84.22%**
Chinook	0	0	0		
Pink	444	3080	3524	**12.60%**	**87.40%**
Steelhead	0	1	1	**0.00%**	**100.00%**
Coho	0	0	0		
Chum	0	0	0		
Eels	0	61	61	**0.00%**	**100.00%**
Total	**13364**	**13148**	**26512**	**50.41%**	**49.59%**

Table 23. 1995 Babine River Fish Wheel Harvest and Release Estimates.

Catch and release estimates of the fish wheel are based on direct counts of fish caught and released by the fish wheel with exception of week 31. Data collected included the date, time, species and harvested or released. Whether the catch was used for food or for commercial purposes is not distinguished in the harvest estimates. Catch estimates for week 31 are the sum of two days of collected data, and an estimate of three days catch for missing data. Two thousand sockeye, two thousand jack sockeye and 500 pink salmon were estimated for the missing days data. From field notes and crew observations these estimates may be higher than the actual catch.

1995 Babine River Fish Wheel Catch and Release Table											
Week	Sy	Sy Rel.	J. Sy	J. Sy Rel.	Cn Rel.	Pk	Pk Rel	Sthd Rel.	Co Rel.	Cm Rel.	Eels
29	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0
31	3321	5	164	2000	0	0	501	0	0	0	10
32	4533	138	486	5410	0	0	1720	1	0	0	40
33	2552	11	1193	1790	0	444	656	0	0	0	11
34	671	14	0	638	0	0	203	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0
Totals	11077	168	1843	9838	0	444	3080	1	0	0	61

Table 24. 1995 Babine Fish Wheel Catch and Release Estimates by week.

As the fish wheel was not in operation until week 31, the data of the catches indicate that with a longer fishing period, minor improvements to the leads and slight modifications to the fish wheel catches could reach 50,000 sockeye or more.

2.4.2.2. Gisgagaas Canyon Selective Fishery

The Gisgagaas Canyon dip net catch and release estimates are based on the commercial deliveries, log book entries and the fish wheel by-catch to sockeye catch ratios (shown in Table 24) compared to the total sockeye catch of the canyon fishery. With the fish wheel and the canyon fishery being only a few kilometers apart it is assumed that for individual weeks the proportional catch of the fish wheel was an indication of the proportion of by-catch of the canyon fishery.

1995 Babine River Fish Wheel By-Catch to Sockeye Catch Ratios									
Week	Sy	Sy Rel.	J. Sy	J. Sy Rel.	Cn Rel.	Pk Rel	Sthd Rel.	Co Rel.	Cm Rel.
29	0.00	0.00:1	0.00:1	0.00:1	0.00:1	0.00:1	0.00:1	0.00:1	0.00:1
30	0.00	0.00:1	0.00:1	0.00:1	0.00:1	0.00:1	0.00:1	0.00:1	0.00:1
31	1.00	0.00:1	0.05:1	0.65:1	0.00:1	0.15:1	0.00:1	0.00:1	0.00:1
32	1.00	0.03:1	0.11:1	1.30:1	0.00:1	0.38:1	0.0002:1	0.00:1	0.00:1
33	1.00	0.00:1	0.47:1	1.17:1	0.00:1	0.43:1	0.00:1	0.00:1	0.00:1
34	1.00	0.02:1	0.00:1	0.95:1	0.00:1	0.30:1	0.00:1	0.00:1	0.00:1
35	0.00	0.00:1	0.00:1	0.00:1	0.00:1	0.00:1	0.00:1	0.00:1	0.00:1

Table 25. 1995 Babine River Fish Wheel By-Catch to Sockeye Catch Ratios.

None of the jack sockeye with the exception of week 30, and none of the pink salmon caught in the Gisgagaas Canyon dip net fishery were retained. To estimate releases we used the ratio of the fish wheel total jack sockeye and the total pink catch to sockeye.. From canyon fisher interviews The steelhead estimate is based on interviews with canyon fishers. It probably is accurate to within one or two fish. Although the fish wheel did not catch any chinook or coho, interviews with canyon fishers confirmed that some chinook and coho were caught in the canyon fishery. The total number of chinook and coho is less than ten.

A small selective harvest taken in Gisgagaas Canyon with a brailer is included with the dip net total.

The estimated catch of the Gisgagaas Canyon fishery is 54,164 salmon and steelhead. Table 25 shows detailed harvest (retained fish) and release data for this fishery.

1995 Gisgagaas Canyon Selective Harvest and Release Estimates			
	Harvested	**Released**	**Total**
Sockeye	24023	313	24336
Jack Sockeye	230	21928	22158
Chinook	0	5	5
Pink	0	6745	6745
Steelhead	0	2	2
Coho	0	5	5
Chum	0	0	0
Total	**24253**	**28998**	**53251**

Table 26. 1995 Gisgagaas Canyon Selective Fishery Harvest and Release Estimates.

The Gisgagaas Canyon selective fishery began in week 29 when the Youth Survival Cultural Camp (YSCC) harvested a sockeye for food purposes. The main effort of this fishery was during weeks 30 to 34 and ending in week 35.

The catches during the weeks of higher effort during the fishery produced catches of 2,471 to 7,475 sockeye, low catches were recorded during week 29, the start and week 35, the end of the canyon selective fishery. The weekly catch and release estimates are shown in Table 26, note that except for week 30 jack sockeye all by catch was released during this fishery.

1995 Gisgagaas Canyon Selective Harvest and Release Estimates										
Week	**Sy**	**Sy Rel.**	**J. Sy**	**J. Sy Rel.**	**Cn Rel.**	**Pk**	**Pk Rel.**	**Sthd Rel.**	**Co Rel.**	**Cm Rel.**
29	1	0	0	0	0	0	0	0	0	0
30	2566	0	230	0	0	0	0	0	0	0
31	5436	8	0	3542	0	0	820	0	0	0
32	7475	228	0	11342	3	0	3402	2	0	0
33	5987	26	0	4694	2	0	1776	0	0	0
34	2471	52	0	2349	0	0	748	0	5	0
35	87	0	0	0	0	0	0	0	0	0
Total	**24023**	**313**	**230**	**21928**	**5**	**0**	**6745**	**2**	**5**	**0**

Table 27. 1995 Gisgagaas Canyon Selective Fishery Harvest (fish retained) and Release Estimates by Week.

2.5. The 1995 Skeena River Catch

Total catch estimates for 1995 Skeena River Fisheries are shown in Table 1 and Table 27. These numbers are the sum of the gill net fishery (set and drift) and the selective fishery. A graph of the total Gitksan Skeena River fisheries catch divided by fishing zones, follows as Figure 3. Graphs of total and weekly catches by species for set gill nets on the Lower Skeena and the Upper Skeena are shown in Figures 7 through 19. Graphs of the Skeena River drift net fishery are shown in Figures 33 through 38. Weekly set gill net CPUE data are presented in Figures 20 through 32 and drift net CPUE are presented in Figures 39 through 44.

1995 Skeena River Total Catch Estimates					
	Up Skeena	Lo Skeena	Drift Net	Selective	Total
Sockeye	28351	27954	5837	82853	**144995**
Chinook	1234	2590	451	0	**4275**
J. Chinook	353	905	127	0	**1385**
Pink	3714	5116	623	114	**9568**
Steelhead	65	210	77	0	**353**
Coho	103	212	20	0	**335**
Chum	4	0	0	0	**4**
Total	**33825**	**36988**	**7134**	**82967**	**160914**

Table 28. 1995 Skeena River Total Catch Estimates.
Note: Up Skeena and Lo Skeena are set gill net totals.

Table 28 compares the various Skeena River fisheries and their proportion of the total Gitksan Skeena River catch.

1995 Skeena River Catch Comparisons				
	Up Skeena	Lo Skeena	Drift Net	Selective
Sockeye	19.55%	19.28%	4.03%	57.14%
Chinook	28.87%	60.59%	10.54%	0.00%
J. Chinook	25.48%	65.34%	9.18%	0.00%
Pink	38.82%	53.48%	6.51%	1.20%
Steelhead	18.50%	59.65%	21.85%	0.00%
Coho	30.75%	63.37%	5.88%	0.00%
Chum	100.00%	0.00%	0.00%	0.00%

Table 29. 1995 Skeena River Catch Comparisons.
Note: Up Skeena and Lo Skeena are set gill net totals.

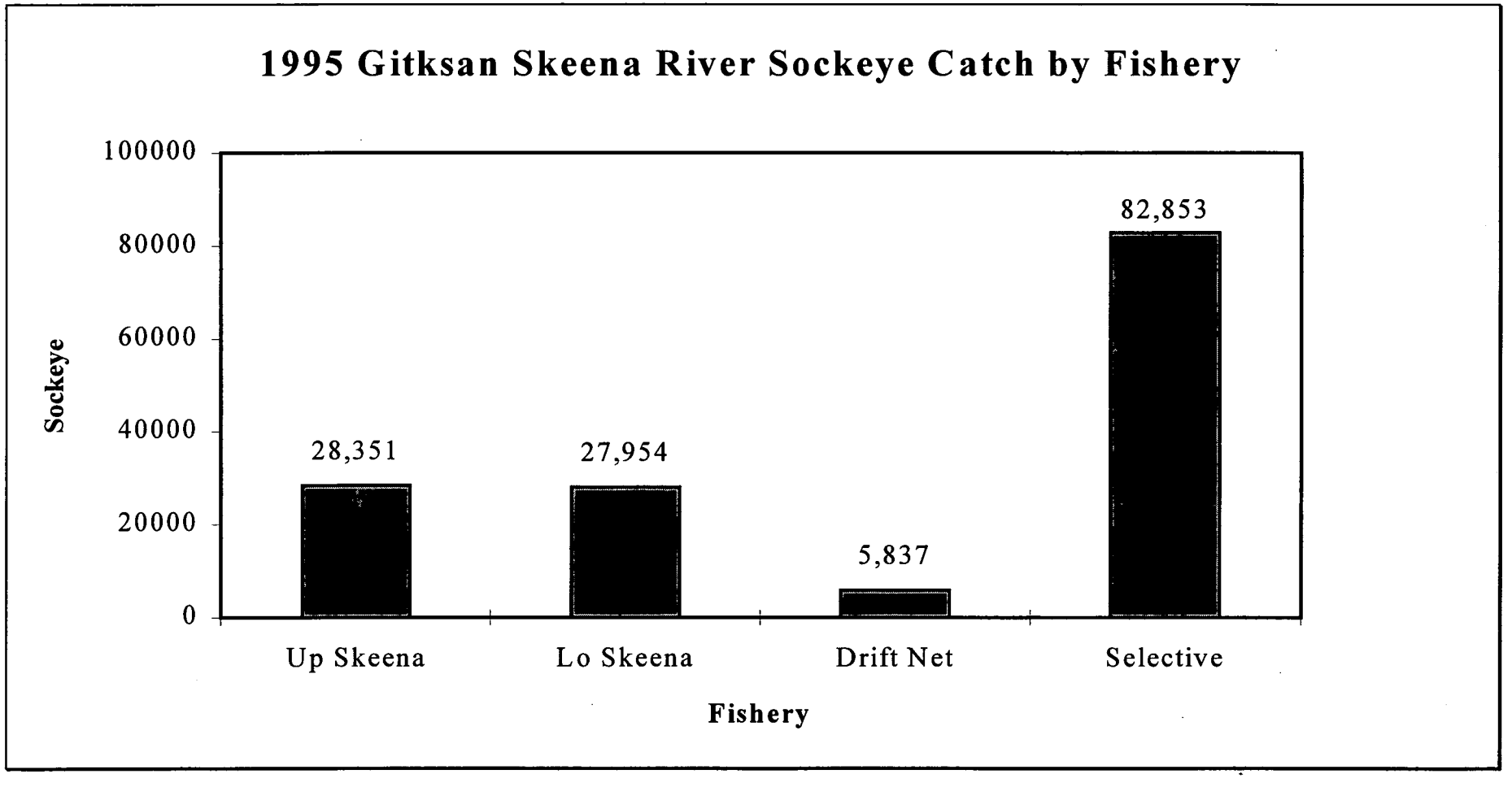


FIGURE 3. 1995 SKEENA RIVER TOTAL CATCH ESTIMATES.
Note: Up Skeena and Lo Skeena are set gill net totals.

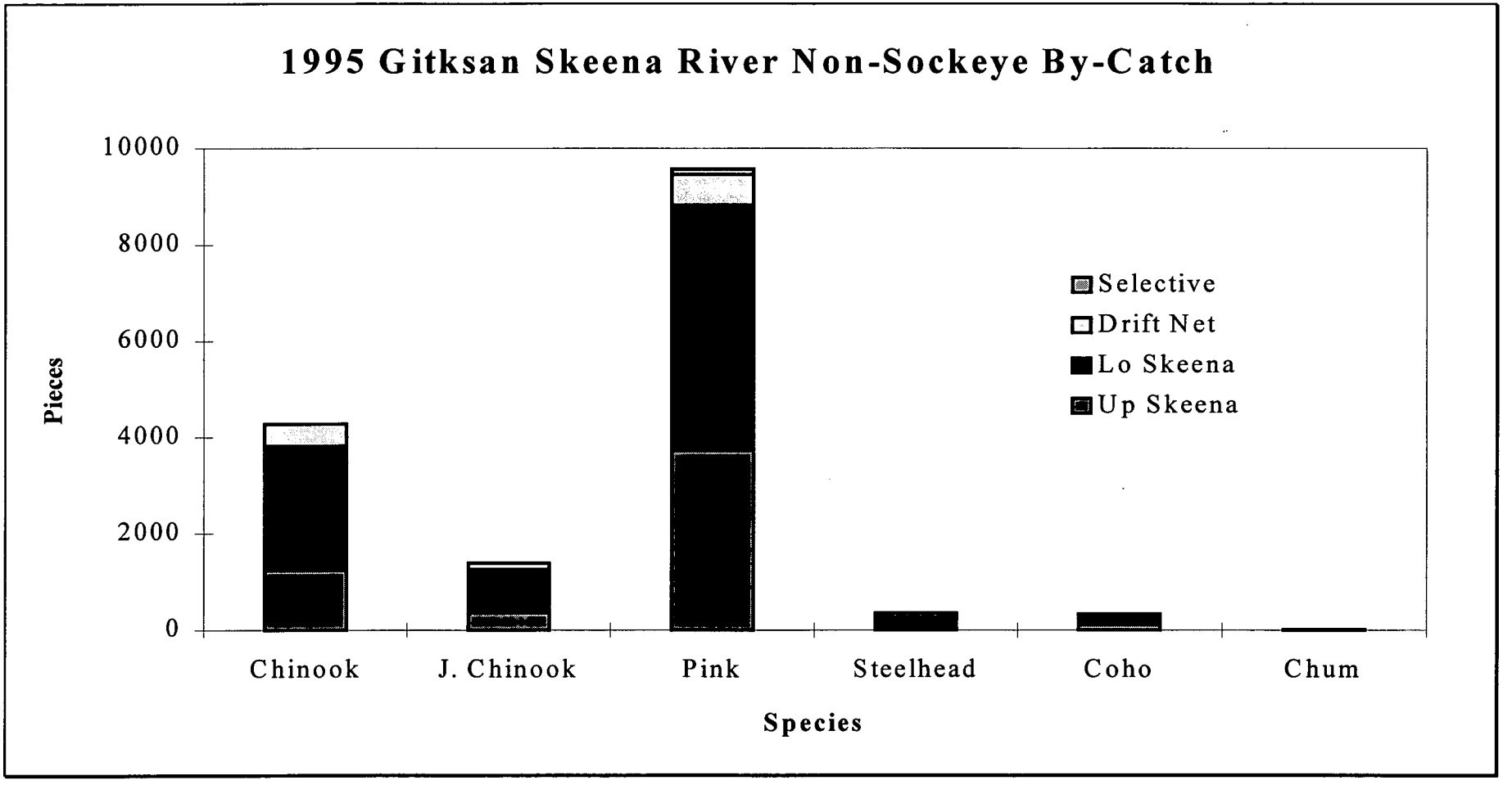


FIGURE 4. 1995 GITKSAN SKEENA RIVER FISHERY NON-SOCKEYE BY-CATCH.
Note: Up Skeena and Lo Skeena are set gill net totals.

2.6. The 1995 Babine River Catch

Total catch estimates for 1995 Babine River Fisheries are shown in Table 1 and 29. These numbers are the sum of the gill net fishery and the selective fishery (fish wheel and Gisgagaas Canyon dip net). A graph of the total Gitksan Babine River fisheries catch divided by fishery, follows as Figures 5 and 6.

1995 Babine River Harvest Estimates				
	Fish Wheel	**Canyon Sel.**	**Gill Net**	**Total**
Sockeye	11077	24023	92	35192
Jack Sockeye	1843	230	0	2073
Chinook	0	0	0	0
Pink	444	0	0	444
Steelhead	0	0	0	0
Coho	0	0	0	0
Chum	0	0	0	0
Total	**13364**	**24253**	**92**	**37709**

Table 30. 1995 Gitksan Babine River Total Harvest By Fishery.

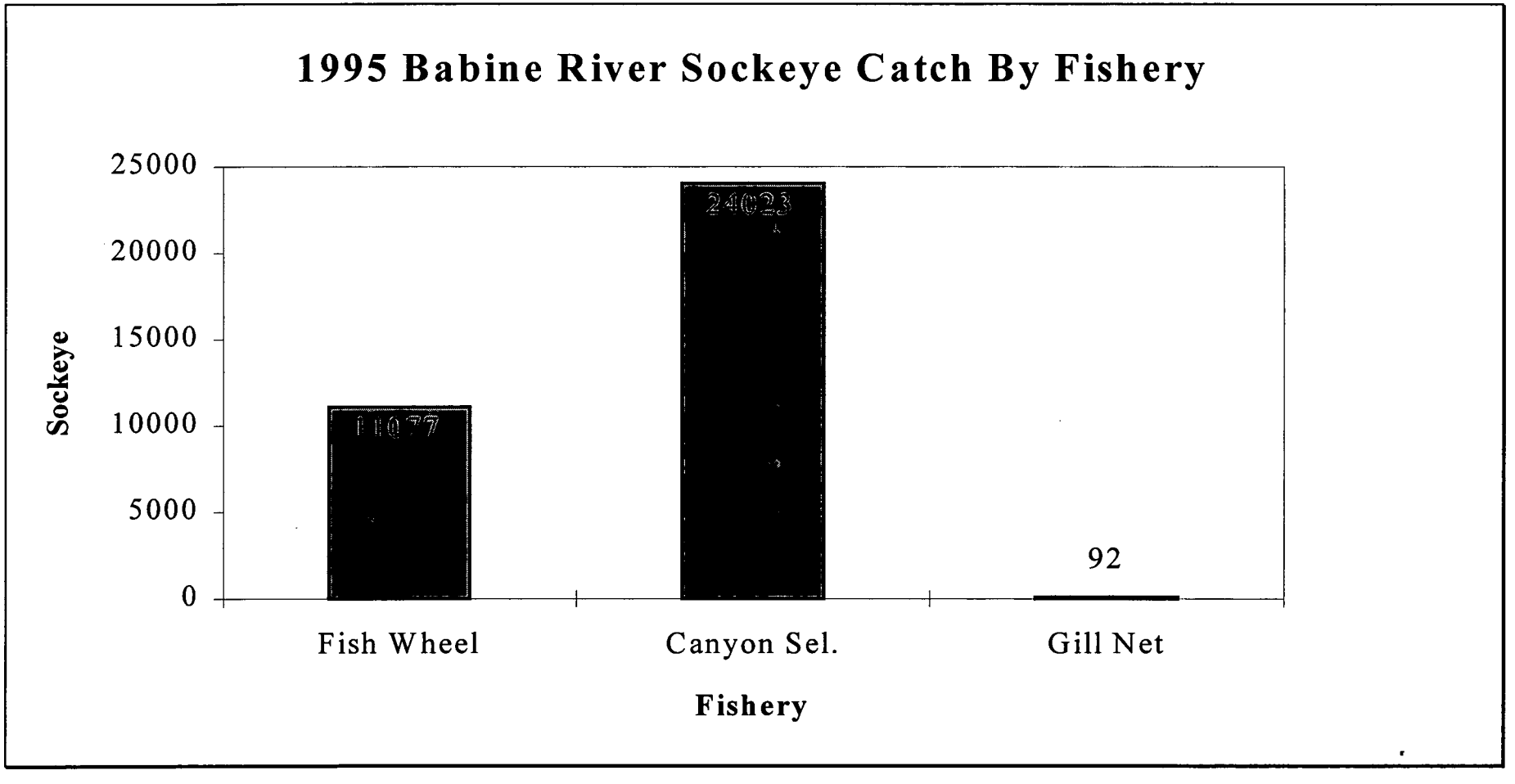


FIGURE 5. 1995 GITKSAN BABINE SOCKEYE CATCH BY FISHERY.

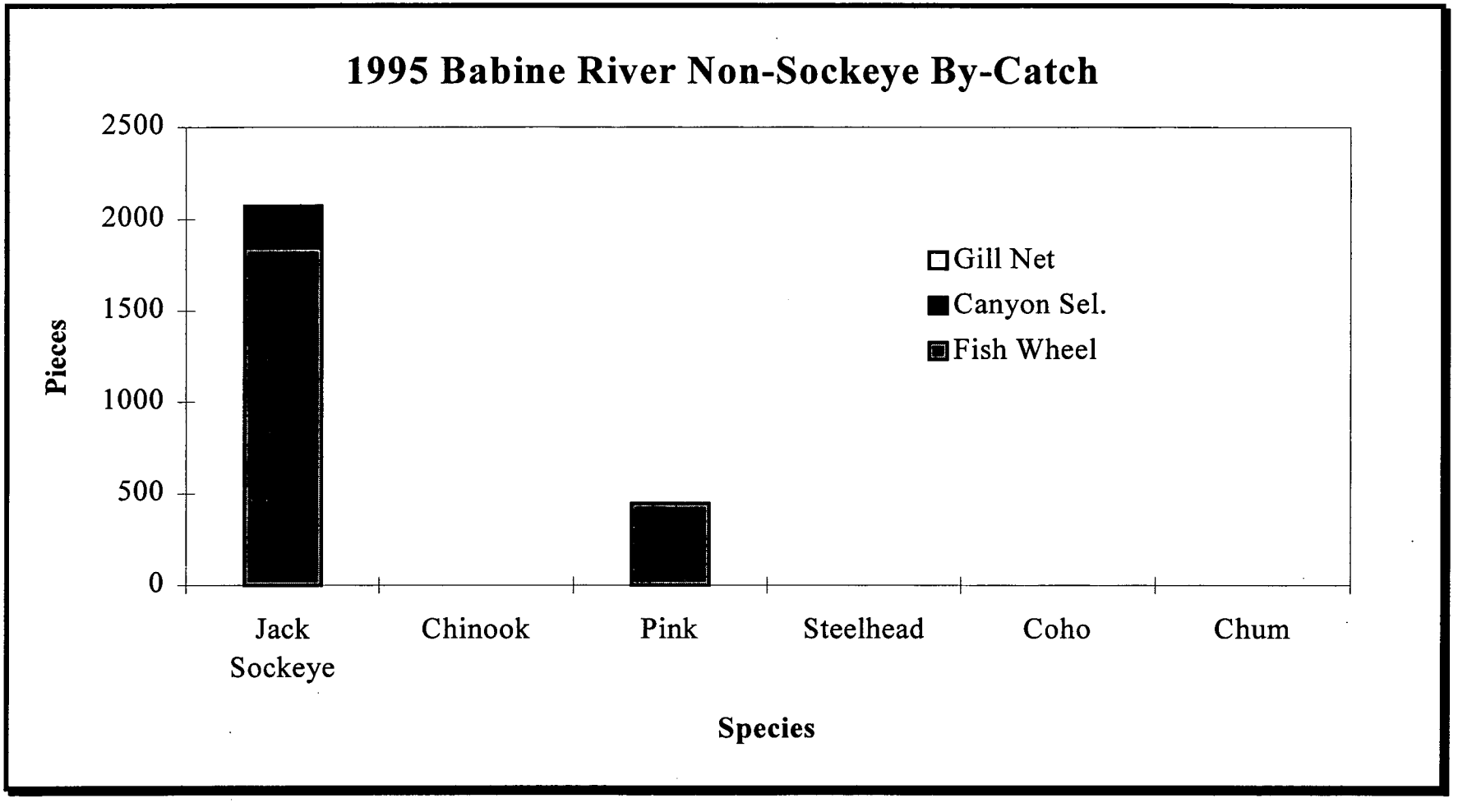


FIGURE 6. 1995 GITKSAN BABINE RIVER NON-SOCKEYE BY-CATCH.

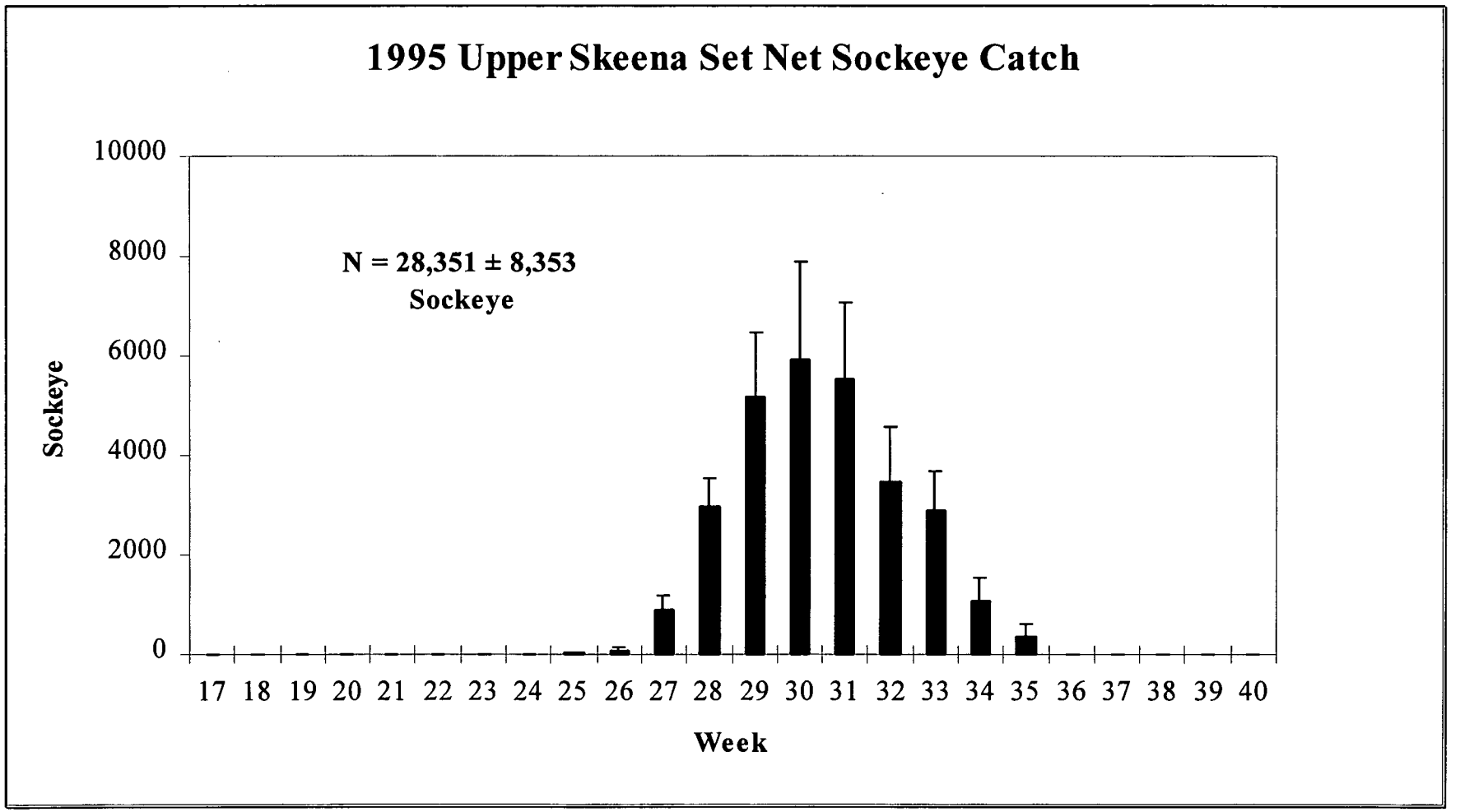


FIGURE 7. 1995 UPPER SKEENA RIVER SET GILL NET SOCKEYE CATCH.

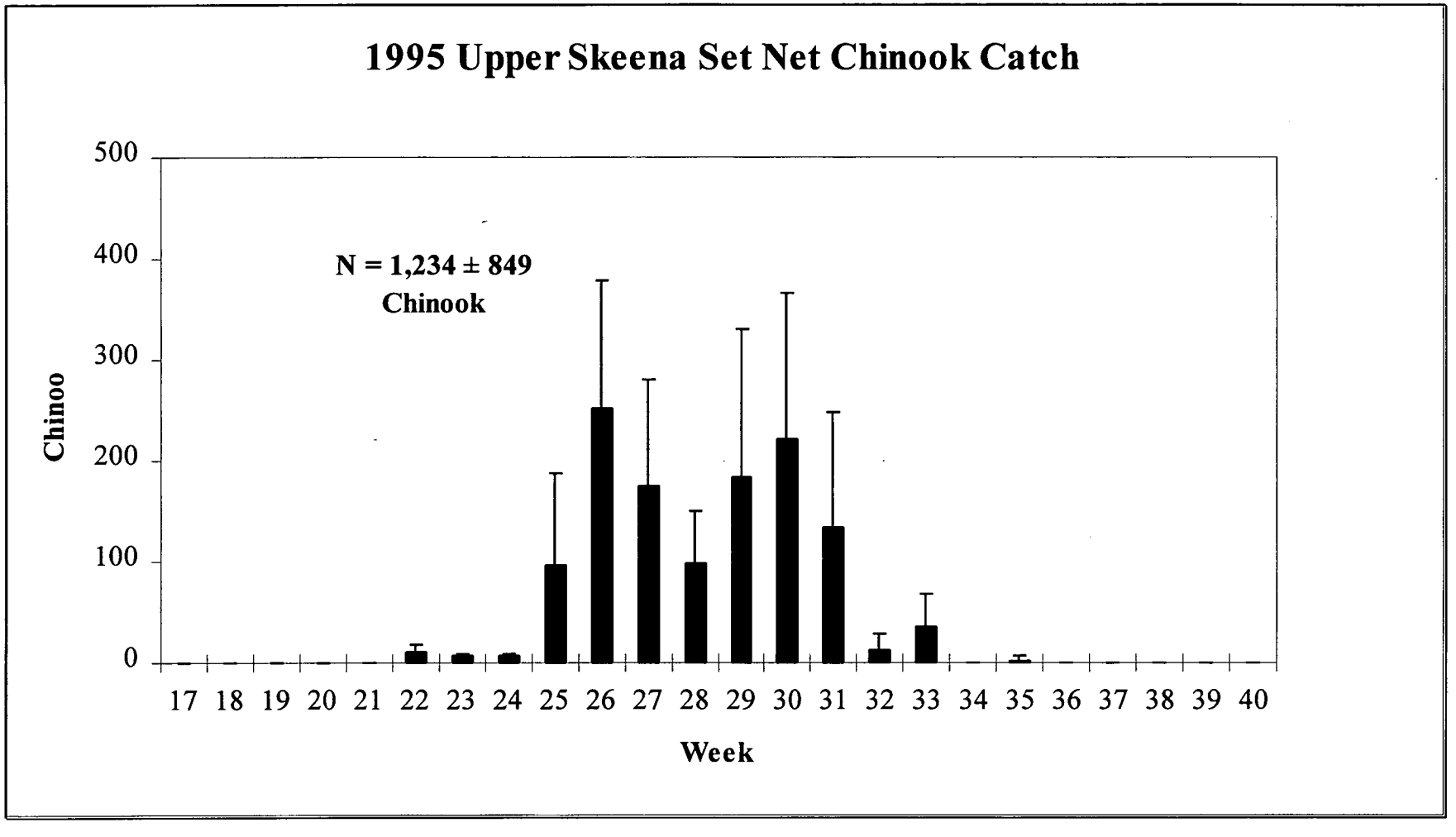


FIGURE 8. 1995 UPPER SKEENA RIVER SET GILL NET CHINOOK CATCH.

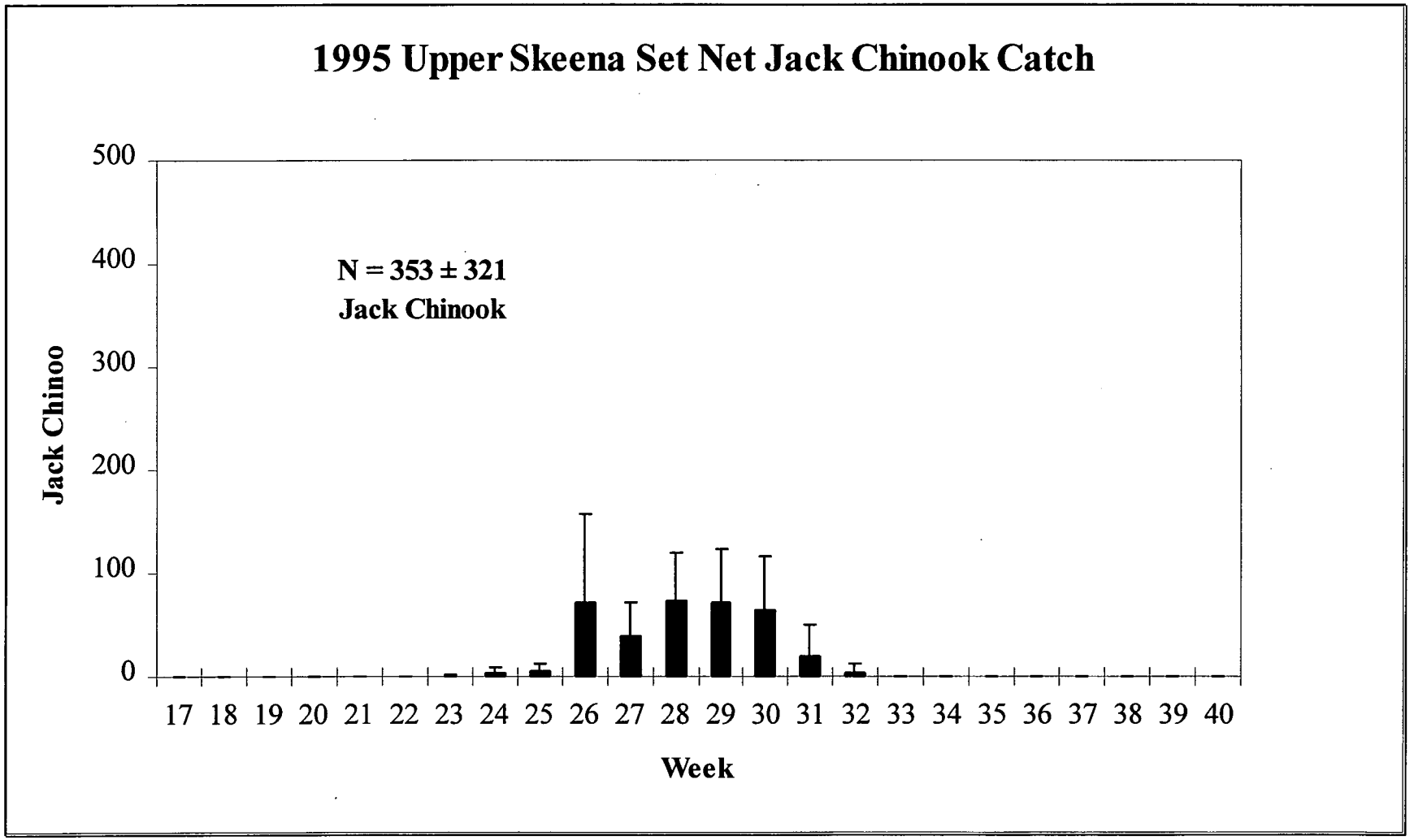


FIGURE 9. 1995 UPPER SKEENA RIVER SET GILL NET JACK CHINOOK CATCH.

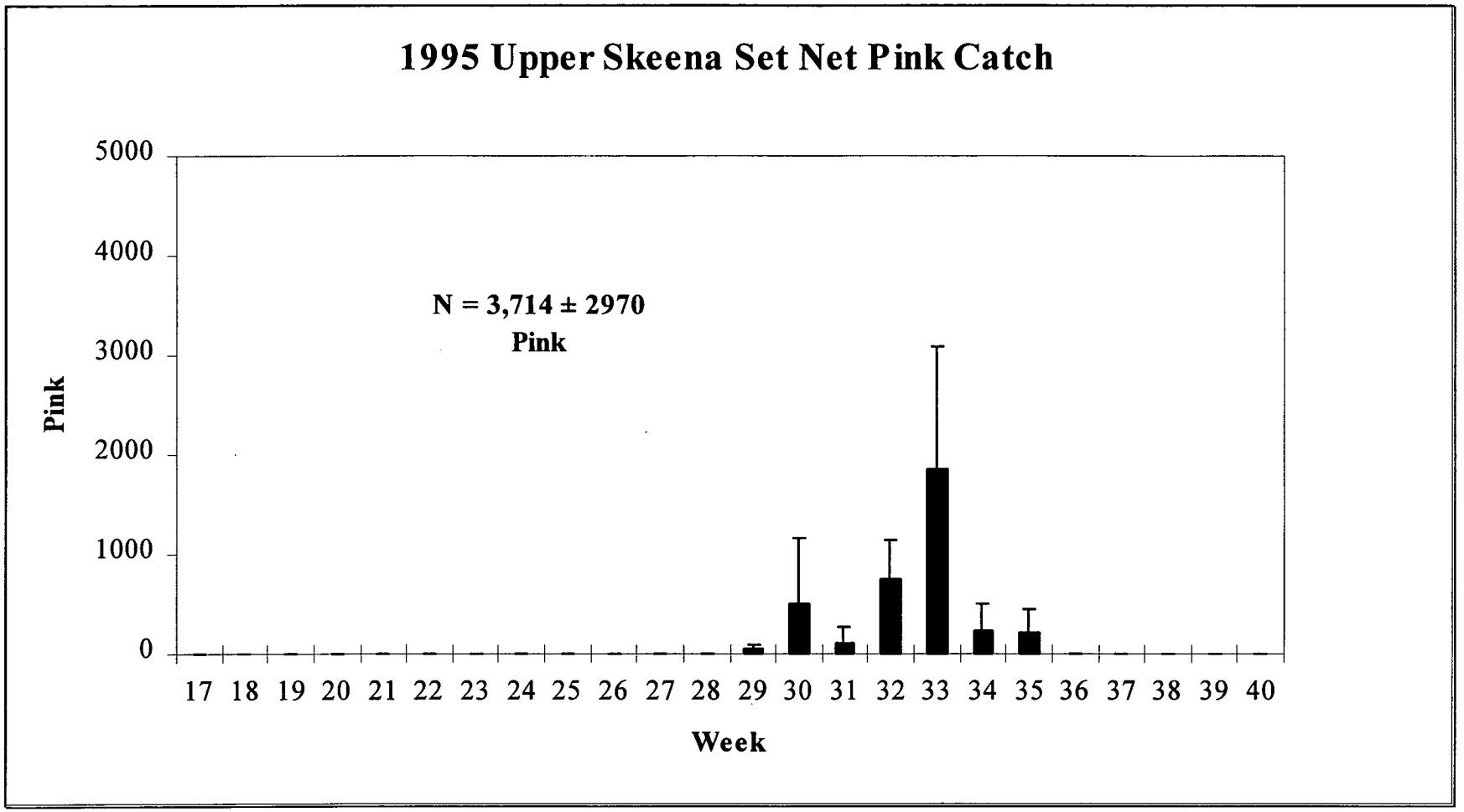


FIGURE 10. 1995 UPPER SKEENA RIVER SET GILL NET PINK CATCH.

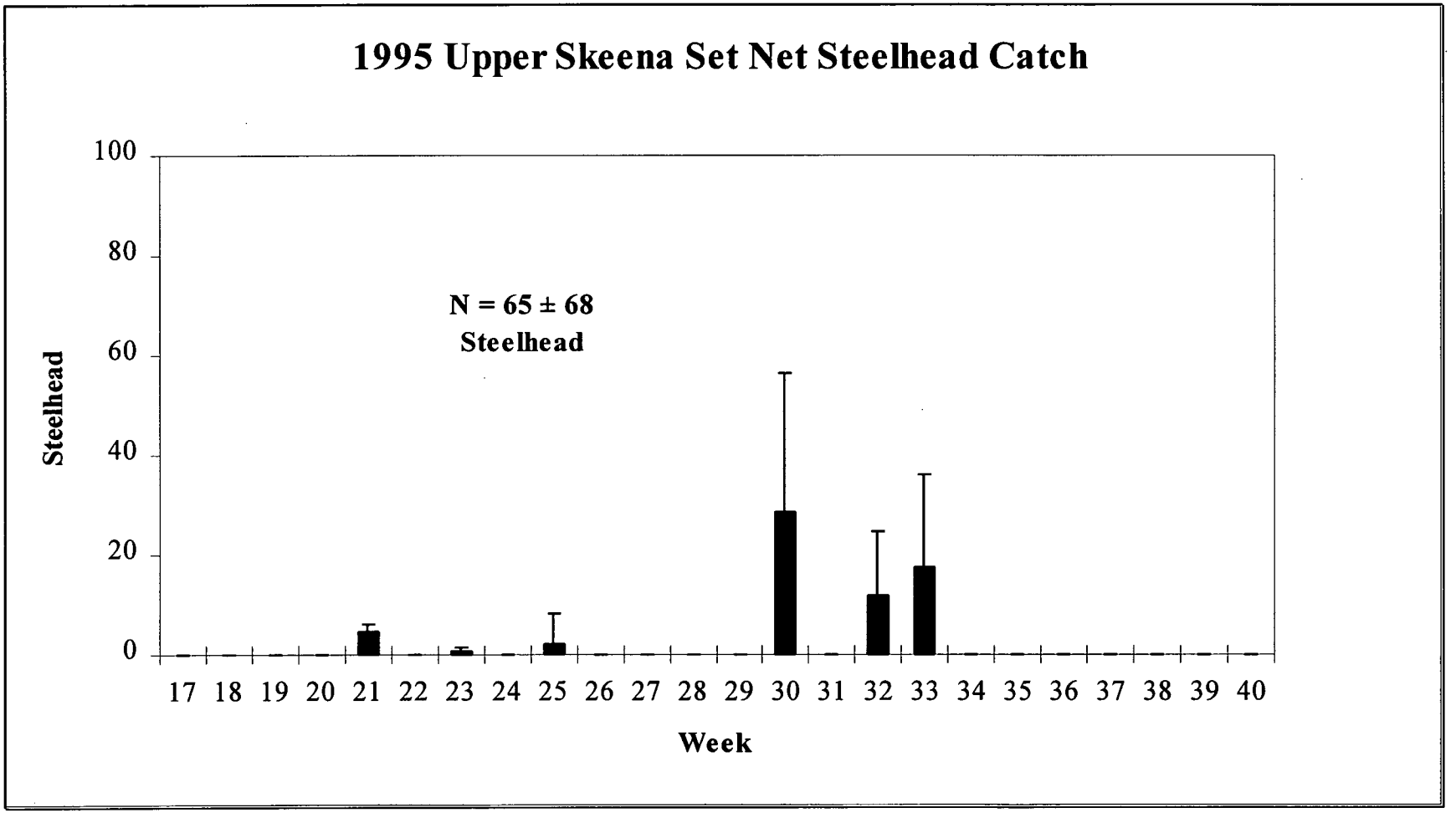


FIGURE 11. 1995 UPPER SKEENA RIVER SET GILL NET STEELHEAD CATCH.

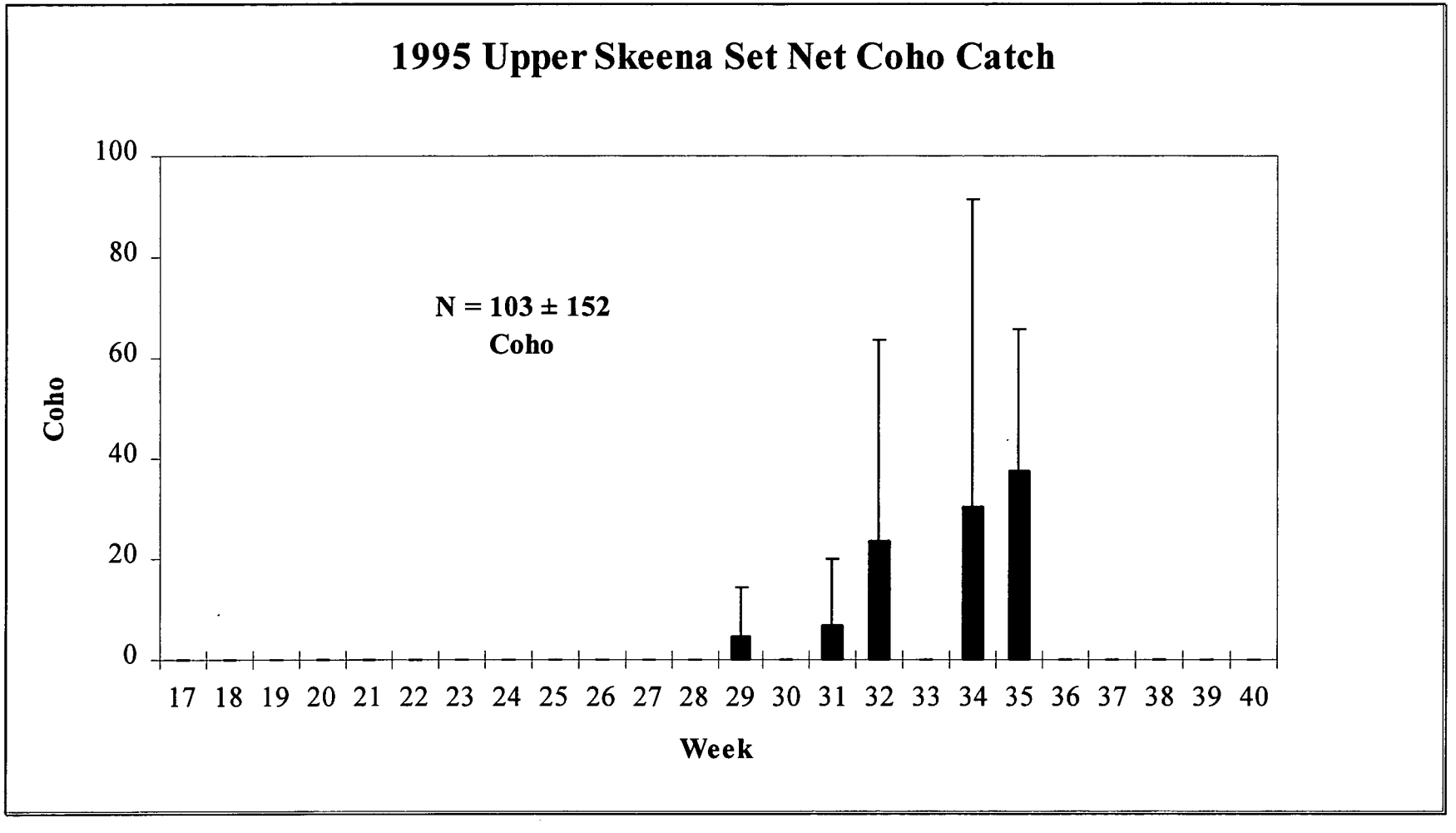


FIGURE 12. 1995 UPPER SKEENA RIVER SET GILL NET COHO CATCH.

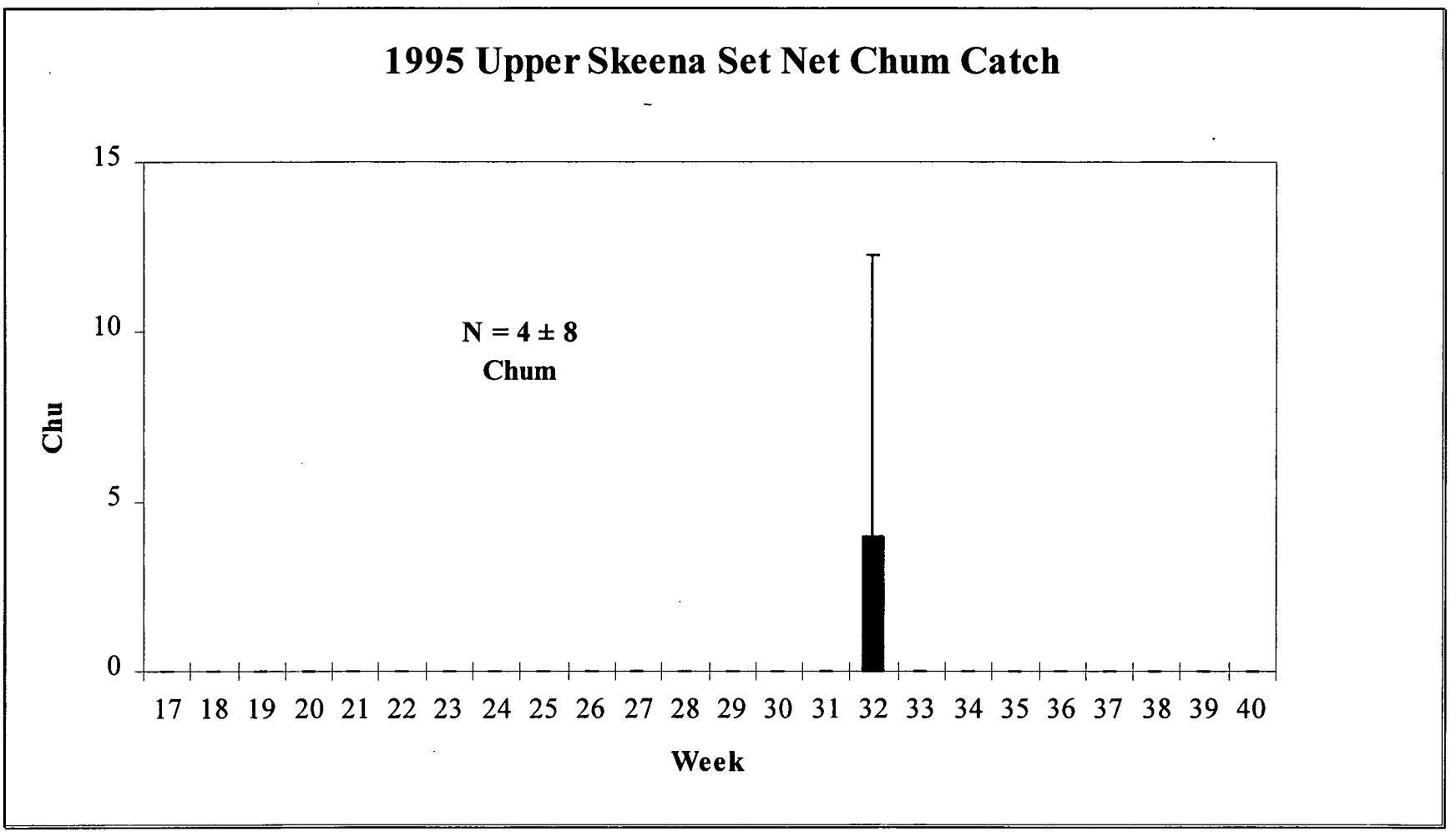


FIGURE 13. 1995 UPPER SKEENA RIVER SET GILL NET CHUM CATCH.

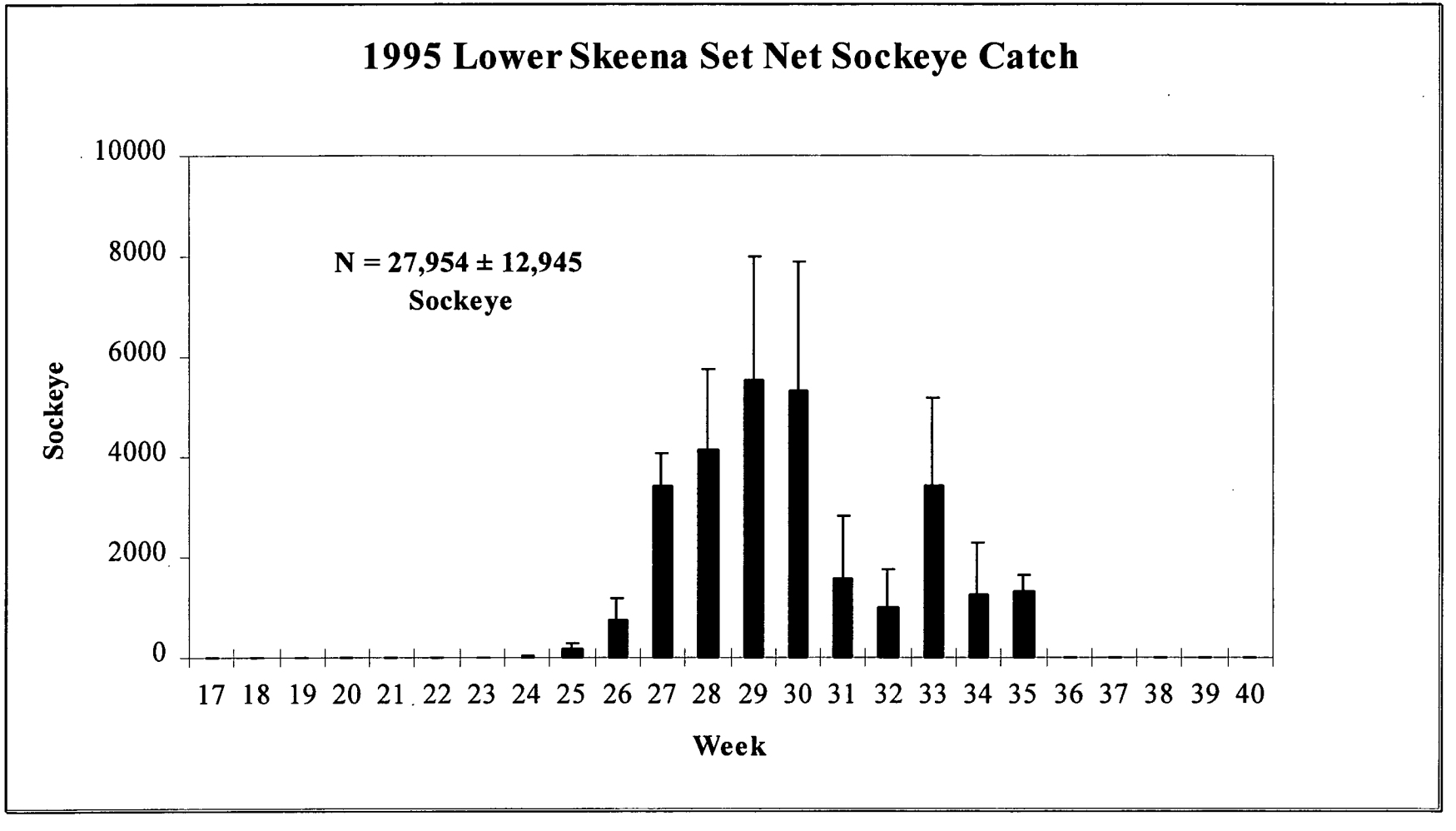


FIGURE 14. 1995 LOWER SKEENA RIVER SET GILL NET SOCKEYE CATCH.

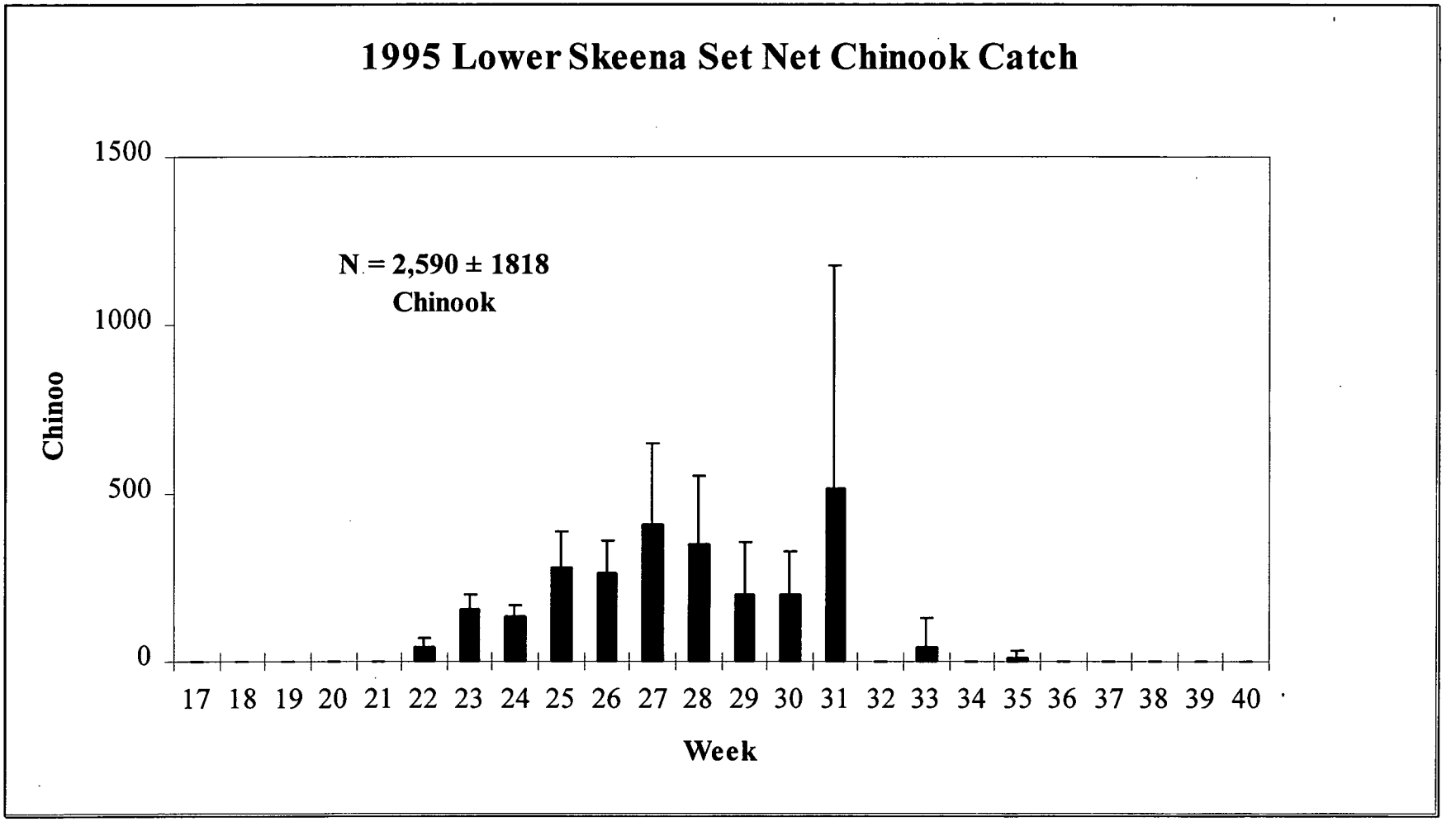


FIGURE 15. 1995 LOWER SKEENA RIVER SET GILL NET CHINOOK CATCH.

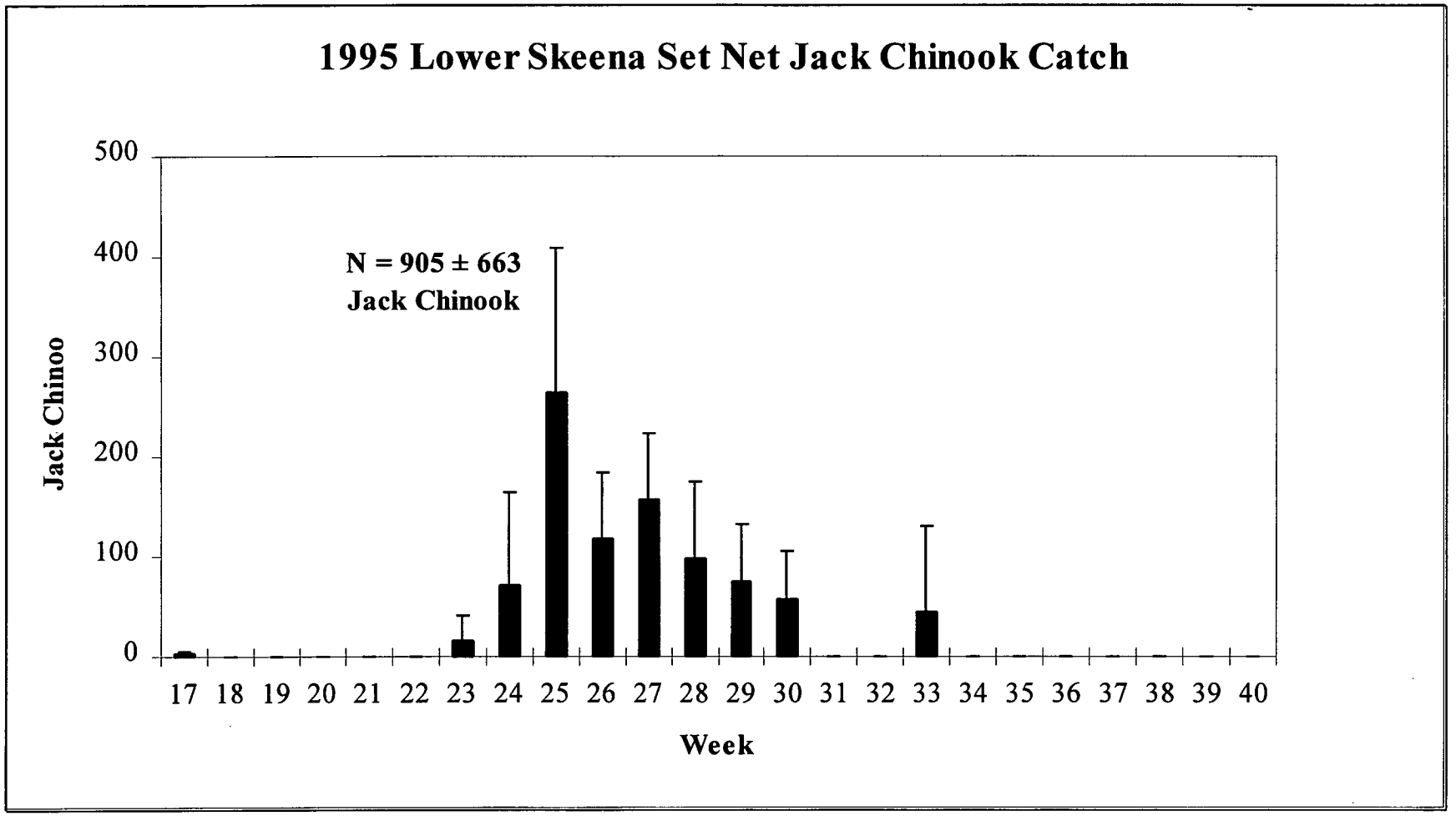


FIGURE 16. 1995 LOWER SKEENA RIVER SET GILL NET JACK CHINOOK CATCH.

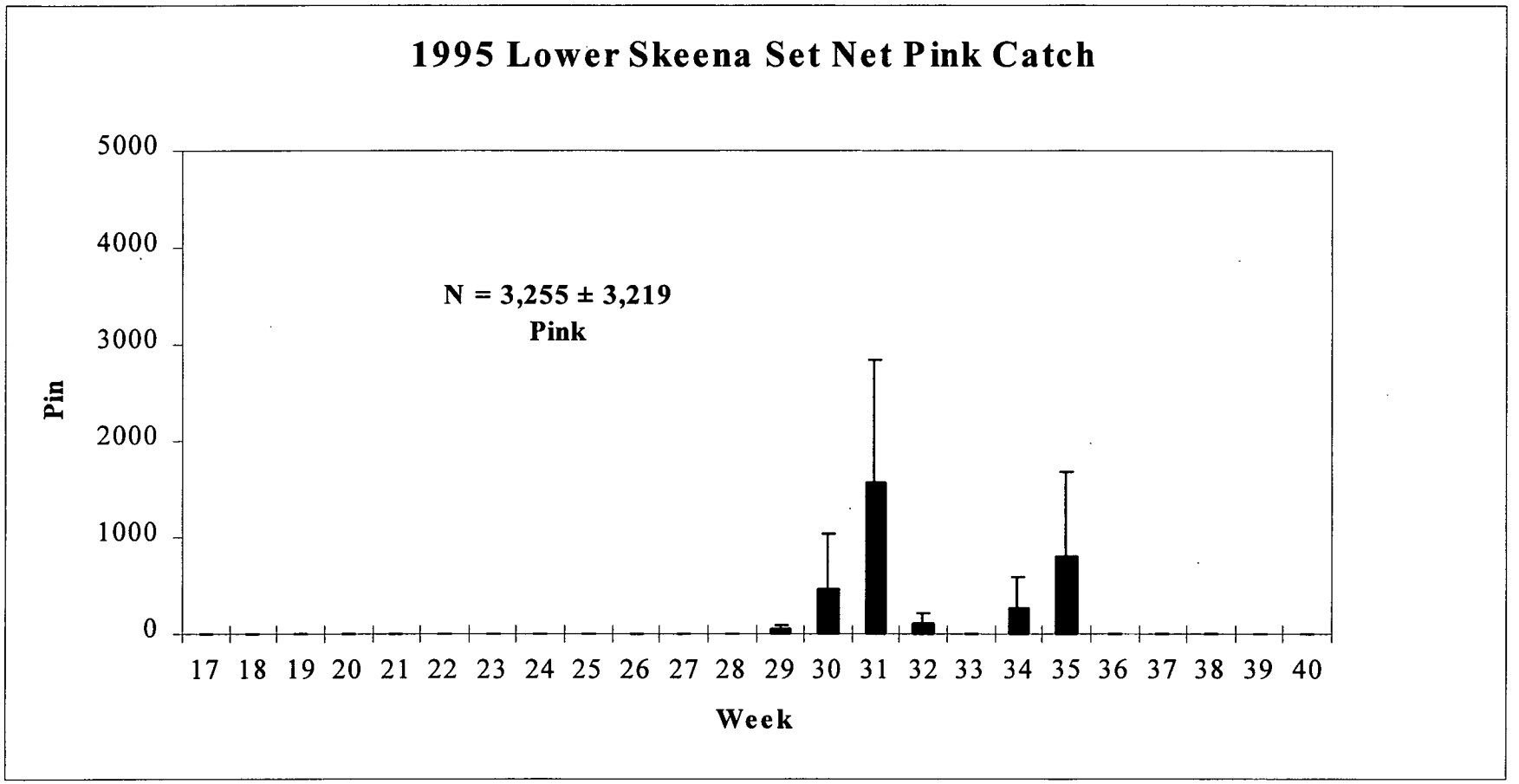


FIGURE 17. 1995 LOWER SKEENA RIVER SET GILL NET PINK CATCH.

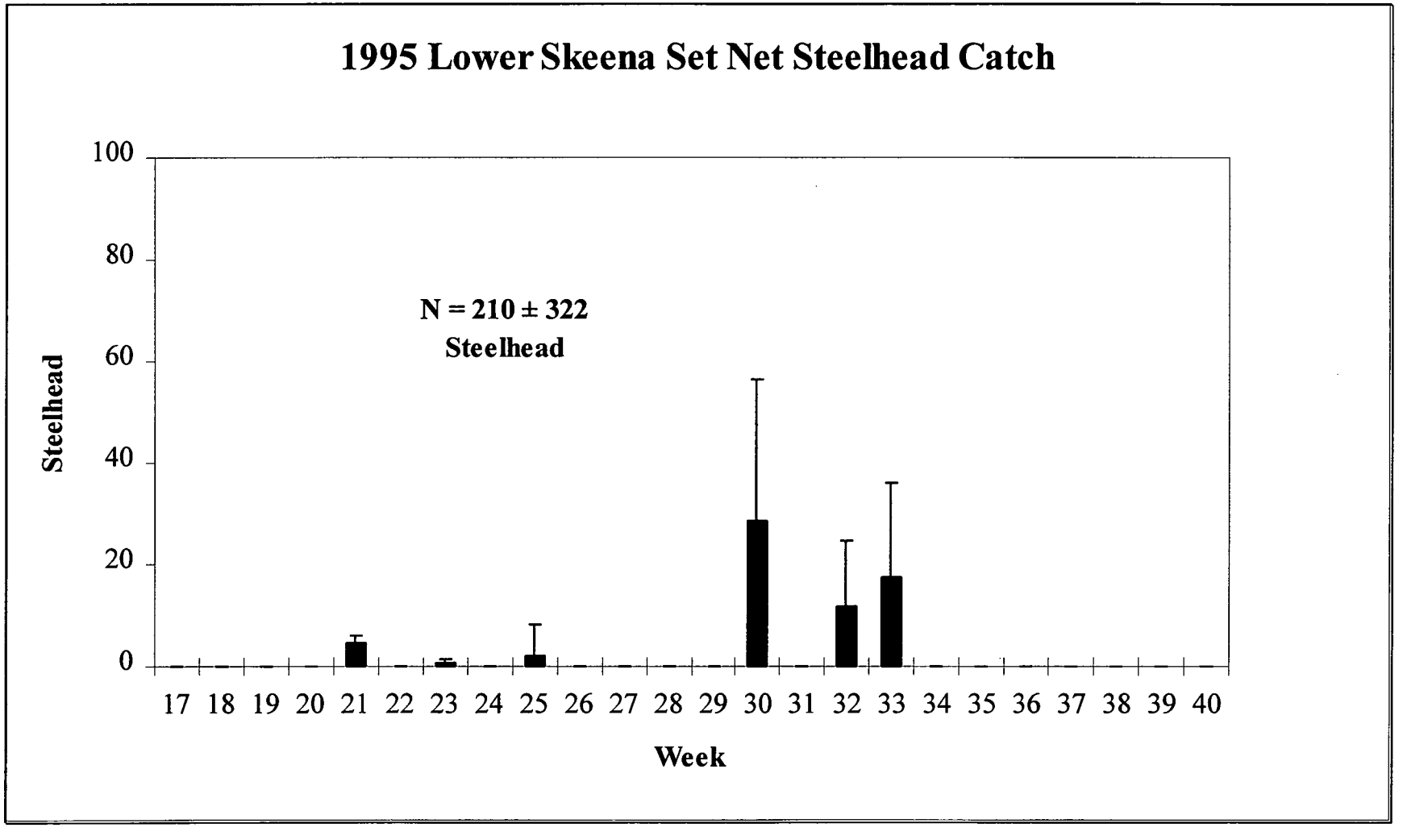


FIGURE 18. 1995 LOWER SKEENA RIVER SET GILL NET STEELHEAD CATCH.

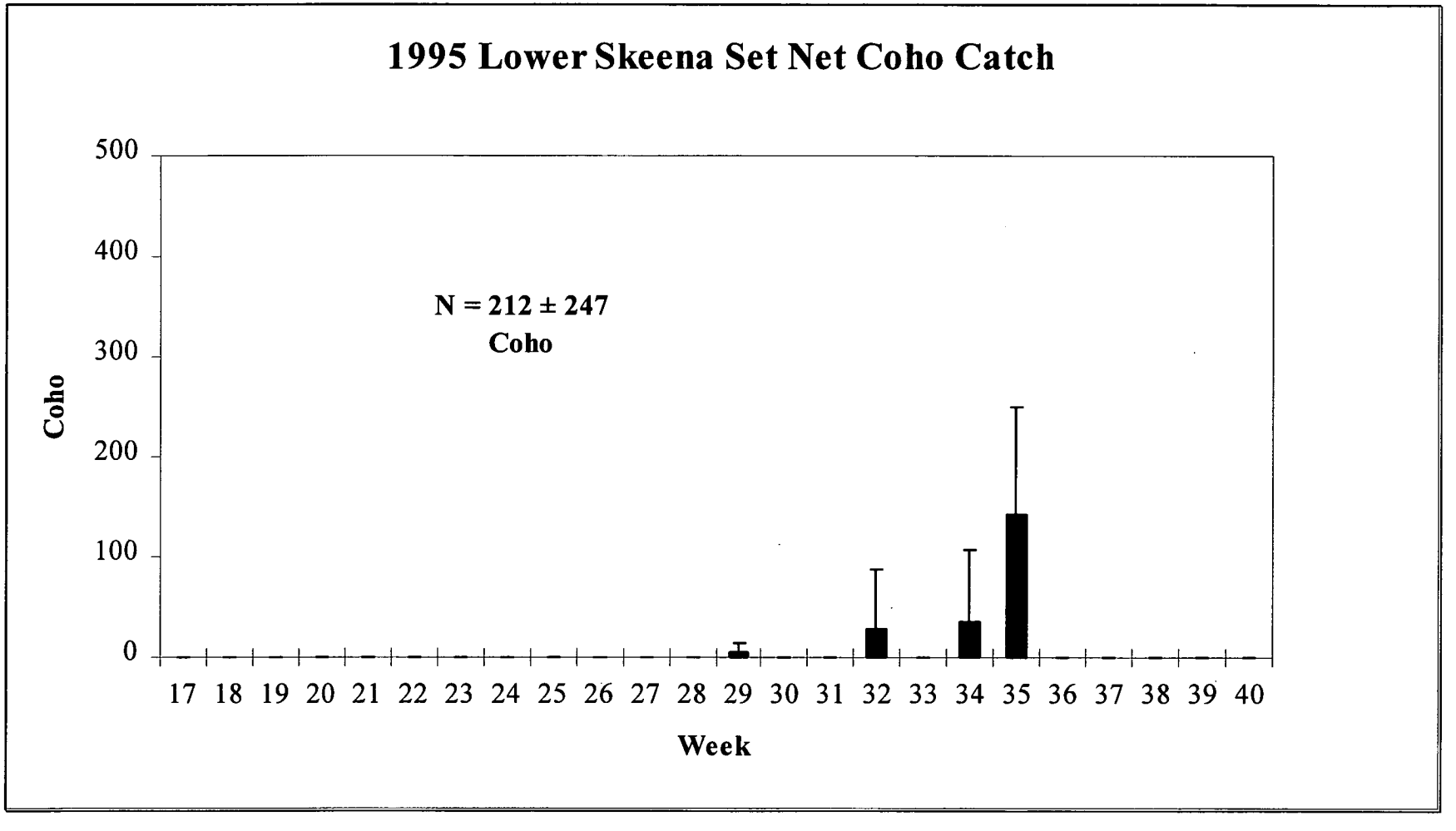


FIGURE 19. 1995 LOWER SKEENA RIVER SET GILL NET COHO CATCH.

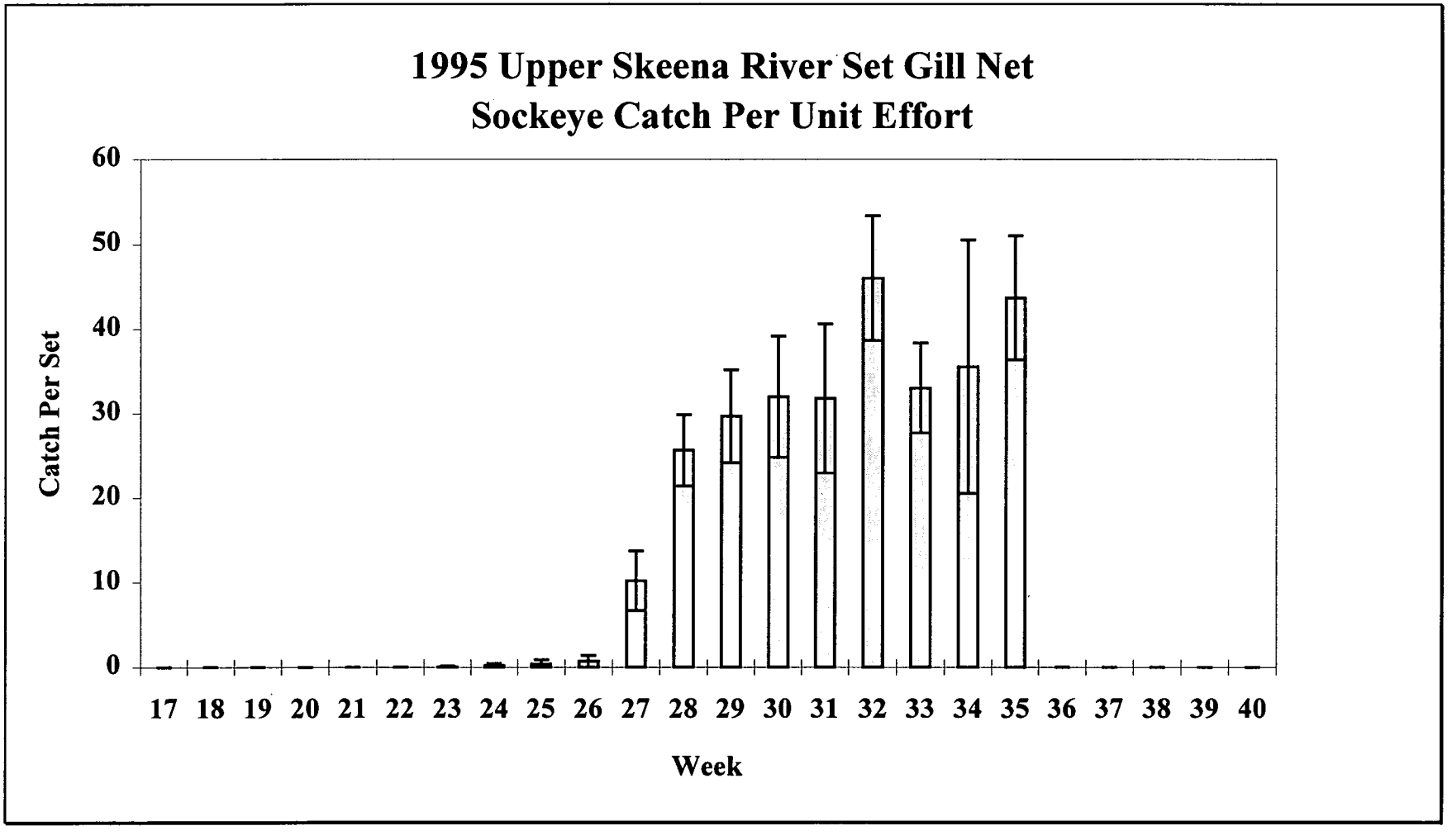


FIGURE 20. 1995 UPPER SKEENA RIVER SET GILL NET SOCKEYE CPUE.

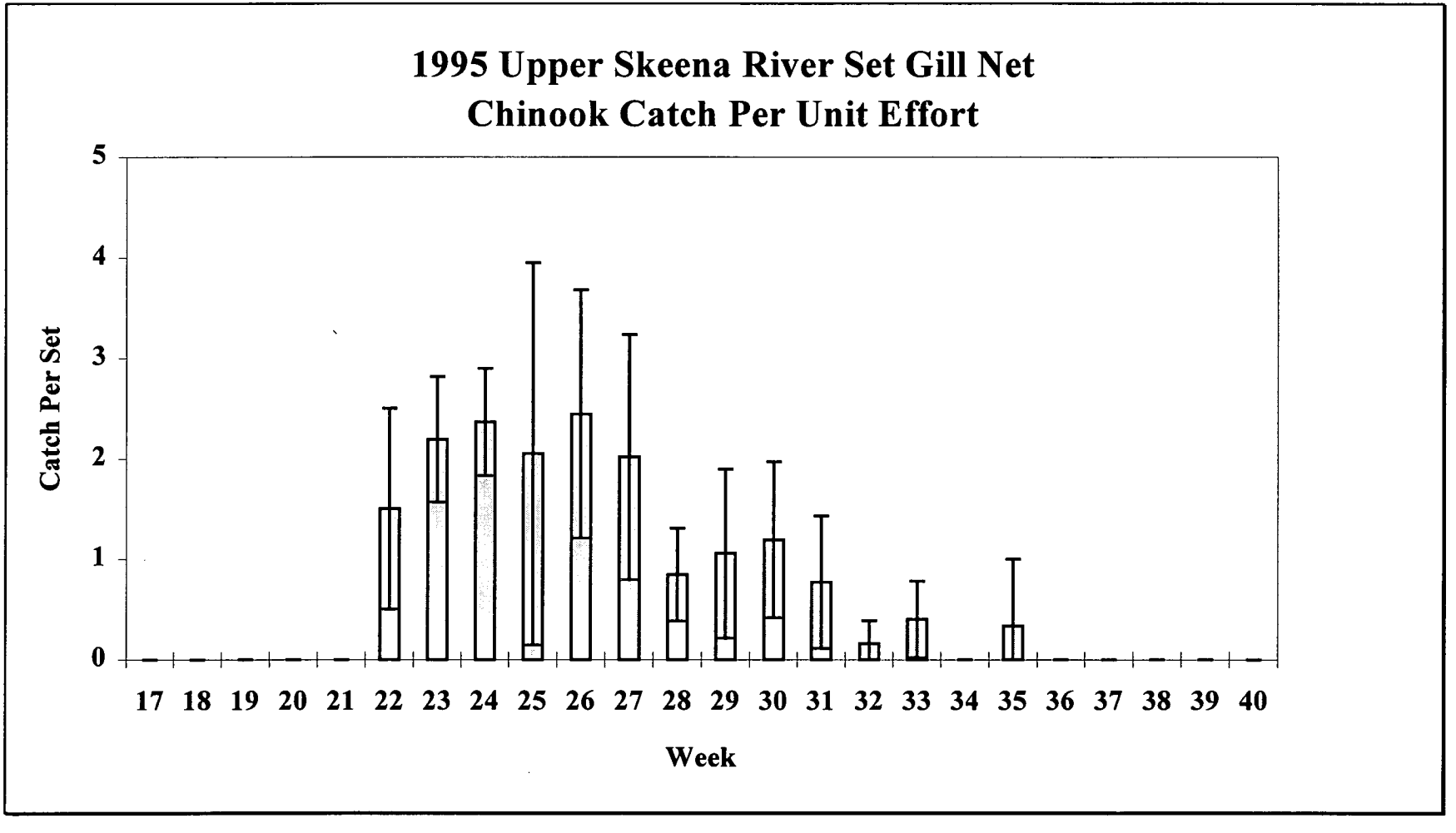


FIGURE 21. 1995 UPPER SKEENA RIVER SET GILL NET CHINOOK CPUE.

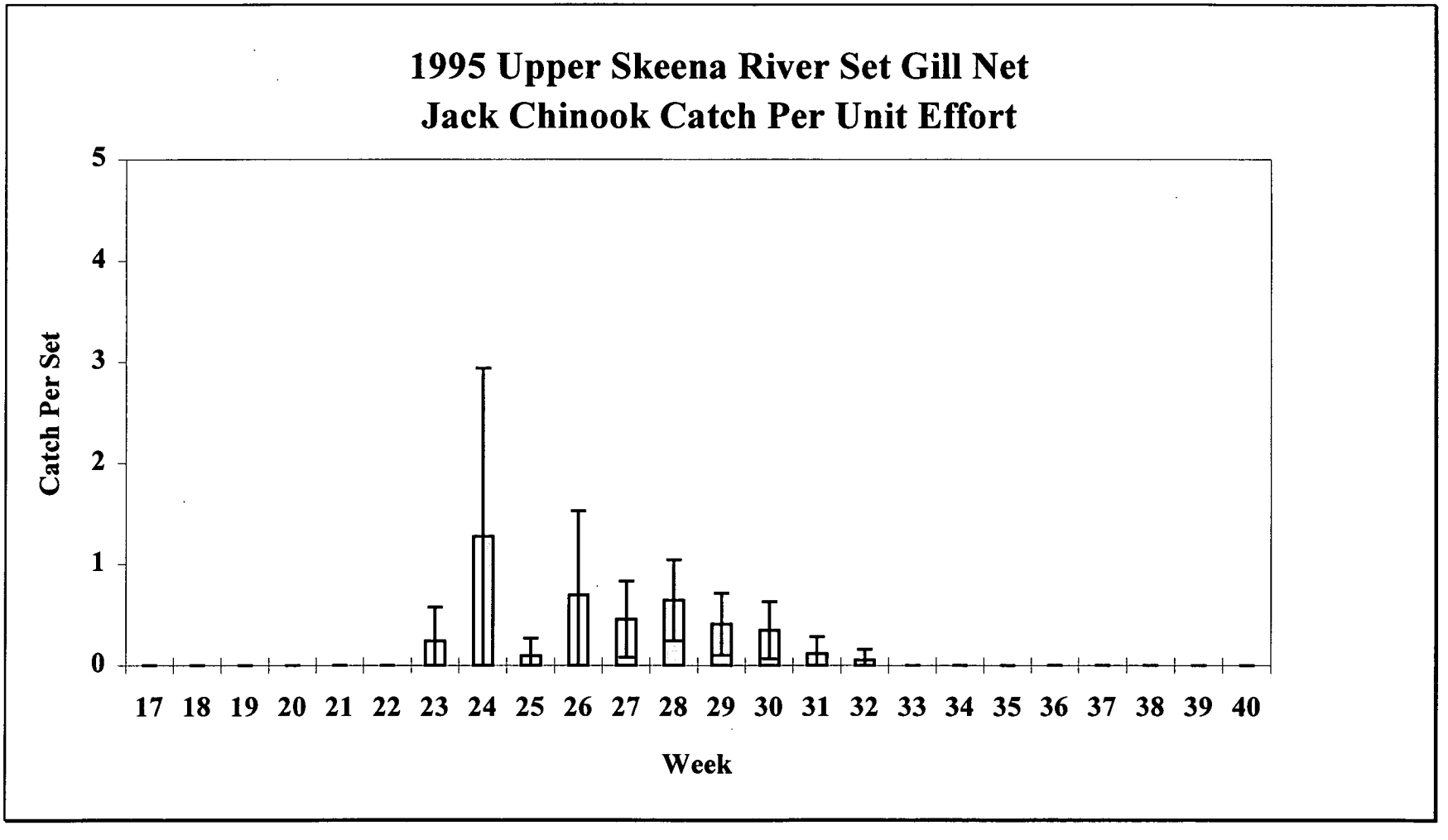


FIGURE 22. 1995 UPPER SKEENA RIVER SET GILL NET JACK CHINOOK CPUE.

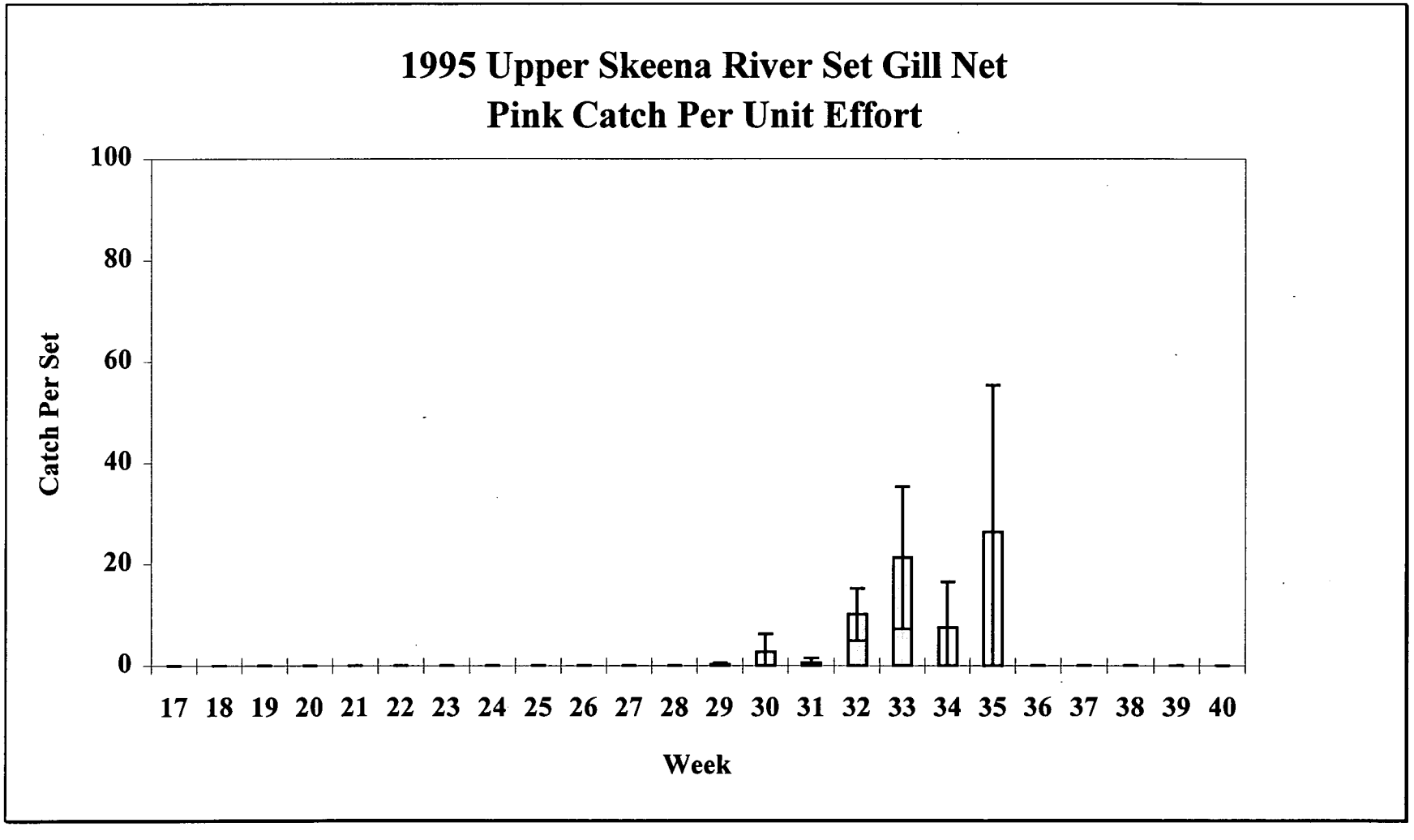


FIGURE 23. 1995 UPPER SKEENA RIVER SET GILL NET PINK CPUE.

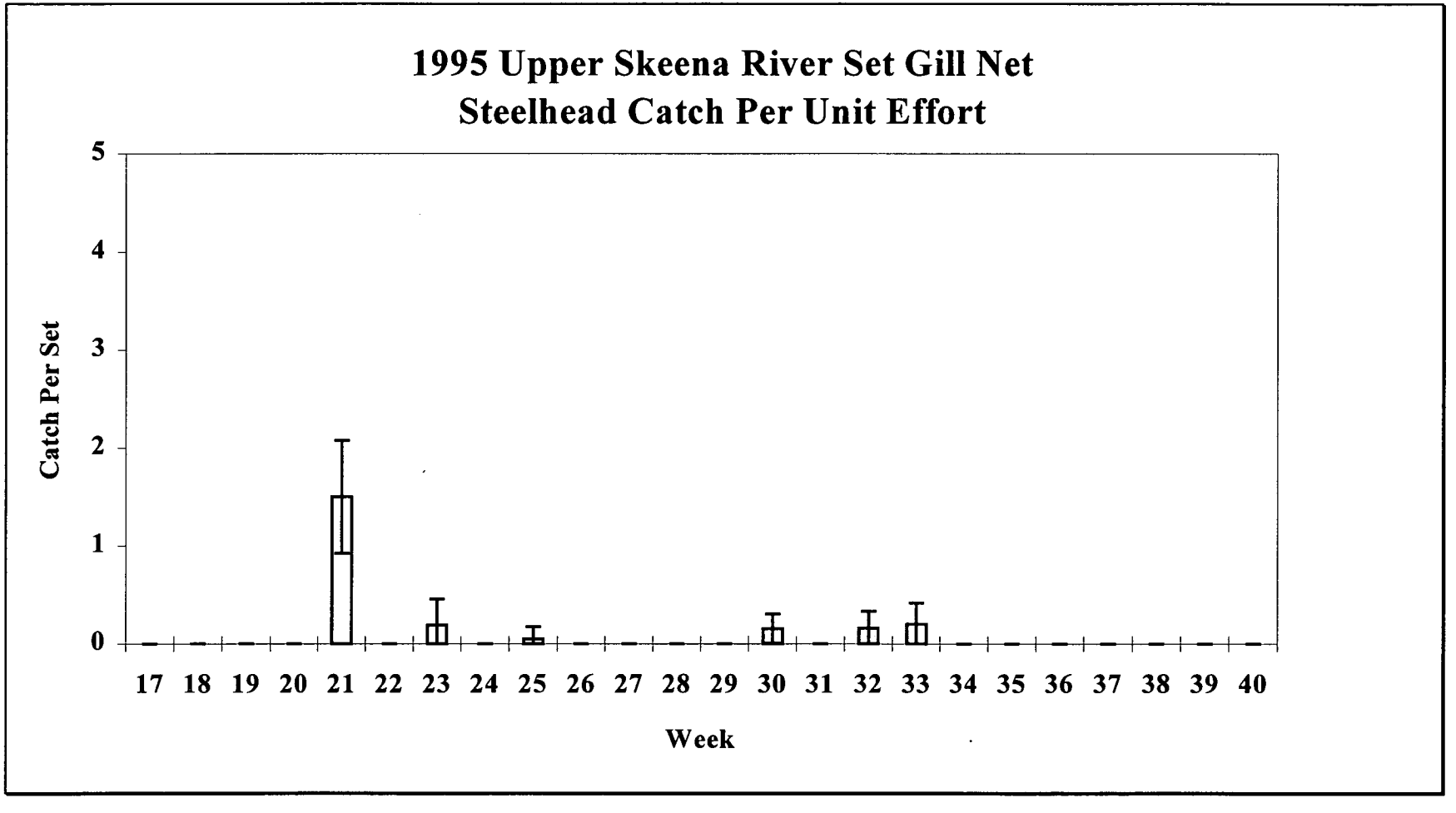


FIGURE 24. 1995 UPPER SKEENA RIVER SET GILL NET STEELHEAD CPUE.

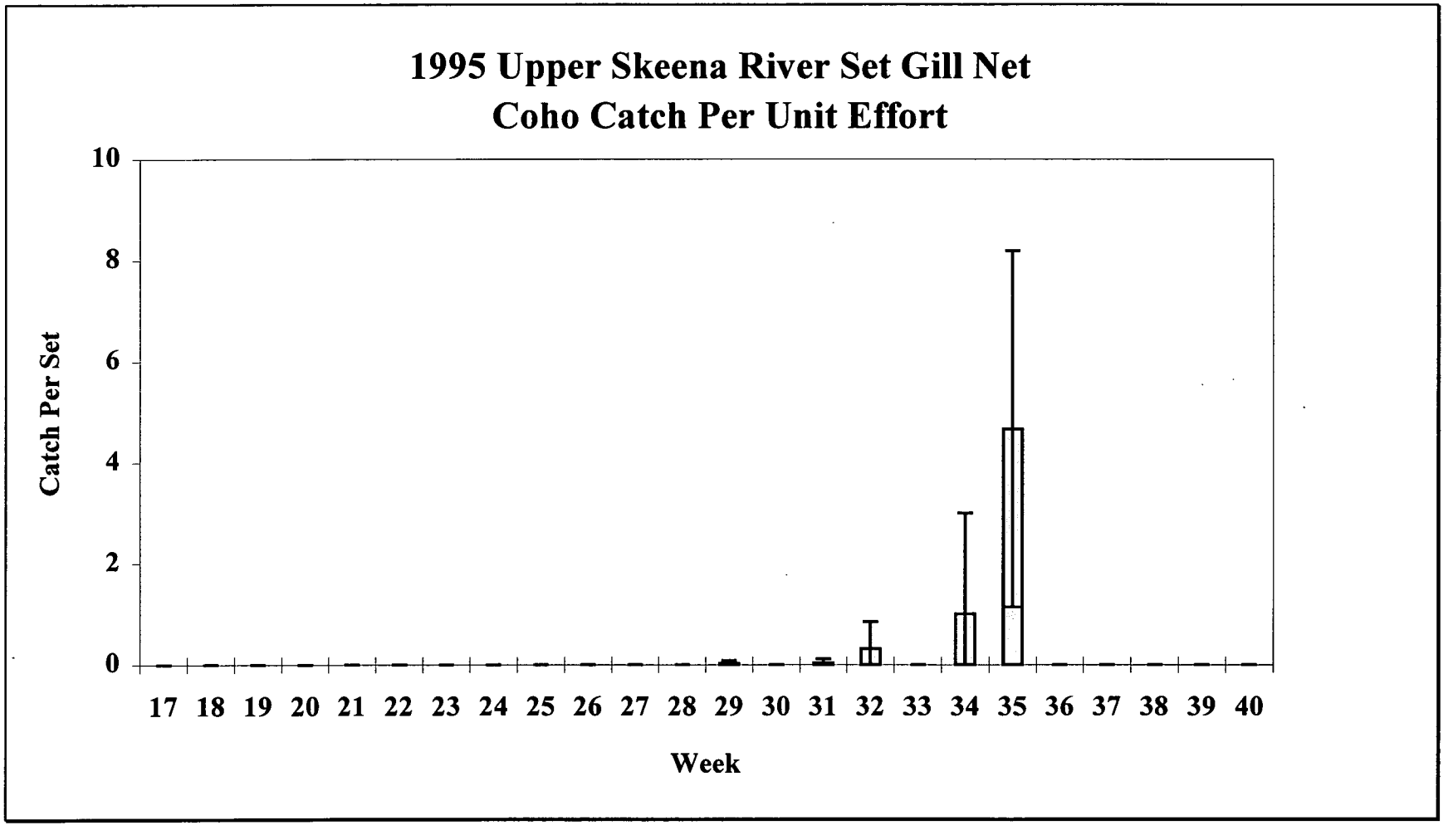


FIGURE 25. 1995 UPPER SKEENA RIVER SET GILL NET COHO CPUE.

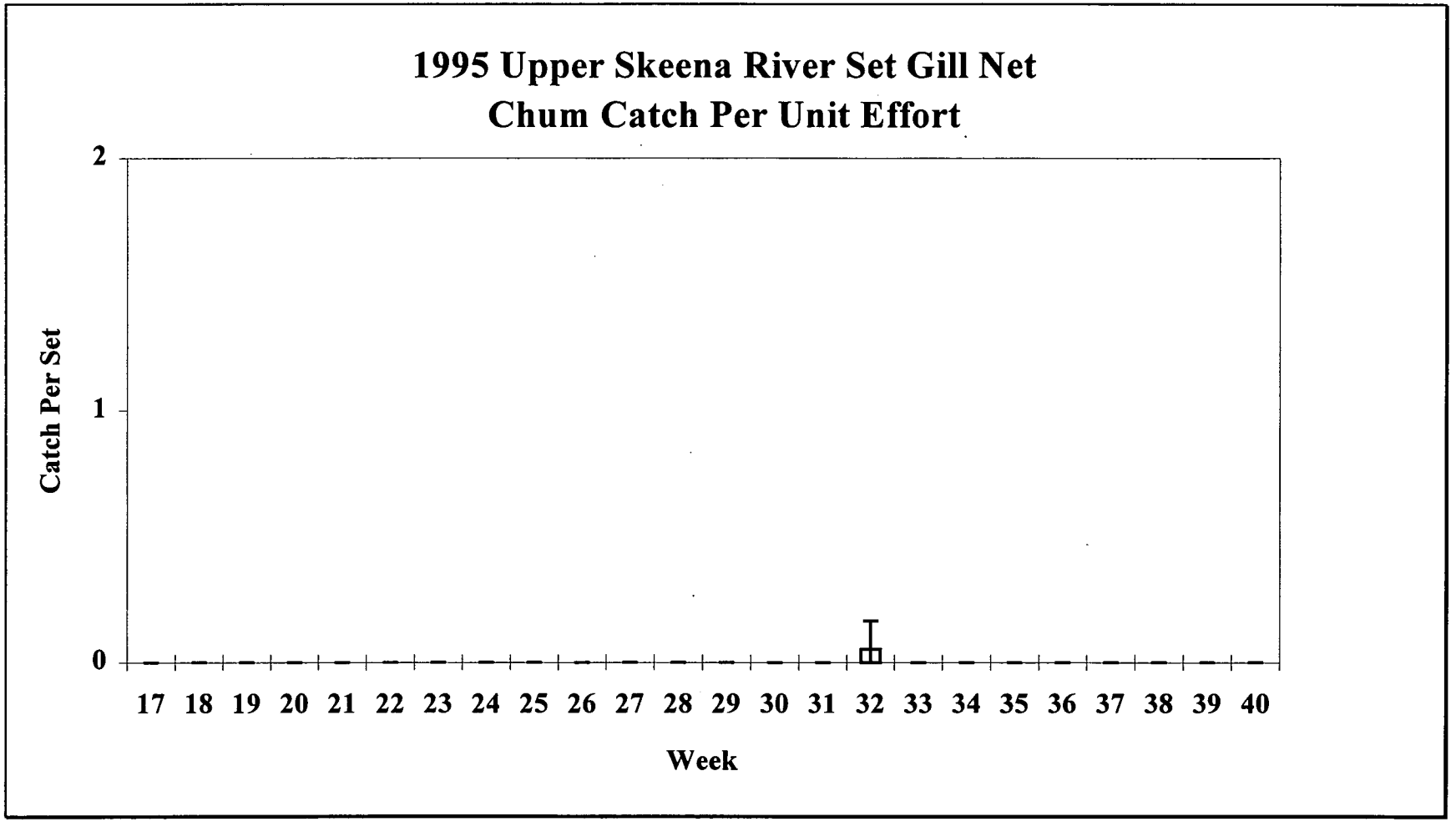


FIGURE 26. 1995 UPPER SKEENA RIVER SET GILL NET CHUM CPUE.

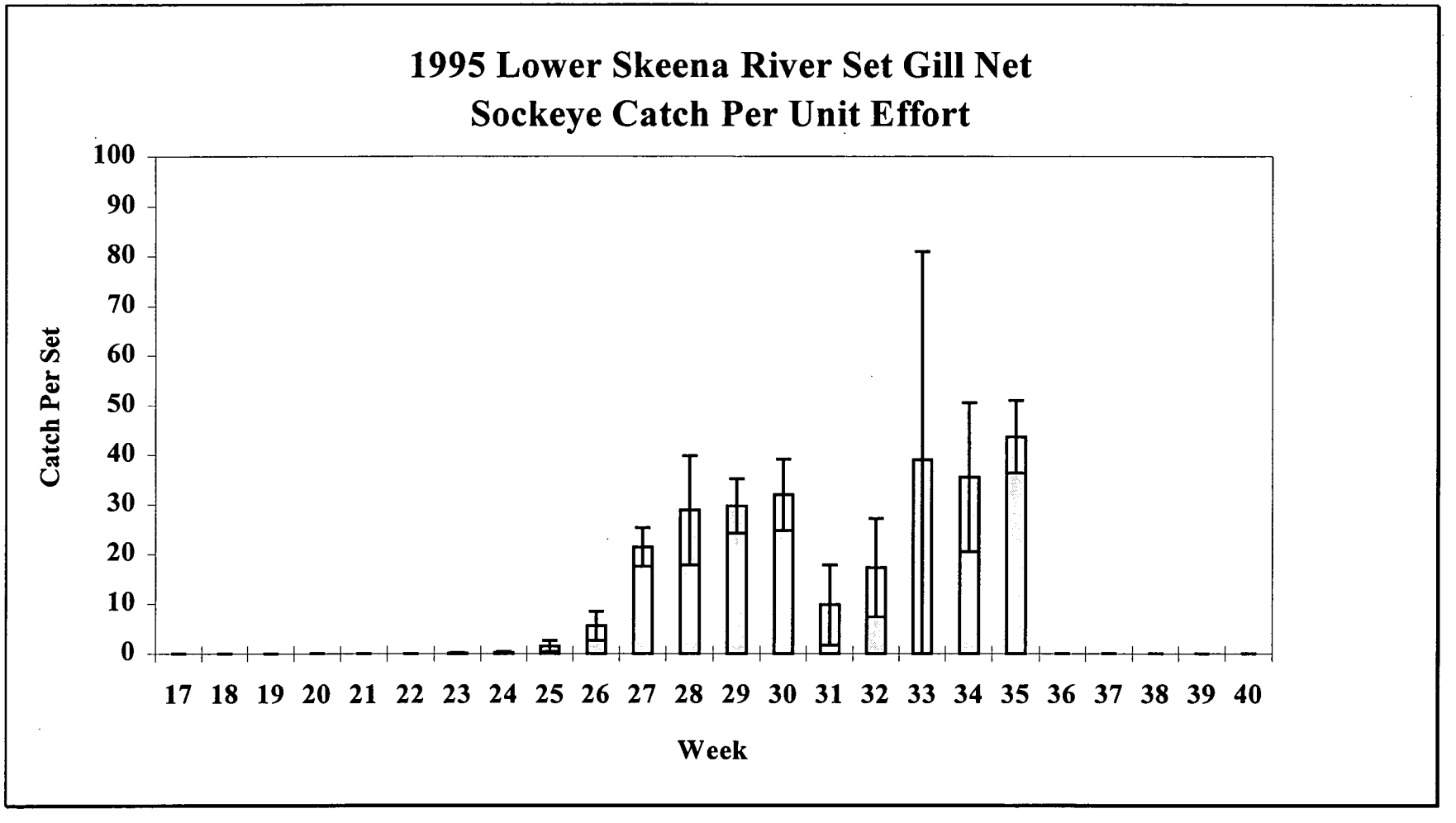


FIGURE 27. 1995 LOWER SKEENA RIVER SET GILL NET SOCKEYE CPUE.

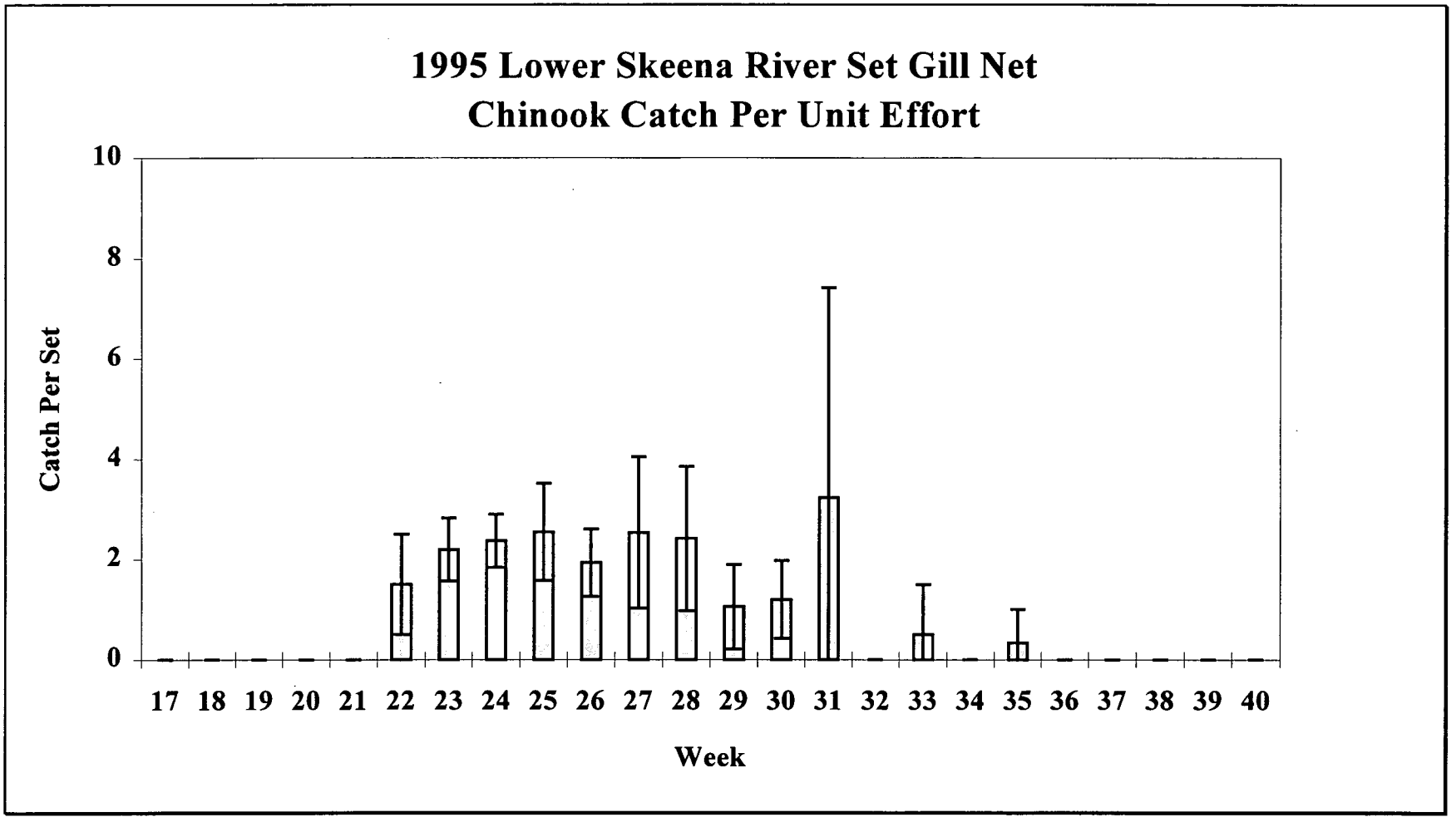


FIGURE 28. 1995 LOWER SKEENA RIVER SET GILL NET CHINOOK CPUE.

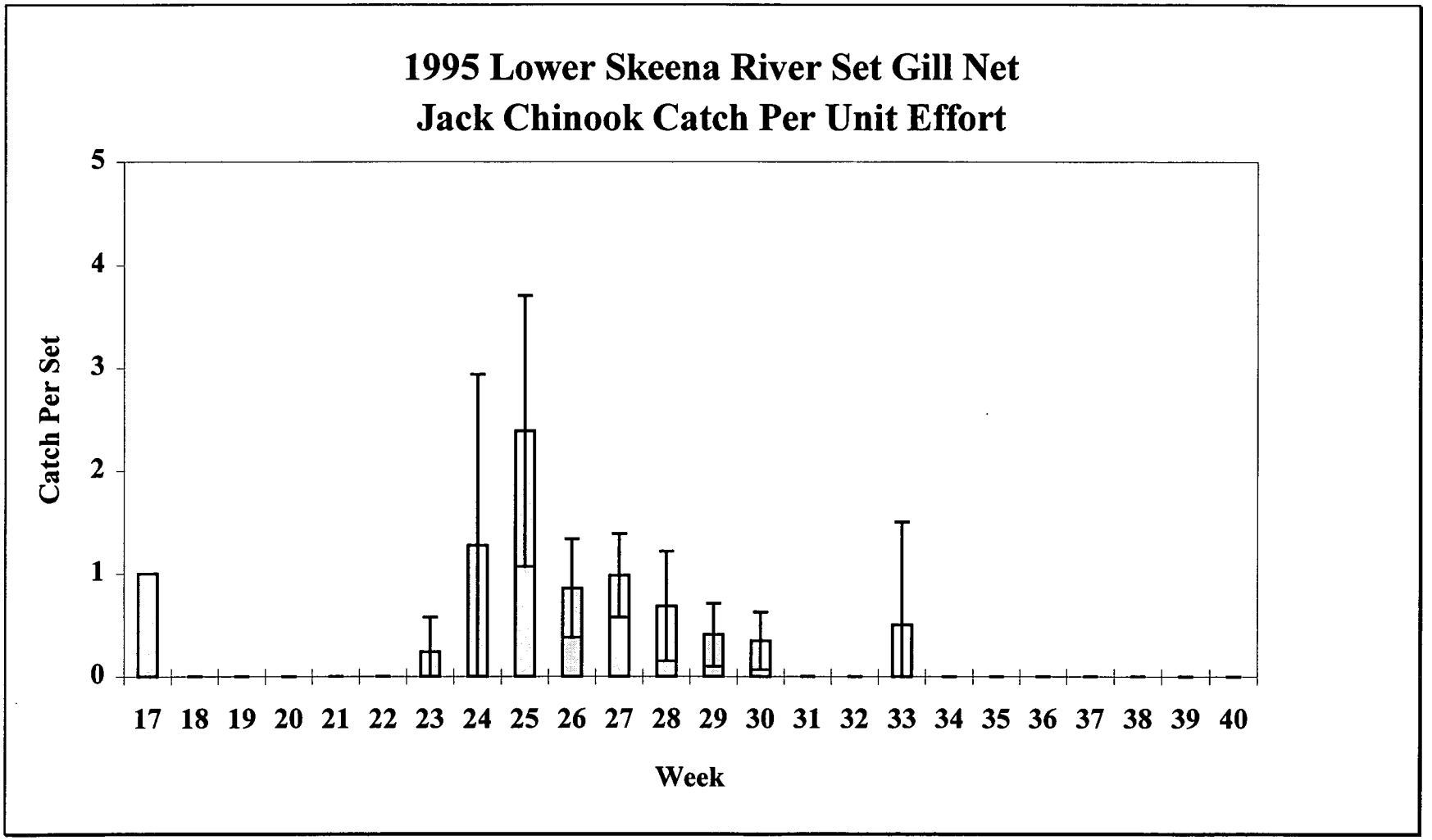


FIGURE 29. 1995 LOWER SKEENA RIVER SET GILL NET JACK CHINOOK CPUE.

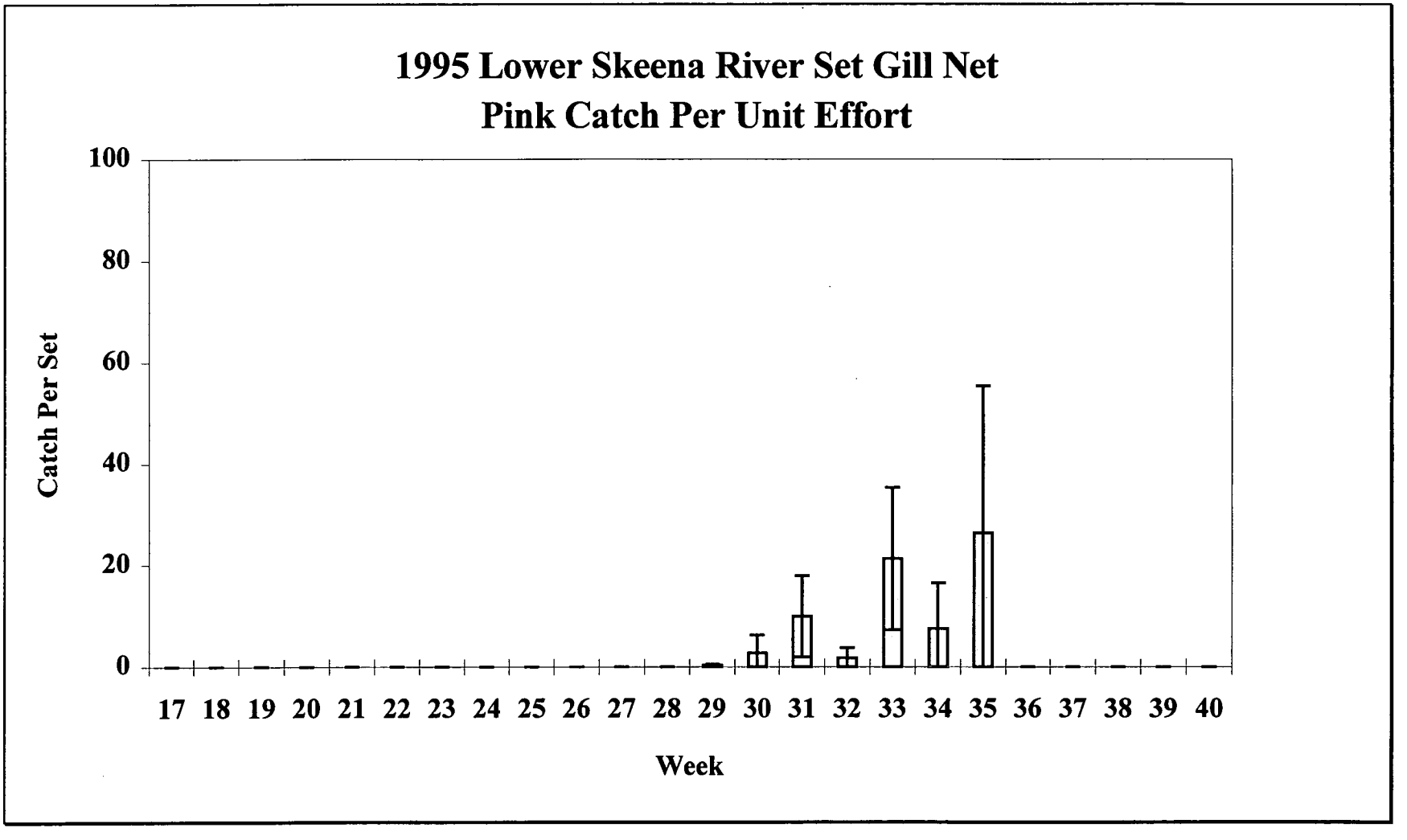


FIGURE 30. 1995 LOWER SKEENA RIVER SET GILL NET PINK CPUE.

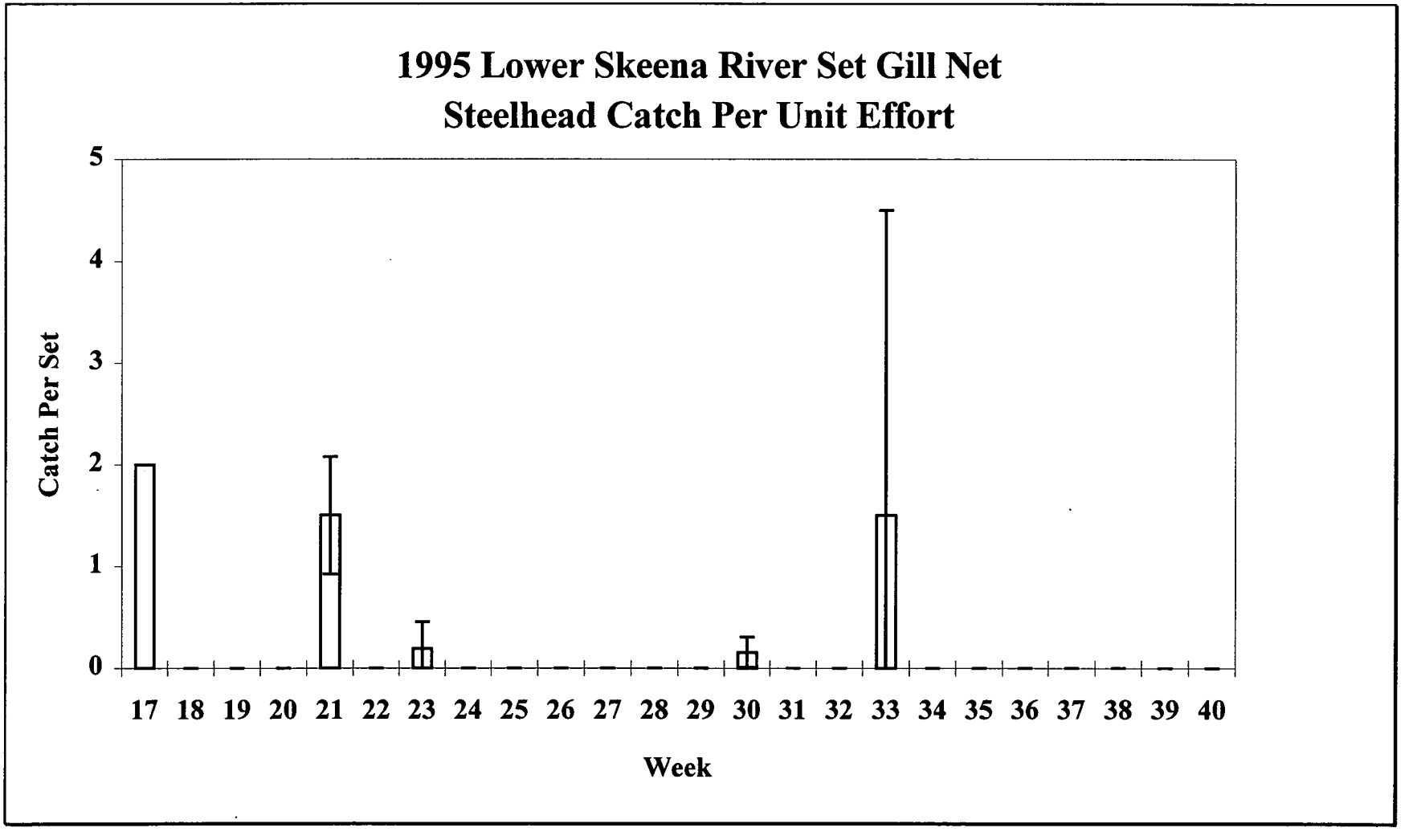


FIGURE 31. 1995 LOWER SKEENA RIVER SET GILL NET STEELHEAD CPUE.

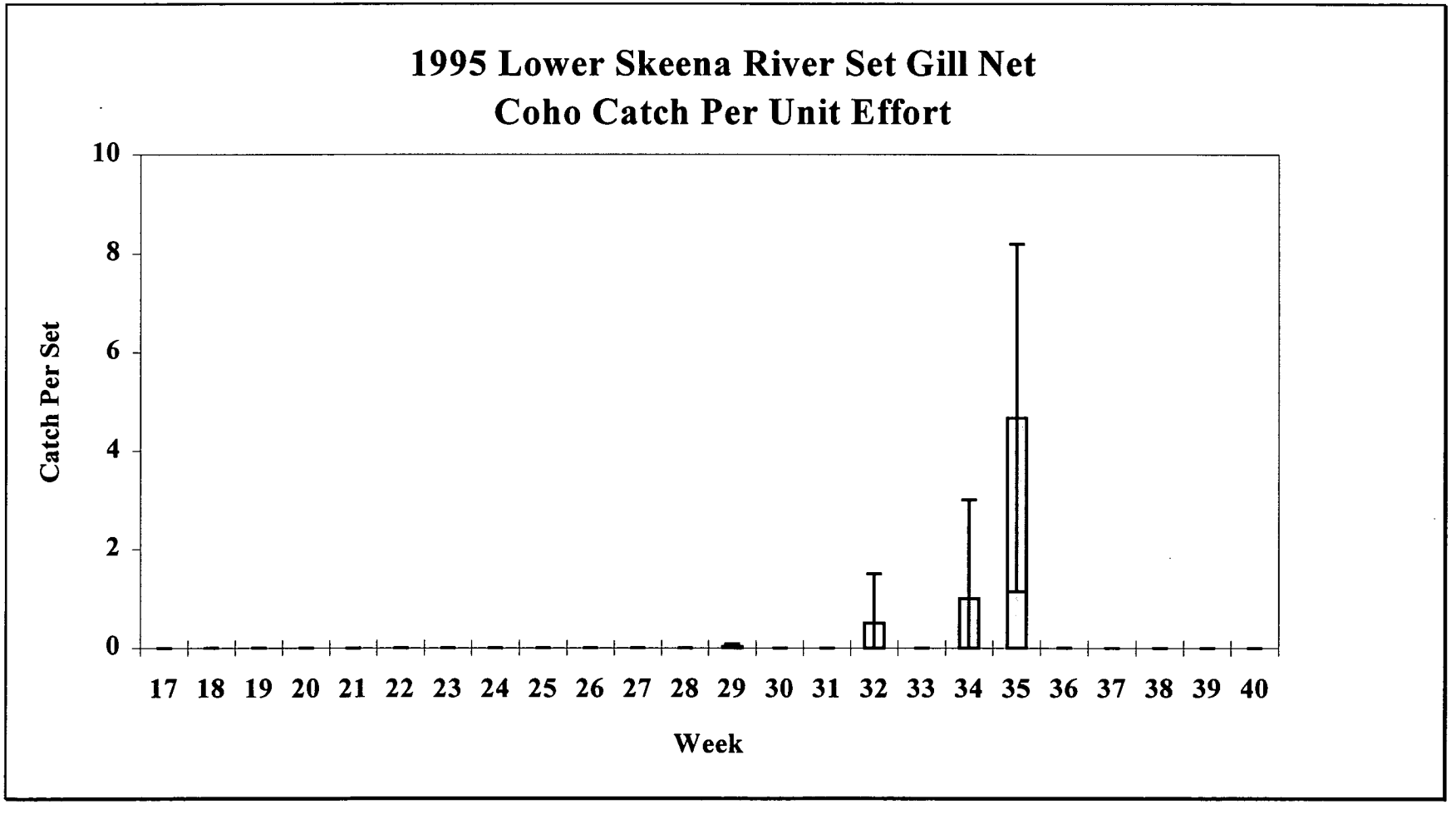


FIGURE 32. 1995 LOWER SKEENA RIVER SET GILL NET COHO CPUE.

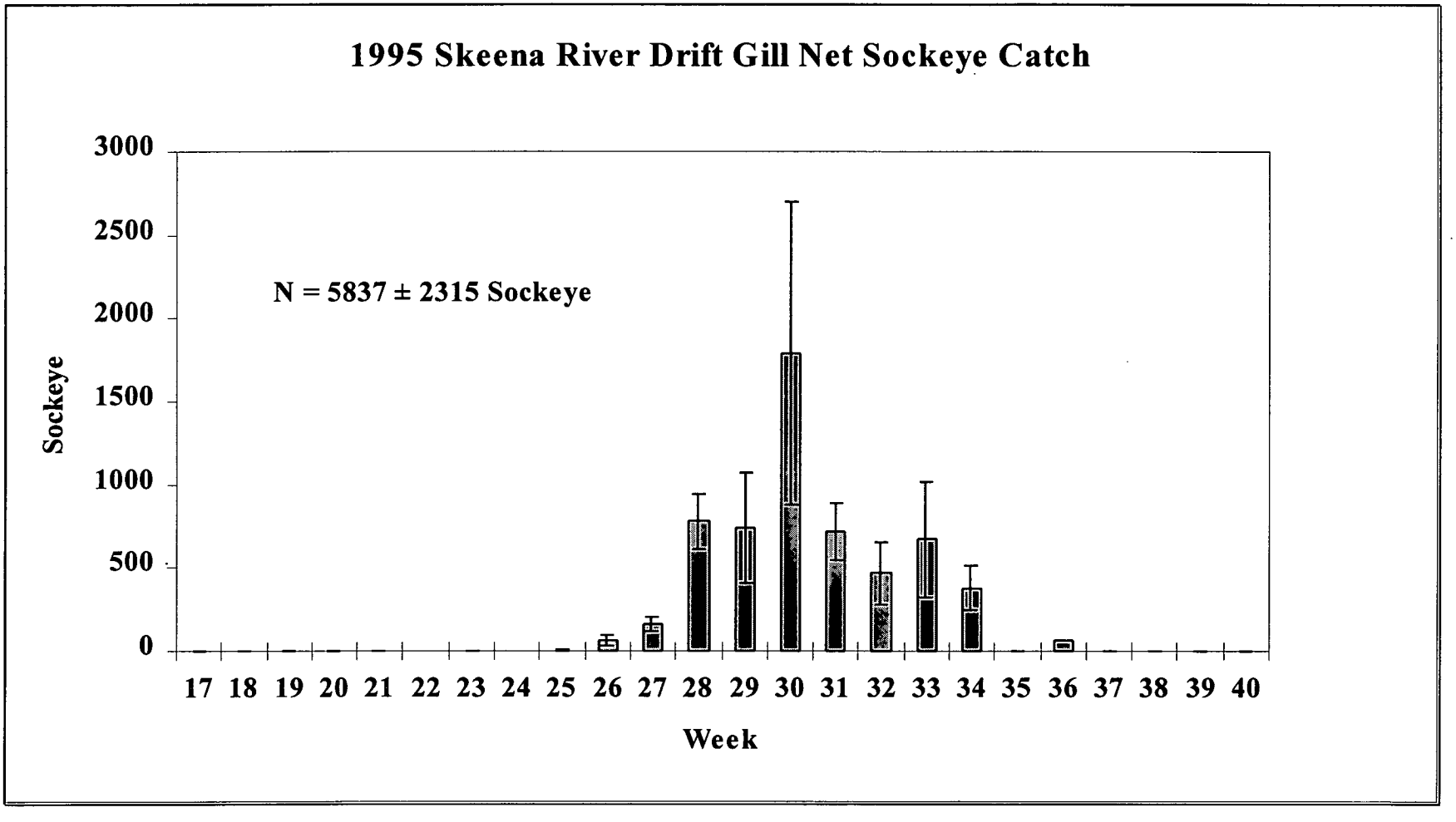


FIGURE 33. 1995 SKEENA RIVER DRIFT GILL NET SOCKEYE CATCH.

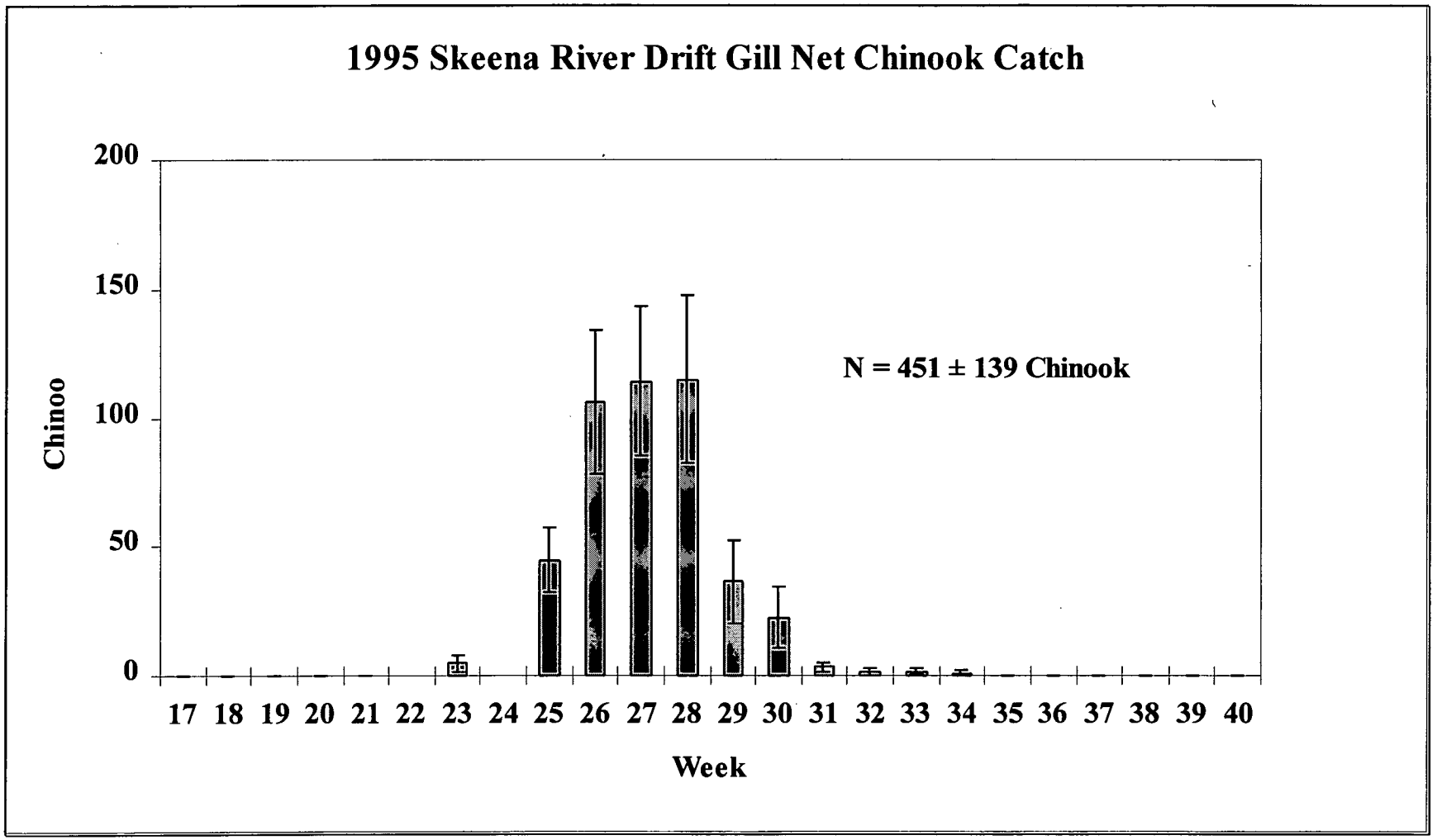


FIGURE 34. 1995 SKEENA RIVER DRIFT GILL NET CHINOOK CATCH.

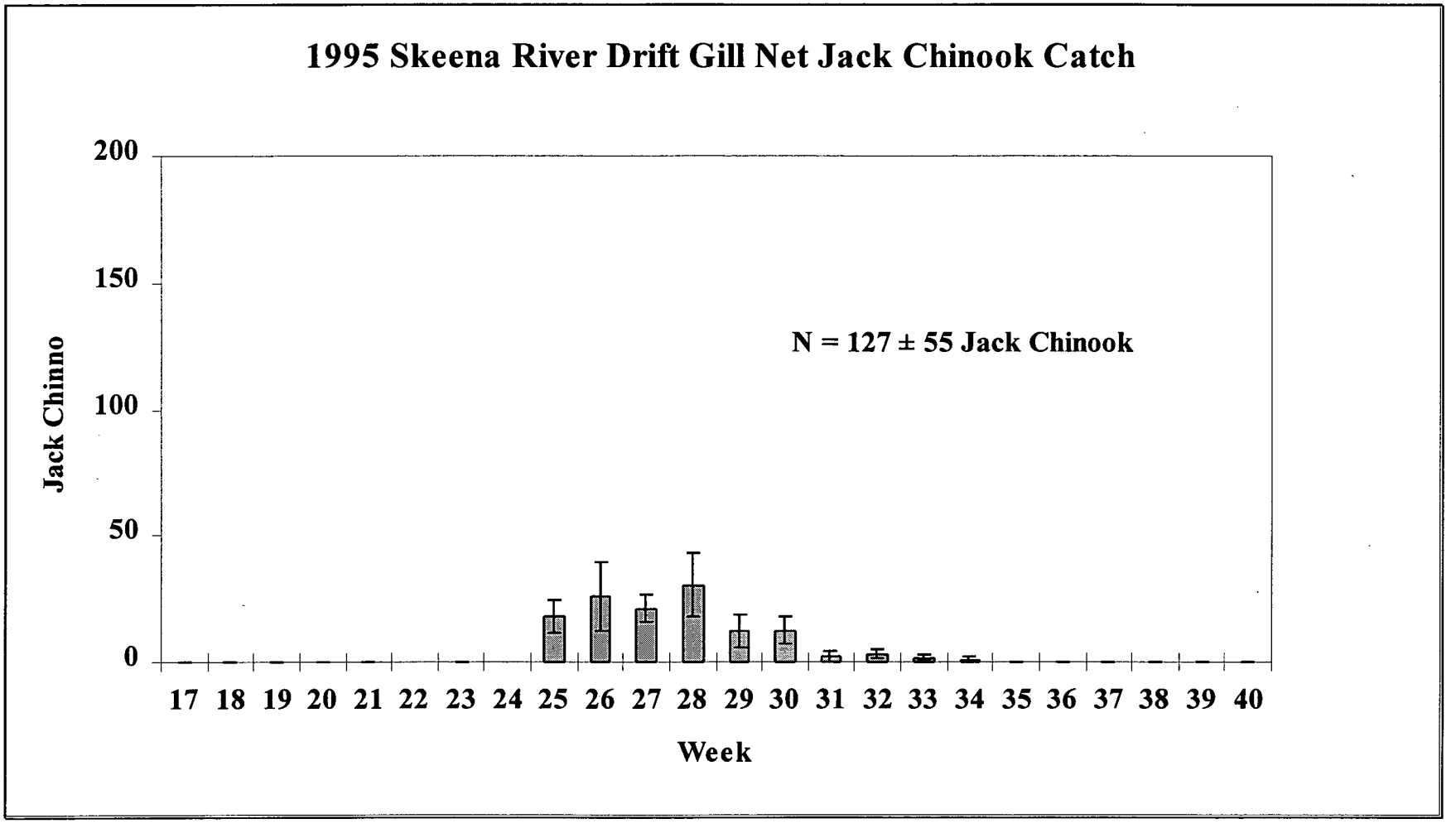


FIGURE 35. 1995 SKEENA RIVER DRIFT GILL NET JACK CHINOOK CATCH.

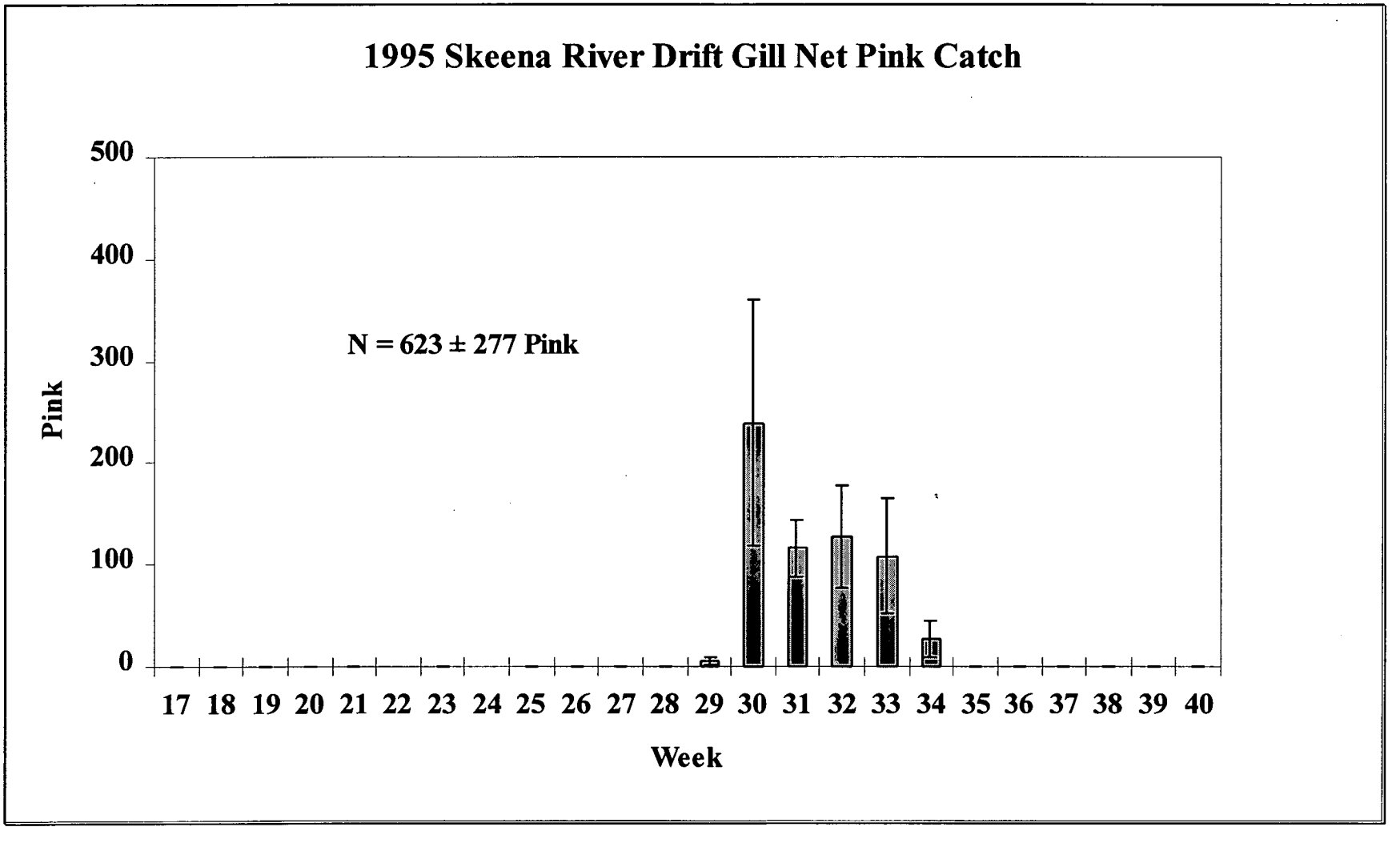


FIGURE 36. 1995 SKEENA RIVER DRIFT GILL NET PINK CATCH.

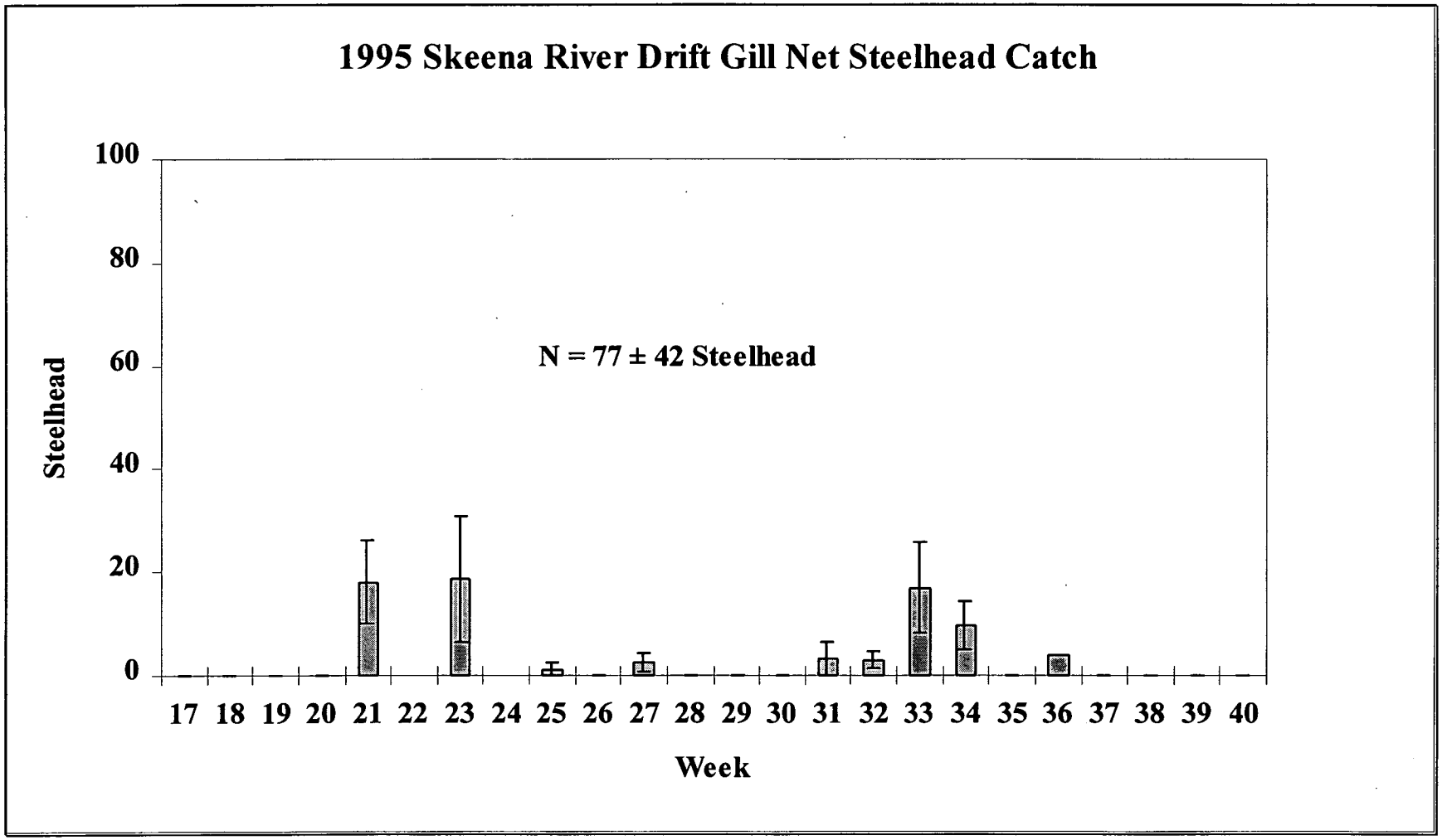


FIGURE 37. 1995 SKEENA RIVER DRIFT GILL NET STEELHEAD CATCH.

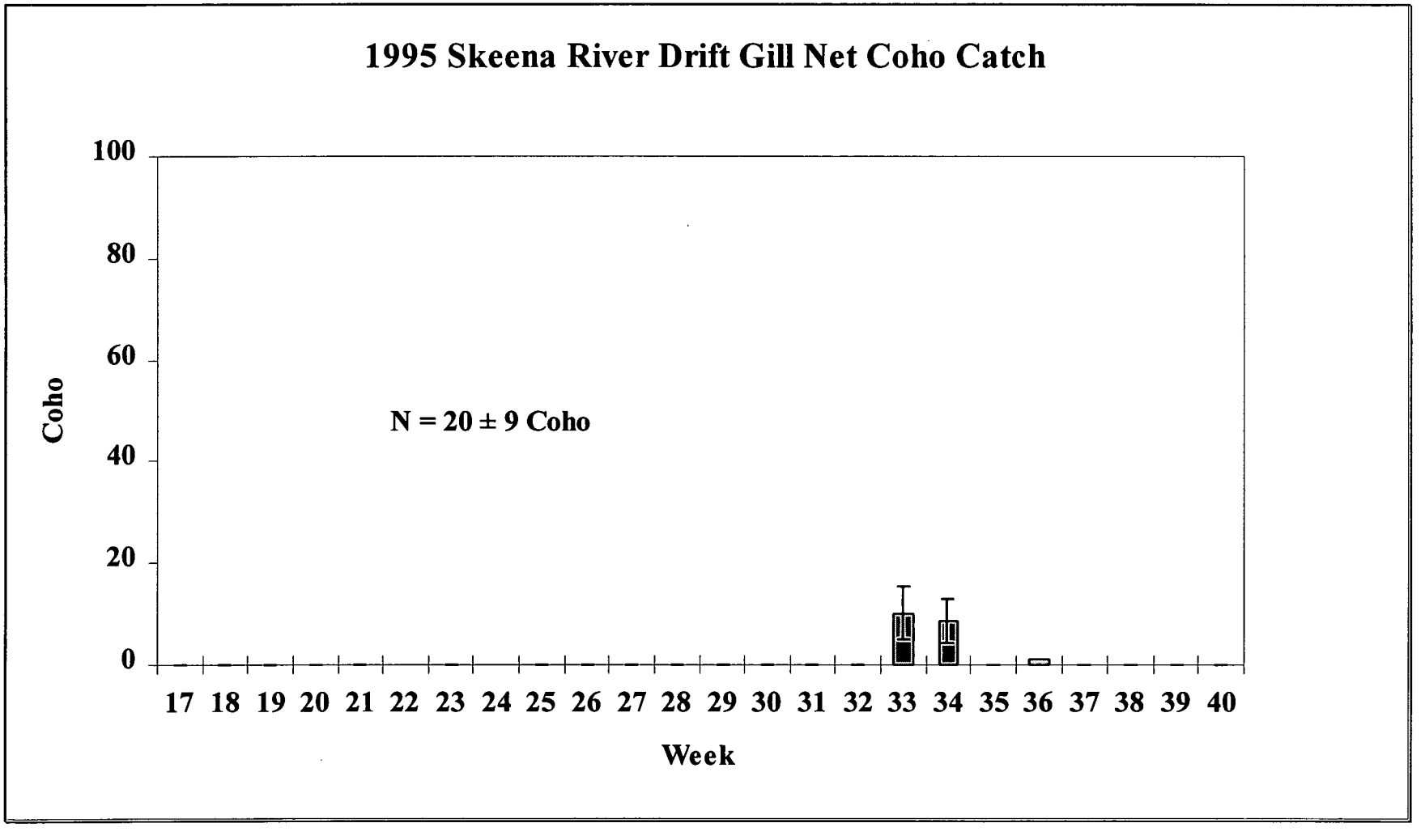


FIGURE 38. 1995 SKEENA RIVER DRIFT GILL NET COHO CATCH.

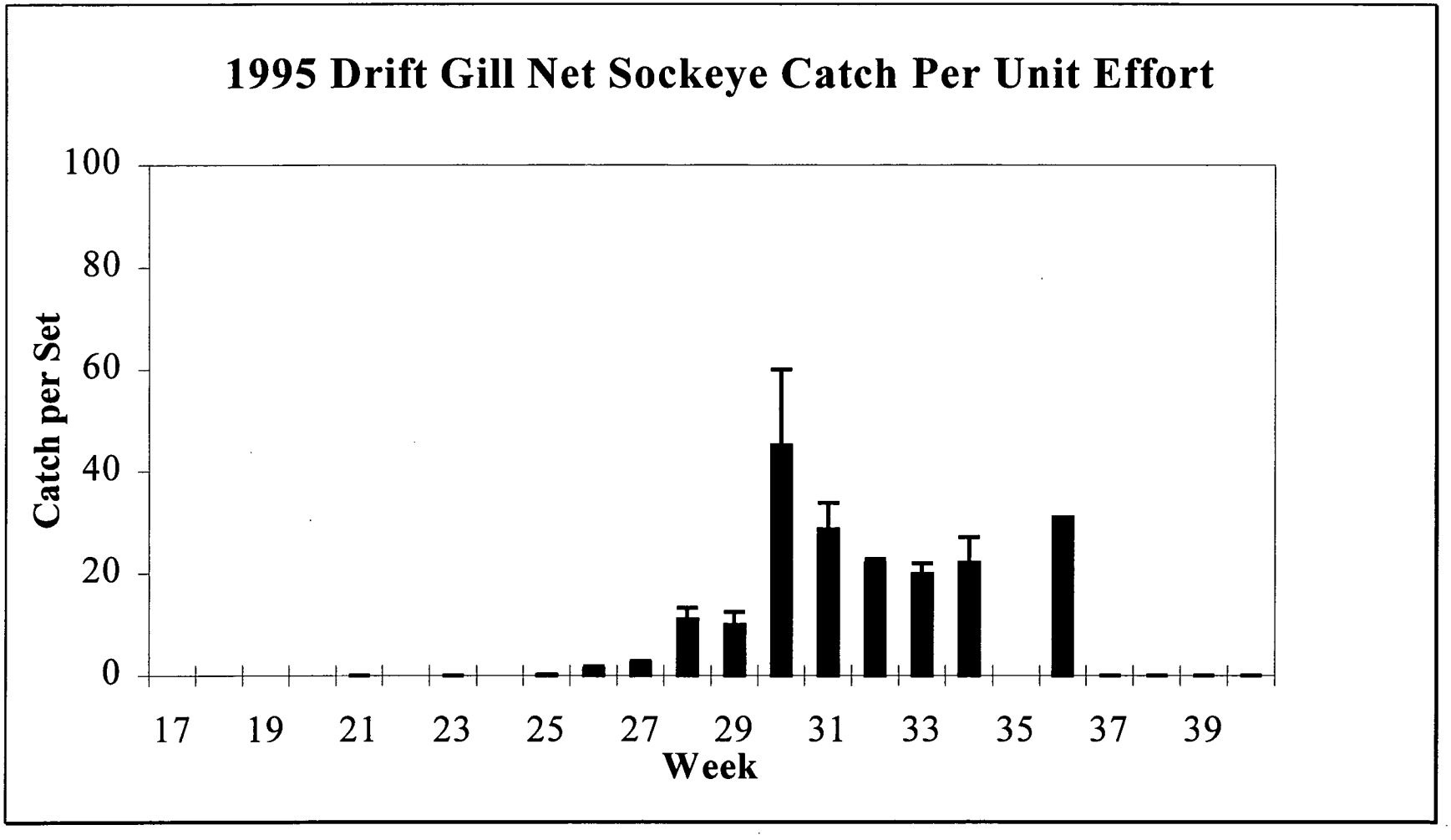


FIGURE 39. 1995 SKEENA RIVER DRIFT GILL NET SOCKEYE CPUE.

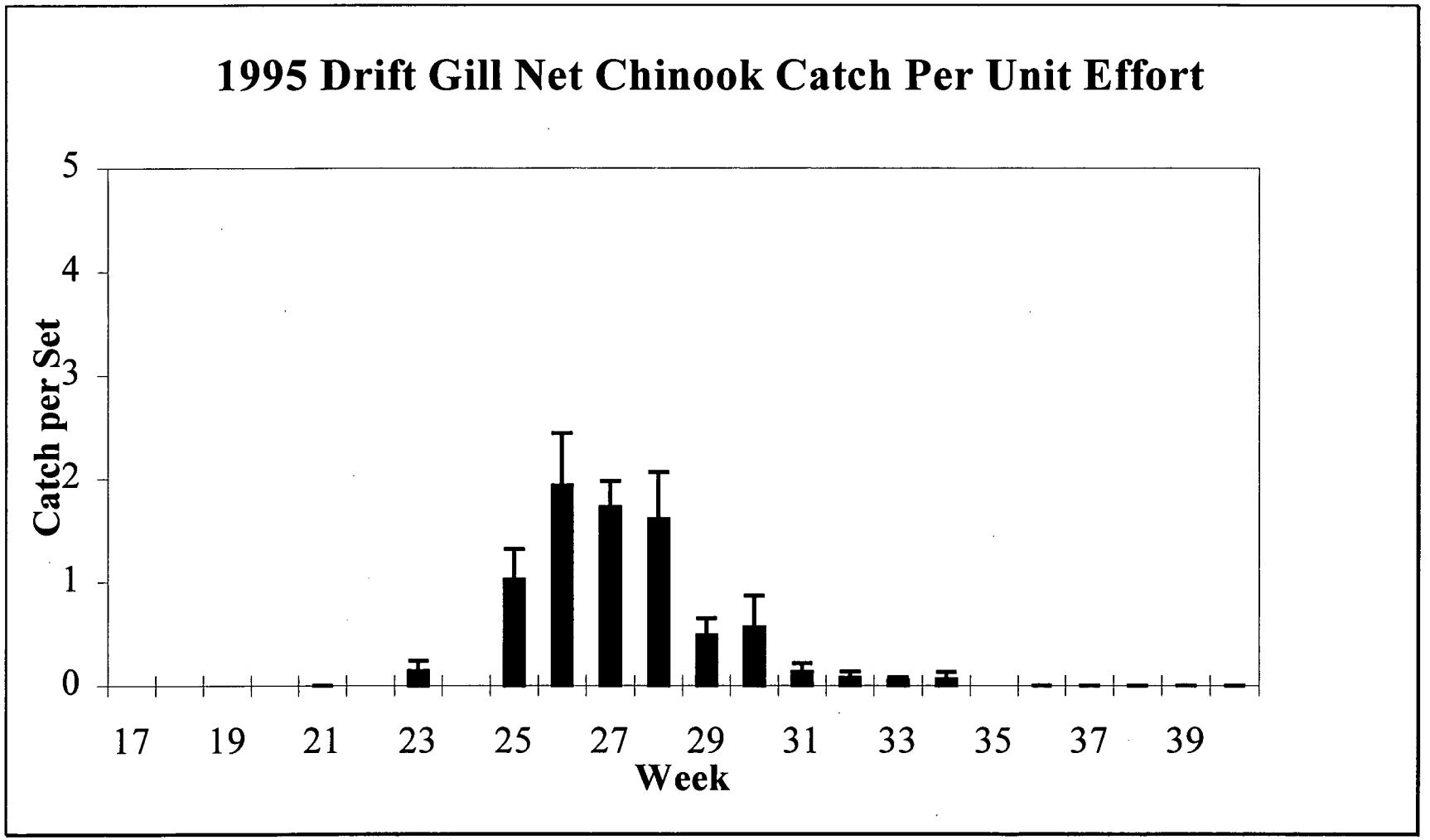


FIGURE 40. 1995 SKEENA RIVER DRIFT GILL NET CHINOOK CPUE.

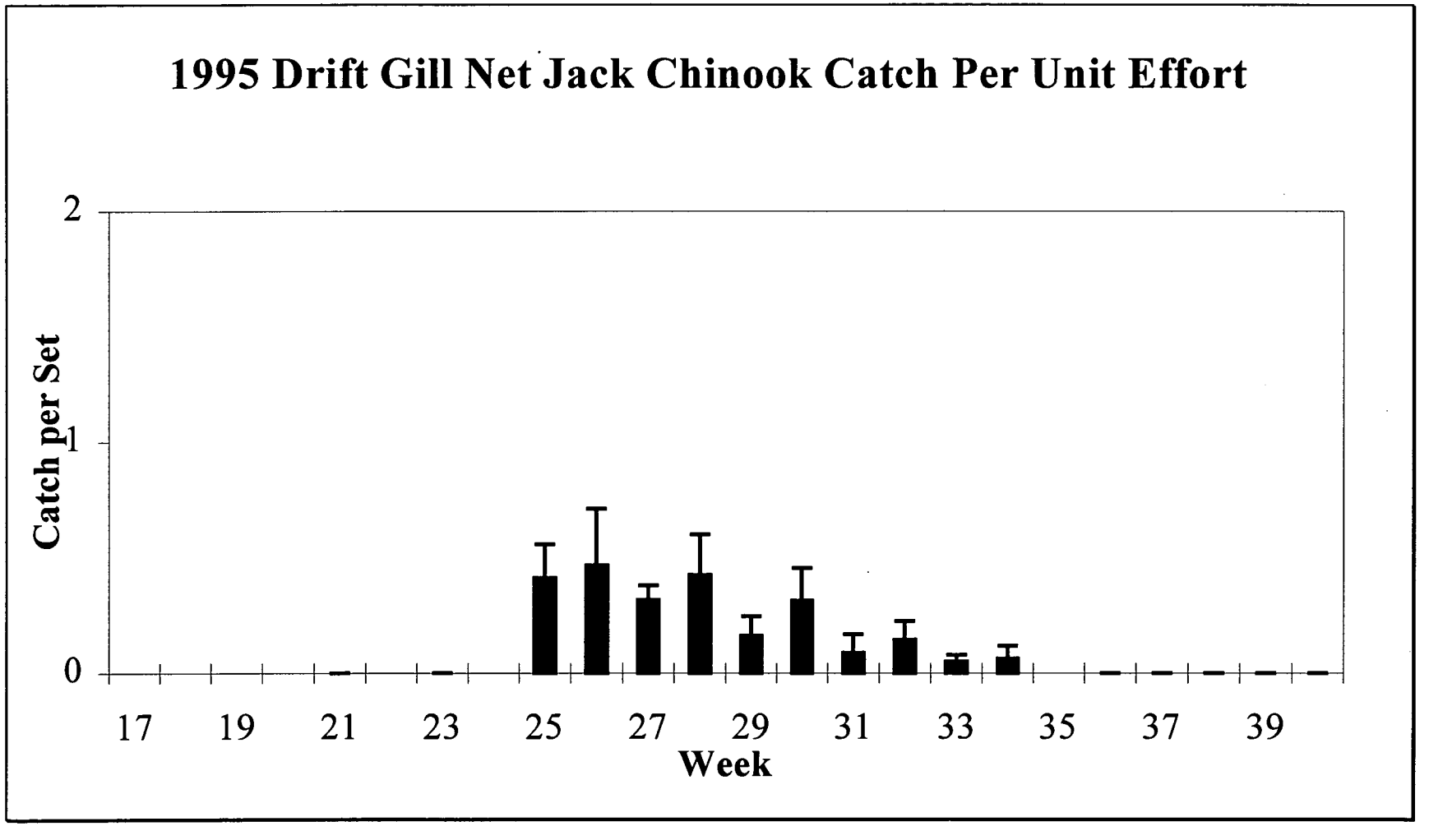


FIGURE 41. 1995 SKEENA RIVER DRIFT GILL NET JACK CHINOOK CPUE.

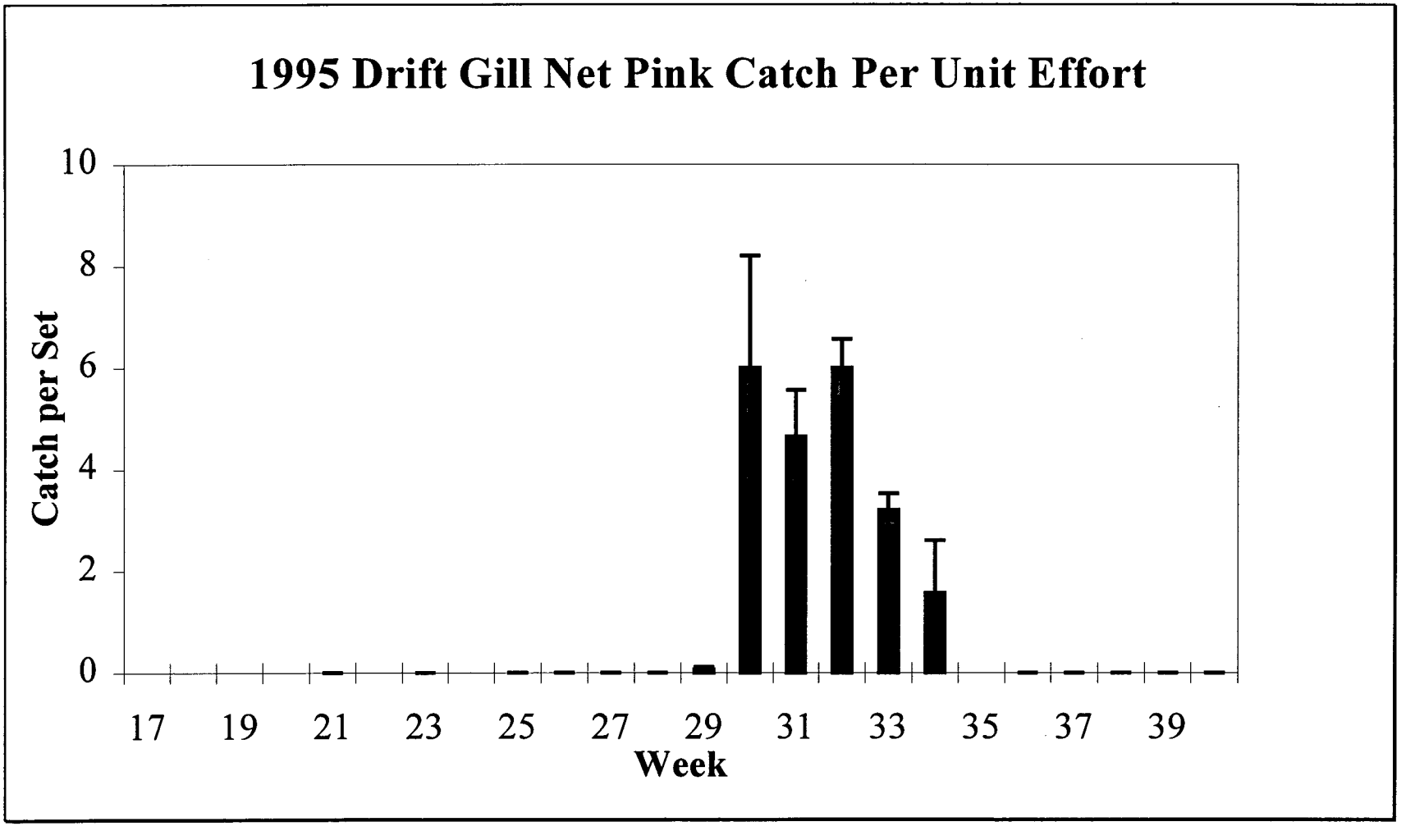


FIGURE 42. 1995 SKEENA RIVER DRIFT GILL NET PINK CPUE.

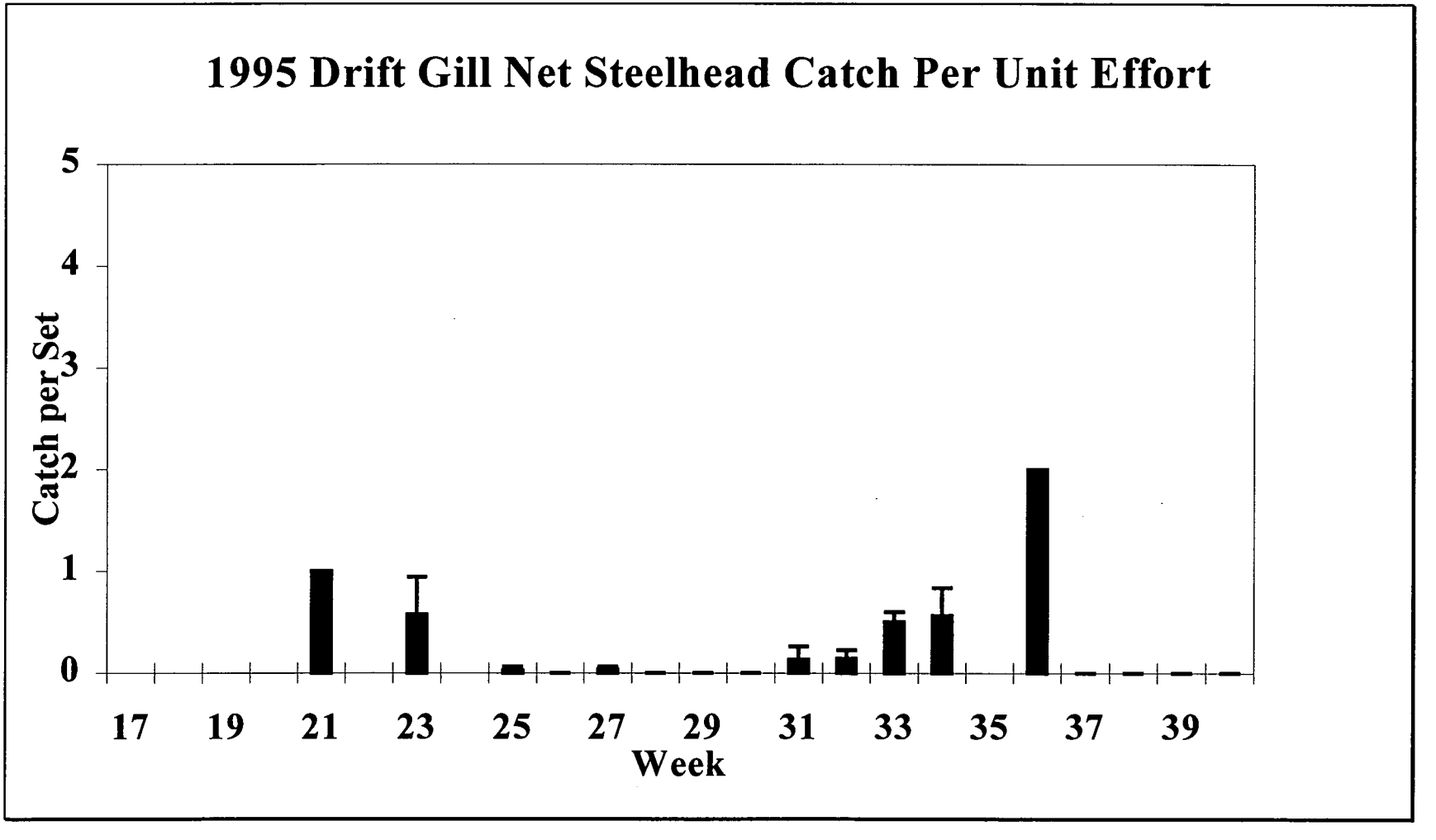


FIGURE 43. 1995 SKEENA RIVER DRIFT GILL NET STEELHEAD CPUE.

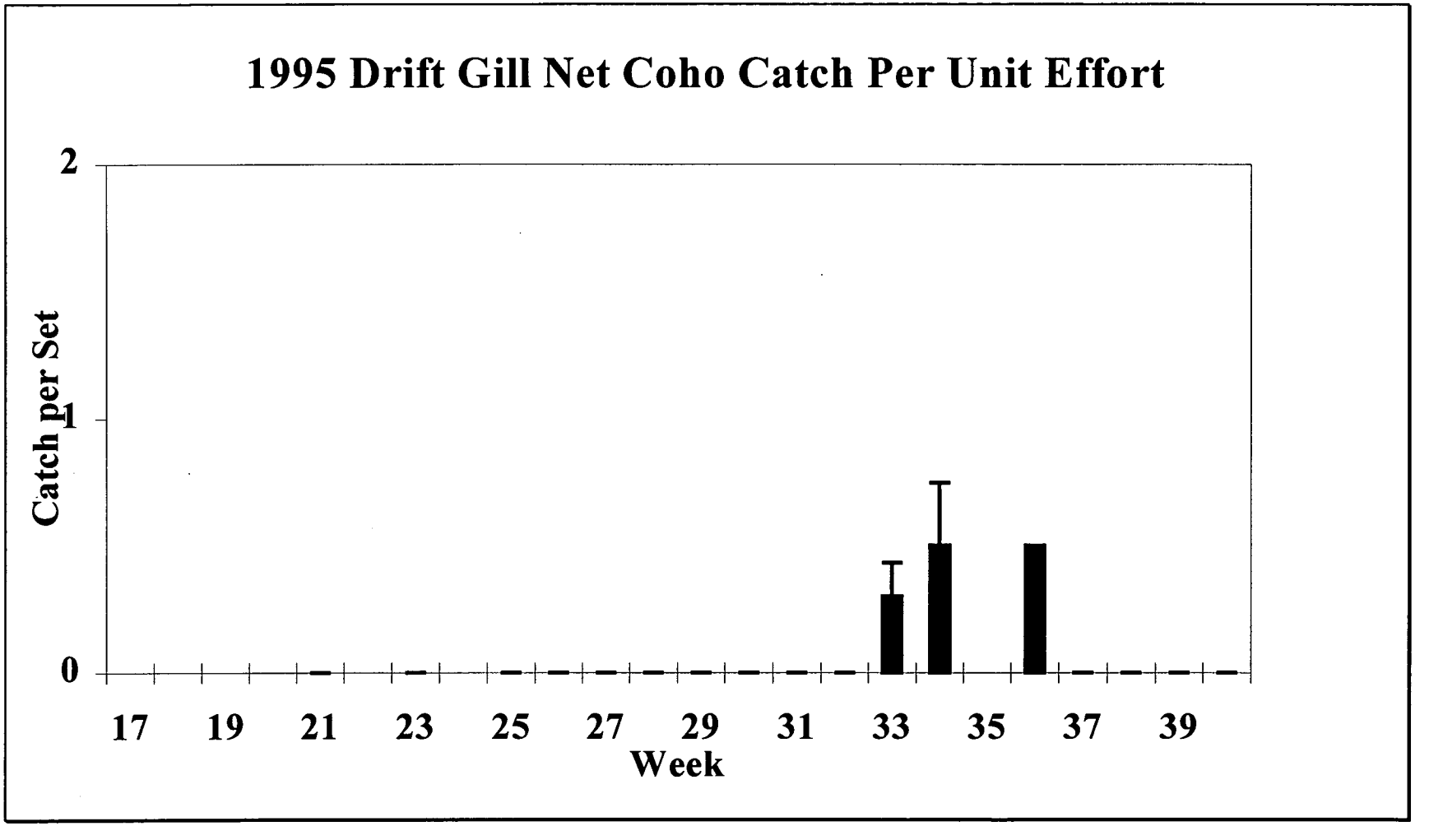


FIGURE 44. 1995 SKEENA RIVER DRIFT GILL NET COHO CPUE.

2.7. The 1995 Bulkley River Fishery

2.7.1. The Wet'suwet'en Fishery at Moricetown Canyon

The Wet'suwet'en Fishery is located at Moricetown Canyon on *Wet-zuhn-kwa* (Bulkley/Morice River) a tributary of the Skeena River in northwestern British Columbia. The reserve community of Moricetown is located on Highway 16 between the municipalities of Smithers and New Hazelton British Columbia.

Moricetown Canyon is a strategic location for harvest of salmonids migrating to points further upstream in Wet'suwet'en territories. The significant species for sustenance are sockeye and chinook. However, smaller numbers of steelhead and coho and pink are taken at the fishery. Pink salmon are the least desired species and are frequently returned to the river. During the 1995 season an ESSR license permitted Wet'suwet'en fishers to harvest pink salmon for commercial purposes. Chum salmon do not occur this far upstream in the Skeena Watershed.

Before the early 1900's Moricetown Falls was an ideal location for trap and weir techniques. Today, the fishery has changed because of significant alterations to the fishery made in the mid 1950's by blasting the rocks for fish ways. If the traps and weirs of the past were in place today, they would be effective for live capture harvest. After the blasting and alteration, gaffing became a more important mode of harvest. The use of jigs and dip nets also became alternatives for harvesting food fish. The jig ban implemented in 1994 by the Wet'suwet'en Canyon Committee has reduced the jig fishery to almost nil.

The catch estimates of the Moricetown Canyon are calculated in two separate manners. The first estimates are produced using methods developed by Morrell, and the second using the same basic methodology with minor changes. This is explained later in the Moricetown Canyon fishery report.

2.7.1.1. Gaffing

Although gaffing became a prevailing mode due to these historic consequences, there is evidence that this technique was used prior to European contact. Gaffing is probably the most effective method for harvesting larger species like chinook in the deeper, faster waters of Moricetown Canyon. From data and monitoring it is evident that the gaff fishery is targeted mainly at the chinook stocks.

The gaff is used for deep holes, where a single large hook is attached to a long pole. This hook is tied to a short sturdy peg which is designed to fit the end of the gaff pole. The peg and gaff hook are attached to the gaff pole by a strip of buckskin. The gaffer lowers the gaff pole into the deep pools of the canyon using the currents. He can feel when a salmon bumps the pole, whereupon the gaff is pulled upwards to impale the fish and retrieve the catch. The hook and peg, which are tied to the end of the pole, dislodge from the pole when the salmon is hooked. By dislodging the hook and peg from the pole there is less shake from

the pole as it is absorbed by the buckskin as the fish are raised from the water, reducing loss rates. The Wet'suwet'en gaffers at Moricetown are very skilled at this technique of harvesting salmonids.

There are nine gaffing sites at Moricetown falls of which six are frequently used. Two of the three most productive sites for chinook fishing are on the right bank of the canyon near the strait fish ladder; the third is on the left bank immediately below the falls.

2.7.1.2. **Jigging**

Jigging is also known as snagging. The "jiggin' riggin'" as it is sometimes called, is a short pole with a heavy line attached to a weighted three prong hook. Jigging was banned as a technique of harvest at the fishery starting in 1994 fishing season and carried on throughout the 1995 fishing season. The gear restriction banning this method came into effect to help alleviate the loss of injured fish at the Wet'suwet'en fishery.

The jig ban was supported by Wet'suwet'en Hereditary Chiefs and was a positive step demonstrating traditional management of the fishery. The jig ban demonstrated that, traditional jurisdiction and contemporary objectives are possible, and can lead to improved results. In other words, if conservation is a contemporary issue whereupon we are seeking the renewal of this resource for future generations, then it can still be addressed at the traditional Wet'suwet'en level. The jig ban which encourages more use of dip nets as a selective method, can be used as a tool to sort the harvest by selectively harvesting stronger stocks, while the opportunity exists to release the less stronger or endangered stocks. This was demonstrated through tagging and the pink harvest throughout the 1995 fishing season at Moricetown Canyon.

Other than a few incidents with jig fishers the catch of the jig fishery is near nil. Jig fishers caught had their jig gear confiscated by GWWA Rangers. For this report no estimate is made for the catch of the jig fishery.

In 1993, jigging accounted for 18.5 % of the total fishery at Moricetown, in 1994, jigging was reduced to 2.5 % of the take. In 1995, we still met some resistance early in the season but jigging was reduced to much less than 1% of the total take.

2.7.1.3. Dip Net fishery

Since introduction of dip nets in the mid 1980's the use of this live capture gear has expanded to levels that allow the Moricetown Canyon fishery to reach almost 99% of the total catch by dip net. The 1995 canyon fishery harvested 98.13% of the sockeye and over 90% of coho, steelhead, and pink by dip net, shown in Table 31. In the 1995 chinook fishery 44.96% of the chinook were taken by dip net.

As in recent years, the dip net fishery at Moricetown provided the opportunity to tag and release adult coho and steelhead. This season, a co-operative steelhead tag and release program was carried with the Wet'suwet'en dip netters, LGL Consultants, and the Provincial Ministry of Environment.

The concern for the future of the salmon and steelhead must not only be encouraged at the Wet'suwet'en fishery but also amongst all other user groups. The jig ban and the move towards dip netting has been a positive step, that demonstrates the ability of the Wet'suwet'en to selectively harvest at in river locations.

1995 Moricetown Canyon Total Catch by Gear			
	Dip Net	Gaff	Total
Chinook	545	667	1212
Sockeye	23466	446	23912
Coho	537	38	574
Steelhead	432	17	448
Pink	89980	43	90023
Total	114959	1211	116170

Table 31. 1995 Moricetown Canyon Catch By Gear.

1995 Moricetown Canyon Harvest Rates by Gear		
	Dip Net	Gaff
Sockeye	98.13%	1.87%
Chinook	44.96%	55.04%
Coho	93.45%	6.55%
Steelhead	96.25%	3.75%
Pink	99.95%	0.05%
Total	98.96%	1.04%

Table 32. 1995 Species Harvest Ratios of the Moricetown Canyon fishery, by gear type.

Moricetown Canyon Catches Rates by Dip Net			
	1993	1994	1995
Sockeye	77%	94%	98%
Chinook	15%	20%	45%
Coho	78%	99%	93%
Steelhead	95%	89%	96%
Pink	83%	88%	99%

Table 33. Harvest rate comparisons of the Moricetown Canyon Dip Net fishery.

Moricetown Canyon Catches Rates by Gaff			
	1993	1994	1995
Sockeye	5%	3%	2%
Chinook	66%	67%	55%
Coho	13%	0%	7%
Steelhead	3%	11%	4%
Pink	3%	11%	1%

Table 34. Harvest rate comparisons of the Moricetown Canyon Gaff fishery.

2.7.2. Moricetown Catch Monitoring

The fishery at Moricetown canyon is sampled by direct observation. A single technician can observe all of the active fishing sites at the Moricetown canyon. With the help of binoculars and cooperation from the Moricetown Canyon fishers, fish caught and retained or released can be identified to species. A system of hand signals has developed by which fishers can communicate the species of the fish taken. Captured fish were identified to species 99.9% of the time. In the gaff or jig fishery, fish may be lost under the surface of the water. These cannot be determined to species.

In 1995 the fishery was observed for over 1285 hours of a possible 1771 possible fishing hours. During hours of observation 18,486 fish were caught. The hours of observation are distributed throughout the daylight hours. Hours assumed available for fishing range from 119 hours per week in July to 84 hours per week at the end of the fishery in October. This distribution of hours probably slightly exceeds the number of hours actually fished but is consistent with those assumed by Morrell, Barnes, and Harris (1985) for the 1985 fishery and the GWWA in 1992 through 1994. Observation of fishing activity took place in 73% of all estimated hours available for fishing.

2.7.3. Moricetown Catch Estimation

The Moricetown Canyon fishing effort may be measured in fisherman hours (Figure 34) or hours available for fishing. Since there are few productive fishing stations in the Canyon and the fish are sensitive to disturbance, it is likely that the number of fish caught per hour is little affected by the number of fishermen present. The catch estimates in the following tables and graphs were made by using one hour of fishing as the standard of effort. Thus assumption is consistent with that used by Morrell 1985 and Morrell, Barnes and Harris 1985 and GWWA 1992, 1993 and 1994.

The catch per hour was calculated for each week of the fishery (Table 36). Two standard errors below and above the mean value give estimates of the confidence limits. If the catch data are randomly distributed then two standard errors give 95% confidence limits with large sample size. Assuming that catches are not randomly distributed but show a central tendency, then two standard errors give at least 75% confidence limits.

The mean value of catch per hour and the lower and upper limits are multiplied by the number of hours available for fishing to provide low, best, and high estimates of the catch. Catch estimates based on this procedure are presented in Table 34. This is followed by a series of graphs of weekly catch with confidence limits for each of the species of salmon in the fishery (Figures 47 through 51). The confidence limits are shown by the thin line extending above and below the top of the columns in the column graphs.

During the 1995 season, observation of fishing activity took place in 73% of all estimated hours available for fishing. During these observation hours, there is no uncertainty in the Moricetown catch. Therefore using the variance of the CPUE for all fishing hours probably overestimates the uncertainty of the total catch. As a second approach to estimating the catch we have used the CPUE to estimate only the catch during hours without direct observation.

With this method of catch estimation the margin of error was greatly reduced in the catch estimates of the Moricetown Canyon. For consistency with previous years of monitoring the first method of estimating the Moricetown catch is used for comparisons. The results of the second method of catch estimation are shown later in this report.

1995 Moricetown Canyon Observation Table				
	Est Hrs	Hrs. Obs.	Hrs No Obs.	Obs. Rate
26	105	11.00	94.00	10.48%
27	112	63.50	48.50	56.70%
28	112	63.50	48.50	56.70%
29	112	44.75	67.25	39.96%
30	119	71.50	47.50	60.08%
31	119	84.50	34.50	71.01%
32	119	88.00	31.00	73.95%
33	119	115.00	4.00	96.64%
34	112	105.22	6.78	93.94%
35	98	92.48	5.52	94.37%
36	98	97.05	0.95	99.03%
37	98	84.42	13.58	86.14%
38	98	80.50	17.50	82.14%
39	98	84.33	13.67	86.05%
40	84	77.42	6.58	92.16%
41	84	64.00	20.00	76.19%
42	84	58.00	26.00	69.05%
Weeks	Est. Hrs.	Hrs. Obs.	Hrs. No Obs.	Tot. Obs. Rate
17	1771	1285.17	485.83	72.57%

Table 35.1995 Moricetown Canyon Monitoring Hours of Observation.

1995 Moricetown Canyon Catch Table														
Stat. Wk	Est. Hrs	Hrs. Obs	Cn	Cn Err	Sy	Sy Err	Unk	Unk Er	Co	Co Err	Sthd	Sthd Er	Pk	Pk Err
26	105	11.00	10	19	0	0	0	0	0	0	0	0	0	0
27	112	63.50	72	40	1048	33	0	0	0	0	0	0	0	0
28	112	63.50	58	30	1489	17	0	0	0	0	0	0	0	0
29	112	44.75	223	77	6194	69	0	0	0	0	5	7	0	0
30	119	71.50	151	60	5274	122	0	0	0	0	5	6	105	72
31	119	84.50	237	73	5187	34	8	8	37	25	32	22	86	130
32	119	88.00	179	66	2815	58	3	4	60	35	34	20	1088	97
33	119	115.00	128	37	1521	5	0	0	13	13	10	13	77673	13
34	112	105.22	70	34	290	11	0	0	138	42	83	31	10566	591
35	98	92.48	32	16	70	0	0	0	118	29	79	20	428	342
36	98	97.05	27	14	24	3	0	0	107	30	71	28	68	91
37	98	84.42	24	15	0	0	0	0	67	29	59	19	2	5
38	98	80.50	0	0	0	0	0	0	18	14	30	18	6	10
39	98	84.33	0	0	0	0	0	0	15	9	29	15	1	2
40	84	77.42	0	0	0	0	0	0	0	0	2	4	0	0
41	84	64.00	0	0	0	0	0	0	0	0	0	0	0	0
42	84	58.00	0	0	0	0	0	0	0	0	9	13	0	0
Total	1771	1285	1212	481	23912	352	11	12	574	226	448	217	90023	1353

Table 36. 1994 Moricetown Canyon Catch Estimates.

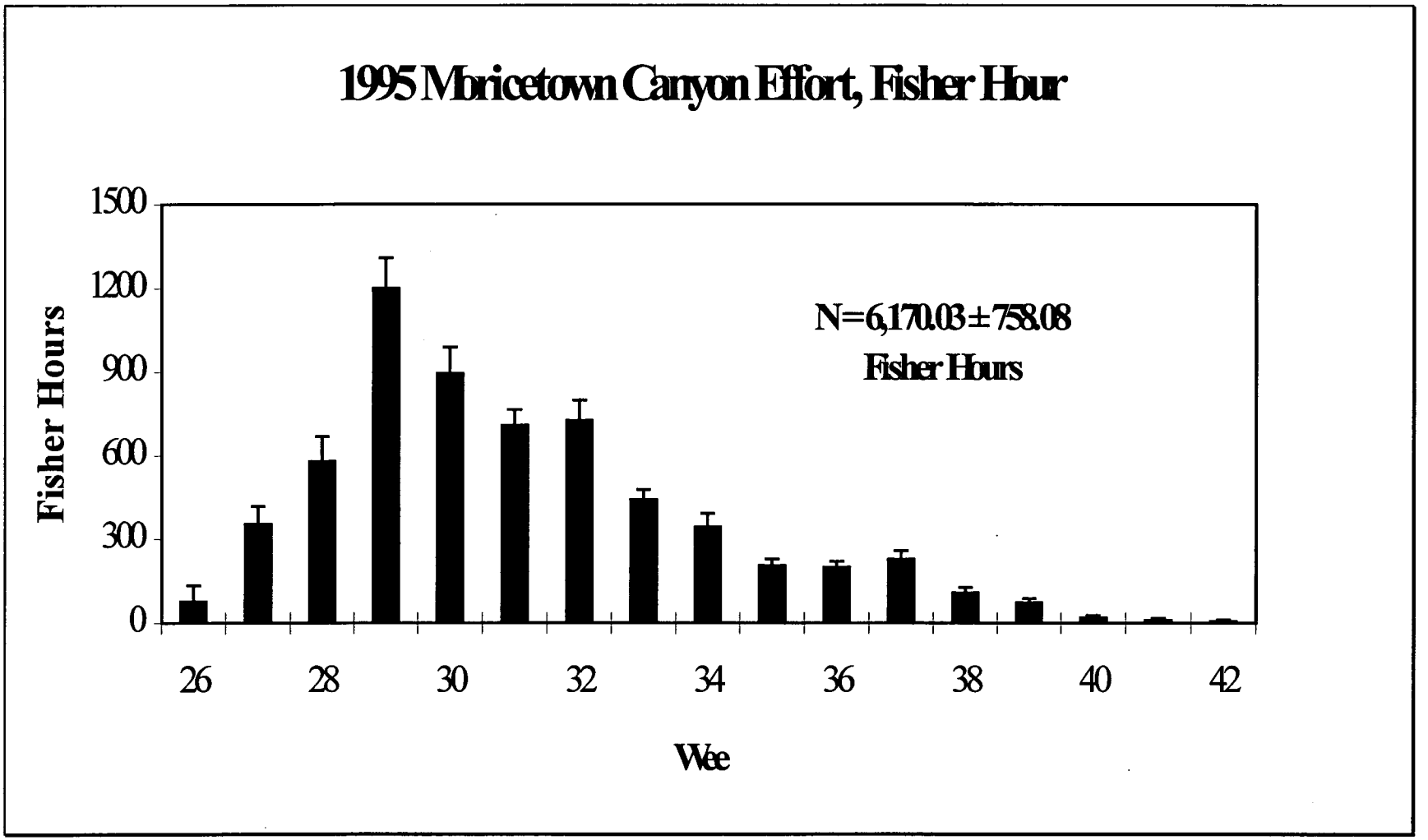


FIGURE 45. 1995 MORICETOWN CANYON FISHING EFFORT.

1995 Moricetown Canyon CPUE Summary Table														
Stat. Wk	Est Hrs	Hrs. Obs.	Cn	Cn Er	Sy	Sy Err	Unk	Unk Err	Co	Co Err	Sthd	Sthd Err	Pk	Pk Err
26	105	11.00	0.09	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	112	63.50	0.65	0.36	9.35	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	112	63.50	0.52	0.27	13.29	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	112	44.75	1.99	0.68	55.31	0.61	0.00	0.00	0.00	0.00	0.04	0.06	0.00	0.00
30	119	71.50	1.27	0.50	44.32	1.03	0.00	0.00	0.00	0.00	0.04	0.05	0.88	0.61
31	119	84.50	1.99	0.61	43.59	0.28	0.07	0.07	0.31	0.21	0.27	0.18	0.72	1.09
32	119	88.00	1.50	0.56	23.66	0.49	0.02	0.03	0.50	0.29	0.28	0.17	0.74	0.81
33	119	115.00	1.08	0.31	12.78	0.04	0.00	0.00	0.11	0.11	0.09	0.11	0.06	0.11
34	112	105.22	0.63	0.31	2.59	0.10	0.00	0.00	1.24	0.38	0.74	0.28	13.27	5.28
35	98	92.48	0.33	0.16	0.72	0.00	0.00	0.00	1.21	0.30	0.80	0.21	4.36	3.49
36	98	97.05	0.28	0.15	0.25	0.03	0.00	0.00	1.09	0.31	0.72	0.29	0.69	0.93
37	98	84.42	0.25	0.15	0.00	0.00	0.00	0.00	0.69	0.29	0.60	0.19	0.02	0.05
38	98	80.50	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.14	0.31	0.19	0.06	0.10
39	98	84.33	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.09	0.30	0.15	0.01	0.02
40	84	77.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.05	0.00	0.00
41	84	64.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	84	58.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.15	0.00	0.00

Table 37. 1995 Moricetown Canyon Catch Per Unit Effort Table.

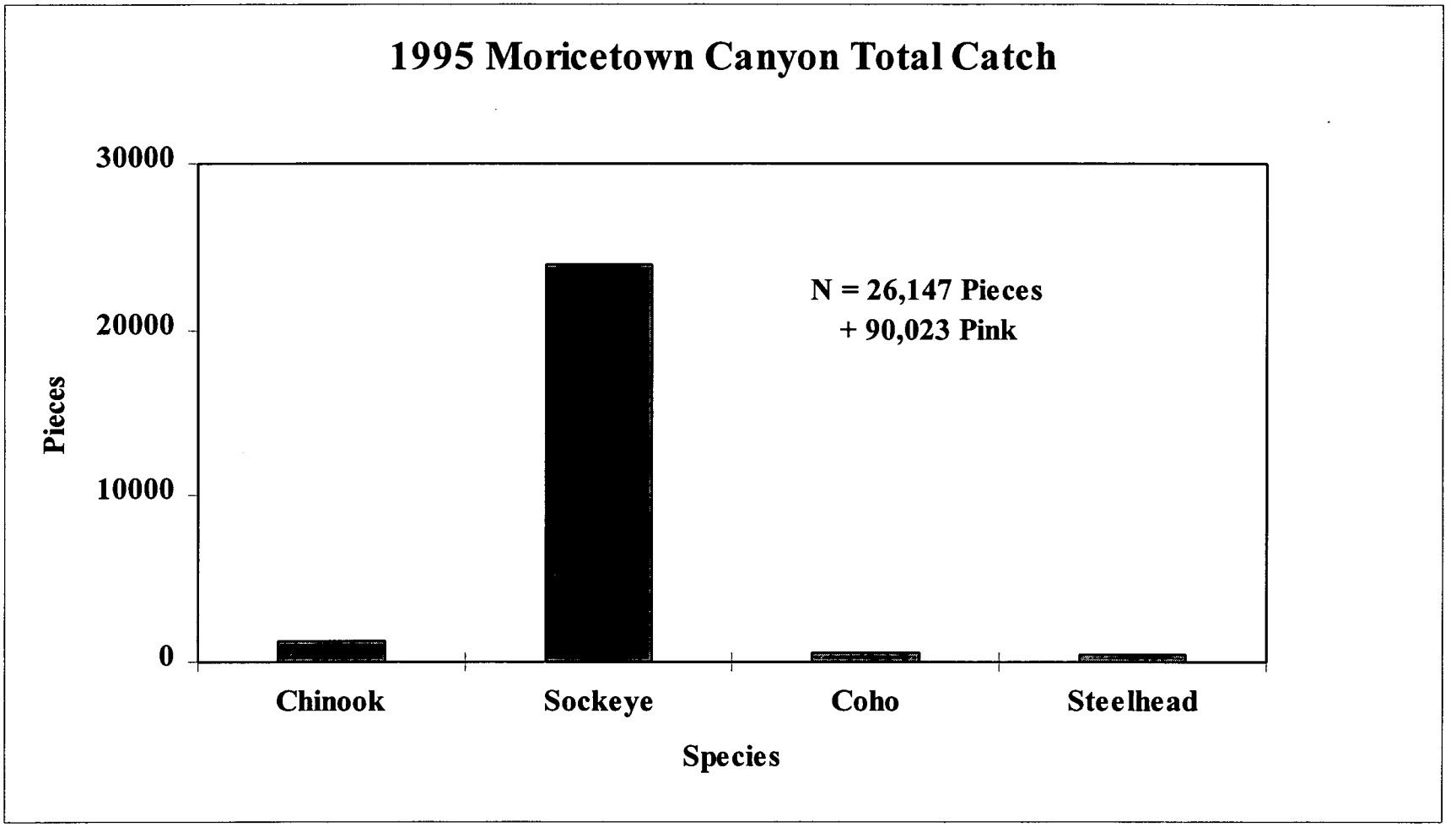


FIGURE 46. 1995 MORICETOWN CANYON TOTAL CATCH.

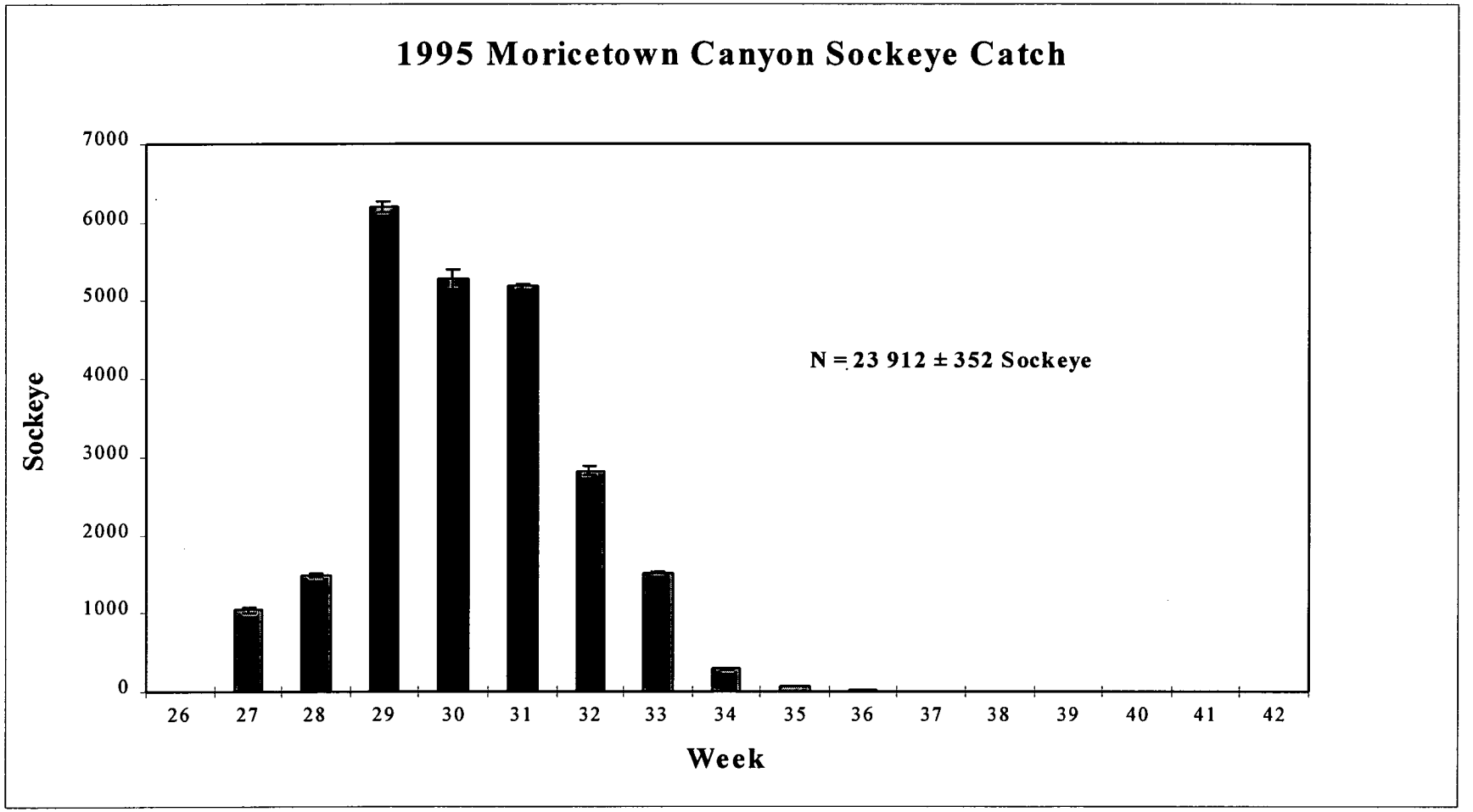


FIGURE 47. 1995 MORICETOWN CANYON SOCKEYE CATCH.

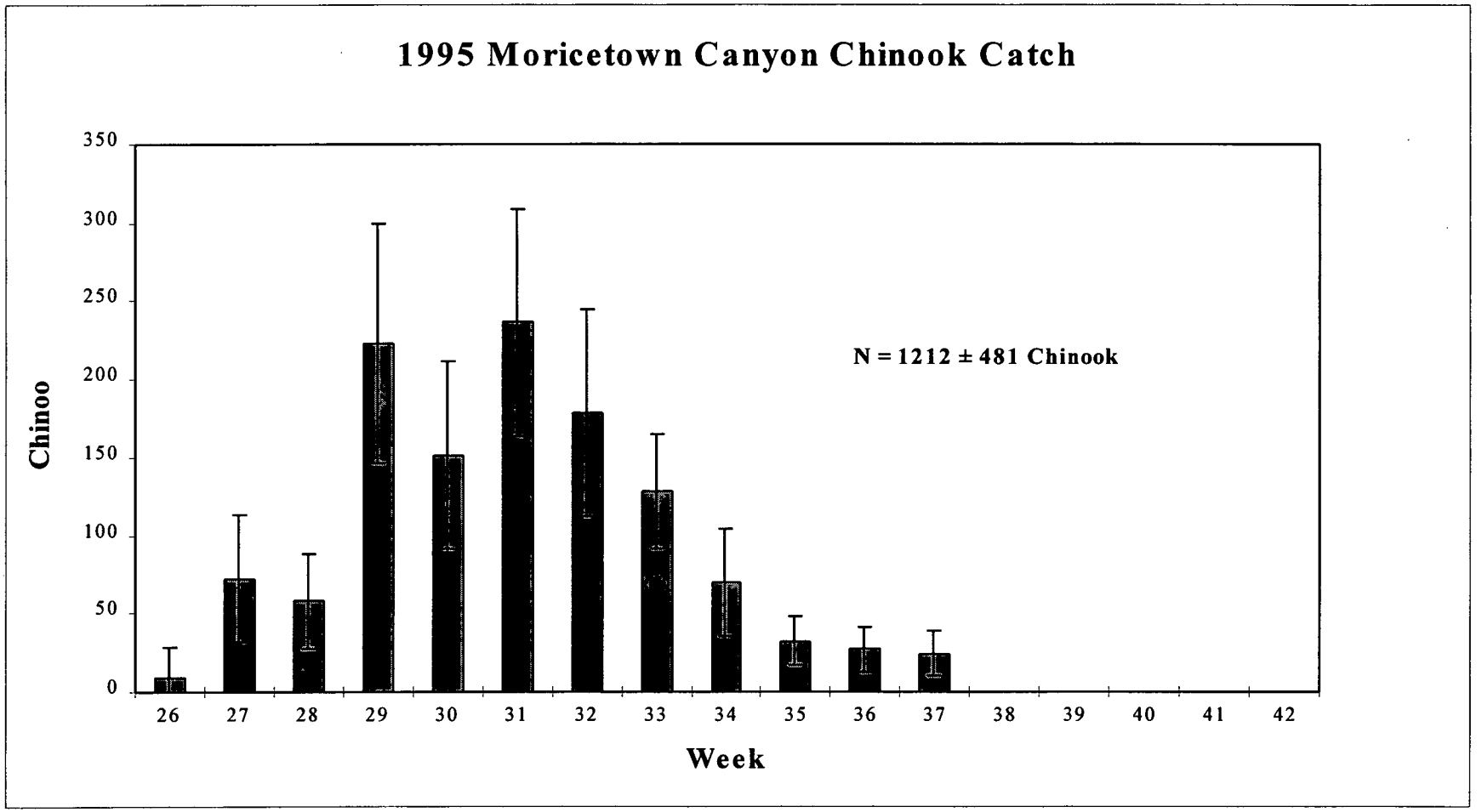


FIGURE 48. 1995 MORICETOWN CANYON CHINOOK CATCH.

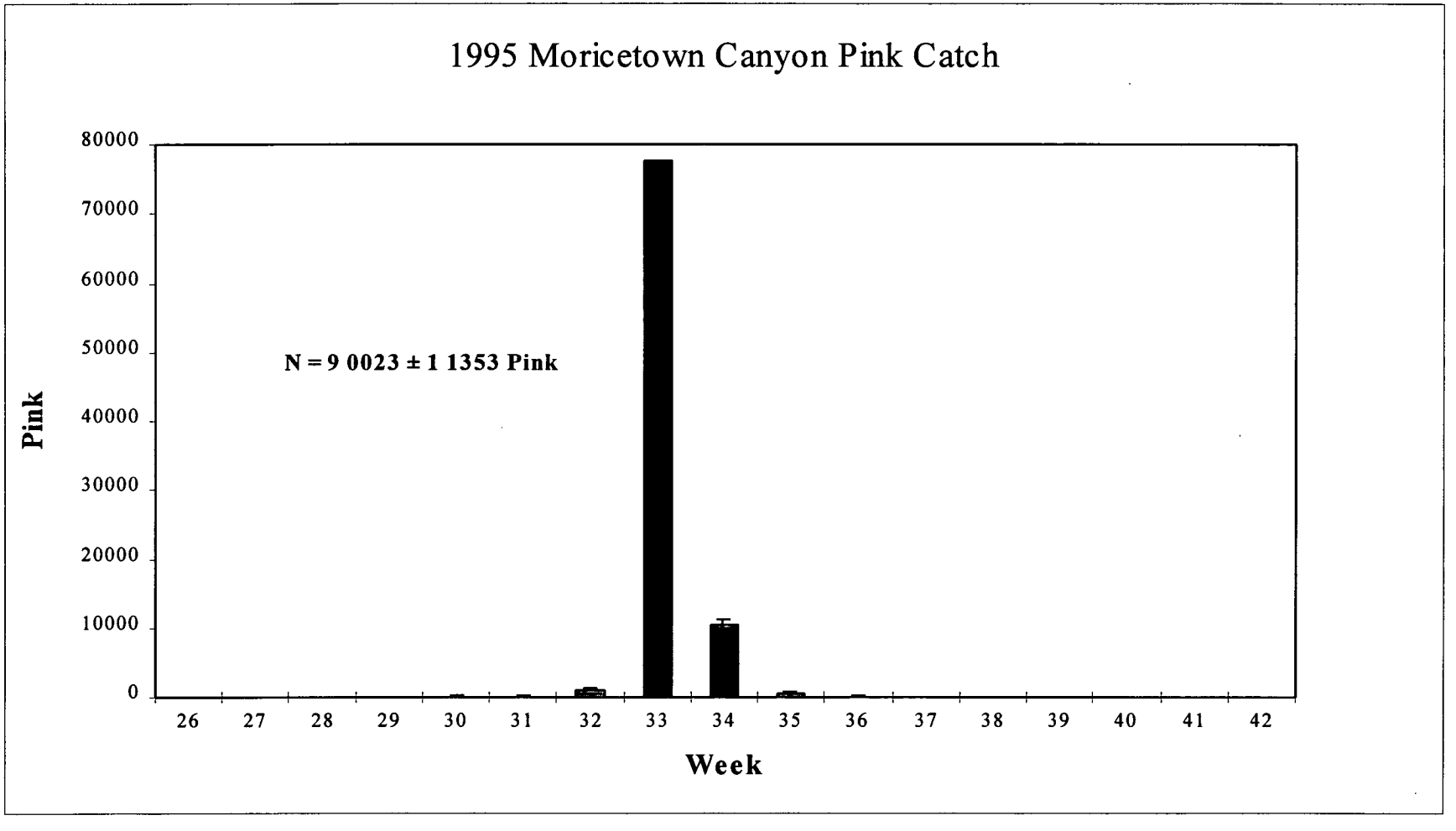


FIGURE 49. 1995 MORICETOWN CANYON PINK CATCH.

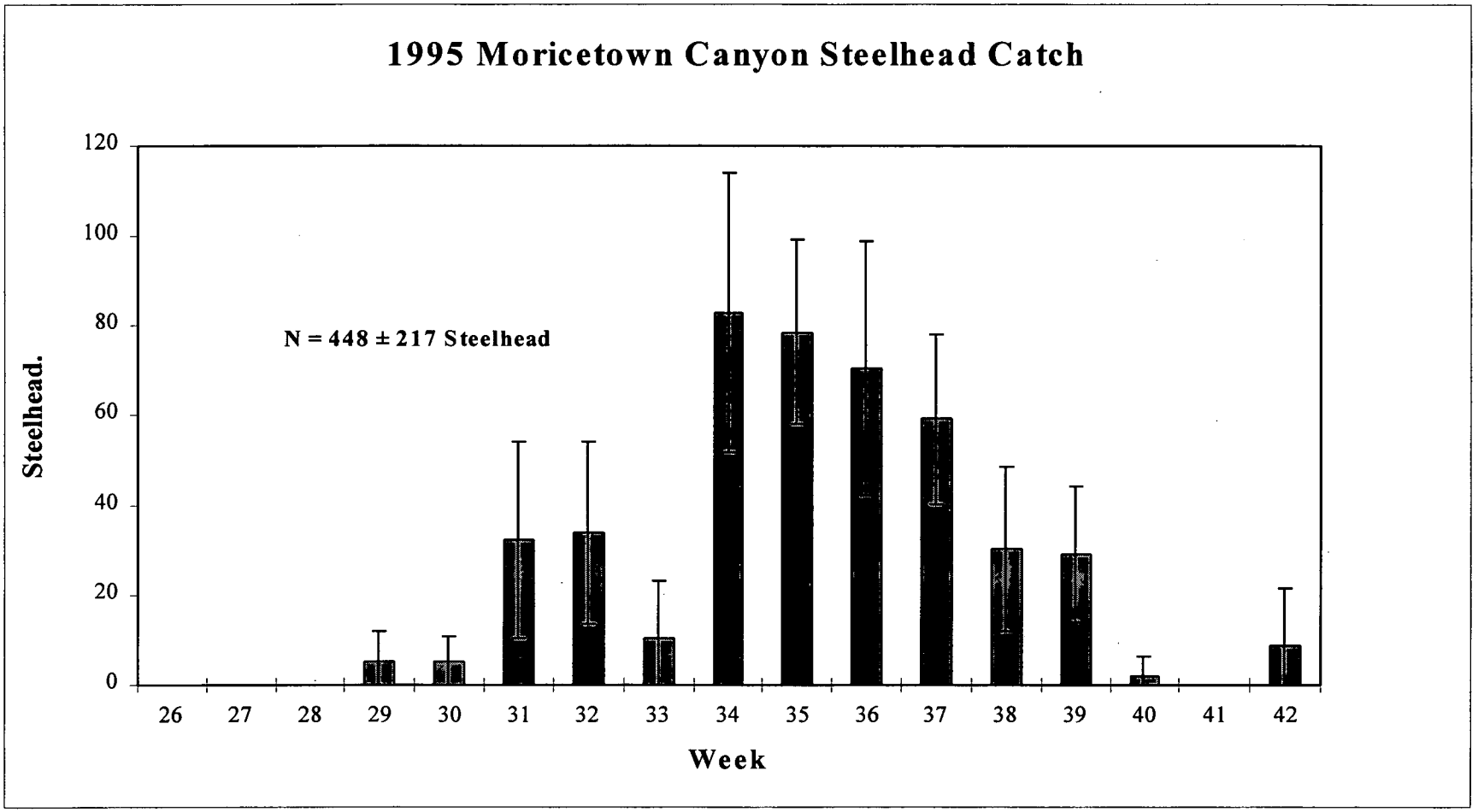


FIGURE 50. 1995 MORICETOWN CANYON STEELHEAD CATCH.

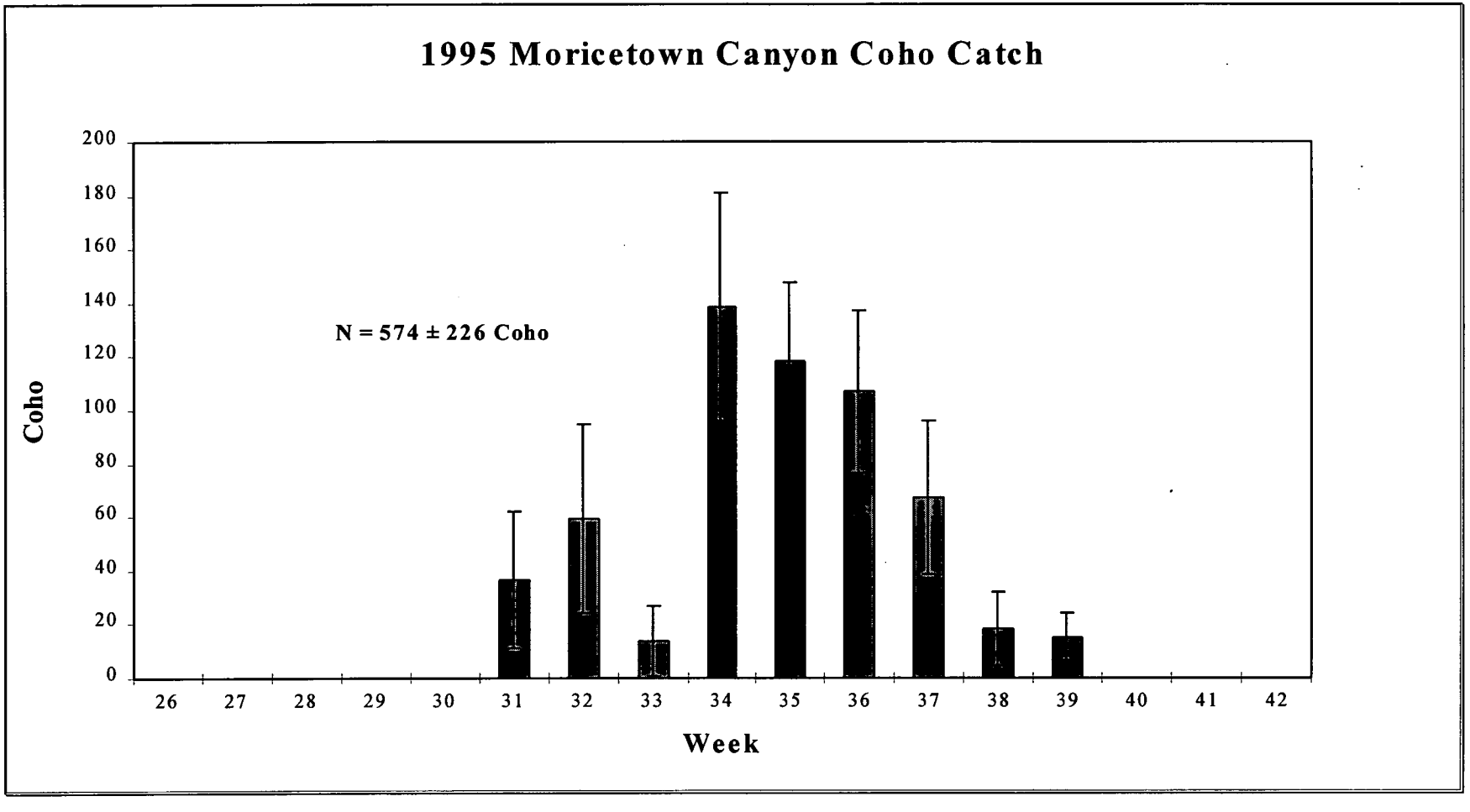


FIGURE 51. 1995 MORICETOWN CANYON COHO CATCH.

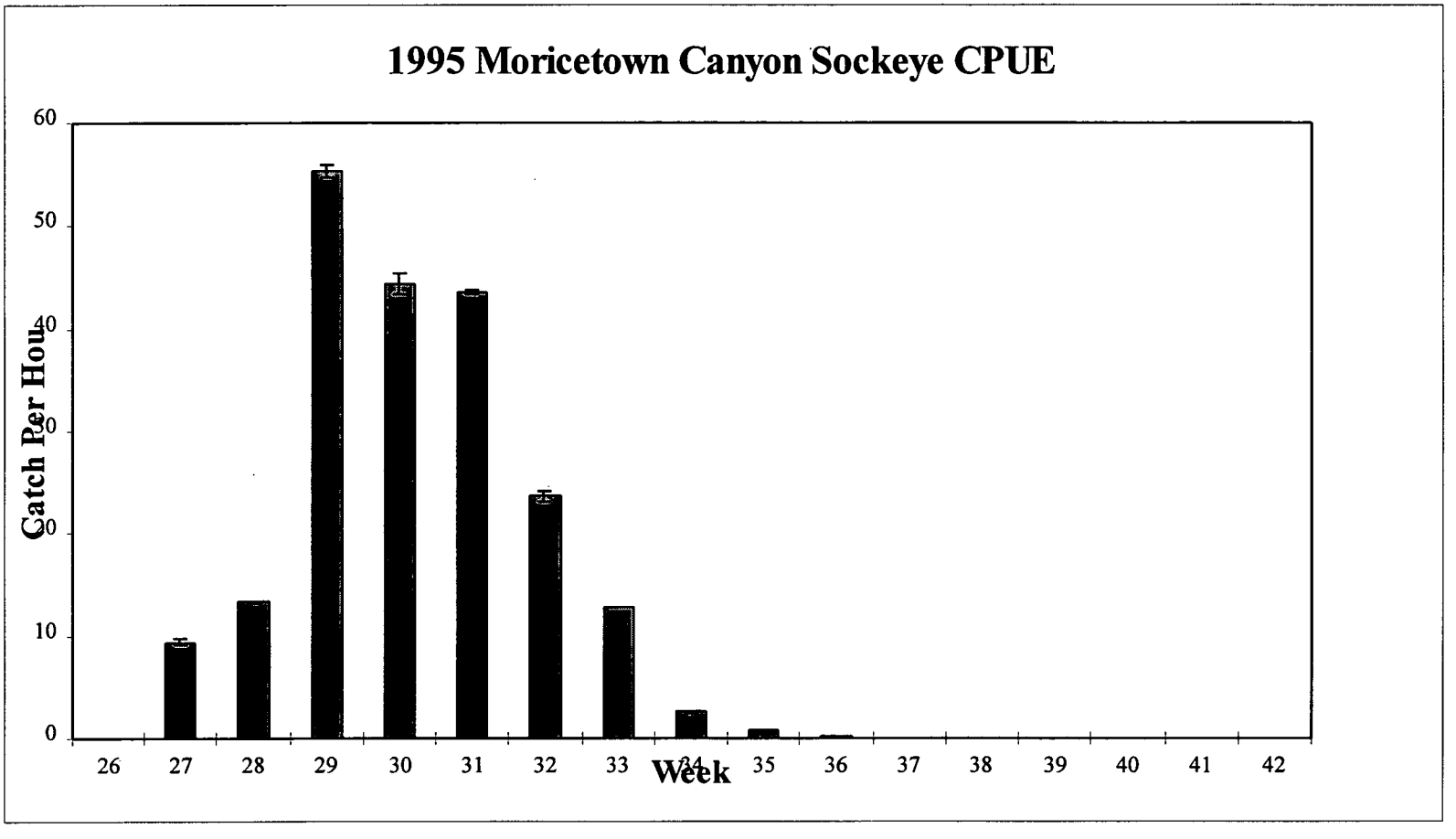


FIGURE 52. 1995 MORICETOWN CANYON SOCKEYE CPUE.

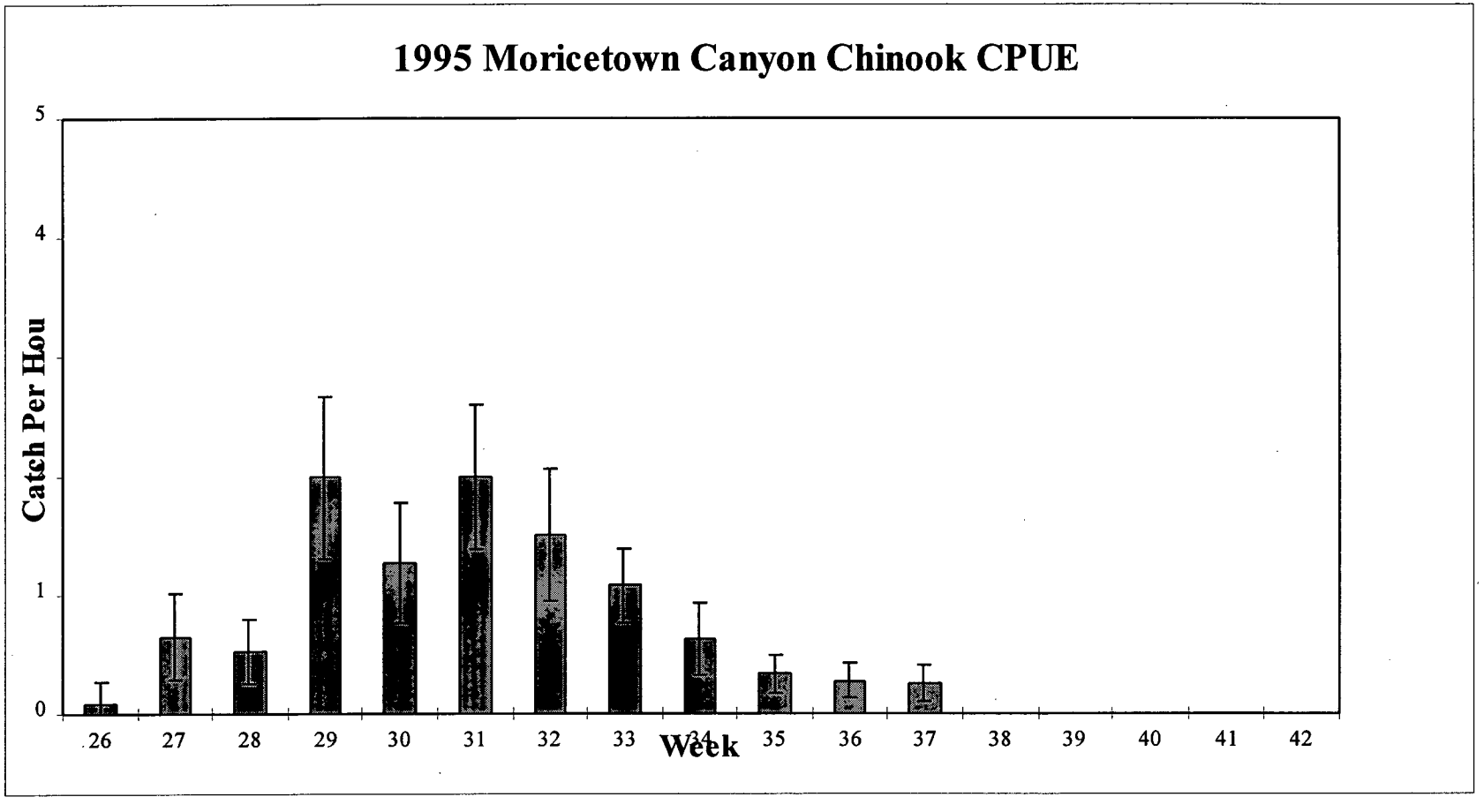


FIGURE 53. 1995 MORICETOWN CANYON CHINOOK CPUE.

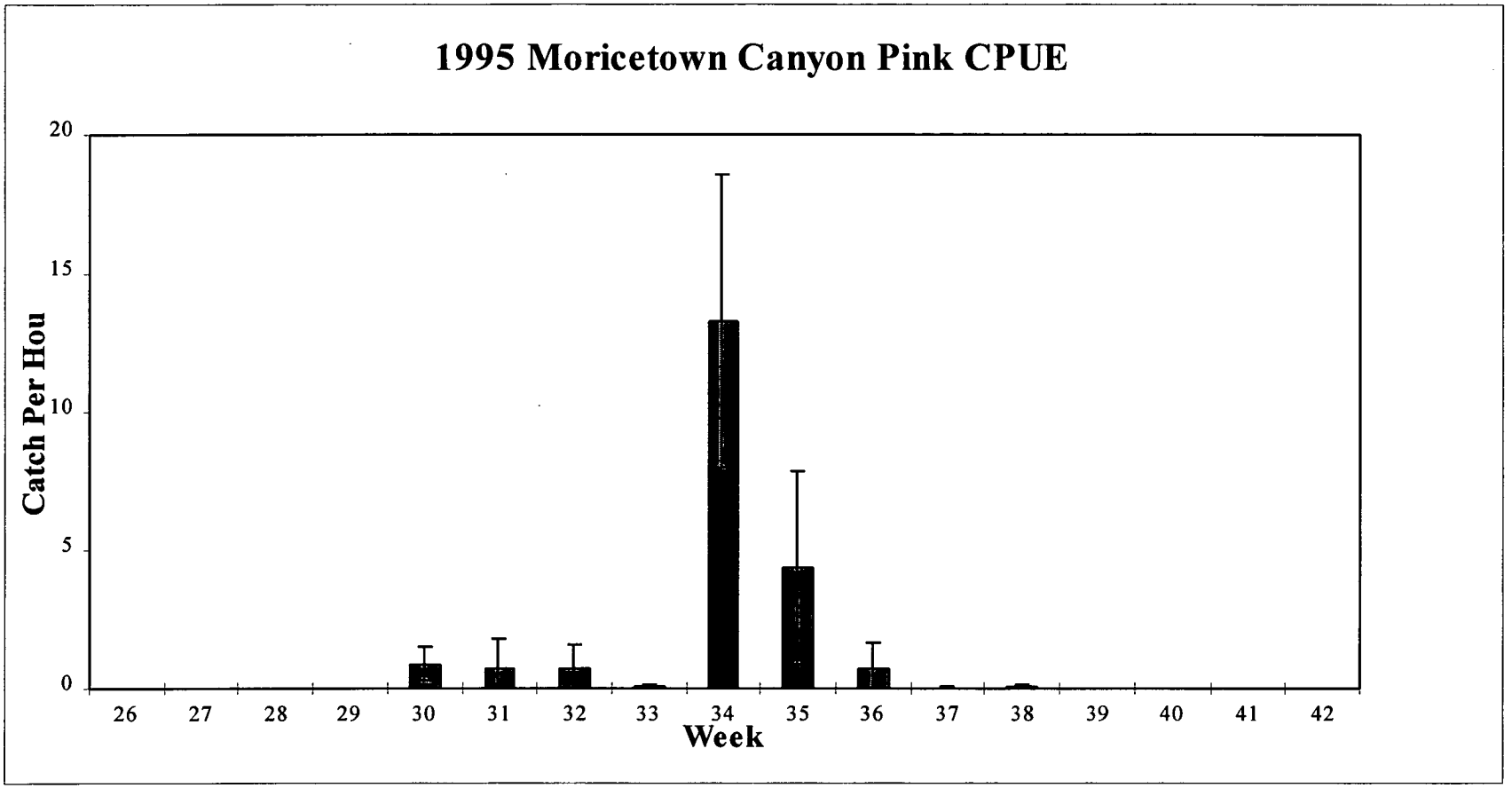


FIGURE 54. 1995. MORICETOWN CANYON PINK CPUE.

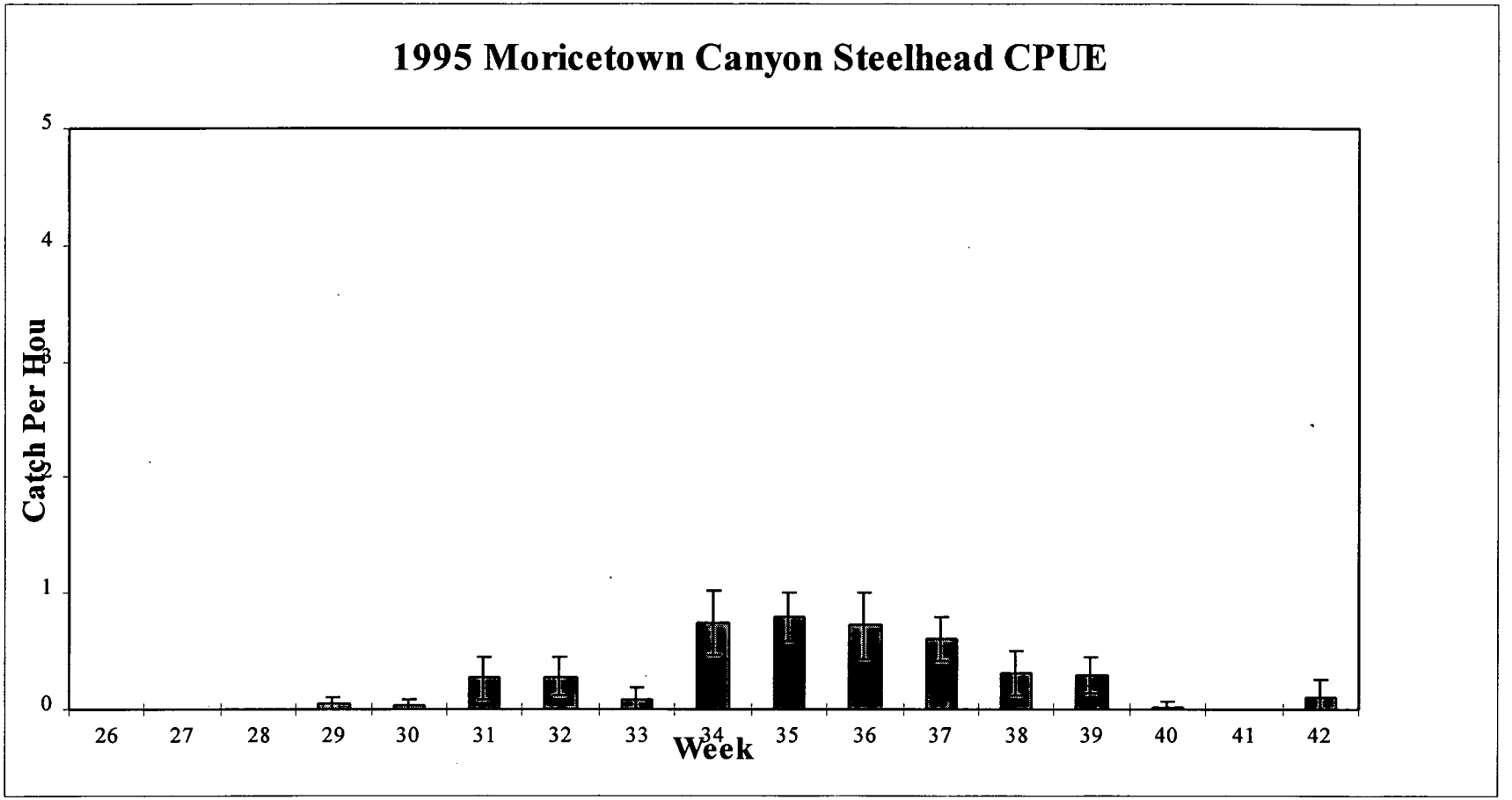


FIGURE 55. 1995 MORICETOWN CANYON STEELHEAD CPUE.

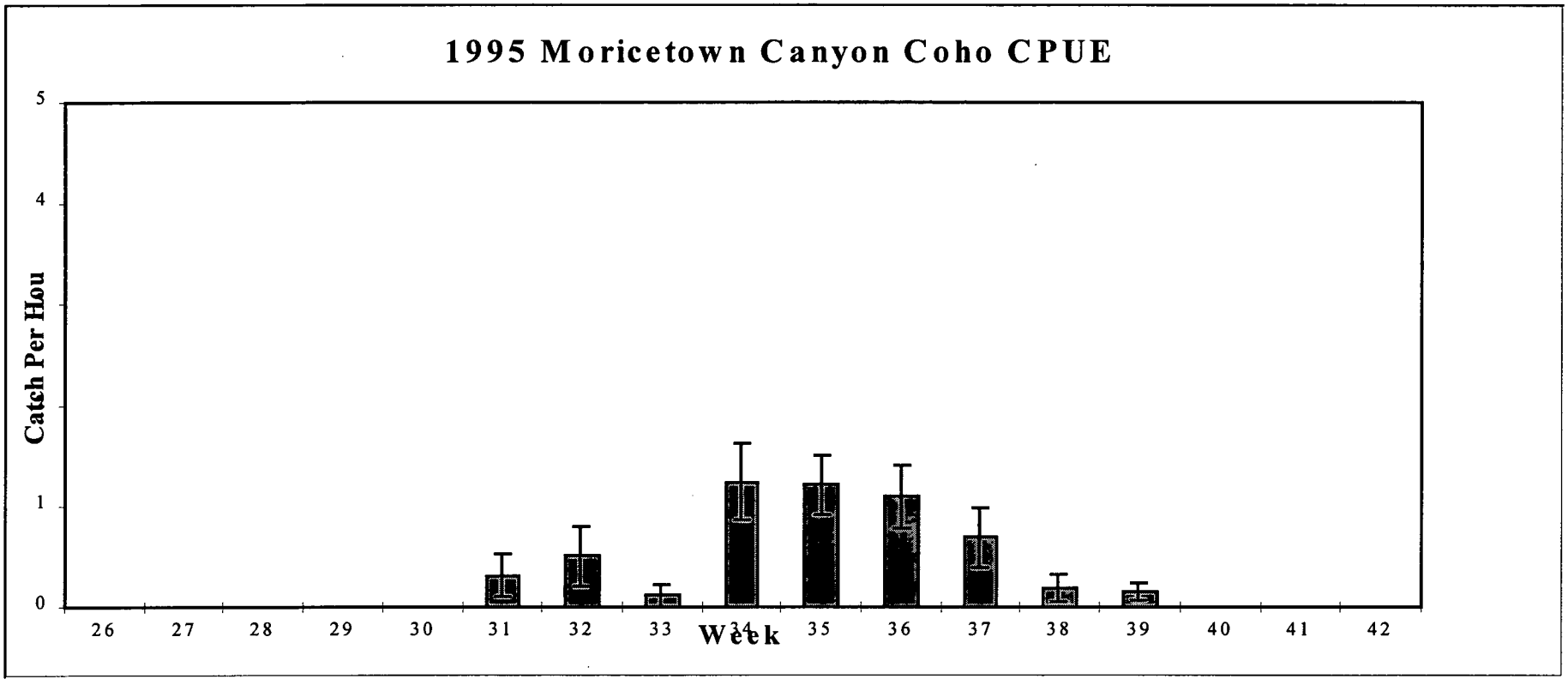


FIGURE 56. 1995 MORICETOWN CANYON COHO CPUE.

2.7.4. Comparisons of Catch Estimation Methods.

1995 Moricetown Canyon Total Catch		
Species	Best Est.	Error
Chinook	1212	481
Sockeye	23912	352
Coho	574	226
Steelhead	448	217
Pink	90023	1353
Total	116170	2629

Table 38. 1995 Moricetown Canyon Original Method Catch Estimation.

1995 Moricetown Canyon Total Catch Table		
Species	Best Est.	Error
Chinook	1212	162
Sockeye	23913	138
Coho	575	29
Steelhead	443	34
Pink	90027	151
Total	116171	514

Table 39. 1995 Moricetown Canyon Second Method of Catch Estimation.

Tables 37 and 38 show the two estimates of the 1995 Moricetown Canyon total catch. Note that the estimates made with the second method are slightly higher, with the exception of steelhead and the error ranges are much smaller. These tables show the accuracy of the original method of estimating the Moricetown Canyon fishery catches.

Table 39 shows the total catch estimates of the Moricetown canyon fishery during hours of observation plus the estimated catch of hours with no observation using the second method. The contributions of the observed catches and the estimates of the unobserved catch are given in Table 40.

1995 Moricetown Canyon Catch Estimates #2													
Stat. Wk	Est Hrs	Hrs. Obs.	Hrs No Obs.	Cn Est.	Cn Err.	Sy Est.	Sy Err.	Co Est.	Co Err.	Sthd Est.	Sthd Err.	Pk Est.	Pk Err.
26	105	11.00	94.00	10	17	0	0	0	0	0	0	0	0
27	112	63.50	48.50	72	17	1048	14	0	0	0	0	0	0
28	112	63.50	48.50	58	13	1489	8	0	0	0	0	0	0
29	112	44.75	67.25	223	46	6194	41	0	0	5	4	0	0
30	119	71.50	47.50	151	24	5274	49	0	0	5	2	105	29
31	119	84.50	34.50	237	21	5187	10	37	7	32	6	86	38
32	119	88.00	31.00	179	17	2815	15	60	9	34	5	1088	25
33	119	115.00	4.00	128	1	1521	0	13	0	10	0	77673	0
34	112	105.22	6.78	70	2	290	1	138	3	83	2	10566	36
35	98	92.48	5.52	33	1	71	0	120	2	79	1	432	19
36	98	97.05	0.95	27	0	24	0	107	0	71	0	68	1
37	98	84.42	13.58	24	2	0	0	67	4	59	3	2	1
38	98	80.50	17.50	0	0	0	0	18	2	30	3	6	2
39	98	84.33	13.67	0	0	0	0	15	1	29	2	1	0
40	84	77.42	6.58	0	0	0	0	0	0	2	0	0	0
41	84	64.00	20.00	0	0	0	0	0	0	0	0	0	0
42	84	58.00	26.00	0	0	0	0	0	0	3	4	0	0
Weeks	Est. Hrs.	Hrs. Obs.	Hrs No Obs.	Cn Est.	Cn Err.	Sy Est.	Sy Err.	Co Est.	Co Err.	Sthd Est.	Sthd Err.	Pk Est.	Pk Err.
17	1771	1285.17	485.83	1212	162	23913	138	575	29	443	34	90027	151

Table 40. 1995 Moricetown Canyon Catch Estimates using the second methodology.

1995 Moricetown Canyon Catch During Hours Observation and Estimates of Hours with no Observation Table																	
Stat. Wk	Est Hrs	Hrs. Obs.	Hrs No Obs.	Obs On	On Est.	On Err.	Obs. Sy	Sy Est.	Sy Err.	Obs Co	Co Est.	Co Err.	Obs. Shd	Shd Est.	Shd Err.	Obs. Pk	Pk Est.
26	105	11.00	94.00	1	9	17	0	0	0	0	0	0	0	0	0	0	0
27	112	63.50	48.50	41	31	17	594	454	14	0	0	0	0	0	0	0	0
28	112	63.50	48.50	33	25	13	844	645	8	0	0	0	0	0	0	0	0
29	112	44.75	67.25	89	134	46	2475	3719	41	0	0	0	2	3	4	0	0
30	119	71.50	47.50	91	60	24	3169	2105	49	0	0	0	3	2	2	63	42
31	119	84.50	34.50	168	69	21	3683	1504	10	26	11	7	23	9	6	61	25
32	119	88.00	31.00	132	47	17	2082	733	15	44	16	9	25	9	5	1065	23
33	119	115.00	4.00	124	4	1	1470	51	0	13	0	0	10	0	0	77673	0
34	112	105.22	6.78	66	4	2	272	18	1	130	8	3	78	5	2	10476	90
35	98	92.48	5.52	31	2	1	67	4	0	113	7	2	75	4	1	408	24
36	98	97.05	0.95	27	0	0	24	0	0	106	1	0	70	1	0	67	1
37	98	84.42	13.58	21	3	2	0	0	0	58	9	4	51	8	3	2	0
38	98	80.50	17.50	0	0	0	0	0	0	15	3	2	25	5	3	5	1
39	98	84.33	13.67	0	0	0	0	0	0	13	2	1	25	4	2	1	0
40	84	77.42	6.58	0	0	0	0	0	0	0	0	0	2	0	0	0	0
41	84	64.00	20.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	84	58.00	26.00	0	0	0	0	0	0	0	0	0	0	3	4	0	0
Weeks	Est. Hrs.	Hrs. Obs.	Hrs No Obs.	Obs On	On Est.	On Err.	Obs. Sy	Sy Est.	Sy Err.	Obs Co	Co Est.	Co Err.	Obs. Shd	Shd Est.	Shd Err.	Obs. Pk	Pk Est.
17	1771	1285.17	485.83	824	388	162	14680	9233	138	518	57	29	389	54	34	89821	206

Table 41. 1995 Moricetown Canyon Second Method Catch Estimates showing the contribution to the total catch of the observed and estimated components.

2.7.5. The Wet'suwet'en Selective Fishery at Moricetown Canyon

Traditional Wet'suwet'en selective fisheries were located at Ditzleh (weir fishery), and Moricetown Canyon (fish traps and spears). Other traditional Wet'suwet'en selective fisheries were at various locations on the Upper Bulkley. The fishery harvested chinook, sockeye, pinks, and smaller numbers of steelhead and coho. Traps and weirs are proven live capture methods. But recent history changed these methods. The 1906 Barricades Agreement banned these traditional methods of live capture gear which forced our people to use less selective methods like gaffs and gill nets. The alteration of Moricetown Canyon by the installation of fish ladders in the 1950's also promoted the use of gaffs and jigs. These factors essentially changed the fishery to less-selective harvest methods, and increased the loss of injured fish.

In the mid 1980's the Wet'suwet'en chiefs called for a move to a dip net fishery in order to reduce the loss rate due to gaffs and jigs (Morrell 1985). Since then dip nets have become the dominant fishing gear harvesting 99% of the total catch. The "Jig Ban" implemented in 1994 and the increased use of dip nets has reduced the non-selective harvest of the Moricetown Canyon fishery to one percent of the total catch in 1995. The proportional take by jigs declined to 2.5% in 1994 and almost 0% in 1995.

In 1995 93% to 99% of the sockeye, pink, coho, and steelhead were captured by dip nets (Table 15, Figure 43). In contrast, two thirds of the chinook were taken by gaffs in 1993 and 1994, and in 1995, 55% of the chinook were harvested with the gaff.

The dominance of selective fishing at Moricetown for non-chinook salmon permits the release of fish belonging to depleted stocks and of pink salmon which are not favored for local use.

The data for fishing losses include intentional releases. 1993 dip net losses were about 2%. In 1994 steelhead losses were recorded as 32%. These losses were intentional releases and represent the effort to avoid fishing this depleted stock. In 1994 16,000 Pink salmon were released after capture by dip nets. The releases were 96% of the pink salmon catch. The bulk of the pink salmon that were retained were smoked and distributed to elders in Moricetown. The 1995 fishery harvested 99.9% of the pink salmon by dip net.

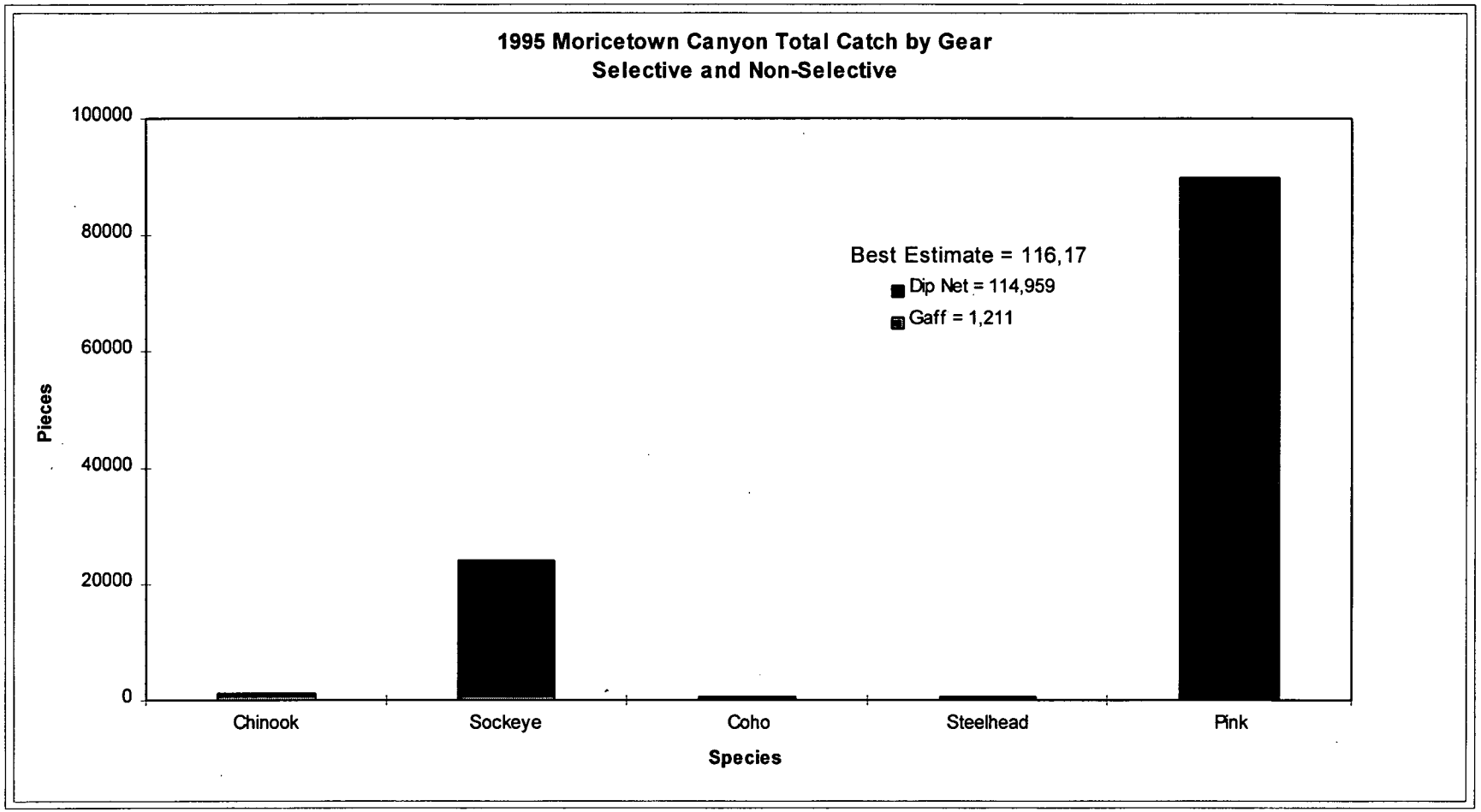


FIGURE 57. 1995 MORICETOWN CANYON TOTAL CATCH, SELECTIVE VS. NON-SELECTIVE.

2.7.5.1. Moricetown Catch/Loss Data

Success in landing fish at Moricetown depends on the gear employed. Losses of fish in the dip net fishery are rare , fish lost in the dip net fishery are more apt to be released than actually lost. No attempt was made to estimate the losses of the dip net fishery. The gaff fishery does not usually release catch other than pink salmon. Some of the fish in the gaff fishery are lost, mainly due to gaffer inexperience and river turbulence.

1995 losses from the total catch of the gaff fishery are 27.77%, 7.34% higher than in 1994 and up 10.8% from 1993. Table 41 shows the catches, losses, and ratios by species of the 1995 Moricetown gaff fishery. Table 41 is based only on observations of fish caught and lost, the method for estimating catches and losses is the average catch and loss per hour multiplied by the available hours of fishing for individual weeks.

These data might underestimate the losses because only fish identified to species are included. Fish lost before they break the surface are recorded as "unknown lost". Some of the lost fish, especially in the gaff fishery are seriously wounded. Some are later captured; others may survive. Data on the fate of wounded fish are difficult to obtain.

Damage to lost fish is a concern in Moricetown. Although most fish are taken with live capture gear there does not at this time seem to be a replacement for the gaff for obtaining chinook.

1995 Moricetown Canyon Gaff Catch/Loss Estimates				
	Caught	Lost	C/L Ratio	Loss Rate
Chinook	606	175	3.46:1	22.43%
Sockeye	405	120	3.38:1	22.84%
Coho	38	6	6.86:1	12.72%
Steelhead	16	5	3.18:1	23.95%
Pink	38	119	0.32:1	75.49%
Total	1103	424	2.60:1	27.77%

Table 42. 1995 Moricetown Canyon catch/loss ratios in the gaff fishery.

2.7.6. The Bulkley River Set Net Fishery

The emphasis of fishing in the Wet'suwet'en area is at Moricetown Canyon. Set net fishing is a small component of the Bulkley River catch. In 1995 five gill nets were fished on the Bulkley River. One net near the mouth, one at Hagwilget, one near the Suskwa River, and three below Moricetown Canyon.

In 1995 the gill nets fished near the mouth of the Bulkley and at Hagwilget Canyon were fished during weeks 26 to 28 (late June and July). The gill net fished near the Suskwa River was fished in two locations during weeks 28 and 29. During week 28 it was fished near Mud Flat Creek with no catches, at the end of week 28 the net was moved to below the bridge crossing the Bulkley River on the Suskwa Road. The gill nets fished near Moricetown were fished from weeks 26 to 30.

The Bulkley gill net fishery targets mainly chinook and sockeye. Once the pink salmon begin to appear in the Bulkley River most fishers quit fishing with gill nets. The high pink escapements to the Bulkley River make gill net fishing more of an inconvenience to the fishers targeting the sockeye and Chinook stocks. The time it takes to remove the pink salmon from the nets prove to be time consuming and more of a problem.

Catches estimates of this fishery are based on interviews, and set net log books collected during the 1995 fishing season, no direct samples were obtained.

1995 Bulkley Gill Net Catch Estimates	
	Catch Est.
Sockeye	713
Chinook	69
Pink	5
Steelhead	0
Coho	1
Chum	0
Total	788

Table 43. 1995 Bulkley River Gill Net Catch Estimates.

2.8. Discussion

2.8.1. The Gitksan and Wet'suwet'en Fisheries in 1995

Salmon returns to the Skeena River are dominated by sockeye and pinks. The most numerous sockeye stocks, contributing 90% to 95% of the total Skeena River escapement, are the sockeye runs to the Babine River, the largest of which are the enhanced Pinkut Creek and Fulton River stocks. These stocks contribute 1 to 3 million fish per year (Sprout and Kadowacki 1987).

Pink salmon runs to the Skeena System are nearly as large, but many of the fish spawn below the Gitksan and Wet'suwet'en area. Pinks are the second most abundant species within the Gitksan and Wet'suwet'en territories.

In contrast to these stocks, some of the wild stocks are severely depressed. The Sicintine River, in the Upper Skeena, had a 1993 spawning escapement of about 2 sockeye; the target escapement is 100 (Jantz et al. 1989). The Maxan Lake sockeye stock in the Upper Bulkley, formerly was an important food source for the Broman Lake People. In 1994 the observed spawning escapement was 3. The 1992 data for the Kitwancool (Kitwanga) River, formerly with escapement of thousands of sockeye was 12. If these data are indicative of the size of the stocks surveyed, they are near extinction. Many streams in the logged drainages of the Skeena and Bulkley Rivers now have extremely low numbers of coho. Many populations of coho, especially those in logging impacted drainages appear to be extinct.

In 1995 we concentrated on the Kispiox river drainage. The total observed escapement to the Kispiox drainage was 761. The target escapement is over 50,000. The creeks in the Kispiox Watershed with higher escapements such as Nangeese River (255) and Ironside Creek(190) show severely depressed numbers of spawners with less than 15% of target escapement. Murder Creek with a target escapement of 500 had no coho this year. Hodder Creek with a target escapement of 300 had an observed escapement of 2.

Mixed stock fishing problems are a severe test of salmon management ability and will. If fishing access is set by the ability of the enhanced stock to sustain fishing pressure then most natural stocks will decline. Moving a portion of the fishery upriver serves to alleviate this problem. If selective fishing takes place upriver, with the release of threatened species, then there is the potential to avoid some of the negative consequences of mixed stock fishing. If techniques are developed for in-season separation of sockeye stocks, regulation of fishing openings combined with selective fishing may avoid most of the negative effects of the in-river mixed stock fishery.

The Gitksan Skeena River fishery is dominated by the sockeye harvest which makes up 90% of the total salmon caught. It is likely that the main part of the Gitksan fishing effort is late enough to avoid part of the Morice Lake (Nanika and Atna Rivers) runs. Furthermore these runs are only harvested in the Lower Skeena Gitksan fishery. It is therefore likely that the total Gitksan Skeena River fishery is composed of about 86% Babine Lake Sockeye. The sockeye fishery is composed of over 95% Babine Lake fish.

The Wet'suwet'en sockeye fishery harvests the Morice Lake sockeye stocks. These stocks have rebounded to pre 1954 levels and are meeting escapement objectives of the DFO and GWWA within the limits of sampling accuracy. In 1992 30,000 sockeye from this stock were harvested at Moricetown, in 1994 approximately 14,000 were taken: in 1995 the harvest was approximately 24,000. With careful management, an allocation of part of the Morice Lake stocks for Moricetown seems justified.

The total Gitksan and Wet'suwet'en catches of Chinook are significant with about 7,000 fish caught. Although the size of this catch is relatively small it may represent 10% to 25% of the spawning escapement. In Moricetown, 3233 chinook were taken in 1992, 4902 chinook in 1993, 2022 chinook in 1994, and 1212 in 1995. These represent 19% in 1992, 26% in 1993, and 38.2% in 1994 of the known spawning escapements. At the time of report preparation escapement data for the Bulkley river is not available. Of these years chinook escapements approximated or exceeded DFO (Janz et al. 1989) and GWWA escapement goals. The prevailing Wet'suwet'en harvest rates are apparently sustainable.

Pink catches in the Skeena River were relatively low in part because of the perceived low value of this species. Morrell (1985) points out that Gitksan gill netters tend to arrange their fishing effort to avoid catching pink salmon which appear in August.

The increase in the total Gitksan and Wet'suwet'en pink harvest to 100,000 pieces in 1995 represents the commercial take of over 90,000 fish at Moricetown. The Moricetown pink fishery is in response to the dramatic increase in Bulkley River pink escapements in the last ten years. The expansion of the Bulkley River pink stocks is probably due to changes in the management of pink salmon at Moricetown Canyon instituted by the Wet'suwet'en. In the mid 1980's the Moricetown Canyon fish ladder was modified and dip net caught pink salmon were transported above the falls. Ten fold increases in escapement followed within two cycles (4 years).

Gitksan and Wet'suwet'en catches of steelhead, coho, and chum are small, in part due to their extremely depressed population levels in the Skeena River, and in part due to releases with selective fishing gear. We hope that cooperative arrangements can be made with commercial and sports fishing groups to reduce capture of these vulnerable fish.

2.8.2. Accuracy of the Catch Estimates

Catch estimates for the Skeena River set net fisheries are dependent on effort data and CPUE data. In the 1995 data, the confidence limits based on the effort estimate and the CPUE estimate are similar, suggesting a good distribution of sampling attention.

The effort data are good for days of fishing activity and are presumably unbiased. Estimates of the number of sets per day are dependent on the co-operation of fishers and frequency of inspection. In 1995, with the exception of weeks 29 and 30 on the Lower Skeena, fishers co-operated with GWWA Rangers in providing data. In those cases where we have log book data and other sources of data on fishing effort, the numbers agree closely. It is probable that the confidence limits used are wide enough to include the actual catch.

Catch per unit effort numbers are largely obtained by the use of set net log books. Frequent visits by GWWA Rangers help to maintain the co-operation of fishers and result in improving the quality of the data recovered. Since acquisition of fishing effort and catch data have been carried on in previous years, many fishers are familiar with the set net log books and readily co-operate. The co-operation of these members of the community is gratefully acknowledged.

Catch per unit effort numbers for the Skeena gill net fishery have a wide distribution. This is probably due to the variability between fishing sites, the pulse-like migration of fish, and varying efficiency of net sites with different stage levels of the river. Probably the estimates of CPUE are unbiased despite the large variation in values. Probably the variation of CPUE would not be much decreased with large increases in the sample size.

In statistical weeks 29, 30 and 34, on the Lower Skeena, and weeks 21 through 24, and 35 on the Upper Skeena, only effort data was collected. The CPUE estimate was derived from CPUE data of the other set gill net district. This substitution does not significantly affect the overall catch estimates of sockeye and chinook, the main components of the fishery. Other methods of substituting CPUE data, such as using the average of past years, or regressing the CPUE data of the Lower and Upper Skeena yield estimates very close to those used.

For the Lower skeena set gill net fishery The values reconstructed account for 39% of the sockeye and 36% of the chinook estimated catch. Since the effort level is known, and the CPUE are similar in the two districts, the inaccuracy of the total harvest level is small. for the Upper Skeena the weeks of missing data occur when the sockeye and chinook catches are low (weeks 21 through 24) or fishing effort was low (week 35). The values reconstructed account for 0% of the sockeye and 7% of the chinook estimated catch. Consequently, they have little effect on the catch estimates.

The accuracy of the estimates of the drift net fishery is much improved in 1995 over previous years data. The high rate of sampling in 1995 (66%) results in a reliable estimate of this portion of the fishery and suggests that the true catch is within the stated confidence limits.

This is the first year when seine netting activity was monitored at a level which permits estimates of by-catch and releases (85 samples collected, 9% of total sets). The seine net fishery estimate is dependent on the assumption that all or nearly all sockeye were delivered to the buying station for calculation of the number of sets/day. Consequently the error limits in catch and release data are dependent on the CPUE range alone. An increase in sampling rate (anticipated in 1996) would permit an independant estimate of effort to be made.

The data on the Babine fishery is relatively complete. Total catch data for the Babine fishery in 1995 includes fish retained for sustenance use. Release ratios for the dip net component of this fishery were estimated from release ratios of the nearby fish wheel. Familiarity with the fishery suggests that the release values may have been underestimated. Late season fishing for coho and steelhead as in 1994 did not take palce in 1995. The gill net fishery in 1995 was very limited and was well sampled.

The data at Moricetown has a high degree of reliability. The catch estimate is based on observations of the Moricetown fishery. Approximately 73% of the fishing hours were observed. In 1995 there was good coverage of all of the fishing hours, including early in the mornings. The ability of the technicians to identify fish caught and the number of fish caught is indicated by the ability to identify fish caught to species more than 99% of the time. In 1995 the fishery was monitored from the first day of fishing until the end of September when fishing effort approached zero. This provides the best season data yet collected and the best late season data since 1979 (Morrell, 1982).

The hours of fishing used for estimating the Moricetown catch are likely to be slightly conservative. If this bias is present the real value of the catch may be slightly lower than that assumed, but is probably is well within the confidence limits. Although we have observations of the actual fishing hours, this bias is retained for consistency with previous years estimates.

2.8.3. The Growth of Selective Fisheries

The Gitksan and Wet'suwet'en have been moving towards a selective fishery for the past ten years. Selective fisheries are popular within Native cultures because they are seen as a way to take care of the fish stocks and to avoid the waste of undesirable species such as pinks. The effective management of the Aboriginal Fishery by the GWWA for the past four seasons has sped the introduction of innovative live capture techniques and encouraged the readoption of traditional selective capture techniques.

The Moricetown fishery has been changing to selective gear over the last ten years with the adoption of dip netting as the prevailing mode of capture for sockeye, pinks, coho, and steelhead. With the Jig Ban in effect and the increased use of dip nets the Moricetown Canyon fishery has evolved to become a selective fishery. This gear change is effectively complete. The selective harvest began in the mid 1980's targeted on pink and sokeye salmon. In 1992, 79% of the sockeye were harvested by dip net and in 1995, 98.13% of the sockeye were harvested by dip net. In 1995 nearly 99% of the total harvest (all species) was taken with dip nets.

The selective catch of sockeye in the Gitksan Skeena fisheries has increased dramatically since 1992, the first year that selective gear was re-introduced to the Skeena as it passes through Gitksan territories. With development of beach seine and fish wheel live capture gear, and an increased interest in fishing with this type of gear, the capacity of the selective fishery has grown. In 1995 more than half of the total Gitksan fishery (52%) was selectively harvested.. In 1992, 11% of the sockeye were live captured, in 1993, 51%, in 1994, 40%, and 1n 1995, 57%. In the 1996 fishing season we expect the proportion of selective caught fish in the Gitksan Fishery to continue to expand as experience is gained with beach seine nets and fish wheels. A diagram of the ratios of selective to non-selective sockeye catch in 1995 is given in Figure 58.

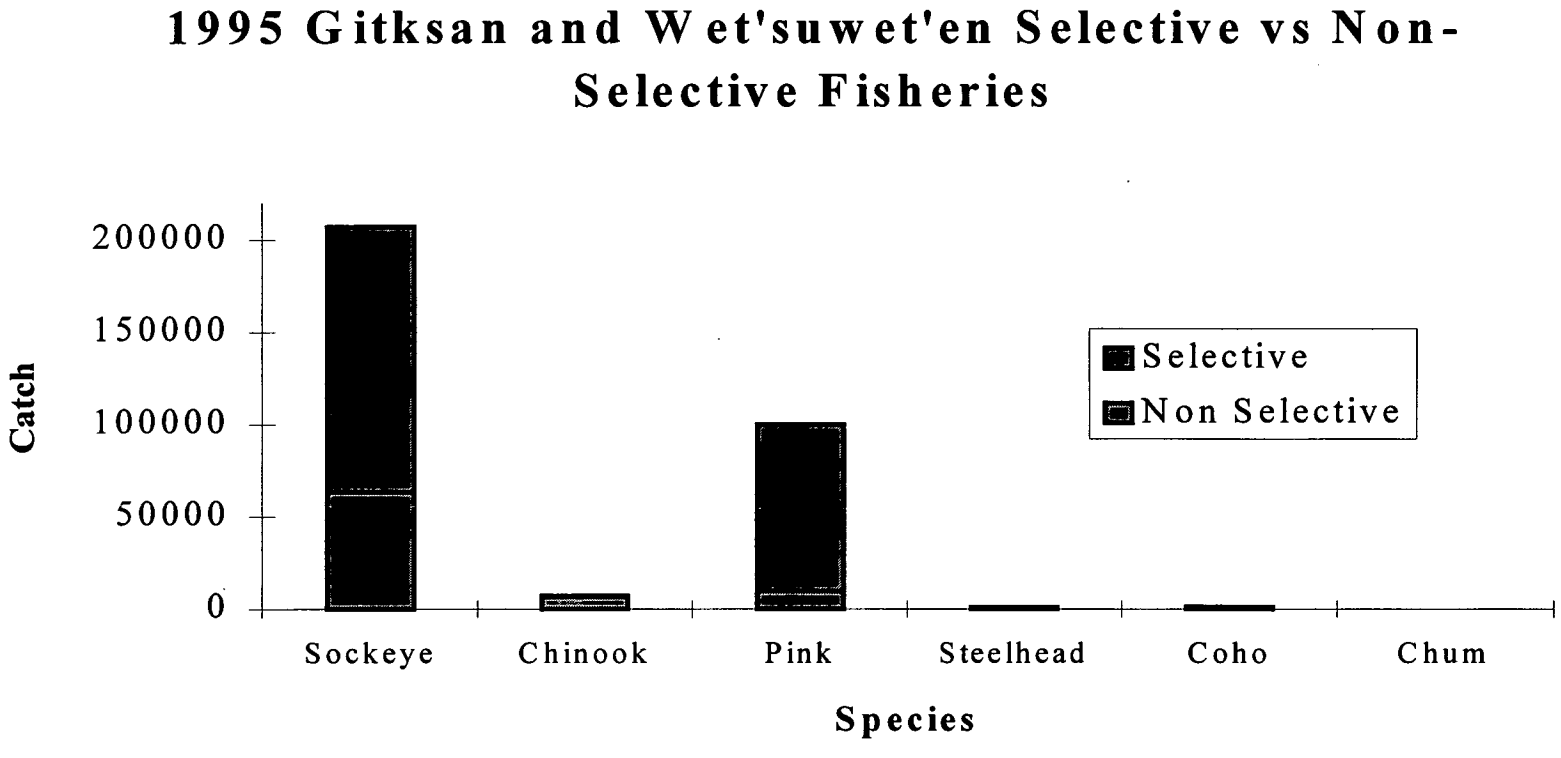


FIGURE 58. THE COMPARISON OF THE 1994 SELECTIVE TO NON-SELECTIVE CATCH IN THE GITKSAN AND WET'SUWET'EN FISHERIES.

2.8.4. Comparison of the 1995 Fisheries with Previous Years

Collection of 1995 catch statistics in a manner comparable to earlier studies permits simple comparison with earlier years data (Table 22). The 1992-94 data sets are probably the most complete. In general sampling of the Skeena and Bulkley fisheries from 1992 through 1995 is better than in previous years. Sampling of the drift net fishery has improved greatly since it was started in 1993. Sampling of the by-catch of the seine net fishery began in 1995. In almost all respects the 1995 catch estimates are the best yet produced for the Skeena River aboriginal fishery.

In general the pre-1985 data are relatively incomplete, except for the 1982 Upper Skeena data set. The 1984 data on CPUE are more complete in the Upper Skeena than the 1992 or 1993 survey data.

Comparison of the 1995 fishery with earlier fishery shows:

1) An increase in the selective fishery, beginning in 1985 and expanding to 75% of all fish caught in 1995.
2) The total Skeena River sockeye catch has increased greatly from 47,000 in 1982, and 57,000 in 1985, to 184,000 in 1995. The increase in sockeye harvest represents the selective fishing as part of the ESSR. Non-selective sockeye catches are close to 1985 and below the 1992 levels. The pre-1985 data are too incomplete for comparison.
3) The Babine fishery has expanded from 5000 - 9000 in 1985 through 1994 to 37,000. It is the selective harvest with the least impact on other sockeye stocks.
3) The Moricetown sockeye fishery has grown from 5000-6000 in the 1980's to 10,000-30,000 in the 1990's. The 1995 level was 24,000. The increase in sockeye catch accompanies a recovery of spawning escapement to the Nanika River to pre-1953 levels.
4) Overall chinook catches have changed little over the past 10 years except for a strong decline in chinook catch at Moricetown in 1994 and 1995.
5) The pink salmon fishery in Moricetown in 1995 was 90,000. This is much higher than previous years except for 1992. As in 1992, the harvest in the Moricetown catch resulted from commercial exploitation of the expanding Bulkley River pink escapement in both even and odd years.
6) Steelhead and Coho fisheries have declined greatly in the Skeena River. This reduction indicates the serious state of decline of these stocks. In part the low rate of catch in the Gitksan and Wet'suwet'en fisheries demonstrates an effort to decrease fishing pressure on these endangered stocks and the shows the potential of selective fisheries.
7) The Gitksan fisheries harvested only 4 chum in 1995. Although this is not a target species, this catch rate suggests a collapse of the Skeena River chum stocks.

	Year	Up & Lo Skeena	Babine	Moricetown	Total
Sockeye	1979	21063			21063
	1980	17176			17176
	1981	29864			29864
	1982	47787		6043	53830
	1985	51335	5762	5229	62326
	1992	66697	5223	30337	102257
	1993	63868	9266	11795	84929
	1994	70028	6846	14298	91172
	1995	144995	37265	23912	206172
Chinook	1979	703			703
	1980	925			925
	1981	1849			1849
	1982	1268		5605	6873
	1985	6198	8	4556	10762
	1992	6319	2	3233	9554
	1993	4531	0	4902	9433
	1994	5349	7	2022	7378
	1995	5660	0	1212	6872
Pink	1979	3140		9055	12195
	1980	2809			2809
	1981	6640			6640
	1982	3957		2374	6331
	1985	11795	375	13144	25314
	1992	6583	700	75979	83262
	1993	2851	0	474	3325
	1994	10996	55	1334	12385
	1995	9568	444	90023	100035
Steelhead	1979	870		268	1138
	1980	503			503
	1981	1786			1786
	1982	2820		442	3262
	1985	2944	67	1167	4178
	1992	340	7	270	617
	1993	361	0	177	538
	1994	1153	5	1430	2588
	1995	353	5	448	806
Coho	1979	1306		1886	3192
	1980	626			626
	1981	1822			1822
	1982	2775		425	3200
	1985	568	33	670	1271
	1992	156	2	924	1082
	1993	313	0	475	788
	1994	995	1	3735	4731
	1995	335	0	574	909
Chum	1979	111			111
	1980	279			279
	1981	501			501
	1982	665			665
	1985	704	0	0	704
	1992	146	0	0	146
	1993	208	0	0	208
	1994	683	0	0	683
	1995	4	0	0	4

Table 44. Comparison of the 1995 Fishery with previous years.

2.8.5. The Relative Size of the Gitksan and Wet'suwet'en Aboriginal Fishery

A sockeye run reconstruction is presented in Table 45 and Figure 59. This reconstructiopn is based on commercial catch data from the Depaertment of Fisheries and Oceans Prince Rupert. This model suggests a total run size of 4.75 million sockeye, nearly all of which pass through or spawn in the Gitksan and Wet'suwet'en territories. The total commercial harvest of Skeena Sockeye was at least 2.7 million, or 57% of the total run.

The total coastal and Skeena River Aboriginal harvest of sockeye was approximately 7.2% of the total run. The total sockeye catch for the Gitksan and Wet'suwet'en fisheries was 193,000 accounting for 4.1% of the run.

A harvest rate of over 63.8% of the salmon stock is sustainable by only the few strongest stocks, such as the Pinkut and Fulton River enhanced stocks of Babine Lake. The decline of most wild sockeye stocks, and coho, steelhead is the legacy of this rate of fishing. The Gitksan and Wet'suwet'en are attempting to inaugurate a change in fishing philosophy, one that leads to selective harvest of only those stocks that can sustain heavy fishing pressure. The predictable result of reducing fishing pressure on suppressed stocks will be an overall increase in the cumulative fish supply.

1995 Sockeye Run Reconstruction	
Escapement	1719708
Native Fisheries	343553
Canadian Commercial Catch	2373963
Alaskan Commercial Catch	315209
Total	4752433

Table 45. 1995 Skeena River sockeye run reconstruction.

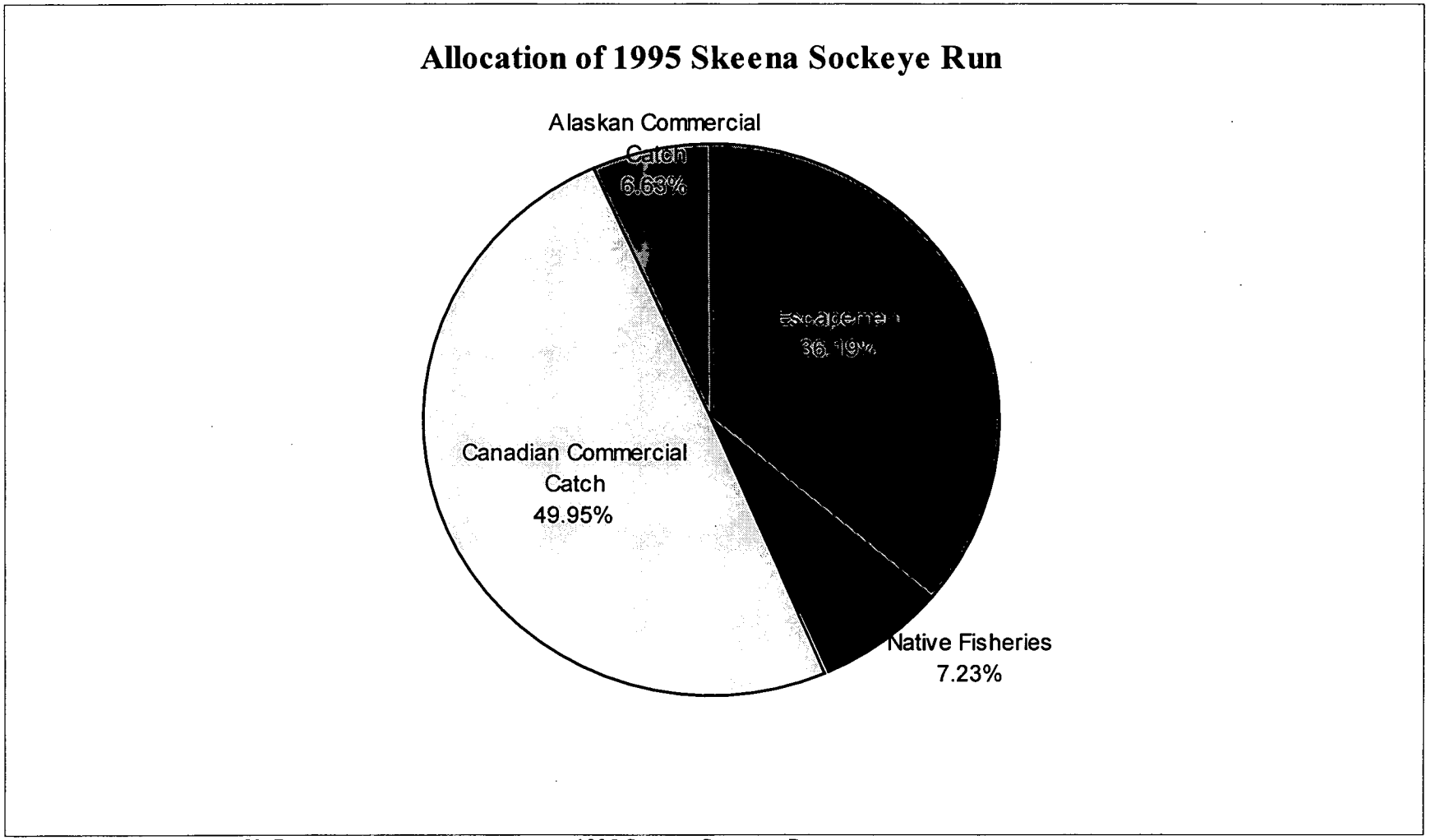


FIGURE 59. DIAGRAM OF ALLOCATION OF THE 1995 SKEENA SOCKEYE RUN.

2.9. Recommendations for 1996

1. Strive to obtain 20% sampling of sets for all weeks of the 1996 Skeena River set net fishery.
2. Continue the effort and CPUE surveys of the Skeena River drift net fisheries as carried out in 1995.
3. Increase monitoring effort of the Skeena River beach seine fishery to obtain confidence limits of effort and CPUE data and rates of harvest and release.
4. Increase monitoring of the Gisgagaas Dip net fishery to obtain better release rate estimates.
5. A slight increase of effort surveys and sample rates for the Bulkley set net fishery.
6. Continue monitoring the Moricetown Canyon fishery at the 1992 to 1995 level.
7. Obtain accurate escapement estimates for the Nanika-Morice, Kispiox, Bear and Kitwancool Rivers.

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