

Nome River Salmon Counting Weir  
Project Summary Report, 1997

by

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## TABLE OF CONTENTS

List of Tables.....	ii
List of Figures.....	ii
Introduction .....	1
Objectives.....	1
Methods.....	1
Results .....	2
Discussion .....	3
Acknowledgments.....	4
Literature Cited.....	5
Tables .....	6
Figures.....	10

## LIST OF TABLES

<u>Table</u>		<u>Page</u>
1.	Daily passage of all salmonid species at the Nome River weir, Norton Sound, 1997.....	6
2.	Results of chum salmon sampling sorted by date and age/sex category, Nome River, Norton Sound, 1997.....	7
3.	Chum salmon escapement sample age and sex composition, and mean length, Nome River, Norton Sound, 1997.....	8
4.	Climatological observations at the Nome River weir, Norton Sound 1997.....	9

## LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1.	Area location map of the Nome River weir project site, Norton Sound, 1997.....	10
2.	Daily chum salmon migration past the Nome River weir, Norton Sound, 1997.....	11
3.	Cumulative chum salmon migration past the Nome River weir, Norton Sound, 1997.....	11
4.	Daily pink salmon migration past the Nome River weir, Norton Sound, 1997.....	12
5.	Cumulative pink salmon migration past the Nome River weir, Norton Sound, 1997.....	12
6.	Daily king salmon migration past the Nome River weir, Norton Sound, 1997.....	13
7.	Cumulative king salmon migration past the Nome River weir, Norton Sound, 1997.....	13
8.	Daily coho salmon migration past the Nome River weir, Norton Sound, 1997.....	14

9.	Cumulative coho salmon migration past the Nome River weir, Norton Sound, 1997.....	14
10.	Daily Dolly Varden migration past the Nome River weir, Norton Sound, 1997.....	15
11.	Cumulative Dolly Varden migration past the Nome River weir, Norton Sound, 1997.....	15
12.	Cumulative passage of chum salmon past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1997, Norton Sound .....	16
13.	Cumulative odd year pink salmon migration past the Nome River counting tower, 1993-1995, and the Nome River weir, 1997, Norton Sound .....	17
14.	Cumulative even year pink salmon migration past the Nome River counting tower, 1994, and the Nome River weir, 1996, Norton Sound.....	17
15.	Cumulative passage of king salmon past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1997, Norton Sound .....	18
16.	Cumulative passage of coho salmon past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1997, Norton Sound .....	18
17.	Cumulative passage of Dolly Varden past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1997, Norton Sound .....	19

## INTRODUCTION

The Nome River drains into Norton Sound approximately three miles east of Nome. Commercial fishing has been gradually reduced through regulatory restrictions since the late 1970s and the marine waters near the mouth were closed in 1984. The Nome River currently supports a large number of subsistence and sport users, however, their fishing opportunities generally continue to decrease as fewer salmon return to the river most years. The subsistence and sport fisheries are now managed at a level of intensity similar to a commercial fishery, with Emergency Orders regulating restrictions and fishing periods.

A salmon counting tower was operated on the Nome River starting in 1993 (Bue 1994, Rob 1995a and Rob 1995b). A weir replaced the counting tower in 1996 (Rob 1997). This was the second year of weir operation. The returns of chum, pink, king, and coho salmon and of Dolly Varden were counted. The project operates as a means to obtain timely and accurate escapement information that is required to actively manage the stocks throughout the season.

## OBJECTIVES

1. Obtain daily and seasonal estimates of the timing and magnitude of the salmon escapement by species, to the Nome River.
2. Estimate the age, sex, and length composition of the chum salmon escapement to the Nome River.
3. Obtain daily and seasonal estimates for the timing and magnitude of the Dolly Varden escapement to the Nome River.

## METHODS

The Nome River tower camp is approximately 3 miles upstream from the mouth of the river, on land leased to the Alaska Department of Fish & Game (ADF&G) by the Sitnasuak Native Corporation (Figure 1). This year the project site was moved approximately ½ mile downstream from the previous counting tower site. The new site is wider, shallower and better suited for weir operations.

The crew began working on 23 June, 1997. After inventorying equipment and purchasing supplies, they ferried equipment to the project site by truck and jet boat. Then the camp was established. A full weir was built to completely block the river to fish passage. A gate and trap were installed in the weir to allow fish passage, enumeration and capture of

fish for sampling and broodstock. The weir was made of a series of 1¼" pipes assembled in pairs using locking metal brackets. Aluminum stringers twelve feet long connected the pairs of pipes horizontally. Metal conduit pipes ten feet long were inserted vertically in holes 1¾ inches on center on the stringers. This formed a weir designed to be easily cleaned, fish tight and easily removed in the event of a flash flood.

The crew traveled to Nome for their days off and also to pick up groceries, supplies and mail. Nome office staff transported the crew to and from the Nome River highway bridge and provided other logistical support.

## RESULTS

Table 1 shows the daily and cumulative weir passage for each species.

The total cumulative weir counts were: 5,131 chum salmon, 8,035 pink salmon, 22 king salmon, 321 coho salmon, and 1,352 Dolly Varden (Table 1). Figures 2-11 show graphs of the daily the cumulative totals for each species counted.

Counting began on 27 June. Chum salmon, king salmon and Dolly Varden were first observed on 27 June, pink salmon were first observed on 28 June, and coho salmon were first observed on 8 July (Table 1). The daily peak of 477 chum salmon occurred on 21 July, the daily peak of 4 king salmon occurred on 18 July, the daily peak of 1,520 pink salmon occurred on 21 July, the daily peak of 81 coho salmon occurred on 13 August, and the daily peak of 210 Dolly Varden occurred on 12 August (Table 1). Most chum salmon returned during the four week period from 4 July through 31 July when 83% passed the weir (Table 1 and Figures 2 and 3). Most pink salmon returned during the four week period from 16 July through 12 August when 96% passed the weir (Table 1 and Figures 4 and 5). Most king salmon returned during the three week period from 5 July through 25 July when 73% passed the weir (Table 1 and Figures 6 and 7). Most coho salmon returned during the last three weeks of weir operation when 93% passed the weir (Table 1 and Figures 8 and 9). Most Dolly Varden returned during the last three weeks of weir operation when 95% passed the weir (Table 1 and Figures 11 and 12).

Usable age, length and sex information was collected from 173 chum salmon in conjunction with eggtake activity for Nome River rehabilitation projects. The chum salmon scale samples collected on 25 and 31 July, 1997 were composed of 30 or 0.6% age-0.2, 1,869 or 36.4% age-0.3, 3,114 or 60.7% age-0.4, and 119 or 2.3% age-0.5 (Tables 2 and 3).

A peak aerial survey count of 956 chum salmon was made on 16 July, 1997. The total season weir count of chum salmon was 5,131 (Table 1). The peak aerial survey counted 19% of the total season weir count of chum salmon. The peak aerial survey counted 796 chum salmon above the weir on 16 July, when the cumulative weir count of chum salmon

was 1,763 (Table 1). The peak aerial survey counted 45% of the cumulative weir count on 16 July.

A peak aerial survey count of 544 coho salmon was made on 21 August, 1997. The total season weir count of coho salmon was 321 (Table 1). The peak aerial survey counted 169% of the total season weir count of coho salmon. The peak aerial survey counted 104 coho salmon above the weir on 21 August, when the cumulative weir count of chum salmon was 211 (Table 1). The peak aerial survey counted 49% of the cumulative weir count on 21 August.

Climatological and stream observations are shown in Table 4.

## DISCUSSION

This was the fifth consecutive year of operation for an escapement project on the Nome River. This year the project was moved downstream approximately ½ mile to a site better suited to operation of a full weir. River conditions this year were good with generally stable water levels (Table 4).

The Nome River counting tower operated from 25 July to 28 August in 1993. Comparisons between the 1993 and 1997 data can be made for the period from 25 July through 27 August. The escapements of all species, except Dolly Varden, were greater during this time period in 1993. From 25 July to 27 August in 1997 the weir count of chum salmon was 1,367, during the same time period in 1993 the expanded tower count was 1,564 chum salmon. In 1997 the weir count of pink salmon during this time period was 4,700, during the same time period in 1993 the expanded tower count was 13,036 pink salmon. In 1997 the weir count of king salmon during this time period was 5, during the same time period in 1993 the expanded tower count was 59 king salmon. In 1997 the weir count of coho salmon during this time period was 315, during the same time period in 1993 the expanded tower count was 4,279 coho salmon. In 1997 the weir count of Dolly Varden during this time period was 1,296, during the same time period in 1993 the expanded tower count was 1,255 Dolly Varden (Table 1, Figures 12-17, and Bue 1994).

The Nome River counting tower operated from 24 June to 15 August 1994. Comparisons between the 1994 and 1997 data can be made for the period from 27 June through 15 August. The escapements of king salmon and coho salmon were less and the escapements of chum and Dolly Varden were greater in 1997, the even and odd year pink salmon escapements are not comparable. From 27 June to 15 August in 1997 the weir count of chum salmon was 4,965, during the same time period in 1994 the expanded tower count was 2,893 chum salmon. In 1997 the weir count of king salmon during this time period was 19, during the same time period in 1994 the expanded tower count was 54 king salmon. In 1997 the weir count of coho salmon during this time period was 191, during the same time period in 1994 the expanded tower count was 726 coho salmon. In 1997 the weir count of Dolly Varden during this time period was 662, during the same

time period in 1994 the expanded tower count was 175 Dolly Varden (Table 1, Figures 12-17, and Rob 1995a).

The Nome River counting tower operated from 22 June to 6 September in 1995. Comparisons between the 1995 and 1997 data can be made for the period from 27 June through 27 August. The escapements of chum salmon, king salmon and Dolly Varden were greater and the escapements of pink salmon and coho salmon were less in 1997. From 27 June to 27 August in 1997 the weir count of chum salmon was 5,131, during the same time period in 1995 the expanded tower count was 5,077 chum salmon. In 1997 the weir count of pink salmon during this time period was 8,035, during the same time period in 1995 the expanded tower count was 13,831 pink salmon. In 1997 the weir count of king salmon during this time period was 22, during the same time period in 1995 the expanded tower count was 5 king salmon. In 1997 the weir count of coho salmon during this time period was 321, during the same time period in 1995 the expanded tower count was 1,376 coho salmon. In 1997 the weir count of Dolly Varden during this time period was 1,352, during the same time period in 1995 the expanded tower count was 838 Dolly Varden (Table 1, Figures 12-17, and Rob 1995b).

The Nome River weir operated from 26 June to 23 July in 1996. Comparisons between the 1996 and 1997 data can be made for the period from 27 June through 23 July. The escapements of chum salmon, king salmon and Dolly Varden were greater and the escapement of coho salmon was less in 1997, the even and odd year pink salmon escapements are not comparable. From 27 June to 23 July in 1997 the weir count of chum salmon was 3,764, during the same time period in 1996 the expanded tower count was 3,339 chum salmon. In 1997 the weir count of king salmon during this time period was 17, during the same time period in 1996 the expanded tower count was 5 king salmon. In 1997 the weir count of coho salmon during this time period was 6, during the same time period in 1996 the expanded tower count was 66 coho salmon. In 1997 the weir count of Dolly Varden during this time period was 56, during the same time period in 1996 the expanded tower count was 18 Dolly Varden (Table 1, Figures 12-17, and Rob 1997).

#### ACKNOWLEDGEMENTS

The Norton Sound Economic Development Corporation (NSEDC) provided and funded a college intern to be a member of the crew. The crew leader for the season was Eva Oyoumick. Myra Slwooko, the NSEDC intern was the second crewmember. Craig Komp was a crewmember for two weeks in July. Bill Cavaney operated the weir during the last two weeks of the project. A draft of this report was reviewed by Larry Buklis.

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Table 1. Daily weir passage of all salmonid species at the Nome River weir, Norton Sound, 1997.

	Daily chum salmon	Cumulative chum salmon	Daily pink salmon	Cumulative pink salmon	Daily king salmon	Cumulative king salmon	Daily coho salmon	Cumulative coho salmon	Daily Dolly Varden	Cumulative Dolly Varden
27-Jun	10	10	0	0	1	1	0	0	1	1
28-Jun	6	0	3	3	0	1	0	0	0	1
29-Jun	15	15	0	3	0	1	0	0	4	5
30-Jun		15		3		1		0		5
1-Jul	15	30	0	3	0	1	0	0	1	6
2-Jul	8	38	0	3	0	1	0	0	1	7
3-Jul	68	106	0	3	0	1	0	0	3	10
4-Jul	313	419	13	16	0	1	0	0	1	11
5-Jul	3	422	0	16	2	3	0	0	0	11
6-Jul	73	495	9	25	1	4	0	0	0	11
7-Jul	180	675	4	29	0	4	0	0	3	14
8-Jul	48	723	0	29	2	6	1	1	1	15
9-Jul	1	724	0	29	0	6	0	1	0	15
10-Jul	60	784	16	45	0	6	0	1	4	19
11-Jul	70	854	1	46	0	6	0	1	0	19
12-Jul	341	1,195	5	51	1	7	0	1	1	20
13-Jul	10	1,205	0	51	0	7	0	1	2	22
14-Jul	163	1,368	6	57	0	7	0	1	3	25
15-Jul	395	1,763	14	71	0	7	2	3	1	26
16-Jul	274	2,037	126	197	0	7	0	3	13	39
17-Jul	352	2,389	306	503	2	9	0	3	5	44
18-Jul	95	2,484	169	672	4	13	0	3	6	50
19-Jul	64	2,548	12	684	0	13	0	3	0	50
20-Jul	473	3,021	329	1,013	2	15	2	5	2	52
21-Jul	477	3,498	1,520	2,533	1	16	0	5	2	54
22-Jul	262	3,760	801	3,334	0	16	1	6	2	56
23-Jul	4	3,764	1	3,335	1	17	0	6	0	56
24-Jul		3,764		3,335		17		6		56
25-Jul		3,764		3,335		17		6		56
26-Jul	6	3,770	0	3,335	0	17	0	6	0	56
27-Jul	7	3,777	8	3,343	0	17	0	6	0	56
28-Jul	144	3,921	330	3,673	0	17	2	8	1	57
29-Jul	228	4,149	1,121	4,794	0	17	5	13	5	62
30-Jul	93	4,242	243	5,037	0	17	0	13	3	65
31-Jul	102	4,344	445	5,482	0	17	0	13	4	69
1-Aug	55	4,399	700	6,182	1	18	3	16	3	72
2-Aug	36	4,435	113	6,295	0	18	2	18	0	72
3-Aug	18	4,453	57	6,352	0	18	1	19	0	72
4-Aug		4,453		6,352		18		19		72
5-Aug	0	4,453	0	6,352	0	18	0	19	0	72
6-Aug	17	4,470	92	6,444	0	18	2	21	0	72
7-Aug	55	4,525	233	6,677	0	18	7	28	4	76
8-Aug	100	4,625	326	7,003	0	18	15	43	12	88
9-Aug	88	4,713	300	7,303	0	18	11	54	48	136
10-Aug	26	4,739	43	7,346	0	18	4	58	168	304
11-Aug	57	4,796	215	7,561	0	18	10	68	1	305
12-Aug	109	4,905	207	7,768	0	18	40	108	210	515
13-Aug	50	4,955	57	7,825	0	18	81	189	79	594
14-Aug	3	4,958	4	7,829	0	18	0	189	23	617
15-Aug	7	4,965	5	7,834	1	19	2	191	45	662
16-Aug	4	4,969	7	7,841	0	19	1	192	6	668
17-Aug	40	5,009	14	7,855	0	19	14	206	97	765
18-Aug	2	5,011	7	7,862	0	19	0	206	30	795
19-Aug	12	5,023	8	7,870	0	19	2	208	138	933
20-Aug	8	5,031	6	7,876	0	19	3	211	207	1,140
21-Aug	47	5,078	29	7,905	1	20	53	264	41	1,181
22-Aug	13	5,091	22	7,927	0	20	7	271	50	1,231
23-Aug	7	5,098	22	7,949	0	20	2	273	6	1,237
24-Aug	14	5,112	34	7,983	1	21	34	307	55	1,292
25-Aug	9	5,121	29	8,012	1	22	11	318	17	1,309
26-Aug	2	5,123	8	8,020	0	22	0	318	0	1,309
27-Aug	8	5,131	15	8,035	0	22	3	321	43	1,352

Shaded areas indicate days when the weir gate was removed due to high water

Table 2. Results of chum salmon sampling sorted by date and age/sex category, Nome River, Norton Sound, 1997.

Age Sex Category	Sample Date		Total
	7/25/97	7/31/97	
Female Age-0.2	0	0	0
Female Age-0.3	5	29	34
Female Age-0.4	15	43	58
Female Age-0.5	0	0	0
Male Age-0.2	1	0	1
Male Age-0.3	11	18	29
Male Age-0.4	27	20	47
Male Age-0.5	2	2	4
Total	61	112	173

Table 3. Chum salmon escapement sample age and sex composition, and mean length, Nome River, Norton Sound, 1997.

	<u>Brood Year and Age Group</u>				
	1994 (0.2)	1993 (0.3)	1992 (0.4)	1991 (0.5)	Total
Number of male chum salmon	1	29	47	4	81
%	0.6%	16.8%	27.2%	2.3%	46.8%
Mean Length (mm)	555	590	613	620	
Number of female chum salmon		34	58		92
%		19.7%	33.5%		53.2%
Mean Length (mm)		564	572		
Total chum salmon	1	63	105	4	173
%	0.6%	36.4%	60.7%	2.3%	

Table 4. Climatological observations at the Nome River weir, Norton Sound, 1997.

Date	Time	Air Temp °C	Water Temp °C	% Cloud Cover	Water Guage (inches)	Water Visibility	Remarks
27-Jun			10.0		17.50		
28-Jun			10.0		17.50		
29-Jun			12.0		17.00		
30-Jun			12.0		17.00		
1-Jul			11.5		16.50		
2-Jul			11.5		16.50		
3-Jul			11.5		16.50		
4-Jul			12.0		16.25		
5-Jul			13.0		16.25		
6-Jul			15.0		15.50		
7-Jul			15.0		15.00		
8-Jul			14.5		15.50		
9-Jul					15.50		
10-Jul			10.0		15.60		
11-Jul			9.0		14.75		
12-Jul			10.0		14.50		
13-Jul			11.5		14.25		
14-Jul			10.0		14.00		
15-Jul			10.0		14.25		
16-Jul			10.0		14.00		
17-Jul			11.0		14.00		
18-Jul			11.5		14.00		
19-Jul			10.2		13.80		
20-Jul			11.5		13.50		
21-Jul			10.5		13.50		
22-Jul			11.5		13.25		
23-Jul			11.5		13.00		
24-Jul					18.50		
25-Jul			10.0		18.50		
26-Jul			10.0		16.00		
27-Jul			10.0		15.00		
28-Jul			10.0		14.50		
29-Jul			11.0		14.25		
30-Jul			14.0		14.00		
31-Jul			14.0		13.75		
1-Aug			13.5		13.50		
2-Aug			12.0		16.00		
3-Aug			12.0		32.00		
4-Aug			11.0		19.00		
5-Aug			12.0		18.00		
6-Aug			12.0		19.0		
7-Aug			11.0		19.5		
8-Aug			11.0		18.0		
9-Aug			13.0		17.0		
10-Aug			12.5		17.5		
11-Aug			12.0		17.8		
12-Aug			11.5		20.8		
13-Aug			11.5		21.3		
14-Aug			11.5		19.3		
15-Aug			10.5		20.0		
16-Aug			10.5		22.0		
17-Aug			9.5		21.0		
18-Aug			8.0		20.5		
19-Aug			8.0		20.0		
20-Aug			10.0		20.0		
21-Aug			8.0		20.5		
22-Aug			9.0		19.5		
23-Aug			9.0		19.5		
24-Aug			8.0		20.0		
25-Aug			8.5		19.5		
26-Aug			8.0		19.5		
27-Aug			7.0		19.0		

Figure 1. Area location map of the Nome River weir project site, Norton Sound, 1997

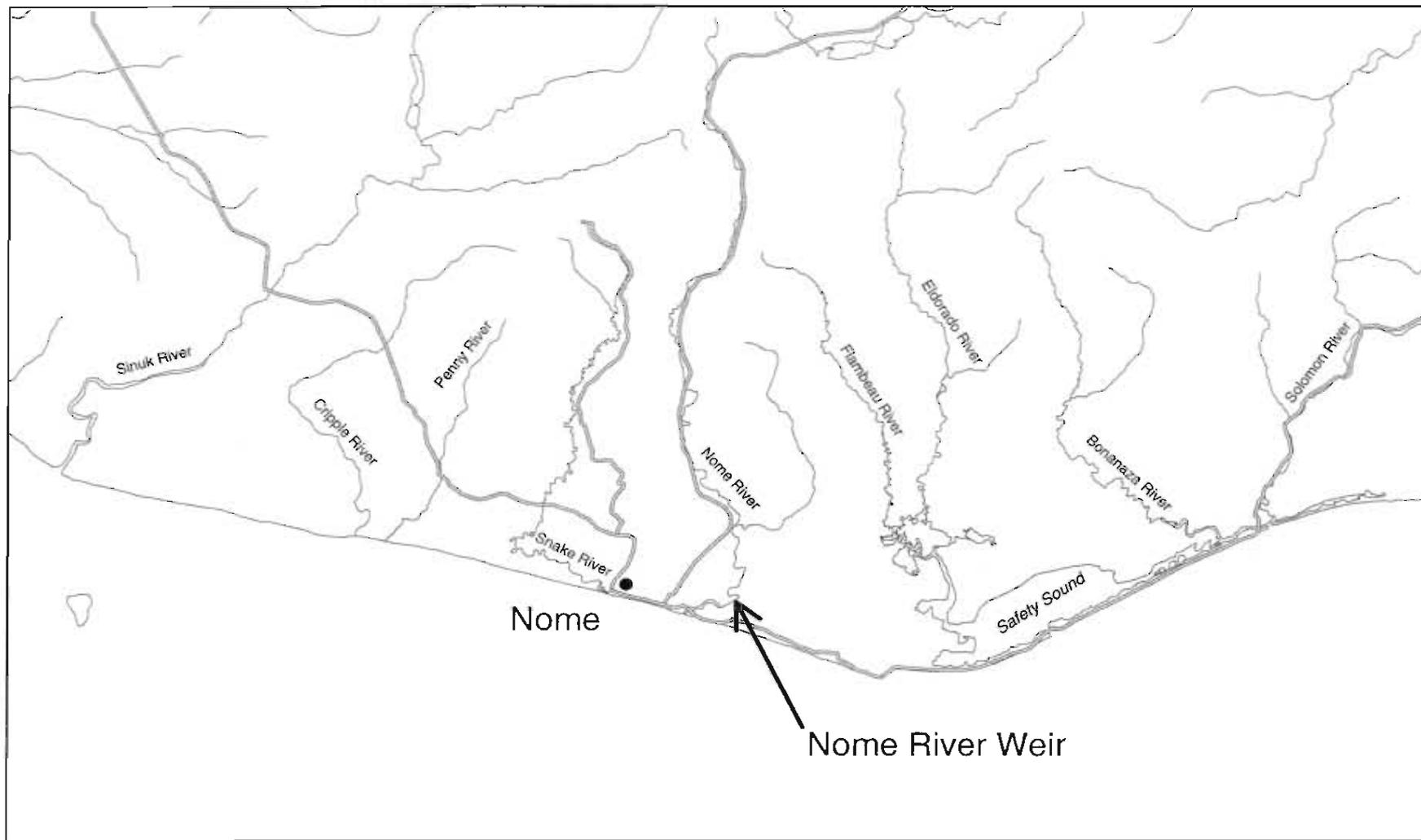


Figure 2. Daily chum salmon migration past the Nome River weir, Norton Sound, 1997.

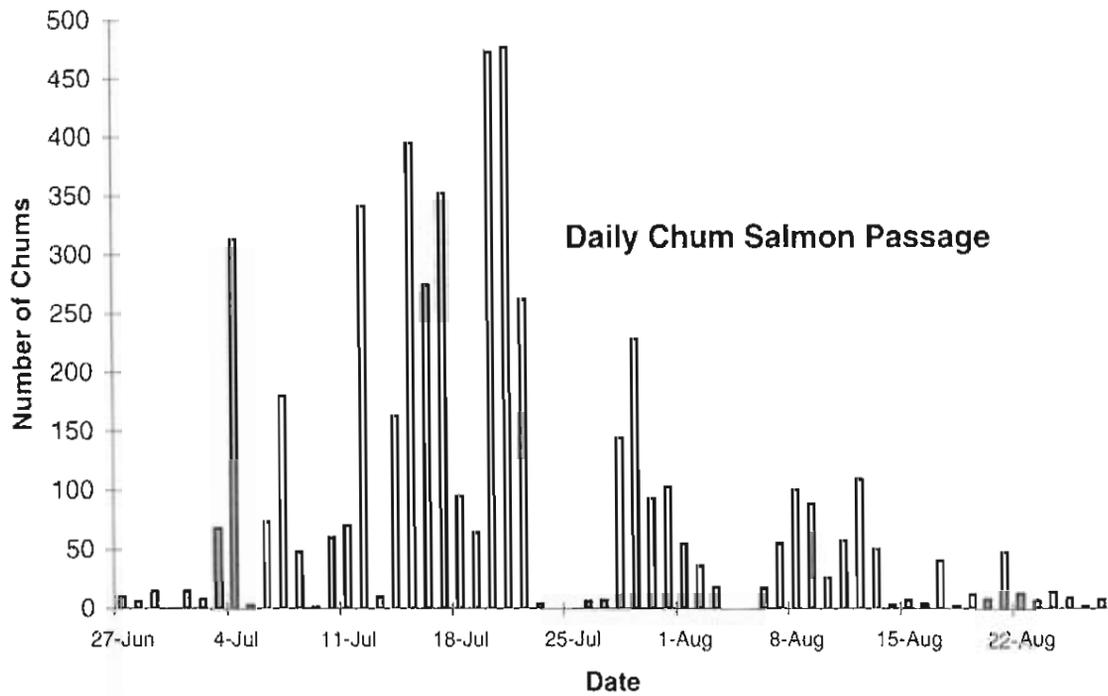


Figure 3. Cumulative chum salmon migration past the Nome River weir, Norton Sound 1997.

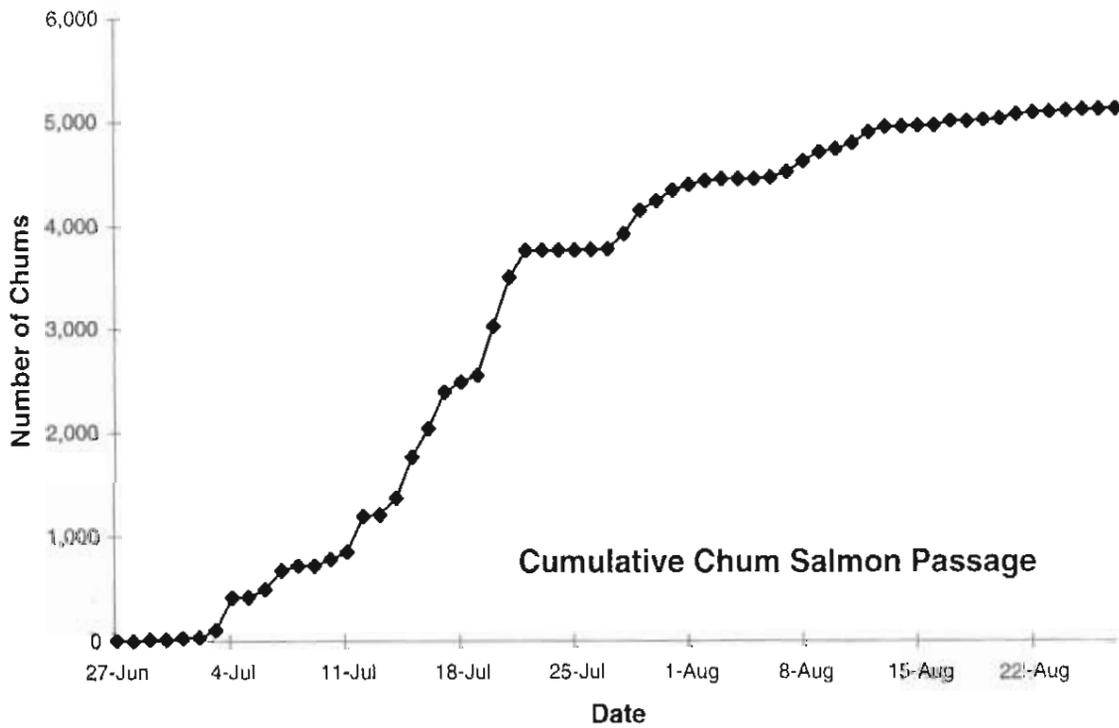


Figure 4. Daily pink salmon migration past the Nome River weir, Norton Sound, 1997.

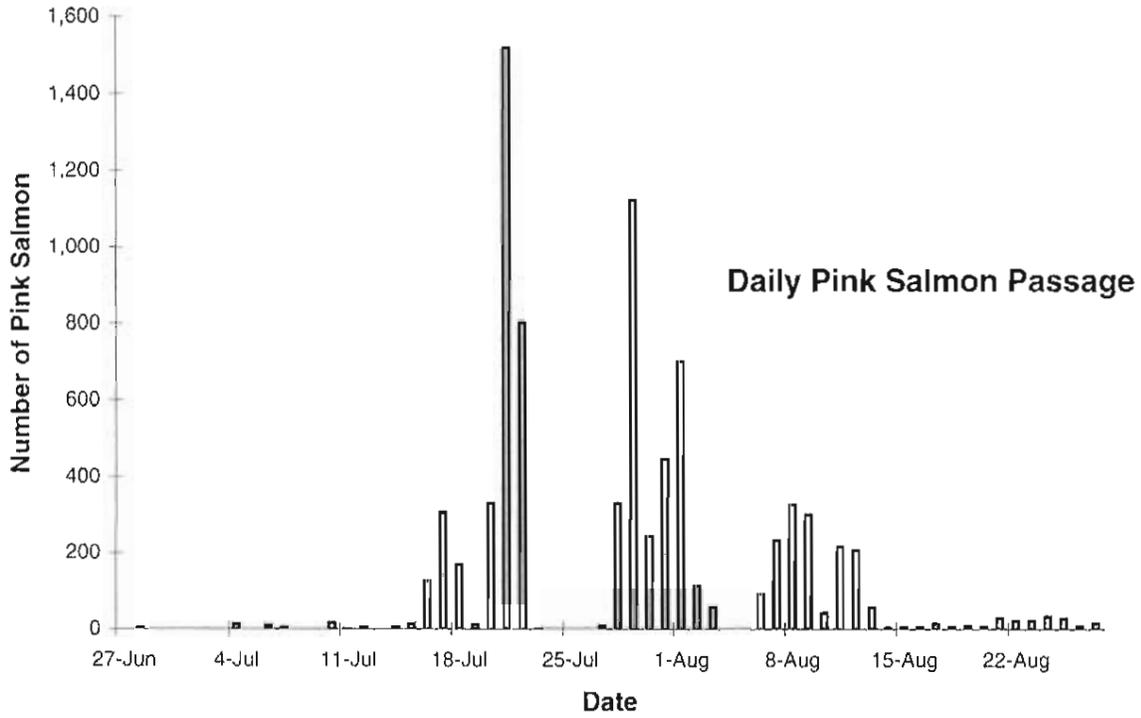


Figure 5. Cumulative pink salmon migration past the Nome River weir, Norton Sound, 1997.

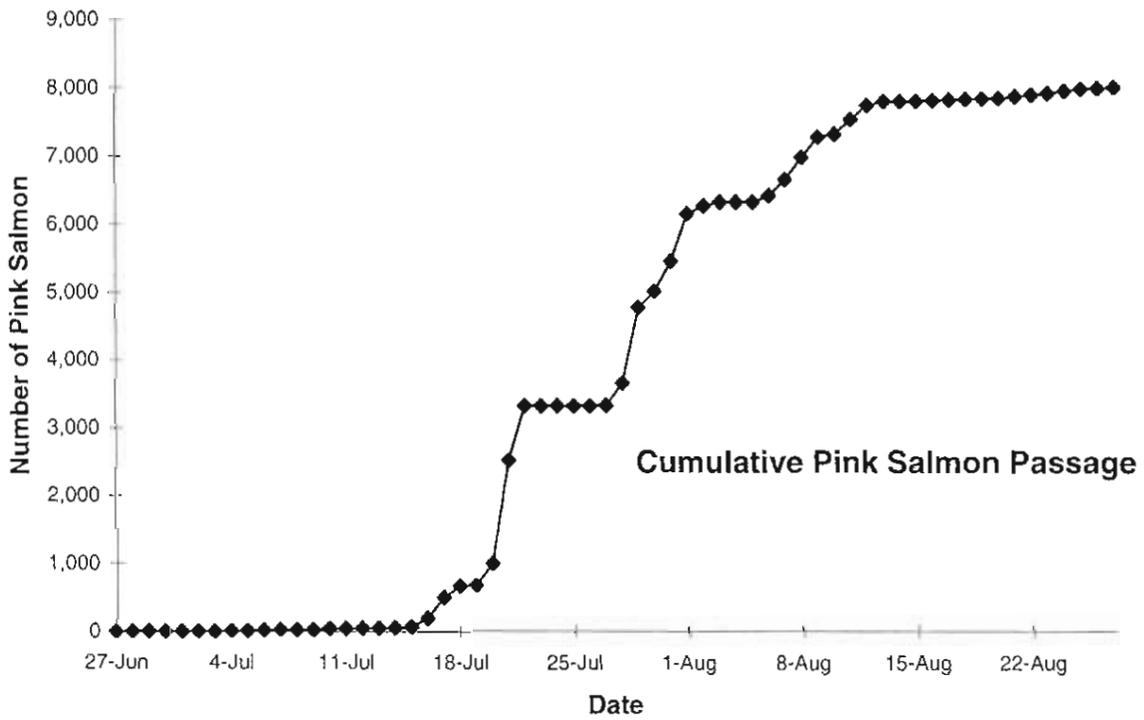


Figure 6. Daily king salmon migration past the Nome River weir, Norton Sound, 1997.

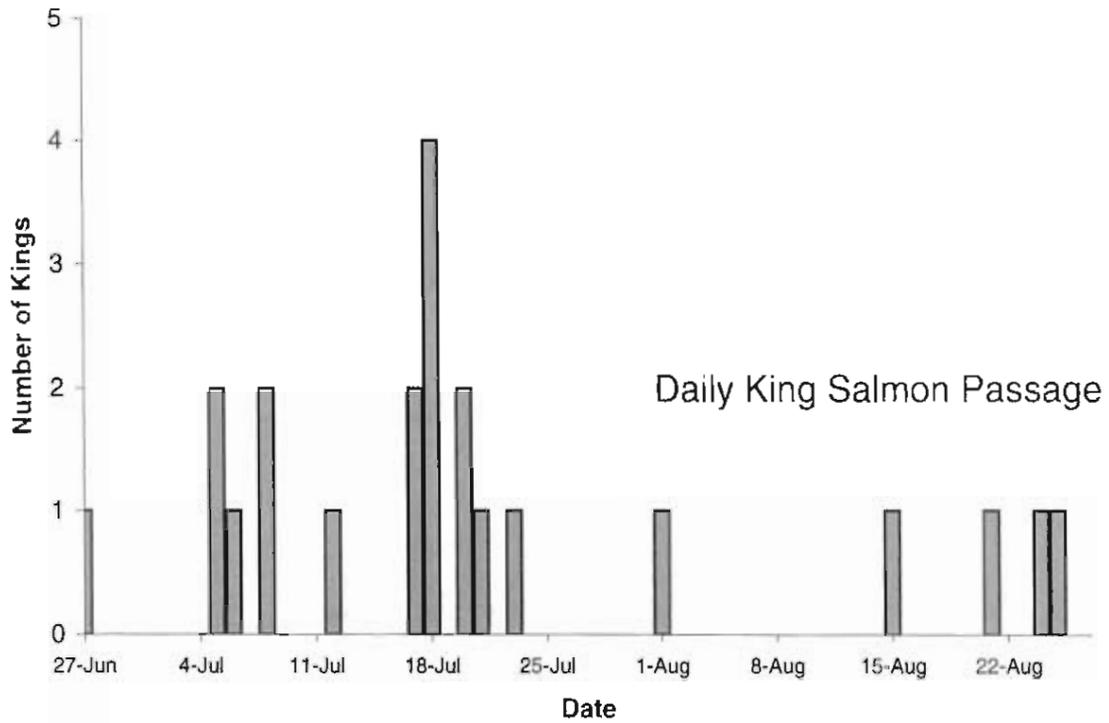


Figure 7. Cumulative king salmon migration past the Nome River weir, Norton Sound, 1997.

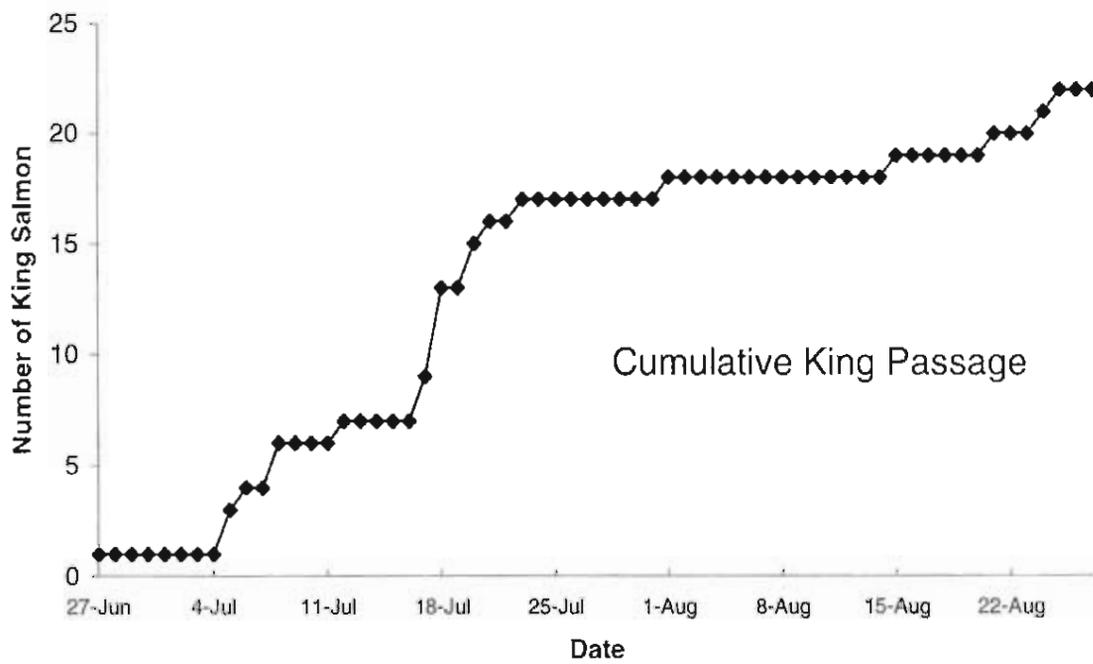


Figure 8. Daily coho salmon migration past the Nome River weir, Norton Sound, 1997.

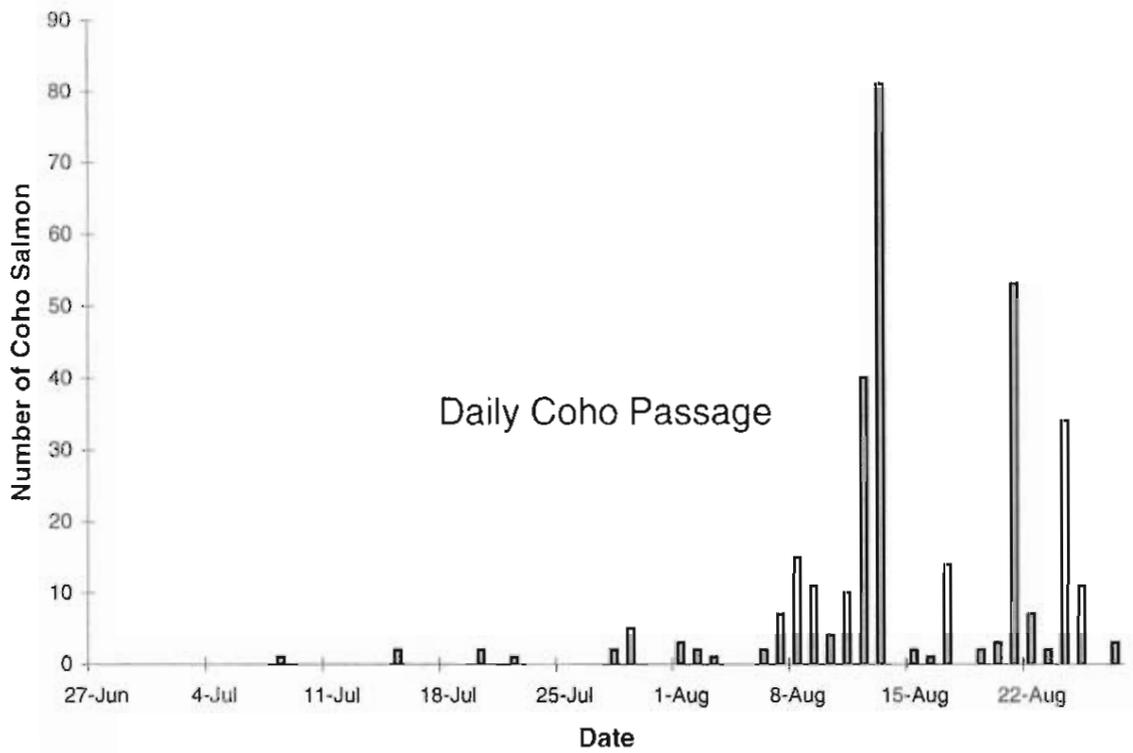


Figure 9. Cumulative coho salmon migration past the Nome River weir, Norton Sound, 1997.

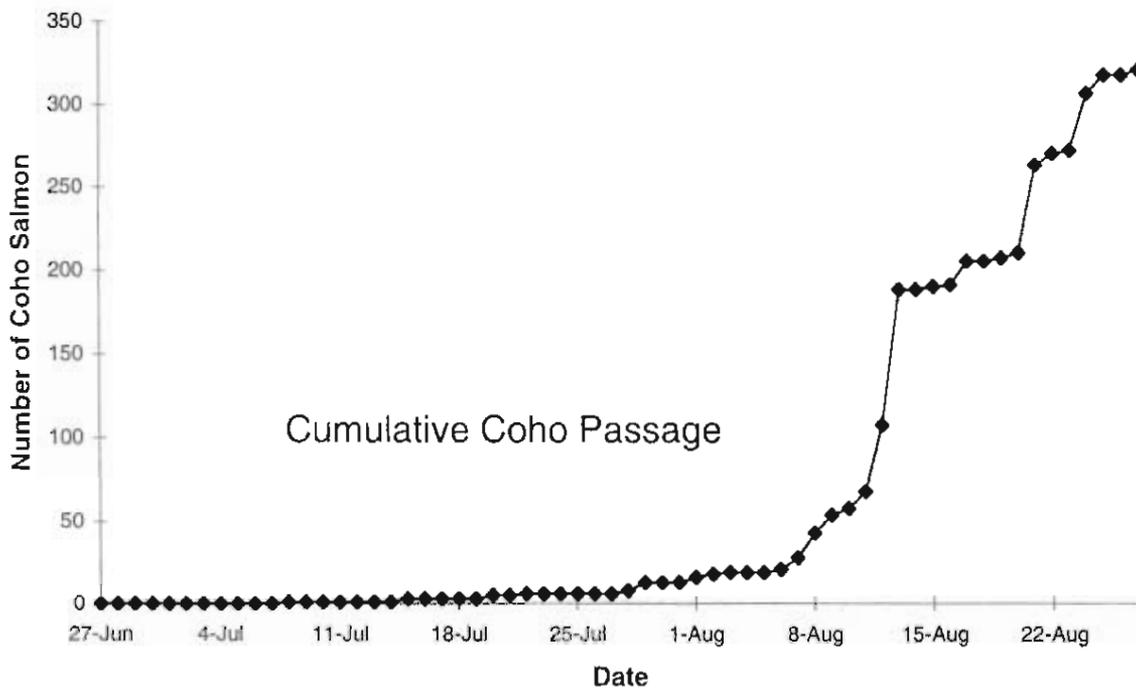


Figure 10. Daily Dolly Varden migration past the Nome River weir, Norton Sound, 1997.

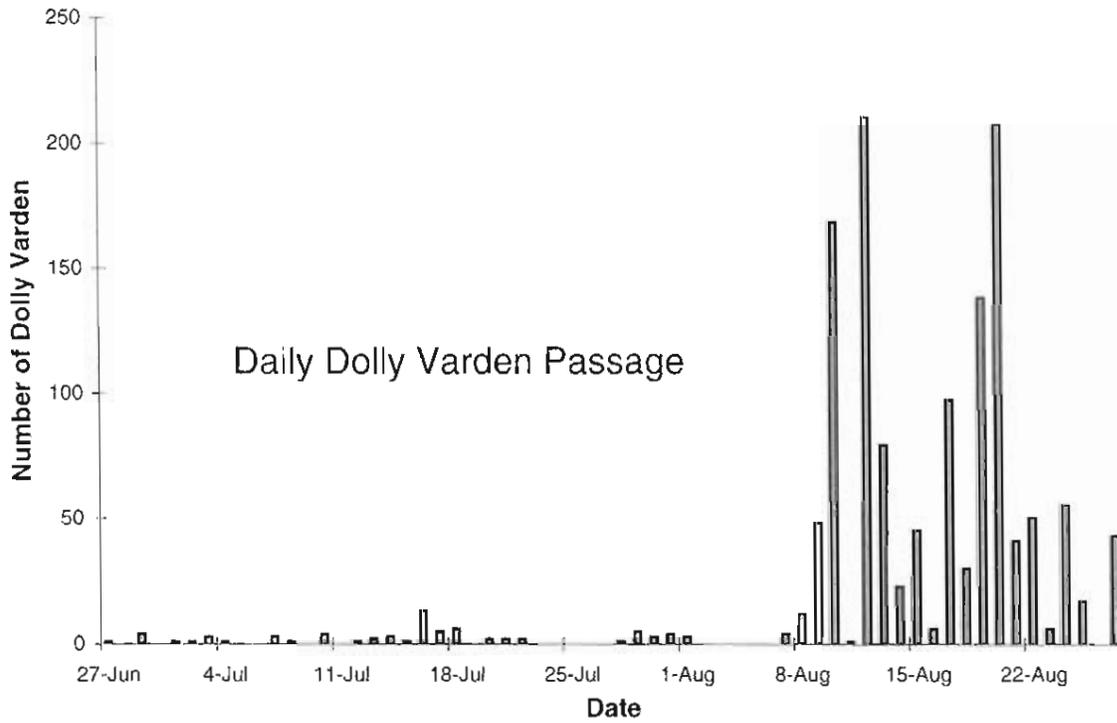


Figure 11. Cumulative Dolly Varden migration past the Nome River weir, Norton Sound, 1997.

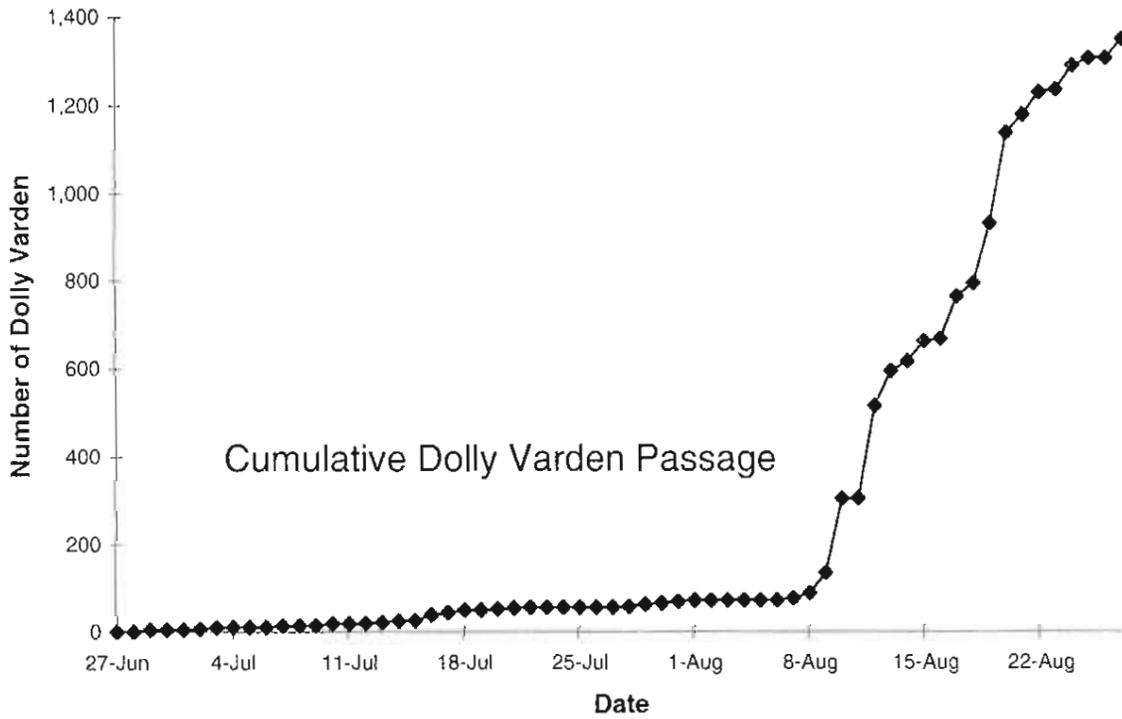


Figure 13. Cumulative odd year pink salmon migration past the Nome River counting tower, 1993-1995, and the Nome River weir, 1997, Norton Sound.

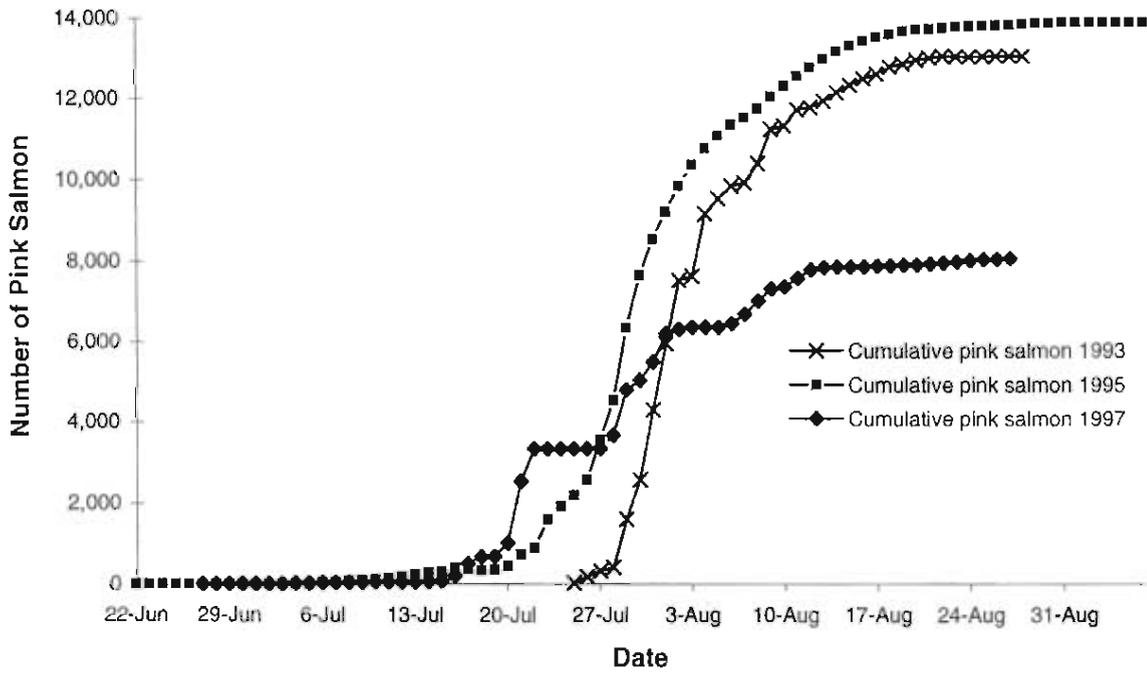


Figure 14. Cumulative even year pink salmon migration past the Nome River counting tower, 1994, and the Nome River weir, 1996, Norton Sound.

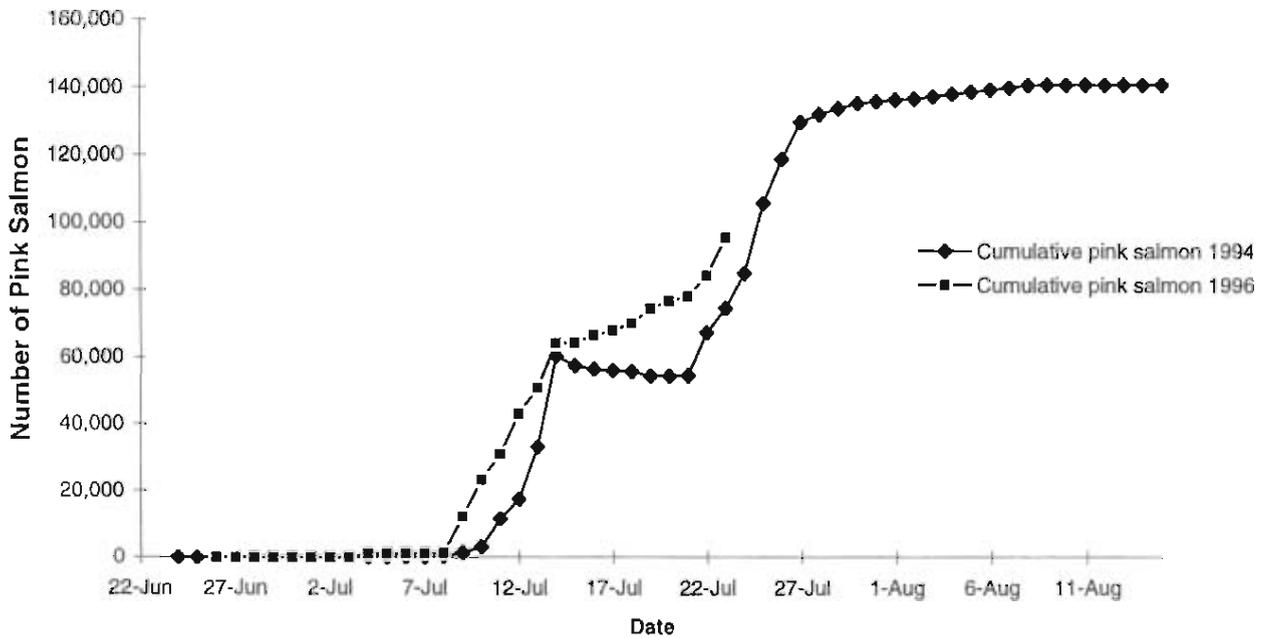


Figure 12. Cumulative passage of chum salmon past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1997, Norton Sound.

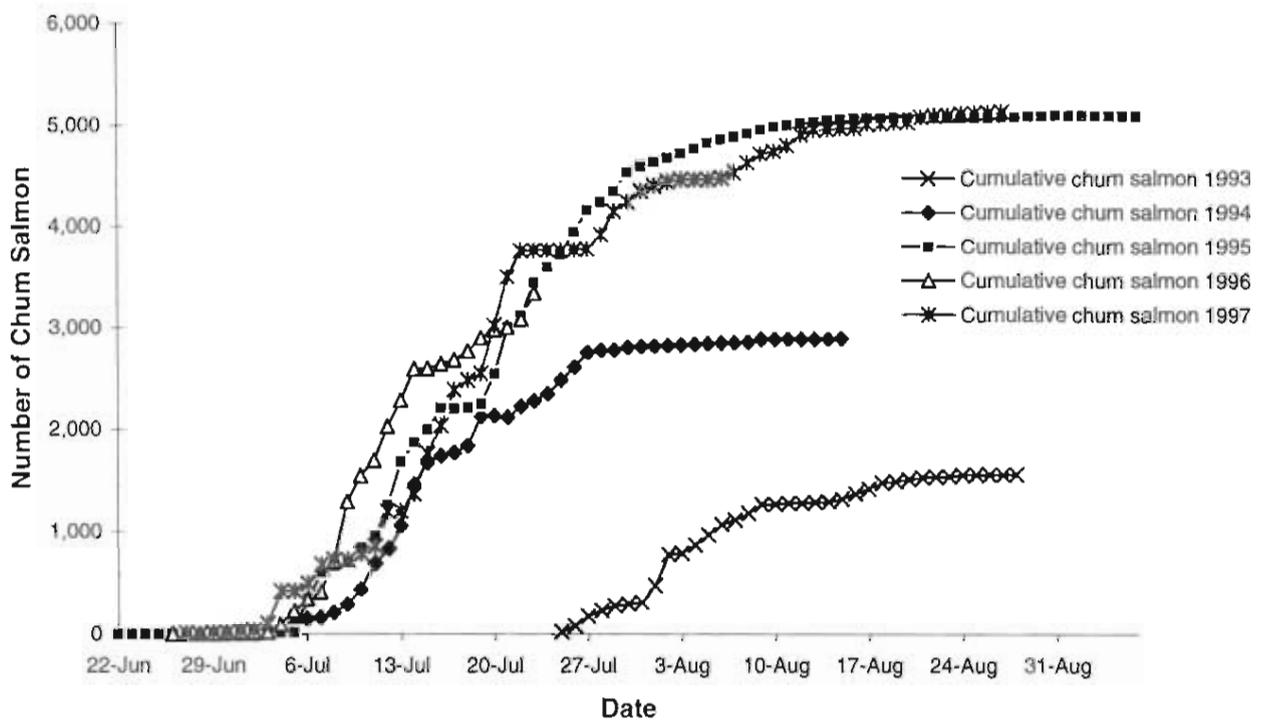


Figure 15. Cumulative king salmon migration past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1997, Norton Sound.

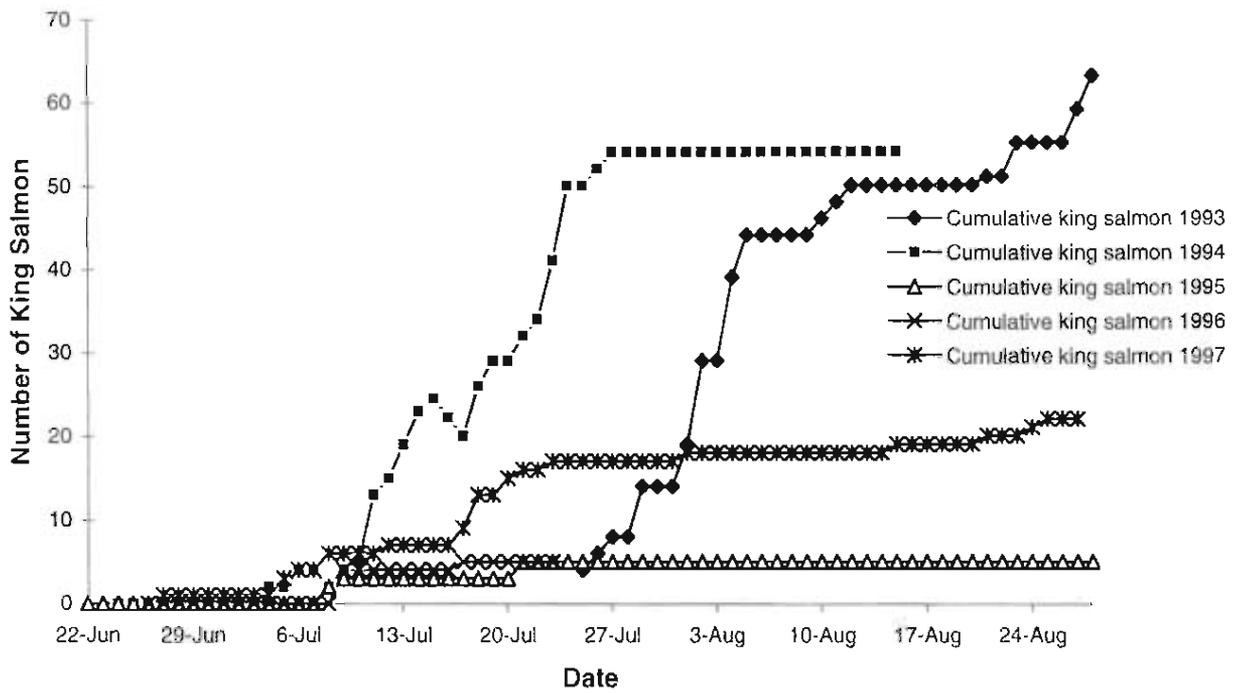


Figure 16. Cumulative coho salmon migration past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1997, Norton Sound.

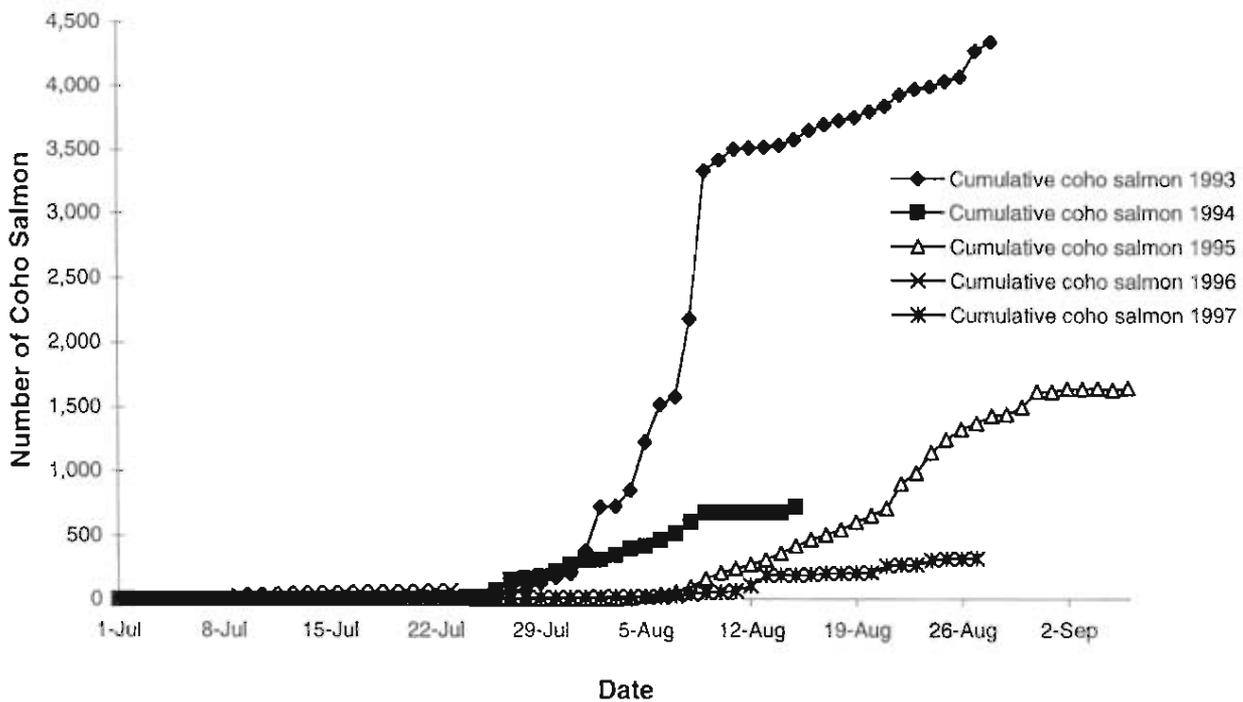


Figure 17. Cumulative Dolly Varden migration past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1997, Norton Sound.

