Niukluk River Salmon Counting Tower
Project Summary Report, 1997

by

Peter J. Rob

Alaska Department of Fish & Game
Commercial Fisheries Management and Development Division, AYK Region
333 Raspberry Road
Anchorage, Alaska 99518-1599

Regional Informational Report[1] No. 3A98-19

May 1998

[1]The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Commercial Fisheries Management and Development Division.

OFFICE OF EQUAL OPPORTUNITY (OEO) STATEMENT

The Alaska Department of Fish and Game conducts all programs and activities free from discrimination on the basis of sex, color, race, religion, national origin, age, marital status, pregnancy, parenthood or disability. For information on alternative formats available for this and other department publications, please contact the department ADA Coordinator at (voice) 907-465-4120, (TDD) 1-800-478-3648, or (fax) 907-586-6596. Any person who believes s/he has been discriminated against should write to: ADF&G, P.O. Box 25526, Juneau, AK 99802-5526; or O.E.O., U.S. Department of Interior, Washington, DC 20240.

TABLE OF CONTENTS

List of Tables ii

List of Figures iv

Introduction 1

Objectives 1

Methods 1

Results 3

Discussion 6

Acknowledgments 7

Literature Cited 8

Tables 9

Figures 49

LIST OF TABLES

Table		Page
1.	Expanded daily and cumulative migration of all salmonid species past the Niukluk River counting tower, Norton Sound 1997	9
2.	Expanded daily hourly chum salmon migration past the Niukluk River counting tower, Norton Sound, 1997	11
3.	Expanded daily hourly pink salmon migration past the Niukluk River counting tower, Norton Sound, 1997	14
4.	Expanded daily hourly king salmon migration past the Niukluk River counting tower, Norton Sound, 1997	17
5.	Expanded daily hourly coho salmon migration past the Niukluk River counting tower, Norton Sound, 1997	20
6.	Expanded daily hourly Dolly Varden migration past the Niukluk River counting tower, Norton Sound, 1997	23
7.	Reported hourly chum salmon observations at the Niukluk River counting tower, Norton Sound, 1997	26
8.	Reported hourly pink salmon observations at the Niukluk River counting tower, Norton Sound, 1997	29
9.	Reported hourly king salmon observations at the Niukluk River counting tower, Norton Sound	32
10.	Reported hourly coho salmon observations at the Niukluk River counting tower, Norton Sound 1997	35
11.	Reported hourly Dolly Varden observations at the Niukluk River counting tower, Norton Sound 1997	38
12.	Age, sex and length composition of chum salmon carcass samples, Niukluk River, Norton Sound, 1997	41
13.	Age, sex and length composition of chum salmon beach seine samples, Niukluk River, Norton Sound, 1997	41

Table		Page
14.	Chi-square test of homogeneity for chum salmon carcass and beach seine samples, Niukluk River, Norton Sound, 1997	42
15.	Weekly chum salmon beach seine samples sorted by age/sex category, Niukluk River counting tower, Norton Sound, 1997	43
16.	Pooled weekly chum salmon beach seine samples sorted by age/sex category, Niukluk River counting tower, Norton Sound, 1997	43
17.	Chum salmon beach seine samples sorted by age/sex category and sample period, as a proportion of period sample size, Niukluk River counting tower, Norton Sound, 1997	44
18.	Estimated contribution to the chum salmon escapement by age/sex category and sample period, Niukluk River counting tower, Norton Sound, 1997	44
19.	Estimated age and sex composition of the chum salmon escapement, weighted by sample period escapement abundance, Niukluk River, Norton Sound, 1997	45
20.	Age and sex composition, and mean length of coho salmon beach seine samples, Niukluk River, Norton Sound 1997	46
21.	Niukluk River counting tower climatological and stream observations. Norton Sound 1997	47

LIST OF FIGURES

Figure		Page
1.	Area location map of the Niukluk River counting tower project site, Norton Sound, 1997	49
2.	Cumulative passage of all salmonid species past the Niukluk River counting tower, Norton Sound, 1997	50
3.	Daily chum salmon migration past the Niukluk River counting tower, Norton Sound, 1997	51
4.	Cumulative chum salmon migration past the Niukluk River counting tower, Norton Sound, 1997	51
5.	Daily pink salmon migration past the Niukluk River counting tower, Norton Sound, 1997	52
6.	Cumulative pink salmon migration past the Niukluk River counting tower, Norton Sound, 1997	52
7.	Daily king salmon migration past the Niukluk River counting tower, Norton Sound, 1997	53
8.	Cumulative king salmon migration past the Niukluk River counting tower, Norton Sound, 1997	53
9.	Daily coho salmon migration past the Niukluk River counting tower, Norton Sound, 1997	54
10.	Cumulative coho salmon migration past the Niukluk River counting tower, Norton Sound, 1997	54
11.	Daily Dolly Varden migration past the Niukluk River counting tower, Norton Sound, 1997	55
12.	Cumulative Dolly Varden migration past the Niukluk River counting tower, Norton Sound, 1997	55
13.	Diurnal pattern of chum salmon migration past the Niukluk River counting tower, Norton Sound, 1997	56

Figure		Page

14. Diurnal pattern of pink salmon migration past the Niukluk River counting tower, Norton Sound, 1997 56

15. Diurnal pattern of king salmon migration past the Niukluk River counting tower, Norton Sound, 1997 57

16. Diurnal pattern of coho salmon migration past the Niukluk River counting tower, Norton Sound, 1997 57

17. Diurnal pattern of Dolly Varden migration past the Niukluk River counting tower, Norton Sound, 1997 58

18. Chum salmon run-timing, Niukluk River counting tower, Norton Sound, 1995-1997 59

19. Pink salmon run-timing, Niukluk River counting tower, Norton Sound, 1995-1997 59

20. King salmon run-timing, Niukluk River counting tower, Norton Sound, 1995-1997 60

21. Coho salmon run-timing, Niukluk River counting tower, Norton Sound, 1995-1997 60

22. Dolly Varden run-timing, Niukluk River counting tower, Norton Sound, 1996-1997 61

23. Cumulative chum salmon passage past the Niukluk River counting tower, Norton Sound, 1995-1997 62

24. Odd year cumulative pink salmon passage past the Niukluk River counting tower, Norton Sound, 1995-1997 62

25. Cumulative king salmon passage past the Niukluk River counting tower, Norton Sound, 1995-1997 63

26. Cumulative coho salmon passage past the Niukluk River counting tower, Norton Sound, 1995-1997 63

27. Cumulative Dolly Varden passage past the Niukluk River counting tower, Norton Sound, 1995-1997 64

INTRODUCTION

The Niukluk River is a tributary of the Fish River, which empties into Golovin Bay on the north coast of Norton Sound. The Niukluk River enters the Fish River approximately ten miles above the village of White Mountain (Figure 1). The village of Council is located on the Niukluk River approximately twelve miles from it's confluence with the Fish River. There is road access to the Niukluk River at the village of Council. Subsistence and sport fisheries occur on the Niukluk River.

The counting tower was successfully operated in 1995 and 1996 (Rob 1995 and 1997). A counting tower on the Niukluk River was operated for approximately three weeks in 1979 (Schaefer, 1979). The project is operated to obtain more timely and accurate escapement information required for the active management of salmon stocks throughout the season and as a means to calibrate the accuracy of aerial surveys on the other components of the Fish River system.

OBJECTIVES

1. Obtain daily and seasonal estimates of the timing and magnitude of the salmon escapement, by species, to the Niukluk River.

2. Collect and analyze age, sex and length information from beach seine sampled chum salmon and chum salmon carcasses.

3. Obtain daily and seasonal estimates of the timing and magnitude of the Dolly Varden escapement to the Niukluk River.

4. Collect and analyze age, sex and length information from beach seine sampled coho salmon and coho salmon carcasses.

METHODS

The Niukluk River tower camp is located approximately 2 miles upstream from the confluence of the Fish and Niukluk Rivers (Figure 1). The tower camp is just upstream of Tom Gray's camp, which is locally known as Mosquito Bar. A letter of understanding from the Council Native Corporation authorizes the tower and weir operation. Permits for the weir were issued by the Alaska Department of Fish & Game (ADF&G), Habitat Division and the Alaska Department of Natural Resources, Division of Land. The camp and tower site is leased for five years on an annual renewal basis from Tom Gray.

Two crewmembers began working in Nome on 23 June, 1997. The first two days were spent inventorying and purchasing equipment and supplies. The equipment and supplies

were trucked to Council, with the assistance of additional ADF&G personnel from Nome. The boats were prepared for use and loaded up. Two trips were needed to ferry all of the supplies and equipment to the tower site. The site was inventoried and the cook tent was set up. The tent platforms had sustained some minor damage during the spring floods. The crew traveled to White Mountain and picked up the third crewmember.

For 1997, the tower, flash panel and partial weir were installed directly in front of the sleeping tent, the same location as in 1996. The counting tower, partial weir and flash panel were installed using the same methods as reported in detail in the 1995 project report (Rob, 1995). The partial weir installation proceeded smoothly and rapidly because three additional crewmembers from Nome provided assistance.

A 120 volt lighting system was installed on the tower to illuminate the flash panel during dark periods. These lights were powered by a portable generator. Beginning in early August the lights operated continuously from dusk to dawn.

The ADF&G, Commercial Fisheries Management and Development Division (CFMD) provided operational funding for the Niukluk River counting tower for the period beginning 23 June and ending 15 August. Starting 16 August and ending 15 September ADF&G, Sport Fish Division provided funding. Counting began at midnight on 27 June 1997. The crew counted 18 half-hour counts in three six hour shifts each day except Tuesdays and Wednesdays. The first shift ran from 0000 hours to 0530 hours, the second ran from 1200 hours to 1730 hours and the third shift ran from 1800 hours to 2330 hours. On Tuesdays the half-hour counts ran for 24 hours in three eight hour shifts. Wednesdays were the day off.

The counts for each half hour shift were doubled to produce the reported hourly counts for each species. Each day the reported hourly counts were added to produce a daily subtotal. Every day, the daily and cumulative subtotals for each species were relayed to the Nome office by radio.

The expanded counts for this report were calculated using the following methods. The 18 hour counts for Wednesdays (the day off) were estimated by adding the counts of each hour of the day before (Tuesdays) to the counts of each hour of the day following (Thursdays) and dividing the result by two, giving expanded hourly counts for 18 hours of the day off. Escapement during the 6 hours not normally counted was estimated using data observed during the 24 hour count days. For each 24 hour count day, the ratio of the count from 0600 hours to 1200 hours to the count during the normal 18 hour counting period was computed. The 18 hour count for the three days before and after each 24 hour count day was multiplied by the ration to estimate escapement during the 6 hours not normally counted. This 6 hour estimate was added to the 18 hour count for each day. This was done for all species counted.

The expanded counts for the days missed because of high water and weir washout were estimated as follows. For a day the normal 18 hour count missed, the count for the

missing day was calculated by adding the counts of each hour of the day before the missed period to the counts of each hour of the day following the missed period and dividing the result by two. If two or more normal 18 hour count days were missed, the count for each of the missing days was calculated by adding the counts of each hour of the day before the missed period to the counts of each hour of the day following the missed period and dividing the result by two. Counts for the 6 hours not normally counted were estimated and added to the 18 hour estimates as previously described.

On most Wednesdays the crew went to White Mountain to pick up groceries, supplies and mail that were sent from Nome via air. Groceries, supplies and mail were also periodically brought to Council by Nome staff.

Beginning 5 July, the crew began beach seining and sampling chum salmon for age, length and sex data. If 40 or less chum salmon were available, then all were sampled. If more than 40 chum salmon were available, then 40 were sampled. Chum salmon carcasses began collecting on the weir and sampling of these began on 26 July and continued until 29 August. The data forms and scale cards were sent to the ADF&G Kotzebue office for processing. A chi-square test of homogeneity was conducted to determine whether or not the age and sex composition of the carcass and beach seine samples are different.

Beginning on 19 July, the first coho salmon were caught by beach seine and sampling for age, length and sex data was initiated. Coho salmon carcasses were not sampled in 1997 because coho salmon were not readily available. The data forms and scale cards were sent to the ADF&G Kotzebue office for processing.

RESULTS

Table 1 shows the expanded daily and cumulative totals for each species. All of the counts for the period from 1600 hours on 30 August through 1700 hours on 4 September are linearly interpolated because of high water.

The reported total hourly counts were: 47,051 chum salmon, 9,238 pink salmon, 284 king salmon, 2,650 coho salmon, and 9,018 Dolly Varden. Tables 7-11 show the hourly counts of each species. The expanded counts were: 57,304 chum salmon, 10,466 pink salmon, 259 king salmon, 3,994 coho salmon, and 11,095 Dolly Varden. Tables 2-6 show the expanded hourly counts of each species. Figure 2 shows a graph of the daily cumulative expanded passage of all salmonid species counted. Figures 3-12 show graphs of the expanded daily totals and the cumulative daily totals for each species.

Chum and king salmon and Dolly Varden were observed on 28 June, the first day of counting. Pink salmon were first observed on 29 June and coho salmon were first observed on 6 July (Table 1). The daily peak count of 4,571 chum salmon occurred on 4 July, the daily peak count of 819 pink salmon occurred on 28 July, the daily peak count of

48 king salmon occurred on 4 July, the daily peak count of 421 coho salmon occurred on 24 August, the daily peak count of 1,477 Dolly Varden occurred on 11 August (Table 1).

Most chum salmon returned during the five week period from 28 June through 1 August when 91% passed the tower (Table 1 and Figures 3 and 4). Most pink salmon returned during the four week period from 16 July through 12 August when 92% passed the tower (Table 1 and Figures 5 and 6). Most king salmon returned during the first two weeks of counting when 97% passed the tower (Table 1 and Figures 7 and 8). Most coho salmon returned from 16 August to the end of the counting on 9 September when 93% passed the tower (Table 1 and Figures 9 and 10). Most Dolly Varden returned during the four week period from 8 August through 4 September when 90% passed the tower (Table 1 and Figures 11 and 12).

All species counted exhibited a diurnal pattern of migration past the counting tower. The greatest hourly chum salmon migration occurred during the hour from 1700 to 1800, when 11% passed the tower. During the ten hour period from 1700 through 0200 hours, 74% of the chum salmon passed the tower (Table 2 and Figure 13). The greatest hourly pink salmon migration occurred during the hour from 0100 to 0200 hours, when 15% passed the tower. During the twelve hour period from 1700 through 0400 hours, 87% of the pink salmon passed the tower (Table 3 and Figure 14). The greatest hourly king salmon migration occurred during the hour from 0200 to 0300, when 34% passed the tower. During the four hour period from 0000 through 0400 hours 73% of the king salmon passed the tower. There was a net downstream migration of king salmon during the hours from 0400 through 1100 and from 2200 through 2300 hours (Table 4 and Figure 15). The greatest hourly coho salmon migration occurred during the hour from midnight to 0100, when 19% passed the tower. During the four hour period from 2300 through 0200 hours 58% of the coho salmon passed the tower. During the nine hour period from 1900 through 0300 hours, 82% of the coho salmon passed the tower (Table 5 and Figure 16). The greatest hourly Dolly Varden migration occurred during the hour from 2300 to midnight, when 25% passed the tower. During the six hour period from 1900 through 0000 hours 66% of the Dolly Varden passed the tower. During the thirteen hour period from 1200 through 0100 hours, 96% of the Dolly Varden passed the tower. There was a net downstream migration of Dolly Varden during the period from 0600 through 1100 hours (Table 6 and Figure 17).

An aerial survey of the entire Niukluk River counted 16,440 chum salmon on 16 July, 1997. The total season expanded tower count of chum salmon was 57,304. The aerial survey counted 29% of the total season expanded tower count of chum salmon. The aerial survey counted 11,810 chum salmon above the counting tower on 16 July, when the cumulative tower count of chum salmon was 30,631. The aerial survey counted 39% of the cumulative tower count on 16 July (Table 1).

A aerial survey count of 131 king salmon was made on 16 July, 1997. The total season expanded tower count of king salmon was 259. The aerial survey counted 51% of the total season expanded tower count of king salmon. The aerial survey counted 127 king

salmon above the counting tower on 16 July, when the cumulative tower count of king salmon was 260. The aerial survey counted 49% of the cumulative tower count on 16 July (Table 1).

A aerial survey count of 983 coho salmon was made on 26 August, 1997. The total season expanded tower count of coho salmon was 3,994. The aerial survey counted 25% of the total season expanded tower count of coho salmon. The aerial survey counted 608 coho salmon above the counting tower on 26 August, when the cumulative tower count of coho salmon was 1,854. The aerial survey counted 33% of the cumulative tower count on 26 August (Table 1).

Readable scales were collected from a total of 1,040 chum salmon, 628 from beach seine samples and 408 from weir carcasses. Beach seine samples were collected from 5 July through 29 August. Weir carcasses were sampled continuously from the first appearance of carcasses to the end of the project. The age composition of the carcass sample was 1.7% age-0.2, 62.0% age-0.3, 35.0% age-0.4 and 1.2% age-0.5. The age composition of the beach seine sample was 2.7% age-0.2, 54.6% age-0.3, 41.1% age-0.4, 1.3% age-0.5 and 0.3% age-0.6. Female chum salmon were 49.5% and male chum salmon were 50.5% of the carcass sample. Female chum salmon were 50.3% and male chum salmon were 49.7% of the beach seine sample. For all age sex categories, except three year old males and six year old females, beach seine sampled chum salmon were larger (non-statistical comparison) than carcass sampled chum salmon (Tables 12 and 13).

The chum salmon beach seine and carcass samples were tested for homogeneity using a chi-square test (Table 14). The test results were $\chi^2 = 8.2$, $P = 0.42$, and $df = 8$, which implies that the age and sex composition of the carcass and beach seine samples are statistically similar. To increase the effectiveness of the test, age-0.5 and age-0.6 fish from both samples were pooled by sex because of the small sample size of fish of these ages (Adler and Roessler, 1964).

The sex and age composition of the chum salmon escapement was estimated by weighting the beach seine sample period. The chum salmon beach seine samples were sorted by weekly sampling period and age/sex category (Table 15). To increase the reliability of the sex and age composition estimate, the weekly samples were pooled at the beginning and end of the sampling season (Table 16). The weekly chum salmon beach seine age/sex categories as a proportion of periodic sample size is presented in Table 17. The estimated contribution to the chum salmon escapement by age/sex category and sample period is presented in Table 18. The sex and age composition of the chum salmon escapement weighted by sample period escapement abundance is presented in Table 19.

Readable scales were collected from 84 beach seine caught coho salmon (Table 20). The goal of 250 beach seine samples was not met and no coho salmon carcass samples were collected this year because of the low return. The age composition of the sample was 7.1% age-1.1, 90.5% age-2.1 and 2.4% age-3.1. The sex composition was 41.7% female

and 58.3% male. The average length increased with age and males were larger than females, except for the age-3.1 males which were the smallest fish on average.

Climatological and stream observations are shown in Table 21.

DISCUSSION

A counting tower project was operated on the Niukluk River in 1979. That project collected incomplete data from 9 July to 27 July, 1979 (Schaefer, 1979).

The Niukluk River counting tower project was operated as a cooperative project between ADF&G and the Kawerak Corporation in 1994. Rains throughout the summer kept water levels high and an early August flood washed out the partial weir so that no useable data was collected. However, much was accomplished in 1994, the camp infrastructure of tent platforms was built and an appreciation of the difficulties associated with operating on the Niukluk River was gained (Charles Lean, ADF&G, CFMD Division, personal communication). In 1995 the Niukluk River counting tower operated successfully for the first time. Steadily decreasing water levels for most of the season and improved partial weir equipment were the primary reasons for this success (Rob, 1996). In 1996 the counting tower was operated successfully again, except for the period from 25 July through 3 August when the partial weir was washed out.

In 1997, counting began at noon on 28 June. The estimated passage of 330 chum, 10 king salmon and 24 Dolly Varden by midnight on 28 June indicates that passage likely began a few days earlier (Tables 2 and 4). Pink salmon passage began on the second day of tower operation (Tables 3). Coho salmon passage began well after the tower began operating (Table 5).

The run-timing of chum salmon in 1997 was similar to the 1995-1996 average run-timing and the magnitude of the escapement was about 66% of the 1995 and 1996 escapements (Figures 18 and 23). The run-timing of the odd year pink salmon escapement in 1997 was about two to seven days later than the 1995 escapement and the magnitude of the 1997 escapement was about 60% of the 1995 odd year escapement (Figures 19 and 24). The run-timing of the king salmon escapement in 1997 was two to fourteen days earlier than the 1995-1996 average run-timing. The king salmon escapement in 1997 was more than double the 1995 escapement and slightly larger than the 1996 escapement (Figures 20 and 25). The run-timing of the coho salmon escapement in 1997 was two to seven days later than the 1995-1996 average and the magnitude was 31% of the 1996 escapement and 85% of the 1995 escapement (Figures 21 and 26). Dolly Varden run-timing passage for the first half of 1997 was earlier and the second half of 1997 was later than the 1996 run-timing and the magnitude of the 1997 escapement was almost three times that of 1996 and eleven times that of 1995 (Figures 22 and 27).

This was the first year of beach seine sampling for age, length and sex data at the tower site. In previous years the samples were obtained by weir carcass sampling and subsistence harvest sampling. Both beach seine and weir carcass samples were collected this year. The beach seine sample data can be stratified by date and compared to escapement stratified by date. The beach seine sample is considered more useful than the carcass sample, because of the ability to stratify escapement passage, and was applied to the entire escapement to estimate age and sex composition.

Difficulties encountered the past three years while counting from the tower included species identification problems at the far end of the flash panel during times of poor visibility, severe glare from sunlight in the evening, spawning fish covering portions of the flash panel with gravel, and occasional wind turbulence that made species identification problematic along the length of the flash panel. Counting accuracy decreases when the rate of passage increases and this probably occurred from 6 July through 20 July in 1996 when there were 38 hours when the count of pink salmon exceeded 6,000 fish per hour (Rob 1997).

Counting was suspended from 1600 hours on 30 August through 1700 hours on 4 September because of high muddy water after three days of almost continuous rain (Table 21).

The same counting schedule was maintained throughout the entire season in both 1996 and 1997. This change from the 1995 operation made the operation much simpler and significantly reduced the amount of time required to expand the counts and present them in a coherent and consistent manner.

ACKNOWLEDGEMENTS

Carl "Bones" Brown was a crew member for the entire season. Kate Persons was the crew leader until early August and was replaced by LarryNeff. Eric Eakon was an Norton Sound Economic Development Corporation (NSEDC) intern until mid-August when he returned to Unalakleet and was replaced by Enid Brown who finished the season. NSEDC hired and provided funding for the interns. Tracy Lingnau pressed and aged all of scale samples. Jeff Bromaghin conducted the chi-square test and reviewed portions of a draft of this report. A draft of this report was reviewed by Larry Buklis.

LITERATURE CITED

Adler, H. L. and Roessler, E. B. 1964. Introduction to Probability and Statistics third edition. W.H. Freeman and Company. San Francisco and London.

Rob, P. J. 1995. Niukluk River Salmon Counting Tower Project Summary Report 1995. Regional Information Report 3A95-27. Alaska Department of Fish & Game, Commercial Fisheries Management and Development Division, Anchorage.

_____. 1997. Niukluk River Salmon Counting Tower Project Summary Report 1996. Regional Information Report 3A97-04. Alaska Department of Fish & Game, Commercial Fisheries Management and Development Division, Anchorage.

Schaefer, G. 1979. Niukluk River Counting Tower Project. AYK Region, Norton Sound Escapement Report 21.

Table 1. Expanded daily and cumulative migration of all salmonid species past the Niukluk River counting tower, Norton Sound, 1997.

Date	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
28-Jun	330	330	0	0	10	10	0	0	24	24
29-Jun	1,965	2,295	52	52	35	45	0	0	69	93
30-Jun	364	2,659	12	64	13	58	0	0	13	107
1-Jul	1,122	3,781	8	72	10	68	0	0	8	115
2-Jul	1,413	5,194	7	79	17	85	0	0	5	120
3-Jul	1,704	6,898	6	85	23	108	0	0	3	123
4-Jul	4,571	11,469	104	189	48	157	0	0	11	133
5-Jul	3,728	15,197	82	271	33	190	0	0	6	139
6-Jul	2,224	17,421	122	392	33	223	2	2	4	143
7-Jul	2,062	19,483	53	446	3	227	0	2	4	147
8-Jul	1,576	21,059	38	484	10	237	4	6	6	153
9-Jul	1,243	22,302	52	536	7	243	3	9	3	156
10-Jul	910	23,213	67	602	3	247	2	11	0	156
11-Jul	1,838	25,051	13	616	3	250	0	11	2	158
12-Jul	1,390	26,441	23	639	0	250	0	11	6	164
13-Jul	901	27,341	23	661	5	255	0	11	3	167
14-Jul	1,028	28,369	75	736	3	258	0	11	0	167
15-Jul	632	29,001	44	780	2	260	2	13	6	173
16-Jul	1,629	30,631	217	997	0	260	1	14	18	191
17-Jul	2,627	33,257	390	1,387	-2	258	0	14	30	221
18-Jul	813	34,070	339	1,726	1	259	2	16	6	227
19-Jul	2,356	36,426	290	2,017	4	263	8	24	6	233
20-Jul	2,904	39,329	669	2,686	2	265	16	40	36	269
21-Jul	1,414	40,744	495	3,180	0	265	8	48	24	293
22-Jul	1,638	42,382	420	3,600	-2	263	4	52	6	299
23-Jul	1,219	43,600	437	4,037	0	263	6	58	6	305
24-Jul	799	44,399	453	4,490	2	265	8	66	6	311
25-Jul	425	44,824	312	4,802	4	269	12	78	18	329
26-Jul	1,053	45,877	391	5,193	2	271	2	80	2	331
27-Jul	709	46,586	503	5,696	0	271	6	86	12	343
28-Jul	1,557	48,143	819	6,515	0	271	4	90	12	355
29-Jul	1,306	49,449	550	7,065	-4	267	8	98	10	365
30-Jul	1,185	50,634	486	7,551	0	267	8	106	24	389
31-Jul	1,064	51,698	556	8,106	0	267	6	112	36	425
1-Aug	208	51,905	154	8,260	-2	265	6	118	38	463
2-Aug	270	52,176	141	8,400	0	265	6	124	16	479
3-Aug	477	52,653	333	8,733	0	265	2	126	13	492
4-Aug	144	52,797	178	8,911	0	265	6	132	10	502
5-Aug	682	53,479	274	9,185	0	265	12	144	8	510
6-Aug	655	54,134	221	9,406	0	265	10	154	14	524
7-Aug	621	54,755	171	9,577	0	265	11	165	20	544

- continued -

Table 1. (Page 2 of 2).

Date	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
8-Aug	682	55,437	190	9,767	0	265	12	177	468	1,012
9-Aug	316	55,753	210	9,977	-4	261	-1	176	1,033	2,045
10-Aug	292	56,045	177	10,154	0	261	7	183	1,416	3,461
11-Aug	165	56,211	109	10,263	-2	259	15	198	1,477	4,938
12-Aug	102	56,313	120	10,383	0	259	26	224	1,256	6,194
13-Aug	118	56,431	74	10,457	0	259	16	239	799	6,994
14-Aug	134	56,564	27	10,484	0	259	5	245	343	7,336
15-Aug	328	56,892	71	10,555	0	259	22	266	196	7,532
16-Aug	43	56,935	23	10,578	0	259	97	363	94	7,626
17-Aug	31	56,967	45	10,623	0	259	69	432	43	7,669
18-Aug	22	56,989	23	10,647	0	259	171	603	66	7,736
19-Aug	-12	56,977	28	10,675	0	259	40	643	146	7,882
20-Aug	7	56,983	22	10,697	0	259	94	738	102	7,983
21-Aug	26	57,009	17	10,714	0	259	149	886	57	8,040
22-Aug	15	57,024	24	10,738	0	259	217	1,103	65	8,105
23-Aug	20	57,044	-46	10,692	0	259	187	1,290	291	8,396
24-Aug	19	57,062	-64	10,628	0	259	421	1,711	29	8,425
25-Aug	62	57,124	-96	10,532	0	259	125	1,836	57	8,482
26-Aug	36	57,160	-4	10,528	0	259	18	1,854	106	8,5[illegible]
27-Aug	24	57,184	-6	10,522	0	259	183	2,037	264	8[illegible]
28-Aug	13	57,197	-8	10,514	0	259	349	2,386	421	9,2[illegible]
29-Aug	24	57,221	-10	10,504	0	259	309	2,695	353	9,627
30-Aug	11	57,232	-14	10,490	0	259	250	2,945	151	9,777
31-Aug	9	57,242	-14	10,476	0	259	182	3,127	149	9,927
1-Sep	15	57,257	0	10,476	0	259	179	3,306	213	10,140
2-Sep	15	57,272	0	10,476	0	259	179	3,485	213	10,352
3-Sep	15	57,287	0	10,476	0	259	179	3,664	213	10,565
4-Sep	1	57,288	0	10,476	0	259	98	3,762	18	10,583
5-Sep	10	57,298	0	10,476	0	259	64	3,826	80	10,663
6-Sep	6	57,304	0	10,476	0	259	29	3,854	54	10,717
7-Sep	0	57,304	-4	10,472	0	259	53	3,907	94	10,811
8-Sep	0	57,304	-8	10,464	0	259	58	3,964	195	11,007
9-Sep	0	57,304	2	10,466	0	259	30	3,994	88	11,095

Table 2. Expanded daily hourly chum salmon migration past the Niukluk River counting tower, Norton Sound, 1997.

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jun	166	106	6	-12	-2	4	18	-4	0	18	2	0	-12	26	0	2	2	-2	12	330	0.6%
29-Jun	52	118	-26	6	-12	-42	109	2	8	0	10	228	292	32	8	272	566	162	180	1,965	3.4%
30-Jun	202	2	14	12	18	-2	20	2	16	2	-2	-8	20	12	26	14	18	-8	6	364	0.6%
1-Jul	18	52	-14	-18	-12	-12	62	-6	52	32	86	20	148	80	146	222	68	38	160	1,122	2.0%
2-Jul	55	3	6	1	7	-9	78	79	79	38	0	69	149	137	136	290	-2	97	200	1,413	2.5%
3-Jul	92	-46	26	20	26	-6	94	164	106	44	-86	118	150	194	126	358	-72	156	240	1,704	3.0%
4-Jul	290	234	178	52	42	24	253	70	132	302	276	-134	1,168	1,166	214	150	130	-90	114	4,571	8.0%
5-Jul	62	106	70	40	60	40	738	-4	10	24	46	394	772	52	610	534	102	66	6	3,728	6.5%
6-Jul	84	222	278	52	2	8	440	0	-10	106	42	60	40	66	168	202	192	264	8	2,224	3.9%
7-Jul	56	30	76	-4	8	24	408	26	24	4	0	84	356	276	206	182	80	88	138	2,062	3.6%
8-Jul	206	180	40	46	18	54	312	-20	94	92	-12	140	96	58	74	44	98	50	6	1,576	2.8%
9-Jul	111	137	81	44	-3	27	246	-17	54	50	-2	67	93	53	51	73	83	73	22	1,243	2.2%
10-Jul	16	94	122	42	-24	0	180	-14	14	8	8	-6	90	48	28	102	68	96	38	910	1.6%
11-Jul	-4	-26	10	-58	-82	-12	364	14	32	296	68	38	356	498	120	92	38	48	46	1,838	3.2%
12-Jul	52	92	112	92	36	86	-132	-152	34	10	64	4	38	32	12	590	94	266	60	1,390	2.4%
13-Jul	-6	34	36	8	24	0	-85	32	10	38	-46	0	348	-128	302	214	32	-2	90	901	1.6%
14-Jul	102	168	70	22	26	2	-98	-16	6	-32	0	140	276	208	70	64	-22	44	-2	1,028	1.8%
15-Jul	20	6	60	-34	-28	-4	-60	4	16	76	-10	-6	-18	94	16	90	28	64	318	632	1.1%
16-Jul	120	290	120	53	92	49	-155	1	-16	22	113	97	148	129	66	78	111	87	224	1,629	2.8%
17-Jul	220	574	180	140	212	102	-249	-2	-48	-32	236	200	314	164	116	66	194	110	130	2,627	4.6%
18-Jul	260	126	62	84	38	-40	-77	-26	86	0	-38	-4	58	54	62	-4	62	32	78	813	1.4%
19-Jul	192	92	166	98	50	110	104	0	-366	304	272	232	78	284	378	46	40	222	54	2,356	4.1%
20-Jul	250	438	544	230	216	94	128	8	-42	60	46	20	78	4	238	60	122	234	176	2,904	5.1%
21-Jul	238	284	72	76	44	30	62	-10	24	42	60	0	62	142	74	62	64	18	70	1,414	2.5%
22-Jul	234	446	126	42	54	38	72	20	-20	4	-50	54	26	102	162	34	88	106	100	1,638	2.9%
23-Jul	133	375	161	44	62	52	54	10	-11	-5	-23	36	37	48	74	13	54	47	58	1,219	2.1%
24-Jul	32	304	196	46	70	66	35	0	-2	-14	4	18	48	-6	-14	-8	20	-12	16	799	1.4%
25-Jul	22	-44	-20	-16	-6	0	19	14	-26	-26	0	160	128	116	96	-66	12	44	18	425	0.7%
26-Jul	134	204	-40	28	-4	110	79	12	20	20	68	104	0	254	86	-30	-20	10	18	1,053	1.8%
27-Jul	62	38	-28	-24	-8	-46	53	-10	16	32	48	-56	42	58	108	70	94	88	172	709	1.2%

- continued -

Table 2. (Page 2 of 3).

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jul	82	106	78	46	18	94	117	-42	80	42	88	0	106	152	186	30	198	76	100	1,557	2.7%
29-Jul	74	48	0	6	4	20	98	52	6	106	72	146	130	90	72	54	88	66	174	1,306	2.3%
30-Jul	157	50	7	21	20	15	89	36	5	73	66	88	94	139	77	57	98	-8	101	1,185	2.1%
31-Jul	240	52	14	36	36	10	80	20	4	40	60	30	58	188	82	60	108	-82	28	1,064	1.9%
1-Aug	8	58	24	32	12	30	16	4	22	50	-8	2	-18	-18	28	-8	-4	-4	-18	208	0.4%
2-Aug	-24	10	12	-4	12	22	52	-10	-6	4	22	28	8	8	28	18	32	30	28	270	0.5%
3-Aug	103	12	-6	12	18	34	92	6	8	-2	4	20	16	96	26	24	12	2	0	477	0.8%
4-Aug	6	18	8	-8	18	28	28	6	-4	14	4	12	-8	12	8	-26	-2	8	22	144	0.3%
5-Aug	26	12	18	22	22	24	132	32	50	34	34	10	48	58	16	0	6	54	84	682	1.2%
6-Aug	17	18	20	24	13	18	127	22	30	22	25	15	35	66	19	40	27	40	77	655	1.1%
7-Aug	8	24	22	26	4	12	120	12	10	10	16	15	22	74	22	80	48	26	70	621	1.1%
8-Aug	60	26	34	36	38	28	132	10	18	4	0	20	46	56	56	30	36	30	22	682	1.2%
9-Aug	6	8	42	16	12	28	37	16	8	22	6	12	23	16	18	8	-6	24	20	316	0.6%
10-Aug	32	26	16	22	42	22	34	4	16	12	12	20	0	6	18	-6	12	8	-4	292	0.5%
11-Aug	20	16	6	16	12	14	19	0	12	12	4	6	10	4	30	12	-10	-20	2	165	0.3%
12-Aug	-14	24	10	26	12	24	12	28	4	4	0	-8	-10	6	12	6	-16	-10	-8	102	0.2%
13-Aug	-5	4	4	14	1	21	14	23	8	4	5	7	-1	9	10	7	-8	-7	8	118	0.2%
14-Aug	4	-16	-2	2	-10	18	16	18	12	4	10	22	8	12	8	8	0	-4	24	134	0.2%
15-Aug	0	22	12	12	12	-4	39	8	12	14	10	22	1	24	28	42	32	32	10	328	0.6%
16-Aug	28	18	16	-8	6	-2	-108	-10	-10	-2	2	15	-6	6	20	34	10	18	16	43	0.1%
17-Aug	-6	16	-10	-4	-8	4	-79	8	8	2	-4	8	4	2	30	36	28	4	-8	31	0.1%
18-Aug	4	8	44	-12	4	-26	-55	8	0	-4	2	5	-4	10	6	10	12	2	8	22	0.0%
19-Aug	-2	0	-8	0	-24	-14	30	-2	0	0	2	2	2	-6	4	2	2	0	0	-12	0.0%
20-Aug	9	2	2	6	-9	-8	-17	1	3	-1	2	1	4	-2	9	1	2	1	1	7	0.0%
21-Aug	20	4	12	12	6	-2	-64	4	6	-2	2	0	6	2	14	0	2	2	2	26	0.0%
22-Aug	4	10	10	-2	0	10	-37	-2	-4	2	-2	0	6	4	-2	8	4	4	2	15	0.0%
23-Aug	4	-4	-2	2	0	0	-5	4	6	-2	0	0	3	2	2	6	0	2	2	20	0.0%
24-Aug	8	2	8	-4	6	0	-5	-2	0	-2	-4	0	0	-2	-2	0	8	6	2	19	0.0%
25-Aug	6	2	0	4	4	0	-17	8	4	-2	0	7	14	2	10	16	4	-2	2	62	0.1%
26-Aug	-2	2	-6	0	4	-2	-10	-6	0	0	6	14	1[illegible]	-2	4	6	12	2	4	36	0.1%

- continued -

Table 2. (Page 3 of 3).

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
27-Aug	0	1	-1	-1	2	-3	-7	-4	0	0	2	8	4	1	2	4	8	4	4	24	0.0%
28-Aug	2	0	4	-2	0	-4	-3	-2	0	0	-2	2	-2	4	0	2	4	6	4	13	0.0%
29-Aug	4	4	0	6	-4	4	-7	-2	-2	-2	0	1	0	4	8	-4	6	2	6	24	0.0%
30-Aug	4	0	-4	-2	4	-6	-3	0	0	2	4	1	0	3	4	-2	4	1	1	11	0.0%
31-Aug	2	0	-2	-1	2	-4	-3	0	0	1	2	1	0	3	4	-2	4	1	1	9	0.0%
1-Sep	2	0	-2	-1	2	-4	3	0	0	1	2	1	0	3	4	-2	4	1	1	15	0.0%
2-Sep	2	0	-2	-1	2	-4	3	0	0	1	2	1	0	3	4	-2	4	1	1	15	0.0%
3-Sep	2	0	-2	-1	2	-4	3	0	0	1	2	1	0	3	4	-2	4	1	1	15	0.0%
4-Sep	2	0	-2	-1	2	-4	0	0	0	1	2	1	0	2	0	0	2	0	-4	1	0.0%
5-Sep	0	0	0	0	0	-2	2	0	0	0	0	0	0	0	2	4	0	0	4	10	0.0%
6-Sep	0	2	2	0	0	0	1	1	0	0	0	0	0	-2	2	2	-2	0	0	6	0.0%
7-Sep	0	0	0	0	0	0	0	2	0	0	0	0	0	-2	0	0	0	0	0	0	0.0%
8-Sep	0	0	0	0	0	0	-6	0	0	0	2	2	0	0	2	0	0	0	0	0	0.0%
9-Sep	0	0	0	0	0	0	-2	0	0	0	0	0	0	0	2	0	0	0	0	0	0.0%
Total	4,364	5,224	3,060	1,459	1,221	1,134	3,939	428	598	1,978	1,632	2,607	5,990	5,289	4,636	4,369	3,117	2,713	3,546	57,304	
	7.6%	9.1%	5.3%	2.5%	2.1%	2.0%	6.9%	0.7%	1.0%	3.5%	2.8%	4.5%	10.5%	9.2%	8.1%	7.6%	5.4%	4.7%	6.2%	100.0%	

Table 3. Expanded daily hourly pink salmon migration past the Niukluk River counting tower, Norton Sound, 1997.

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
29-Jun	0	0	0	0	0	0	0	4	0	0	0	0	0	4	0	12	26	2	4	52	0.5%
30-Jun	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	4	2	2	0	12	0.1%
1-Jul	0	8	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	8	0.1%
2-Jul	1	3	1	0	2	-2	0	0	0	0	0	0	0	1	0	0	0	0	1	7	0.1%
3-Jul	2	-2	4	0	4	-4	0	0	0	0	0	0	0	2	0	0	0	0	0	6	0.1%
4-Jul	20	12	12	4	6	-2	0	0	0	2	0	2	32	16	0	0	0	0	0	104	1.0%
5-Jul	2	18	30	0	2	-2	-4	0	0	0	0	0	24	6	6	0	0	0	0	82	0.8%
6-Jul	16	44	58	10	-4	0	-6	0	0	0	0	0	-2	0	0	2	0	4	0	122	1.2%
7-Jul	12	0	8	4	0	0	-3	0	0	0	0	2	12	2	0	6	2	4	4	53	0.5%
8-Jul	6	14	4	4	2	-2	-2	0	2	-2	0	0	2	2	0	0	6	0	2	38	0.4%
9-Jul	8	11	16	18	-3	-2	-3	-1	1	-1	0	0	2	2	0	0	3	0	1	52	0.5%
10-Jul	10	8	28	32	-8	-2	-4	-2	0	0	0	0	2	2	0	0	0	0	0	67	0.6%
11-Jul	-8	0	-6	2	-6	-2	-1	0	0	6	0	0	0	18	0	0	0	0	10	13	0.1%
12-Jul	-2	0	6	2	2	6	-1	0	0	0	-2	-2	0	-4	0	16	0	6	-4	23	0.2%
13-Jul	-8	4	8	-2	0	0	-1	0	0	0	-2	0	6	6	8	0	2	0	2	23	0.2%
14-Jul	4	8	2	4	0	0	-3	0	2	-2	0	12	12	6	0	14	4	6	6	75	0.7%
15-Jul	0	2	16	2	0	6	-2	0	0	2	2	0	-2	4	4	0	0	8	2	44	0.4%
16-Jul	13	43	37	17	26	7	-10	-3	-1	7	10	3	5	9	6	8	13	12	15	217	2.1%
17-Jul	26	84	58	32	52	8	-18	-6	-2	12	18	6	12	14	8	16	26	16	28	390	3.7%
18-Jul	128	50	24	28	22	-6	-15	4	4	-2	6	18	12	12	12	4	6	12	20	339	3.2%
19-Jul	24	16	34	14	6	8	-6	-8	-2	20	18	16	2	36	58	12	2	24	14	290	2.8%
20-Jul	42	82	144	70	80	12	-13	-2	6	16	14	2	34	8	42	10	30	62	30	669	6.4%
21-Jul	64	138	62	26	2	0	-9	6	44	2	20	0	18	14	24	14	30	14	26	495	4.7%
22-Jul	74	176	54	20	0	-12	-8	0	-2	2	0	2	4	8	24	28	18	10	22	420	4.0%
23-Jul	53	170	98	27	12	8	-8	-2	-7	6	1	5	1	19	13	15	5	3	18	437	4.2%
24-Jul	32	164	142	34	24	28	-9	-4	-12	10	2	8	-2	30	2	2	-8	-4	14	453	4.3%
25-Jul	24	-4	2	-6	-12	-10	-6	12	20	-8	0	112	22	60	38	2	14	16	36	312	3.0%
26-Jul	52	104	-2	-12	-10	2	-21	0	24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	52	14	34	10	14	391	3.7%
27-Jul	32	22	16	-18	12	-2	-27	-4	10	[illegible]	[illegible]	38	34	34	72	74	50	54	66	503	4.8%

- continued -

Table 3. (Pa[illegible] of 3).

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jul	100	156	60	28	20	22	-45	14	70	18	26	0	44	84	102	10	64	8	38	819	7.8%
29-Jul	50	64	40	6	24	-12	-30	12	14	48	14	68	56	46	34	36	26	30	24	550	5.3%
30-Jul	82	47	43	10	18	5	-26	10	1	19	6	39	23	59	26	32	50	-1	43	486	4.6%
31-Jul	114	30	46	34	32	8	-30	-10	6	32	14	12	46	72	18	28	74	-32	62	556	5.3%
1-Aug	56	40	12	14	12	22	-8	8	-12	-10	-2	10	-10	2	8	8	0	-2	6	154	1.5%
2-Aug	22	-10	10	22	-2	10	21	-12	0	-10	2	4	20	18	0	6	8	14	18	141	1.3%
3-Aug	70	12	6	14	14	38	49	-2	0	2	12	2	4	78	18	34	4	-26	4	333	3.2%
4-Aug	-20	12	-8	0	12	42	26	2	2	6	22	0	4	4	12	16	10	16	20	178	1.7%
5-Aug	-10	2	12	16	18	20	40	6	4	8	4	20	18	52	2	8	8	26	20	274	2.6%
6-Aug	4	11	10	16	16	14	32	4	1	7	1	18	15	34	9	2	2	11	14	221	2.1%
7-Aug	18	20	8	16	14	8	25	2	-2	6	-2	18	12	15	16	-4	-4	-4	8	171	1.6%
8-Aug	14	8	14	12	10	16	28	4	2	4	8	16	14	20	2	-4	2	14	6	190	1.8%
9-Aug	10	2	26	22	16	14	56	8	4	8	4	0	8	16	14	-6	2	4	2	210	2.0%
10-Aug	34	16	16	14	20	18	47	-4	0	-6	-2	6	2	2	-2	6	8	0	2	177	1.7%
11-Aug	6	-12	6	6	12	10	29	6	8	4	4	2	4	4	4	-2	-2	8	12	109	1.0%
12-Aug	22	-10	8	16	14	10	32	0	2	4	6	-2	8	4	2	8	-12	14	-6	120	1.1%
13-Aug	8	-5	10	11	8	1	20	0	3	3	0	0	5	4	0	6	-7	8	-1	74	0.7%
14-Aug	-6	0	12	6	2	-8	7	0	4	2	-6	2	2	4	-2	4	-2	2	4	27	0.3%
15-Aug	0	0	8	10	2	-2	19	0	0	4	2	2	2	4	4	8	8	0	0	71	0.7%
16-Aug	-2	2	2	6	-2	2	-2	-2	2	4	4	3	2	4	0	2	2	-4	0	23	0.2%
17-Aug	0	0	0	4	6	6	-3	2	0	2	0	4	2	0	6	4	8	2	2	45	0.4%
18-Aug	6	2	0	2	0	0	-2	0	2	0	2	5	0	0	4	0	0	2	0	23	0.2%
19-Aug	0	4	0	0	4	4	-2	0	-2	0	0	6	0	0	4	4	2	2	2	28	0.3%
20-Aug	-1	3	1	1	2	3	-2	0	0	-1	0	2	0	1	6	3	1	2	1	22	0.2%
21-Aug	-2	2	2	2	0	2	-1	0	2	-2	0	-2	0	2	8	2	0	2	0	17	0.2%
22-Aug	0	0	2	0	0	0	-2	4	2	2	0	0	6	0	4	0	4	2	0	24	0.2%
23-Aug	2	0	2	0	8	4	-69	0	0	0	2	2	3	0	0	0	2	0	-2	-46	-0.4%
24-Aug	0	6	0	0	2	4	-96	0	0	0	0	0	0	2	4	4	2	6	2	-64	-0.6%
25-Aug	2	-2	6	10	2	-2	-144	10	12	0	2	0	4	2	0	4	0	0	-2	-96	-0.9%
26-Aug	2	2	0	2	0	2	-6	-2	0	0	-2	0	2	-2	-2	-4	0	0	4	-4	0.0%

- continued -

Table 3. (Page 3 of 3).

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
27-Aug	2	1	0	0	0	2	-9	-1	0	0	-2	3	0	-1	-1	-1	-1	-1	3	-6	-0.1%
28-Aug	2	0	0	-2	0	2	-12	0	0	0	-2	6	-2	0	0	2	-2	-2	2	-8	-0.1%
29-Aug	0	2	0	0	0	2	-15	0	0	-2	-2	3	0	0	-2	0	2	0	2	-10	-0.1%
30-Aug	-2	0	2	0	2	0	-21	6	-6	0	0	3	1	2	-2	0	0	0	1	-14	-0.1%
31-Aug	0	0	1	0	1	-1	-21	3	-4	2	0	3	1	2	-2	0	0	0	1	-14	-0.1%
1-Sep	0	0	1	0	1	-1	-7	3	-4	2	0	3	1	2	-2	0	0	0	1	0	0.0%
2-Sep	0	0	1	0	1	-1	-7	3	-4	2	0	3	1	2	-2	0	0	0	1	0	0.0%
3-Sep	0	0	1	0	1	-1	-7	3	-4	2	0	3	1	2	-2	0	0	0	1	0	0.0%
4-Sep	0	0	1	0	1	-1	-6	3	-4	2	0	3	1	4	-2	0	-2	0	0	0	0.0%
5-Sep	2	0	0	0	0	-2	-2	0	-2	4	0	0	2	0	0	-2	0	0	0	0	0.0%
6-Sep	0	0	-4	2	-2	0	6	0	-1	2	1	0	0	-2	-2	0	0	0	0	0	0.0%
7-Sep	0	0	0	0	0	0	-12	0	0	0	2	0	0	0	0	4	0	2	0	-4	0.0%
8-Sep	0	0	2	6	0	4	-24	-2	0	2	-4	0	0	2	4	-2	0	-2	6	-8	-0.1%
9-Sep	0	0	0	0	0	0	6	0	0	0	0	2	0	0	-2	-2	-2	0	0	2	0.0%
Total	1,214	1,582	1,213	618	500	301	-349	72	183	260	237	507	534	956	655	467	520	362	634	10,466	
	11.6%	15.1%	11.6%	5.9%	4.8%	2.9%	-3.3%	0.7%	1.7%	2.5%	2.3%	4.8%	5.1%	9.1%	6.3%	4.5%	5.0%	3.5%	6.1%		

Table 4. Expanded daily hourly king salmon migration past the Niukluk River counting tower, Norton Sound, 1997.

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jun	6	2	2	-2	0	2	-2	0	0	0	0	0	0	-2	0	0	0	0	4	10	3.9%
29-Jun	0	0	-4	0	4	-2	-7	0	0	0	0	6	4	-2	2	24	12	-2	0	35	13.5%
30-Jun	0	4	0	8	0	0	-3	0	0	0	0	0	2	0	0	0	0	2	0	13	5.1%
1-Jul	0	-2	0	-2	-2	-2	-2	0	2	4	2	2	4	4	-2	4	0	0	0	10	3.9%
2-Jul	0	-1	2	-2	-2	-2	-3	14	3	4	0	1	2	1	-2	2	0	0	0	17	6.4%
3-Jul	0	0	4	-2	-2	-2	-5	28	4	4	-2	0	0	-2	-2	0	0	0	0	23	9.0%
4-Jul	4	4	22	2	4	6	-10	0	0	2	0	-2	8	6	2	0	0	0	0	48	18.7%
5-Jul	0	0	30	10	0	-6	-7	0	0	0	0	0	6	2	4	0	0	-2	-4	33	12.9%
6-Jul	4	22	0	10	0	2	-7	0	0	0	0	0	0	2	0	0	0	0	0	33	12.9%
7-Jul	0	-2	0	2	0	2	-1	0	0	0	0	0	0	0	2	0	0	0	0	3	1.3%
8-Jul	0	8	4	4	0	-4	-2	0	0	0	0	0	0	0	0	0	0	0	0	10	3.9%
9-Jul	0	4	5	2	-1	-2	-1	0	0	0	0	0	0	0	0	0	0	0	0	7	2.6%
10-Jul	0	0	6	0	-2	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	3	1.3%
11-Jul	0	2	0	0	0	2	-1	0	0	0	0	0	0	0	0	0	0	0	0	3	1.3%
12-Jul	0	2	4	0	-2	2	0	0	-2	0	-2	0	0	0	0	0	0	-2	0	0	0.0%
13-Jul	0	0	2	0	2	2	-5	0	0	0	0	0	0	0	2	2	0	0	0	5	1.9%
14-Jul	2	4	2	0	0	-2	-3	0	2	0	0	0	0	0	-2	0	0	0	0	3	1.2%
15-Jul	0	2	4	0	0	0	-2	-4	0	0	0	0	-2	0	0	0	0	0	-4	2	0.8%
16-Jul	1	1	2	0	0	-1	0	-3	0	0	0	0	-1	1	-1	0	0	0	1	0	0.0%
17-Jul	2	0	0	0	0	-2	2	-2	0	0	0	0	0	2	-2	0	0	0	-2	-2	-0.8%
18-Jul	2	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4%
19-Jul	-2	0	2	0	-2	2	0	0	0	0	2	2	-2	0	0	2	0	0	0	4	1.5%
20-Jul	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.8%
21-Jul	0	0	0	0	-2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
22-Jul	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	-0.8%
23-Jul	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.0%
24-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0.8%
25-Jul	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	4	1.5%
26-Jul	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.8%
27-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%

- continued -

Table 4. (Page 2 of 3).

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jul	0	0	0	0	0	0	0	-2	0	0	0	0	0	0	2	0	0	0	0	0	0.0%
29-Jul	0	0	0	0	0	0	-4	-2	0	2	0	0	0	0	0	0	0	0	0	-4	-1.5%
30-Jul	0	0	0	0	0	0	0	-1	0	1	0	0	0	0	0	0	0	0	0	0	0.0%
31-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
1-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	0	-2	-0.8%
2-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
3-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
4-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
5-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
6-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
7-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
8-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
9-Aug	0	0	0	0	0	0	0	-2	2	-2	0	0	0	0	0	0	0	0	-2	-4	-1.5%
10-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
11-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	-2	-0.8%
12-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
13-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
14-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
15-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
16-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
17-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
18-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
19-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
20-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
21-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
22-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
23-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
24-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
25-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
26-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%

- continued -

Table 4. (Page 3 of 3).

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
27-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
28-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
29-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
30-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
31-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
1-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
2-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
3-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
4-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
5-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
6-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
7-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
8-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
9-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Total	19	52	89	30	-3	-6	-63	26	11	15	0	11	21	12	6	32	12	-6	1	259	
	7.3%	20.1%	34.4%	11.6%	-1.2%	-2.3%	-24.3%	10.0%	4.2%	5.8%	0.0%	4.2%	8.1%	4.6%	2.3%	12.4%	4.6%	-2.3%	0.4%	100.0%	

Table 5. Expanded daily hourly coho salmon migration past the Niukluk River counting tower, Norton Sound, 1997.

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
29-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
30-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
1-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
2-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
3-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
4-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
5-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
6-Jul	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0.1%
7-Jul	0	0	0	0	-2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0.0%
8-Jul	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	4	0.1%
9-Jul	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	3	0.1%
10-Jul	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.1%
11-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
12-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
13-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
14-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
15-Jul	0	0	0	2	0	0	0	2	-2	0	0	0	0	0	0	0	0	0	0	2	0.1%
16-Jul	0	0	0	1	0	0	0	1	-1	0	0	0	0	0	0	0	0	0	0	1	0.0%
17-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
18-Jul	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.1%
19-Jul	0	0	0	0	0	2	4	0	-2	0	2	0	0	2	0	0	0	0	0	8	0.2%
20-Jul	0	0	0	0	4	2	8	0	0	0	0	2	0	0	0	0	0	0	0	16	0.4%
21-Jul	0	2	0	0	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	8	0.2%
22-Jul	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4	0.1%
23-Jul	0	2	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	6	0.2%
24-Jul	0	2	2	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	8	0.2%
25-Jul	0	0	2	0	0	0	6	2	0	-2	0	4	0	0	0	0	0	0	0	12	0.3%
26-Jul	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0.1%
27-Jul	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	6	0.2%

- continued -

Table 5. (Page 2 of 3).

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jul	0	0	0	0	0	0	0	0	-2	0	0	0	0	2	0	2	0	2	0	4	0.1%
29-Jul	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	4	8	0.2%
30-Jul	1	0	-1	0	1	1	0	0	0	0	0	0	2	2	0	0	0	0	2	8	0.2%
31-Jul	2	0	-2	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	0	6	0.2%
1-Aug	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	2	0	0	0	6	0.2%
2-Aug	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4	6	0.2%
3-Aug	0	0	2	0	0	-2	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0.1%
4-Aug	0	0	0	0	0	0	0	0	0	2	4	0	0	2	-2	0	0	0	0	6	0.2%
5-Aug	2	0	0	0	2	0	0	0	0	0	0	2	0	0	2	0	2	2	0	12	0.3%
6-Aug	1	0	0	0	1	0	0	0	0	2	1	-1	1	-1	1	1	2	1	1	10	0.3%
7-Aug	0	0	0	0	0	0	0	0	0	4	2	-1	2	-2	0	2	2	0	2	11	0.3%
8-Aug	0	0	0	2	0	0	0	0	0	0	2	-4	-2	0	0	8	6	0	0	12	0.3%
9-Aug	0	0	0	2	0	0	0	0	0	0	-2	0	-1	0	0	0	0	0	0	-1	0.0%
10-Aug	0	0	2	0	0	2	-1	0	-2	0	0	2	0	0	0	0	0	0	4	7	0.2%
11-Aug	0	2	0	2	0	0	-2	0	2	4	0	3	0	0	0	0	4	0	0	15	0.4%
12-Aug	0	2	0	4	0	2	-4	0	0	4	0	4	0	4	0	2	0	0	8	26	0.7%
13-Aug	0	2	0	3	0	2	-2	0	0	2	0	2	0	2	0	1	0	0	4	16	0.4%
14-Aug	0	2	0	2	0	2	-1	0	0	0	0	0	0	0	0	0	0	0	0	5	0.1%
15-Aug	0	8	2	0	2	2	-3	0	0	0	0	0	-1	0	4	6	2	-2	2	22	0.5%
16-Aug	2	70	8	2	0	2	-5	0	0	0	0	2	-2	6	-4	10	0	4	2	97	2.4%
17-Aug	2	18	2	4	-2	-8	-3	0	0	0	0	4	4	4	18	6	8	2	10	69	1.7%
18-Aug	24	28	58	14	-6	-10	-9	-2	0	0	0	4	0	2	4	4	16	22	22	171	4.3%
19-Aug	0	6	4	0	-2	0	-2	0	0	0	0	4	0	0	10	4	2	4	10	40	1.0%
20-Aug	9	10	9	9	3	0	-5	0	0	-1	0	2	1	16	15	4	2	6	14	94	2.4%
21-Aug	18	14	14	18	8	0	-7	0	0	-2	0	0	2	32	20	4	2	8	18	149	3.7%
22-Aug	26	58	34	50	12	6	-11	0	0	0	0	0	0	6	4	10	0	0	22	217	5.4%
23-Aug	24	52	34	22	12	4	21	0	0	0	0	0	2	0	2	8	0	0	6	187	4.7%
24-Aug	106	108	36	12	12	0	47	0	0	0	-2	0	4	0	2	20	2	16	58	421	10.5%
25-Aug	20	26	26	12	10	2	14	0	0	0	0	1	0	0	-2	0	0	-2	18	125	3.1%
26-Aug	0	0	0	0	0	0	2	-2	0	0	0	2	2	2	0	0	0	2	10	18	0.5%

- continued -

Table 5. (Page 3 of 3).

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
27-Aug	58	14	3	1	-2	3	20	-1	2	0	1	1	4	3	12	7	0	1	56	183	4.6%
28-Aug	116	28	6	2	-4	6	39	0	4	0	2	0	6	4	24	14	0	0	102	349	8.7%
29-Aug	64	28	4	16	4	-4	34	-2	0	6	0	1	0	2	26	0	0	60	70	309	7.7%
30-Aug	70	22	14	4	8	4	28	0	2	0	10	1	2	1	17	0	0	30	37	250	6.3%
31-Aug	39	11	8	3	4	2	20	1	1	0	5	1	2	1	17	0	0	30	37	182	4.6%
1-Sep	39	11	8	3	4	2	17	1	1	0	5	1	2	1	17	0	0	30	37	179	4.5%
2-Sep	39	11	8	3	4	2	17	1	1	0	5	1	2	1	17	0	0	30	37	179	4.5%
3-Sep	39	11	8	3	4	2	17	1	1	0	5	1	2	1	17	0	0	30	37	179	4.5%
4-Sep	39	11	8	3	4	2	9	1	1	0	5	1	2	0	8	0	0	0	4	98	2.5%
5-Sep	8	0	2	2	0	0	6	2	0	0	0	2	4	0	8	2	0	10	18	64	1.6%
6-Sep	0	6	12	2	-2	2	3	1	-1	1	0	1	2	-2	-2	4	2	2	-2	29	0.7%
7-Sep	2	0	4	2	2	2	11	0	-2	2	0	0	2	6	4	8	6	4	0	53	1.3%
8-Sep	2	4	6	4	0	0	12	0	2	0	2	0	0	0	0	6	6	6	8	58	1.4%
9-Sep	2	0	-2	-2	2	-2	6	0	0	0	0	2	2	4	4	2	0	10	2	30	0.8%
Total	758	571	322	207	85	37	296	6	10	24	54	47	52	105	243	139	64	310	664	3,994	
	19.0%	14.3%	8.1%	5.2%	2.1%	0.9%	7.4%	0.2%	0.3%	0.6%	1.4%	1.2%	1.3%	2.6%	6.1%	3.5%	1.6%	7.8%	16.6%		

Table 6. Expanded daily hourly Dolly Varden migration past the Niukluk River counting tower, Norton Sound, 1997.

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jun	2	2	0	0	0	0	6	2	0	0	0	0	0	2	4	0	2	0	4	24	0.2%
29-Jun	2	2	6	0	2	0	17	0	0	0	0	2	2	0	2	16	16	0	2	69	0.6%
30-Jun	4	0	0	0	0	0	3	0	2	2	0	0	0	0	0	2	0	0	0	13	0.1%
1-Jul	4	0	2	0	-2	0	2	0	0	0	0	0	0	0	0	0	2	0	0	8	0.1%
2-Jul	2	0	1	0	-1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	5	0.0%
3-Jul	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	3	0.0%
4-Jul	0	2	2	0	0	0	3	2	0	0	0	0	0	0	2	0	0	0	0	11	0.1%
5-Jul	0	2	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	6	0.1%
6-Jul	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.0%
7-Jul	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.0%
8-Jul	2	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0.1%
9-Jul	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.0%
10-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
11-Jul	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0.0%
12-Jul	0	0	0	0	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	6	0.1%
13-Jul	2	0	0	0	0	0	1	-2	0	0	2	0	0	0	0	0	0	0	0	3	0.0%
14-Jul	0	2	0	0	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	0	0	0.0%
15-Jul	0	4	0	0	0	0	2	0	0	2	-2	0	0	0	0	0	0	0	0	6	0.1%
16-Jul	1	2	1	0	0	0	6	0	3	2	0	0	2	0	1	0	0	0	0	18	0.2%
17-Jul	2	0	2	0	0	0	10	0	6	2	2	0	4	0	2	0	0	0	0	30	0.3%
18-Jul	2	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	6	0.1%
19-Jul	0	0	0	0	0	0	4	0	-2	4	2	0	-2	0	0	0	0	0	0	6	0.1%
20-Jul	4	0	0	0	2	0	24	0	6	0	0	2	-2	0	0	0	0	0	0	36	0.3%
21-Jul	4	0	2	0	0	0	16	-2	0	0	4	0	0	0	0	0	0	0	0	24	0.2%
22-Jul	0	0	0	0	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	6	0.1%
23-Jul	1	0	0	0	0	0	4	0	0	0	2	-1	0	0	0	0	0	0	0	6	0.1%
24-Jul	2	0	0	0	0	0	4	0	0	0	2	-2	0	0	0	0	0	0	0	6	0.1%
25-Jul	0	0	0	0	0	0	12	0	2	2	0	2	0	0	0	0	0	0	0	18	0.2%
26-Jul	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.0%
27-Jul	0	0	0	0	0	0	0	0	0	0	0	8	2	0	0	0	0	2	0	12	0.1%

- continued -

Table 6. (Page 2 of 3).

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jul	2	4	0	0	0	-4	0	2	0	0	2	0	4	0	0	0	0	2	0	12	0.1%
29-Jul	4	2	0	2	0	0	0	-2	-2	-2	0	0	2	0	4	0	0	0	2	10	0.1%
30-Jul	2	1	1	1	0	0	0	0	-3	-1	6	1	3	2	1	0	3	0	7	24	0.2%
31-Jul	0	0	2	0	-2	0	0	2	-4	0	12	2	4	4	-2	0	6	0	12	36	0.3%
1-Aug	0	0	2	0	0	0	0	0	0	0	0	26	2	0	0	2	4	0	2	38	0.3%
2-Aug	2	2	0	-2	0	0	0	0	0	0	0	-2	0	0	0	8	4	-2	6	16	0.1%
3-Aug	0	0	0	4	-4	2	0	2	0	0	0	-1	0	2	4	0	0	0	4	13	0.1%
4-Aug	0	0	0	0	2	0	0	2	0	0	0	0	-2	2	4	0	0	0	2	10	0.1%
5-Aug	0	0	2	0	2	0	0	-2	0	0	0	2	0	0	0	0	4	-2	2	8	0.1%
6-Aug	0	0	1	0	1	0	0	-1	2	1	0	2	0	2	0	2	5	-2	1	14	0.1%
7-Aug	0	0	0	0	0	0	0	0	4	2	0	2	0	4	0	4	6	-2	0	20	0.2%
8-Aug	2	0	0	0	2	0	0	2	20	-2	2	2	6	0	78	92	94	50	120	468	4.2%
9-Aug	102	2	2	0	6	0	117	0	34	80	10	50	56	94	98	62	110	82	128	1,033	9.3%
10-Aug	262	0	0	0	10	4	160	160	58	94	50	2	106	52	246	108	62	8	34	1,416	12.8%
11-Aug	24	24	16	14	12	18	167	-2	170	70	2	74	76	76	18	98	210	0	410	1,477	13.3%
12-Aug	32	30	22	44	18	36	142	208	-16	0	324	146	102	114	44	6	0	12	-8	1,256	11.3%
13-Aug	16	15	12	22	8	18	90	104	-8	-1	191	90	59	80	22	11	0	7	63	799	7.2%
14-Aug	0	0	2	0	-2	0	39	0	0	-2	58	34	16	46	0	16	0	2	134	343	3.1%
15-Aug	16	0	0	0	0	0	22	0	0	0	2	0	8	4	90	14	14	10	16	196	1.8%
16-Aug	0	0	0	0	0	0	12	0	4	2	0	0	0	2	-2	50	2	8	16	94	0.8%
17-Aug	0	0	0	0	2	0	5	2	0	-2	0	0	2	8	-4	6	10	8	6	43	0.4%
18-Aug	0	0	0	0	0	2	8	2	4	2	2	2	0	6	0	12	4	8	14	66	0.6%
19-Aug	0	0	0	0	0	0	18	0	4	0	-2	4	2	2	50	10	2	4	52	146	1.3%
20-Aug	0	0	1	1	0	1	13	0	4	0	-1	2	3	1	27	9	9	3	29	102	0.9%
21-Aug	0	0	2	2	0	2	7	0	4	0	0	0	4	0	4	8	16	2	6	57	0.5%
22-Aug	2	2	2	0	2	0	8	0	-4	-2	0	-3	2	0	12	4	0	36	4	65	0.6%
23-Aug	6	2	0	0	0	0	-164	-2	0	0	2	-6	-1	4	14	6	4	4	422	291	2.6%
24-Aug	2	0	2	4	0	0	-17	0	-2	0	0	0	-4	-4	16	2	12	2	16	29	0.3%
25-Aug	6	0	-2	0	4	0	-33	2	2	0	0	12	42	2	0	2	2	0	18	57	0.5%
26-Aug	0	2	2	0	2	0	-60	0	-2	24	4	24	8	0	8	6	50	0	38	106	1.0%

- continued -

Table 6. (Page 3 of 3).

Shaded areas indicate hours not counted. Numbers in shaded areas indicate estimated passage.

Date	0000	0100	0200	0300	0400	0500	0600-1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
27-Aug	4	1	2	1	3	0	-149	1	8	12	2	12	4	0	5	6	25	1	326	264	2.4%
28-Aug	8	0	2	2	4	0	-239	2	18	0	0	0	0	0	2	6	0	2	614	421	3.8%
29-Aug	20	16	32	0	0	2	-200	0	42	-2	0	1	0	0	2	38	12	348	42	353	3.2%
30-Aug	14	2	10	2	2	0	-85	-8	-4	-2	-12	1	3	2	1	19	7	174	25	151	1.4%
31-Aug	7	1	5	1	2	0	-85	-5	-2	-1	-6	1	3	2	1	19	7	174	25	149	1.3%
1-Sep	7	1	5	1	2	0	-21	-5	-2	-1	-6	1	3	2	1	19	7	174	25	213	1.9%
2-Sep	7	1	5	1	2	0	-21	-5	-2	-1	-6	1	3	2	1	19	7	174	25	213	1.9%
3-Sep	7	1	5	1	2	0	-21	-5	-2	-1	-6	1	3	2	1	19	7	174	25	213	1.9%
4-Sep	7	1	5	1	2	0	-2	-5	-2	-1	-6	1	3	4	0	0	2	0	8	18	0.2%
5-Sep	0	0	0	0	2	0	-8	-2	0	0	0	2	6	8	14	14	-6	20	30	80	0.7%
6-Sep	6	6	8	4	0	0	-5	0	0	0	0	1	0	6	-2	-4	8	14	12	54	0.5%
7-Sep	2	2	2	0	2	2	6	2	0	0	0	0	0	4	2	16	8	22	24	94	0.9%
8-Sep	0	4	12	0	0	-2	13	18	0	20	0	2	0	2	2	10	6	92	16	195	1.8%
9-Sep	8	-2	2	0	2	2	6	2	0	0	0	-4	2	4	4	36	2	12	12	88	0.8%
Total	616	141	182	110	91	86	-152	471	340	300	642	498	534	546	777	773	746	1,623	2,771	11,095	
	5.6%	1.3%	1.6%	1.0%	0.8%	0.8%	-1.4%	4.2%	3.1%	2.7%	5.8%	4.5%	4.8%	4.9%	7.0%	7.0%	6.7%	14.6%	25.0%	100.0%	

Table 7. Reported hourly chum salmon observations at the Niukluk River counting tower, Norton Sound, 1997.

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jun	166	106	6	-12	-2	4							-4	0	18	2	0	-12	26	0	2	2	-2	12	312	0.7%
29-Jun	52	118	-26	6	-12	-42							2	8	0	10	228	292	32	8	272	566	162	180	1,856	3.9%
30-Jun	202	2	14	12	18	-2							2	16	2	-2	-8	20	12	26	14	18	-8	6	344	0.7%
1-Jul	18	52	-14	-18	-12	-12	0	16	32	2	0	12	-6	52	32	86	20	148	80	146	222	68	38	160	1,122	2.4%
2-Jul																										
3-Jul	92	-46	26	20	26	-6							164	106	44	-86	118	150	194	126	358	-72	156	240	1,610	3.4%
4-Jul	290	234	178	52	42	24							70	132	302	276	-134	1,168	1,166	214	150	130	-90	114	4,318	9.2%
5-Jul	62	106	70	40	60	40							-4	10	24	46	394	772	52	610	534	102	66	6	2,990	6.4%
6-Jul	84	222	278	52	2	8							0	-10	106	42	60	40	66	168	202	192	264	8	1,784	3.8%
7-Jul	56	30	76	-4	8	24							26	24	4		84	356	276	206	182	80	88	138	1,654	3.5%
8-Jul	206	180	40	46	18	54	38	66	170	16	20	2	-20	94	92	-12	140	96	58	74	44	98	50	6	1,576	3.3%
9-Jul																										
10-Jul	16	94	122	42	-24	0							-14	14	8	8	-6	90	48	28	102	68	96	38	730	1.6%
11-Jul	-4	-26	10	-58	-82	-12							14	32	296	68	38	356	498	120	92	38	48	46	1,474	3.1%
12-Jul	52	92	112	92	36	86							-152	34	10	64	4	38	32	12	590	94	266	60	1,522	3.2%
13-Jul	-6	34	36	8	24	0							32	10	38	-46		348	-128	302	214	32	-2	90	986	2.1%
14-Jul	102	168	70	22	26	2							-16	6	-32		140	276	208	70	64	-22	44	-2	1,126	2.4%
15-Jul	20	6	60	-34	-28	-4	-4	-14	0	-18	2	-26	4	16	76	-10	-6	-18	94	16	90	28	64	318	632	1.3%
16-Jul																										
17-Jul	220	574	180	140	212	102							-2	-48	-32	236	200	314	164	116	66	194	110	130	2,876	6.1%
18-Jul	260	126	62	84	38	-40							-26	86	0	-38	-4	58	54	62	-4	62	32	78	890	1.9%
19-Jul	192	92	166	98	50	110							0	-366	304	272	232	78	284	378	46	40	222	54	2,252	4.8%
20-Jul	250	438	544	230	216	94							8	-42	60	46	20	78	4	238	60	122	234	176	2,776	5.9%
21-Jul	238	284	72	76	44	30							-10	24	42	60		62	142	74	62	64	18	70	1,352	2.9%
22-Jul	234	446	126	42	54	38	-2	18	12	-2	20	26	20	-20	4	-50	54	26	102	162	34	88	106	100	1,638	3.5%
23-Jul																										
24-Jul	32	304	196	46	70	66							0	-2	-14	4	18	48	-6	-14	-8	20	-12	16	764	1.6%
25-Jul	22	-44	-20	-16	-6	0							14	-26	-26		160	128	116	96	-66	12	44	18	406	0.9%
26-Jul	134	204	-40	28	-4	110							12	20	20	68	104		254	86	-30	-20	10	18	974	2.1%
27-Jul	62	38	-28	-24	-8	-46							-10	16	32	48	-56	42	58	108	70	94	88	172	656	1.4%

- continued -

Table 7. (Page 2 of 3).

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jul	82	106	78	46	18	94							-42	80	42	88		106	152	186	30	198	76	100	1,440	3.1%
29-Jul	74	162	76	32	16	50	98	8	-16	-40	22	26	52	6	106	72	146	130	90	72	54	88	66	174	1,564	3.3%
30-Jul																										
31-Jul	240	52	14	36	36	10							20	4	40	60	30	58	188	82	60	108	-82	28	984	2.1%
1-Aug	8	58	24	32	12	30							4	22	50	-8	2	-18	-18	28	-8	-4	-4	-18	192	0.4%
2-Aug	-24	10	12	-4	12	22							-10	-6	4	22	28	8	8	28	18	32	30	28	218	0.5%
3-Aug	103	12	-6	12	18	34							6	8	-2	4		16	96	26	24	12	2	0	365	0.8%
4-Aug	6	18	8	-8	18	28							6	-4	14	4	12	-8	12	8	-26	-2	8	22	116	0.2%
5-Aug	26	12	18	22	22	24	60	36	22	8	-2	8	32	50	34	34	10	48	58	16	0	6	54	84	682	1.4%
6-Aug																										
7-Aug	8	24	22	26	4	12							12	10	10	16		22	74	22	80	48	26	70	486	1.0%
8-Aug	60	26	34	36	38	28							10	18	4	0	20	46	56	56	30	36	30	22	550	1.2%
9-Aug	6	8	42	16	12	28							16	8	22	6	12		16	18	8	-6	24	20	256	0.5%
10-Aug	32	26	16	22	42	22							4	16	12	12	20	0	6	18	-6	12	8	-4	258	0.5%
11-Aug	20	16	6	16	12	14							0	12	12	4		10	4	30	12	-10	-20	2	140	0.3%
12-Aug	-14	24	10	26	12	24	18	-20	-2	0	6	10	28	4	4	0	-8	-10	6	12	6	-16	-10	-8	102	0.2%
13-Aug																										
14-Aug	4	-16	-2	2	-10	18							18	12	4	10	22	8	12	8	8	0	-4	24	118	0.3%
15-Aug	0	22	12	12	12	-4							8	12	14	10	22		24	28	42	32	32	10	288	0.6%
16-Aug	28	18	16	-8	6	-2							-10	-10	-2	2		-6	6	20	34	10	18	16	136	0.3%
17-Aug	-6	16	-10	-4	-8	4							8	8	2	-4	8	4	2	30	36	28	4	-8	110	0.2%
18-Aug	4	8	44	-12	4	-26							8	0	-4	2		-4	10	6	10	12	2	8	72	0.2%
19-Aug	-2	0	-8	0	-24	-14	2	20	2	4	-2	4	-2	0	0	2	2	2	-6	4	2	2	0	0	-12	0.0%
20-Aug																										
21-Aug	20	4	12	12	6	-2							4	6	-2	2	0	6	2	14	0	2	2	2	90	0.2%
22-Aug	4	10	10	-2	0	10							-2	-4	2	-2		6	4	-2	8	4	4	2	52	0.1%
23-Aug	4	-4	-2	2	0	0							4	6	-2	0	0		2	2	6	0	2	2	22	0.0%
24-Aug	8	2	8	-4	6	0							-2	0		-4	0	0	-2	-2	0	8	6	2	26	0.1%
25-Aug	6	2	0	4	4	0							8	4	-2	0		14	2	10	16	4	-2	2	72	0.2%
26-Aug	-2	2	-6	0	4	-2	-4	0	4	0	-4	-6	-6	0	0	6	14	10	-2	4	6	12	2	4	36	0.1%

- continued -

Table 7. (Page 3 of 3).

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
27-Aug																										
28-Aug	2	0	4	-2	0	-4							-2	0	0	-2	2	-2	4	0	2	4	6	4	16	0.0%
29-Aug	4	4	0	6	-4	4							-2	-2	-2	0		0	4	8	-4	6	2	6	30	0.1%
30-Aug	4	0	-4	-2	4	-6							0	0	2	4									2	0.0%
31-Aug																									0	0.0%
1-Sep																									0	0.0%
2-Sep																									0	0.0%
3-Sep																									0	
4-Sep																			2	0	0	2	0	-4	0	0.0%
5-Sep	0	0	0	0	0	-2	0	0	0	0	2	0	0	0	0	0	0	0	0	2	4	0	0	4	10	0.0%
6-Sep	0	2	2	0	0	0												0	-2	2	2	-2	0	0	4	0.0%
7-Sep	0	0	0	0	0	0							2	0	0	0	0	0	-2	0	0	0	0	0	0	0.0%
8-Sep	0	0	0	0	0	0							0	0	0	2	2	0	0	2	0	0	0	0	6	0.0%
9-Sep	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0.0%
Total	3,757	4,458	2,746	1,284	1,038	1,022	206	130	222	-30	64	56	276	446	1,772	1,434	2,144	5,400	4,694	4,172	3,816	2,724	2,374	2,846	47,051	
	8.0%	9.5%	5.8%	2.7%	2.2%	2.2%	0.4%	0.3%	0.5%	-0.1%	0.1%	0.1%	0.6%	0.9%	3.8%	3.0%	4.6%	11.5%	10.0%	8.9%	8.1%	5.8%	5.0%	6.0%	100.0%	

Table 8. Reported hourly pink salmon observations at the Niukluk River counting tower, Norton Sound, 1997.

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jun	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
29-Jun	0	0	0	0	0	0							4	0	0	0	0	0	4	0	12	26	2	4	52	0.6%
30-Jun	2	0	0	0	0	0							0	0	0	0	0	2	0	0	4	2	2	0	12	0.1%
1-Jul	0	8	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	8	0.1%
2-Jul																										
3-Jul	2	-2	4	0	4	-4							0	0	0	0	0	0	2	0	0	0	0	0	6	0.1%
4-Jul	20	12	12	4	6	-2							0	0	2	0	2	32	16	0	0	0	0	0	104	1.1%
5-Jul	2	18	30	0	2	-2							0	0	0	0	0	24	6	6	0	0	0	0	86	0.9%
6-Jul	16	44	58	10	-4	0							0	0	0	0	0	-2	0	0	2	0	4	0	128	1.4%
7-Jul	12	0	8	4	0	0							0	0	0		2	12	2	0	6	2	4	4	56	0.6%
8-Jul	6	14	4	4	2	-2	-2	0	0	0	0	0	0	2	-2	0	0	2	2	0	0	6	0	2	38	0.4%
9-Jul																										
10-Jul	10	8	28	32	-8	-2							-2	0	0	0	0	2	2	0	0	0	0	0	70	0.8%
11-Jul	-8	0	-6	2	-6	-2							0	0	6	0	0	0	18	0	0	0	0	10	14	0.2%
12-Jul	-2	0	6	2	2	6							0	0	0	-2	-2	0	-4	0	16	0	6	-4	24	0.3%
13-Jul	-8	4	8	-2	0	0							0	0	0	-2		6	6	8	0	2	0	2	24	0.3%
14-Jul	4	8	2	4	0	0							0	2	-2		12	12	6	0	14	4	6	6	78	0.8%
15-Jul	0	2	16	2	0	6	-6	0	0	2	2	0	0	0	2	2	0	-2	4	4	0	0	8	2	44	0.5%
16-Jul																										
17-Jul	26	84	58	32	52	8							-6	-2	12	18	6	12	14	8	16	26	16	28	408	4.4%
18-Jul	128	50	24	28	22	-6							4	4	-2	6	18	12	12	12	4	6	12	20	354	3.8%
19-Jul	24	18	34	14	6	8							-8	-2	20	18	16	2	36	58	12	2	24	14	296	3.2%
20-Jul	42	82	144	70	80	12							-2	6	16	14	2	34	8	42	10	30	62	30	682	7.4%
21-Jul	64	138	62	26	2	0							6	44	2	10		18	14	24	14	30	14	26	504	5.5%
22-Jul	74	176	54	20	0	-12	-12	-8	0	0	8	4	0	-2	2	0	2	4	8	24	28	18	10	22	420	4.5%
23-Jul																										
24-Jul	32	164	142	34	24	28							-4	-12	10	2	8	-2	30	2	2	-8	-4	14	462	5.0%
25-Jul	24	-4	2	-6	-12	-10							12	20	-8		112	22	60	38	2	14	16	36	318	3.4%
26-Jul	52	104	-2	-12	-10	2							0	24	6	10	14		100	52	14	34	10	14	412	4.5%
27-Jul	32	22	16	-18	12	-2							-4	10	14	26	38	34	34	72	74	50	54	66	530	5.7%

- continued -

Table 8. (Page 2 of 3).

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jul	100	156	60	28	20	22							14	70	18	26		44	84	102	10	64	8	38	864	9.4%
29-Jul	50	64	40	6	24	-12	2	-32	10	-18	14	-6	12	14	48	14	68	56	46	34	36	26	30	24	550	6.0%
30-Jul																										
31-Jul	114	30	46	34	32	8							-10	6	32	14	12	46	72	18	28	74	-32	62	586	6.3%
1-Aug	56	40	12	14	12	22							8	-12	-10	-2	10	-10	2	8	8	0	-2	6	162	1.8%
2-Aug	22	-10	10	22	-2	10							-12	0	-10	2	4	20	18	0	6	8	14	18	120	1.3%
3-Aug	70	12	6	14	14	38							-2	0	2	12		4	78	18	34	4	-26	4	282	3.1%
4-Aug	-20	12	-8	0	12	42							2	2	6	22	0	4	4	12	16	10	16	20	152	1.6%
5-Aug	-10	2	12	16	18	20	30	-8	8	4	6	0	6	4	8	4	20	18	52	2	8	8	26	20	274	3.0%
6-Aug																										
7-Aug	18	20	8	16	14	8							2	-2	6	-2		12	16	16	-4	-4	-4	8	128	1.4%
8-Aug	14	8	14	12	10	16							4	2	4	8	16	14	20	2	-4	2	14	6	162	1.8%
9-Aug	10	2	26	22	16	14							8	4	8	4	0		16	14	-6	2	4	2	146	1.6%
10-Aug	34	16	16	14	20	18							-4	0	-6	-2	6	2	2	-2	6	8	0	2	130	1.4%
11-Aug	6	-12	6	6	12	10							6	8	4	4		4	4	4	-2	-2	8	12	78	0.8%
12-Aug	22	-10	8	16	14	10	-2	10	4	-4	12	12	0	2	4	6	-2	8	4	2	8	-12	14	-6	120	1.3%
13-Aug																										
14-Aug	-6	0	12	6	2	-8							0	4	2	-6	2	2	4	-2	4	-2	2	4	20	0.2%
15-Aug	0	0	8	10	2	-2							0	0	4	2	2		4	4	8	8	0	0	50	0.5%
16-Aug	-2	2	2	6	-2	2							-2	2	4	4		2	4	0	2	2	-4	0	22	0.2%
17-Aug	0	0	0	4	6	6							2	0	2	0	4	2	0	6	4	8	2	2	48	0.5%
18-Aug	6	2	0	2	0	0							0	2	0	2		0	0	4	0	0	2	0	20	0.2%
19-Aug	0	4	0	0	4	4	0	2	-2	0	-2	0	0	-2	0	0	6	0	0	4	4	2	2	2	28	0.3%
20-Aug																										
21-Aug	-2	2	2	2	0	2							0	2	-2	0	-2	0	2	8	2	0	2	0	18	0.2%
22-Aug	0	0	2	0	0	0							4	2	2	0		6	0	4	0	4	2	0	26	0.3%
23-Aug	2	0	2	0	8	4							0	0	0	2	2		0	0	0	2	0	-2	20	0.2%
24-Aug	0	6	0	0	2	4							0	0		0	0	0	2	4	4	2	6	2	32	0.3%
25-Aug	2	-2	6	10	2	-2							10	12	0	2		4	2	0	4	0	0	-2	48	0.5%
26-Aug	2	2	0	2	0	2	-2	-4	4	-2	-2	0	-2	0	0	-2	0	2	-2	-2	-4	0	0	4	-4	0.0%

- continued -

Table 8. (Page 3 of 3).

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
27-Aug																										
28-Aug	2	0	0	-2	0	2							0	0	0	-2	6	-2	0	0	2	-2	-2	2	4	0.0%
29-Aug	0	2	0	0	0	2							0	0	-2	-2		0	0	-2	0	2	0	2	2	0.0%
30-Aug	-2	0	2	0	2	0							6	-6	0	0									2	0.0%
31-Aug																									0	0.0%
1-Sep																									0	0.0%
2-Sep																									0	0.0%
3-Sep																										
4-Sep																			4	-2	0	-2	0	0	0	0.0%
5-Sep	2	0	0	0	0	-2	0	0	0	-2	0	0	0	-2	4	0	0	2	0	0	-2	0	0	0	0	0.0%
6-Sep	0	0	-4	2	-2	0												0	-2	-2	0	0	0	0	-8	-0.1%
7-Sep	0	0	0	0	0	0							0	0	0	2	0	0	0	0	4	0	2	0	8	0.1%
8-Sep	0	0	2	6	0	4							-2	0	2	-4	0	0	2	4	-2	0	-2	6	16	0.2%
9-Sep	0	0	0	0	0	0	0	0	0	-2	6	2	0	0	0	0	2	0	0	-2	-2	-2	0	0	2	0.0%
Total	1,044	1,298	992	518	414	270	8	-40	24	-22	44	12	50	206	208	220	386	464	818	606	402	454	328	534	9,238	
	11.3%	14.1%	10.7%	5.6%	4.5%	2.9%	0.1%	-0.4%	0.3%	-0.2%	0.5%	0.1%	0.5%	2.2%	2.3%	2.4%	4.2%	5.0%	8.9%	6.6%	4.4%	4.9%	3.6%	5.8%	100.0%	

Table 9. Reported hourly king salmon observations at the Niukluk River counting tower, Norton Sound, 1997.

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jun	6	2	2	-2	0	2							0	0	0	0	0	0	-2	0	0	0	0	4	12	4.2%
29-Jun	0	0	-4	0	4	-2							0	0	0	0	6	4	-2	2	24	12	-2	0	42	14.8%
30-Jun	0	4	0	8	0	0							0	0	0	0	0	2	0	0	0	0	2	0	16	5.6%
1-Jul	0	-2	0	-2	-2	-2	0	0	-2	0	0	0	0	2	4	2	2	4	4	-2	4	0	0	0	10	3.5%
2-Jul																										
3-Jul	0	0	4	-2	-2	-2							28	4	4	-2	0	0	-2	-2	0	0	0	0	28	9.9%
4-Jul	4	4	22	2	4	6							0	0	2	0	-2	8	6	2	0	0	0	0	58	20.4%
5-Jul	0	0	30	10	0	-6							0	0	0	0	0	6	2	4	0	0	-2	-4	40	14.1%
6-Jul	4	22	0	10	0	2							0	0	0	0	0	0	2	0	0	0	0	0	40	14.1%
7-Jul	0	-2	0	2	0	2							0	0	0		0	0	0	2	0	0	0	0	4	1.4%
8-Jul	0	8	4	4	0	-4	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	10	3.5%
9-Jul																										
10-Jul	0	0	6	0	-2	0							0	0	0	0	0	0	0	0	0	0	0	0	4	1.4%
11-Jul	0	2	0	0	0	2							0	0	0	0	0	0	0	0	0	0	0	0	4	1.4%
12-Jul	0	2	4	0	-2	2							0	-2	0	-2	0	0	0	0	0	0	-2	0	0	0.0%
13-Jul	0	0	2	0	2	2							0	0	0	0		0	0	2	2	0	0	0	10	3.5%
14-Jul	2	4	2	0	0	-2							0	2	0		0	0	0	-2	0	0	0	0	6	2.1%
15-Jul	0	2	4	0	0	0	-2	0	0	0	0	0	-4	0	0	0	0	-2	0	0	0	0	0	4	2	0.7%
16-Jul																										
17-Jul	2	0	0	0	0	-2							-2	0	0	0	0	0	2	-2	0	0	0	-2	-4	-1.4%
18-Jul	2	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	2	0.7%
19-Jul	-2	0	2	0	-2	2							0	0	0	2	2	-2	0	0	2	0	0	0	4	1.4%
20-Jul	0	0	0	0	2	0							0	0	0	0	0	0	0	0	0	0	0	0	2	0.7%
21-Jul	0	0	0	0	-2	2							0	0	0	0		0	0	0	0	0	0	0	0	0.0%
22-Jul	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	-0.7%
23-Jul																										
24-Jul	0	0	0	0	0	0							0	0	0	0	0	0	0	2	0	0	0	0	2	0.7%
25-Jul	0	0	2	0	0	0							0	0	0	0	2	0	0	0	0	0	0	0	4	1.4%
26-Jul	0	2	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	2	0.7%
27-Jul	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%

- continued -

Table 9. (Page 2 of 3).

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jul	0	0	0	0	0	0							-2	0	0	0		0	0	2	0	0	0	0	0	0.0%
29-Jul	0	0	0	0	0	0	0	0	0	-2	0	-2	-2	0	2	0	0	0	0	0	0	0	0	0	-4	-1.4%
30-Jul																										
31-Jul	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
1-Aug	0	0	0	0	0	0							0	0	0	0	0	0	0	0	-2	0	0	0	-2	-0.7%
2-Aug	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
3-Aug	0	0	0	0	0	0							0	0	0	0		0	0	0	0	0	0	0	0	0.0%
4-Aug	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
5-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
6-Aug																										
7-Aug	0	0	0	0	0	0							0	0	0	0		0	0	0	0	0	0	0	0	0.0%
8-Aug	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
9-Aug	0	0	0	0	0	0							-2	2	-2	0	0		0	0	0	0	0	-2	-4	-1.4%
10-Aug	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
11-Aug	0	0	0	0	0	0							0	0	0	0		0	0	0	0	0	-2	0	-2	-0.7%
12-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
13-Aug																										
14-Aug	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
15-Aug	0	0	0	0	0	0							0	0	0	0	0		0	0	0	0	0	0	0	0.0%
16-Aug	0	0	0	0	0	0							0	0	0	0		0	0	0	0	0	0	0	0	0.0%
17-Aug	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
18-Aug	0	0	0	0	0	0							0	0	0	0		0	0	0	0	0	0	0	0	0.0%
19-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
20-Aug																										
21-Aug	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
22-Aug	0	0	0	0	0	0							0	0	0	0		0	0	0	0	0	0	0	0	0.0%
23-Aug	0	0	0	0	0	0							0	0	0	0	0		0	0	0	0	0	0	0	0.0%
24-Aug	0	0	0	0	0	0							0	0		0	0	0	0	0	0	0	0	0	0	0.0%
25-Aug	0	0	0	0	0	0							0	0	0	0		0	0	0	0	0	0	0	0	0.0%
26-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%

- continued -

Table 9. (Page 3 of 3).

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
27-Aug																										
28-Aug	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
29-Aug	0	0	0	0	0	0							0	0	0	0		0	0	0	0	0	0	0	0	0.0%
30-Aug	0	0	0	0	0	0							0	0	0	0									0	0.0%
31-Aug																									0	0.0%
1-Sep																									0	0.0%
2-Sep																									0	0.0%
3-Sep																										
4-Sep																			0	0	0	0	0	0	0	0.0%
5-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
6-Sep	0	0	0	0	0	0												0	0	0	0	0	0	0	0	0.0%
7-Sep	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
8-Sep	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
9-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Total	18	48	80	30	0	0	-2	0	-2	-2	0	-4	16	8	10	0	10	20	10	8	30	12	-6	0	284	
	6.3%	16.9%	28.2%	10.6%	0.0%	0.0%	-0.7%	0.0%	-0.7%	-0.7%	0.0%	-1.4%	5.6%	2.8%	3.5%	0.0%	3.5%	7.0%	3.5%	2.8%	10.6%	4.2%	-2.1%	0.0%	100.0%	

Table 10. Reported hourly coho salmon observations at the Niukluk River counting tower, Norton Sound, 1997.

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jun	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
29-Jun	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
30-Jun	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
1-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
2-Jul																										
3-Jul	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
4-Jul	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
5-Jul	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
6-Jul	0	0	0	0	0	0							0	0	2	0	0	0	0	0	0	0	0	0	2	0.1%
7-Jul	0	0	0	0	-2	0							0	0	0		0	2	0	0	0	0	0	0	0	0.0%
8-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	4	0.2%
9-Jul																										
10-Jul	0	0	0	0	0	2							0	0	0	0	0	0	0	0	0	0	0	0	2	0.1%
11-Jul	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
12-Jul	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
13-Jul	0	0	0	0	0	0							0	0	0	0		0	0	0	0	0	0	0	0	0.0%
14-Jul	0	0	0	0	0	0							0	0	0		0	0	0	0	0	0	0	0	0	0.0%
15-Jul	0	0	0	2	0	0	0	0	0	0	0	0	2	-2	0	0	0	0	0	0	0	0	0	0	2	0.1%
16-Jul																										
17-Jul	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
18-Jul	2	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	2	0.1%
19-Jul	0	0	0	0	0	2							0	-2	0	2	0	0	2	0	0	0	0	0	4	0.2%
20-Jul	0	0	0	0	4	2							0	0	0	0	2	0	0	0	0	0	0	0	8	0.3%
21-Jul	0	2	0	0	0	0							0	0	0	2		0	0	0	0	0	0	0	4	0.2%
22-Jul	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.2%
23-Jul																										
24-Jul	0	2	2	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	4	0.2%
25-Jul	0	0	2	0	0	0							2	0	-2	0	4	0	0	0	0	0	0	0	6	0.2%
26-Jul	0	0	0	0	0	0							0	0	0	0	2	0	0	0	0	0	0	0	2	0.1%
27-Jul	2	0	0	0	0	0							0	2	0	0	0	0	0	0	0	0	2	0	6	0.2%

- continued -

Table 10. (Page 2 of 3).

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jul	0	0	0	0	0	0							0	-2	0	0		0	2	0	2	0	2	0	4	0.2%
29-Jul	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4	8	0.3%
30-Jul																										
31-Jul	2	0	-2	0	0	0							0	0	0	0	0	2	4	0	0	0	0	0	6	0.2%
1-Aug	0	0	0	0	0	2							0	0	0	2	0	0	0	0	2	0	0	0	6	0.2%
2-Aug	0	0	0	0	0	2							0	0	0	0	0	0	0	0	0	0	0	4	6	0.2%
3-Aug	0	0	2	0	0	-2							0	0	0	0		0	0	0	2	0	0	0	2	0.1%
4-Aug	0	0	0	0	0	0							0	0	2	4	0	0	2	-2	0	0	0	0	6	0.2%
5-Aug	2	0	0	0	2	0	0	-2	2	0	0	0	0	0	0	0	2	0	0	2	0	2	2	0	12	0.5%
6-Aug																										
7-Aug	0	0	0	0	0	0							0	0	4	2		2	-2	0	2	2	0	2	12	0.5%
8-Aug	0	0	0	2	0	0							0	0	0	2	-4	-2	0	0	8	6	0	0	12	0.5%
9-Aug	0	0	0	2	0	0							0	0	0	-2	0		0	0	0	0	0	0	0	0.0%
10-Aug	0	0	2	0	0	2							0	-2	0	0	2	0	0	0	0	0	0	4	8	0.3%
11-Aug	0	2	0	2	0	0							0	2	4	0		0	0	0	0	4	0	0	14	0.5%
12-Aug	0	2	0	4	0	2	0	-2	0	0	-2	0	0	0	4	0	4	0	4	0	2	0	0	8	26	1.0%
13-Aug																										
14-Aug	0	2	0	2	0	2							0	0	0	0	0	0	0	0	0	0	0	0	6	0.2%
15-Aug	0	8	2	0	2	2							0	0	0	0	0		0	4	6	2	-2	2	26	1.0%
16-Aug	2	70	8	2	0	2							0	0	0	0		-2	6	-4	10	0	4	2	100	3.8%
17-Aug	2	18	2	4	-2	-8							0	0	0	0	4	4	4	18	6	8	2	10	72	2.7%
18-Aug	24	28	58	14	-6	-10							-2	0	0	0		0	2	4	4	16	22	22	176	6.6%
19-Aug	0	6	4	0	-2	0	0	-2	0	0	0	0	0	0	0	0	4	0	0	10	4	2	4	10	40	1.5%
20-Aug																										
21-Aug	18	14	14	18	8	0							0	0	-2	0	0	2	32	20	4	2	8	18	156	5.9%
22-Aug	26	58	34	50	12	6							0	0	0	0		0	6	4	10	0	0	22	228	8.6%
23-Aug	24	52	34	22	12	4							0	0	0	0	0		0	2	8	0	0	6	164	6.2%
24-Aug	106	108	36	12	12	0							0	0		-2	0	4	0	2	20	2	16	58	374	14.1%
25-Aug	20	26	26	12	10	2							0	0	0	0		0	0	-2	0	0	-2	18	110	4.2%
26-Aug	14	34	22	4	6	-8	-2	0	0	-2	6	0	-2	0	0	0	2	2	2	0	0	0	2	10	90	3.4%

- continued -

Table 10. (Page 3 of 3).

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
27-Aug																										
28-Aug	116	28	6	2	-4	6							0	4	0	2	0	6	4	24	14	0	0	102	310	11.7%
29-Aug	64	28	4	16	4	-4							-2	0	6	0		0	2	26	0	0	60	70	274	10.3%
30-Aug	70	22	14	4	8	4							0	2	0	10									134	5.1%
31-Aug																									0	0.0%
1-Sep																									0	0.0%
2-Sep																									0	0.0%
3-Sep																										
4-Sep																			0	8	0	0	0	4	12	0.5%
5-Sep	8	0	2	2	0	0	0	4	0	0	2	0	2	0	0	0	2	4	0	8	2	0	10	18	64	2.4%
6-Sep	0	6	12	2	-2	2												2	-2	-2	4	2	2	-2	24	0.9%
7-Sep	2	0	4	2	2	2							0	-2	2	0	0	2	6	4	8	6	4	0	42	1.6%
8-Sep	2	4	6	4	0	0							0	2	0	2	0	0	0	0	6	6	6	8	46	1.7%
9-Sep	2	0	-2	-2	2	-2	2	2	0	0	0	2	0	0	0	0	2	2	4	4	2	0	10	2	30	1.1%
Total	508	522	292	182	68	12	2	0	2	-2	6	2	0	4	20	26	26	32	78	130	126	60	152	402	2,650	
	19.2%	19.7%	11.0%	6.9%	2.6%	0.5%	0.1%	0.0%	0.1%	-0.1%	0.2%	0.1%	0.0%	0.2%	0.8%	1.0%	1.0%	1.2%	2.9%	4.9%	4.8%	2.3%	5.7%	15.2%	100.0%	

Table 11. Reported hourly Dolly Varden observations at the Niukluk River counting tower, Norton Sound, 1997.

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jun	2	2	0	0	0	0							2	0	0	0	0	0	2	4	0	2	0	4	18	0.2%
29-Jun	2	2	6	0	2	0							0	0	0	0	2	2	0	2	16	16	0	2	52	0.6%
30-Jun	4	0	0	0	0	0							0	2	2	0	0	0	0	0	2	0	0	0	10	0.1%
1-Jul	4	0	2	0	-2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	8	0.1%
2-Jul																										
3-Jul	0	0	0	0	0	0							0	0	0	0	0	0	2	0	0	0	0	0	2	0.0%
4-Jul	0	2	2	0	0	0							2	0	0	0	0	0	0	2	0	0	0	0	8	0.1%
5-Jul	0	2	0	2	0	0							0	0	0	0	2	0	0	0	0	0	0	0	6	0.1%
6-Jul	2	0	0	0	2	0							0	0	0	0	0	0	0	0	0	0	0	0	4	0.0%
7-Jul	0	2	0	2	0	0							0	0	0		0	0	0	0	0	0	0	0	4	0.0%
8-Jul	2	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0.1%
9-Jul																										
10-Jul	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
11-Jul	0	0	0	0	0	0							2	0	0	0	0	0	0	0	0	0	0	0	2	0.0%
12-Jul	0	0	0	0	0	0							0	0	0	4	0	0	0	0	0	0	0	0	4	0.0%
13-Jul	2	0	0	0	0	0							-2	0	0	2		0	0	0	0	0	0	0	2	0.0%
14-Jul	0	2	0	0	0	0							0	0	0		0	-2	0	0	0	0	0	0	0	0.0%
15-Jul	0	4	0	0	0	0	0	0	2	2	-2	0	0	0	2	-2	0	0	0	0	0	0	0	0	6	0.1%
16-Jul																										
17-Jul	2	0	2	0	0	0							0	6	2	2	0	4	0	2	0	0	0	0	20	0.2%
18-Jul	2	0	2	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	4	0.0%
19-Jul	0	0	0	0	0	0							0	-2	4	2	0	-2	0	0	0	0	0	0	2	0.0%
20-Jul	4	0	0	0	2	0							0	6	0	0	2	-2	0	0	0	0	0	0	12	0.1%
21-Jul	4	0	2	0	0	0							-2	0	0	4		0	0	0	0	0	0	0	8	0.1%
22-Jul	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	6	0.1%
23-Jul																										
24-Jul	2	0	0	0	0	0							0	0	0	2	-2	0	0	0	0	0	0	0	2	0.0%
25-Jul	0	0	0	0	0	0							0	2	2		2	0	0	0	0	0	0	0	6	0.1%
26-Jul	2	0	0	0	0	0							0	0	0	0	0		0	0	0	0	0	0	2	0.0%
27-Jul	0	0	0	0	0	0							0	0	0	0	8	2	0	0	0	0	2	0	12	0.1%

- continued -

Table 11. (Page 2 of 3).

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
28-Jul	2	4	0	0	0	-4							2	0	0	2		4	0	0	0	0	2	0	12	0.1%
29-Jul	4	2	0	2	0	0	0	0	-6	0	4	2	-2	-2	-2	0	0	2	0	4	0	0	0	2	10	0.1%
30-Jul																										
31-Jul	0	0	2	0	-2	0							2	-4	0	12	2	4	4	-2	0	6	0	12	36	0.4%
1-Aug	0	0	2	0	0	0							0	0	0	0	26	2	0	0	2	4	0	2	38	0.4%
2-Aug	2	2	0	-2	0	0							0	0	0	0	-2	0	0	0	8	4	-2	6	16	0.2%
3-Aug	0	0	0	4	-4	2							2	0	0	0		0	2	4	0	0	0	4	14	0.2%
4-Aug	0	0	0	0	2	0							2	0	0	0	0	-2	2	4	0	0	0	2	10	0.1%
5-Aug	0	0	2	0	2	0	0	-2	0	2	0	0	-2	0	0	0	2	0	0	0	0	4	-2	2	8	0.1%
6-Aug																										
7-Aug	0	0	0	0	0	0							0	4	2	0		0	4	0	4	6	-2	0	18	0.2%
8-Aug	2	0	0	0	2	0							2	20	-2	2	2	6	0	78	92	94	50	120	468	5.2%
9-Aug	102	2	2	0	6	0							0	34	80	10	50		94	98	62	110	82	128	860	9.5%
10-Aug	262	0	0	0	10	4							160	58	94	50	2	106	52	246	108	62	8	34	1,256	13.9%
11-Aug	24	24	16	14	12	18							-2	170	70	2		76	76	18	98	210	0	410	1,236	13.7%
12-Aug	32	30	22	44	18	36	-56	-72	-42	32	130	150	208	-16	0	324	146	102	114	44	6	0	12	-8	1,256	13.9%
13-Aug																										
14-Aug	0	0	2	0	-2	0							0	0	-2	58	34	16	46	0	16	0	2	134	304	3.4%
15-Aug	16	0	0	0	0	0							0	0	0	2	0		4	90	14	14	10	16	166	1.8%
16-Aug	0	0	0	0	0	0							0	4	2	0		0	2	-2	50	2	8	16	82	0.9%
17-Aug	0	0	0	0	2	0							2	0	-2	0	0	2	8	-4	6	10	8	6	38	0.4%
18-Aug	0	0	0	0	0	2							2	4	2	2		0	6	0	12	4	8	14	56	0.6%
19-Aug	0	0	0	0	0	0	0	10	2	4	-2	4	0	4	0	-2	4	2	2	50	10	2	4	52	146	1.6%
20-Aug																										
21-Aug	0	0	2	2	0	2							0	4	0	0	0	4	0	4	8	16	2	6	50	0.6%
22-Aug	2	2	2	0	2	0							0	-4	-2	0		2	0	12	4	0	36	4	60	0.7%
23-Aug	6	2	0	0	0	0							-2	0	0	2	-6		4	14	6	4	4	422	456	5.1%
24-Aug	2	0	2	4	0	0							0	-2		0	0	-4	16	2	12	2	16	256	306	3.4%
25-Aug	6	0	-2	0	4	0							2	2	0	0		42	2	0	2	2	0	18	78	0.9%
26-Aug	0	2	2	0	2	0	-26	-48	16	-2	0	0	0	-2	24	4	24	8	0	8	6	50	0	38	106	1.2%

- continued -

Table 11. (Page 3 of 3).

Shaded areas indicate hours not counted

Date	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total	% of Total
27-Aug																										
28-Aug	8	0	2	2	4	0							2	18	0	0	0	0	0	2	6	0	2	614	660	7.3%
29-Aug	20	16	32	0	0	2							0	42	-2	0		0	0	2	38	12	348	42	552	6.1%
30-Aug	14	2	10	2	2	0							-8	-4	-2	-12									4	0.0%
31-Aug																									0	0.0%
1-Sep																									0	0.0%
2-Sep																									0	0.0%
3-Sep																										
4-Sep																			4	0	0	2	0	8	14	0.2%
5-Sep	0	0	0	0	2	0	0	-4	-2	0	-2	0	-2	0	0	0	2	6	8	14	14	-6	20	30	80	0.9%
6-Sep	6	6	8	4	0	0												0	6	-2	-4	8	14	12	58	0.6%
7-Sep	2	2	2	0	2	2							2	0	0	0	0	0	4	2	16	8	22	24	88	1.0%
8-Sep	0	4	12	0	0	-2							18	0	20	0	2	0	2	2	10	6	92	16	182	2.0%
9-Sep	8	-2	2	0	2	2	4	4	-2	0	0	0	2	0	0	0	-4	2	4	4	36	2	12	12	88	1.0%
Total	554	116	138	80	70	66	-76	-112	-28	38	128	156	392	344	292	472	298	382	470	702	660	658	758	2,460	9,018	
	6.1%	1.3%	1.5%	0.9%	0.8%	0.7%	-0.8%	-1.2%	-0.3%	0.4%	1.4%	1.7%	4.3%	3.8%	3.2%	5.2%	3.3%	4.2%	5.2%	7.8%	7.3%	7.3%	8.4%	27.3%	100.0%	

Table 12. Age, sex and length composition of chum salmon carcass samples, Niukluk River, Norton Sound, 1997.

		Brood Year and (Age Group)					
		1994 (0.2)	1993 (0.3)	1992 (0.4)	1991 (0.5)	1990 (0.6)	Total
Stratum Dates:							
Sampling Dates:	7/26 - 9/7/98						
Sample Size:	408						
Female	Percent of Sample	1.0%	33.6%	14.2%	0.7%	0.0%	49.5%
	Number in Sample	4	137	58	3	0	202
	Mean length (mm) [a]	529	539	557	571		
Male	Percent of Sample	0.7%	28.4%	20.8%	0.5%	0.0%	50.5%
	Number in Sample	3	116	85	2	0	206
	Mean length (mm) [a]	568	580	609	630		
Total	Percent of Sample	1.7%	62.0%	35.0%	1.2%	0.0%	100.0%
	Number in Sample	7	253	143	5	0	408
	Mean length (mm) [a]	546	558	588	594		

[a] Length was from mid-eye to fork of tail.

Table 13. Age, sex and length composition of chum salmon beach seine samples, Niukluk River, Norton Sound, 1997.

		Brood Year and (Age Group)					
		1994 (0.2)	1993 (0.3)	1992 (0.4)	1991 (0.5)	1990 (0.6)	Total
Stratum Dates:							
Sampling Dates:	7/5 - 8/29/97						
Sample Size:	628						
Female	Percent of Sample	1.9%	29.5%	18.5%	0.5%	0.0%	50.3%
	Number in Sample	12	185	116	3	0	316
	Mean length (mm) [a]	558	557	580	532		
Male	Percent of Sample	0.8%	25.2%	22.6%	0.8%	0.3%	49.7%
	Number in Sample	5	158	142	5	2	312
	Mean length (mm) [a]	528	588	616	642	603	
Total	Percent of Sample	2.7%	54.6%	41.1%	1.3%	0.3%	100.0%
	Number in Sample	17	343	258	8	2	628
	Mean length (mm) [a]	549	571	600	601	603	

[a] Length was from mid-eye to fork of tail.

Table 14. Chi-square test of homogeneity for chum salmon carcass and beach seine samples, Niukluk River, Norton Sound, 1997.

Original Data

	Female					Male					
Sample	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	Total
Carcass	4	137	58	3	0	3	116	85	2	0	408
Seine	12	185	116	3	0	5	158	142	5	2	628

Data with ages 0.5 and 0.6 pooled

	Female				Male				
Sample	(0.2)	(0.3)	(0.4)	(0.5) & (0.6)	(0.2)	(0.3)	(0.4)	(0.5) & (0.6)	Total
Carcass	4	137	58	3	3	116	85	2	408
Seine	12	185	116	3	5	158	142	7	628
Total	16	322	174	6	8	274	227	9	1,036

Expected Values

	Female				Male				
Sample	(0.2)	(0.3)	(0.4)	(0.5) & (0.6)	(0.2)	(0.3)	(0.4)	(0.5) & (0.6)	Total
Carcass	6	127	69	2	3	108	89	4	408
Seine	10	195	105	4	5	166	138	5	628
Total	16	322	174	6	8	274	227	9	1,036

Chi-squared Components

	Female				Male				
Sample	(0.2)	(0.3)	(0.4)	(0.5) & (0.6)	(0.2)	(0.3)	(0.4)	(0.5) & (0.6)	Total
Carcass	0.840374	0.818697	1.6166	0.171757892	0.007197	0.606921	0.21633244	0.672941849	4.95082
Seine	0.545975	0.531892	1.050275	0.11158793	0.004676	0.394305	0.14054719	0.437197889	3.216456
Total	1.386349	1.350589	2.666875	0.283345822	0.011872	1.001226	0.35687964	1.110139739	8.167277

Test Statistic:	8.167277
Degrees of Freedom:	8
P-value:	0.417303

Table 15. Weekly chum salmon beach seine samples sorted by age/sex category, Niukluk River counting tower, Norton Sound, 1997.

		Females				Males					
Week Ending	Weekly Escapement	(0.2)	(0.3)	(0.4)	(0.5)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	Total
7/5/97	15,197	0	7	13	0	0	6	19	1	1	47
7/12/97	11,244	0	19	22	0	0	24	34	1	0	100
7/19/97	9,985	2	36	39	1	0	34	48	1	0	161
7/26/97	9,451	4	39	18	0	1	42	23	1	0	128
8/2/97	6,299	2	29	9	0	1	15	7	1	1	65
8/9/97	3,577	3	33	12	2	1	32	8	0	0	91
8/16/97	1,182	1	18	2	0	1	4	2	0	0	28
8/23/97	109	0	3	0	0	0	1	1	0	0	5
8/30/97	260	0	1	1	0	1	0	0	0	0	3
		12	185	116	3	5	158	142	5	2	628

Table 16. Pooled weekly chum salmon beach seine samples sorted by age/sex category, Niukluk River counting tower, Norton Sound, 1997.

		Females				Males					
Period Ending	Periodic Escapement	(0.2)	(0.3)	(0.4)	(0.5)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	Total
7/12/97	26,441	0	26	35	0	0	30	53	2	1	147
7/19/97	9,985	2	36	39	1	0	34	48	1	0	161
7/26/97	9,451	4	39	18	0	1	42	23	1	0	128
8/2/97	6,299	2	29	9	0	1	15	7	1	1	65
8/9/97	3,577	3	33	12	2	1	32	8	0	0	91
8/30/97	1,551	1	22	3	0	2	5	3	0	0	36
		12	185	116	3	5	158	142	5	2	628

Table 17. Chum salmon beach seine samples sorted by age/sex category and sample period, as a proportion of period sample size, Niukluk River counting tower, Norton Sound, 1997.

		Females				Males					
Period Ending	Periodic Escapement	(0.2)	(0.3)	(0.4)	(0.5)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	Total
7/12/97	26,441	0.0000	0.1769	0.2381	0.0000	0.0000	0.2041	0.3605	0.0136	0.0068	1
7/19/97	9,985	0.0124	0.2236	0.2422	0.0062	0.0000	0.2112	0.2981	0.0062	0.0000	1
7/26/97	9,451	0.0313	0.3047	0.1406	0.0000	0.0078	0.3281	0.1797	0.0078	0.0000	1
8/2/97	6,299	0.0308	0.4462	0.1385	0.0000	0.0154	0.2308	0.1077	0.0154	0.0154	1
8/9/97	3,577	0.0330	0.3626	0.1319	0.0220	0.0110	0.3516	0.0879	0.0000	0.0000	1
8/30/97	1,551	0.0278	0.6111	0.0833	0.0000	0.0556	0.1389	0.0833	0.0000	0.0000	1
		0.1352	2.1251	0.9746	0.0282	0.0897	1.4647	1.1173	0.0430	0.0222	

Table 18. Estimated contribution to the chum salmon escapement by age/sex category and sample period, Niukluk River counting tower, Norton Sound, 1997.

		Females				Males					
Period Ending	Periodic Escapement	(0.2)	(0.3)	(0.4)	(0.5)	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	Total
7/12/97	26,441	0	4,677	6,295	0	0	5,396	9,533	360	180	26,441
7/19/97	9,985	124	2,233	2,419	62	0	2,109	2,977	62	0	9,985
7/26/97	9,451	295	2,880	1,329	0	74	3,101	1,698	74	0	9,451
8/2/97	6,299	194	2,810	872	0	97	1,454	678	97	97	6,299
8/9/97	3,577	118	1,297	472	79	39	1,258	314	0	0	3,577
8/30/97	1,551	43	948	129	0	86	215	129	0	0	1,551
	57,304	1.4%	25.9%	20.1%	0.2%	0.5%	23.6%	26.8%	1.0%	0.5%	

Table 19. Estimated age and sex composition of the chum salmon escapement, weighted by sample period escapement abundance, Niukluk River, Norton Sound, 1997.

Sampling Dates: 7/5 - 8/29/97
Sample Size: 628

		Brood Year and (Age Group)					
		1994 (0.2)	1993 (0.3)	1992 (0.4)	1991 (0.5)	1990 (0.6)	Total
Females							
	Percent of Sample	1.4%	25.9%	20.1%	0.2%		47.6%
	Number in Escapement	774	14,844	11,516	141	0	27,275
Males							
	Percent of Sample	0.5%	23.6%	26.8%	1.0%	0.5%	52.4%
	Number in Escapement	296	13,533	15,330	593	277	30,029
Totals							
	Percent of Sample	1.9%	49.5%	46.8%	1.3%	0.5%	100.0%
	Number in Escapement	1,070	28,377	26,847	733	277	57,304

Table 20. Age and sex composition, and mean length of coho salmon beach seine samples, Niukluk River, Norton Sound, 1997.

		Brood Year and (Age Group) 1994 (1.1)	1993 (2.1)	1992 (3.1)	Total
Stratum Dates:					
Sampling Dates:	7/19-8/29/97				
Sample Size:	84				
Female	Percent of Sample	2.4%	39.3%	0.0%	41.7%
	Number in Sample	2	33	0	35
	Mean length (mm) [a]	555	597		
Male	Percent of Sample	4.8%	51.2%	2.4%	58.3%
	Number in Sample	4	43	2	49
	Mean length (mm) [a]	559	606	535	
Total	Percent of Sample	7.1%	90.5%	2.4%	100.0%
	Number in Sample	6	76	2	84
	Mean length (mm) [a]	558	602	535	

[a] Length was from mid-eye to fork of tail.

Table 21. Niukluk River counting tower climatological and stream observations, Norton Sound 1997.

Date	Time	Air Temp °C	Water Temp °C	% Cloud Cover	Water Gauge	Water Visibility	Remarks
26-Jun	1930	15	17	10%	22.00	Good	
27-Jun	1930	18	16	10%	22.00	Good	
28-Jun	1530	14	15	35%	21.50	Good	
29-Jun	1730	24	16	40%	21.25	Good	
30-Jun	1500	16	15	95%	21.00	Good	
1-Jul	1530	18	16	50%	20.75	Good	
2-Jul	1530	18	16	40%	20.50	Good	
3-Jul	1730	18	17	40%	20.25	Good	
4-Jul	1530	23	17	30%	20.00	Good	
5-Jul	1900	21	19	15%	19.50	Good	
6-Jul	1530	16	17	90%	19.25	Good	
7-Jul	1900	16	18	40%	19.25	Good	
8-Jul	1530	15	17	90%	19.25	Good	Showers
9-Jul	1530	12	14	100%	19.25	Good	Showers
10-Jul	1530	10	12	80%	19.25	Good	N wind to 30
11-Jul	1530	14	11	75%	19.25	Good	
12-Jul	1530	12	12	75%	18.75	Good	
13-Jul	1730	11	13	80%	18.75	Good	
14-Jul	1730	9	11	100%	18.25	Good	SW wind to 15
15-Jul	1730	11	12	100%	18.25	Good	
16-Jul	1530	17	13	50%	18.25	Good	Smoke
17-Jul	1530	19	13	50%	18.00	Good	
18-Jul	1530	19	15	10%	17.75	Good	
19-Jul	1530	20	16	20%	17.75	Good	
20-Jul	1530	21	16	60%	17.50	Good	
21-Jul	1530	23	17	30%	17.25	Good	
22-Jul	1530	17	16	80%	17.25	Good	Showers
23-Jul	1730	14	15	50%	17.25	Good	
24-Jul	1730	11	13	100%	17.25	Good	Light rain
25-Jul	1730	13	12	100%	19.75	Good	Light rain
26-Jul	1530	11	11	100%	21.50	Good	Light rain
27-Jul	1730	16	13	90%	20.25	Good	
28-Jul	1730	17	13	100%	19.50	Good	
29-Jul	1530	25	16	40%	19.00	Good	
30-Jul	1530	25	17	5%	18.50	Good	Smoke
31-Jul	1730	23	17	35%	18.00	Good	Smoke
1-Aug	1530	18	15	100%	18.50	Good	Rain
2-Aug	1530	14	15	100%	19.25	Good	Rain
3-Aug	1530	14	14	100%	21.00	Good	Rain
4-Aug	1530	13	12	100%	25.00	Good	Rain
5-Aug	1630	15	13	100%	26.00	Good	Rain
6-Aug	1530	16	14	100%	29.50	Good	Rain

- continued -

Table 21. (Page 2 of 2).

Date	Time	Air Temp °C	Water Temp °C	% Cloud Cover	Water Gauge	Water Visibility	Remarks
7-Aug	1800	19	15	40%	30.50	Good	
8-Aug	1530	18	15	45%	28.00	Good	
9-Aug	1630	18	15	75%	26.50	Good	
10-Aug	1530	17	15	95%	24.50	Fair	Windy & Heavy Rain
11-Aug	1530	16	14	100%	24.00	Good	Rain
12-Aug	1530	16	13	100%	27.50	Good	Rain
13-Aug	1530	12	12	100%	31.25	Fair	
14-Aug	1530	13	12	100%	31.25	Poor	Windy
15-Aug	1530	12	11	100%	30.00	Fair	Windy & Rain
16-Aug	1645	11	11	100%	32.50	Fair	Windy & Rain
17-Aug	1530	9	10	100%	32.25	Good	Sprinkles
18-Aug	1530	8	9	70%	31.00	Good	
19-Aug	1530	11	10	100%	30.00	Good	
20-Aug	1530	12	11	100%	29.50	Good	Sprinkles
21-Aug	1530	14	11	90%	29.25	Good	
22-Aug	1630	16	12	75%	28.25	Good	
23-Aug	1630	12	12	100%	27.75	Good	Drizzle
24-Aug	1530	14	12	75%	27.75	Fair	Windy
25-Aug	1530	13	11	95%	27.75	Fair	Windy
26-Aug	1530	11	11	95%	27.25	Good	
27-Aug	1400	12	11	100%	26.75	Good	
28-Aug	1530	11	10	100%	27.50	Fair	Wind & Rain
29-Aug	1530	13	10	100%	30.25	Good	Drizzle
30-Aug	1530	16	11	90%	41.00	Bad	Muddy
31-Aug	1530	14	10	100%	>50	Bad	Rain
1-Sep	1530	11	10	98%	>50	Bad	
2-Sep	1530	12	10	100%	47.50	Bad	Rain
3-Sep	1530	11	10	100%	47.50	Poor	Rain
4-Sep	1730	14	10	80%	47.00	Fair	
5-Sep	1530	17	10	70%	44.00	Good	
6-Sep	1650	13	10	100%	42.50	Good	
7-Sep	1530	16	10	70%	41.00	Good	
8-Sep	1530	14	11	90%	38.25	Good	
9-Sep	1530	16	11	85%	37.00	Good	

Figure 1. Area location map of the Niukluk River counting tower project site, Norton Sound, 1997.

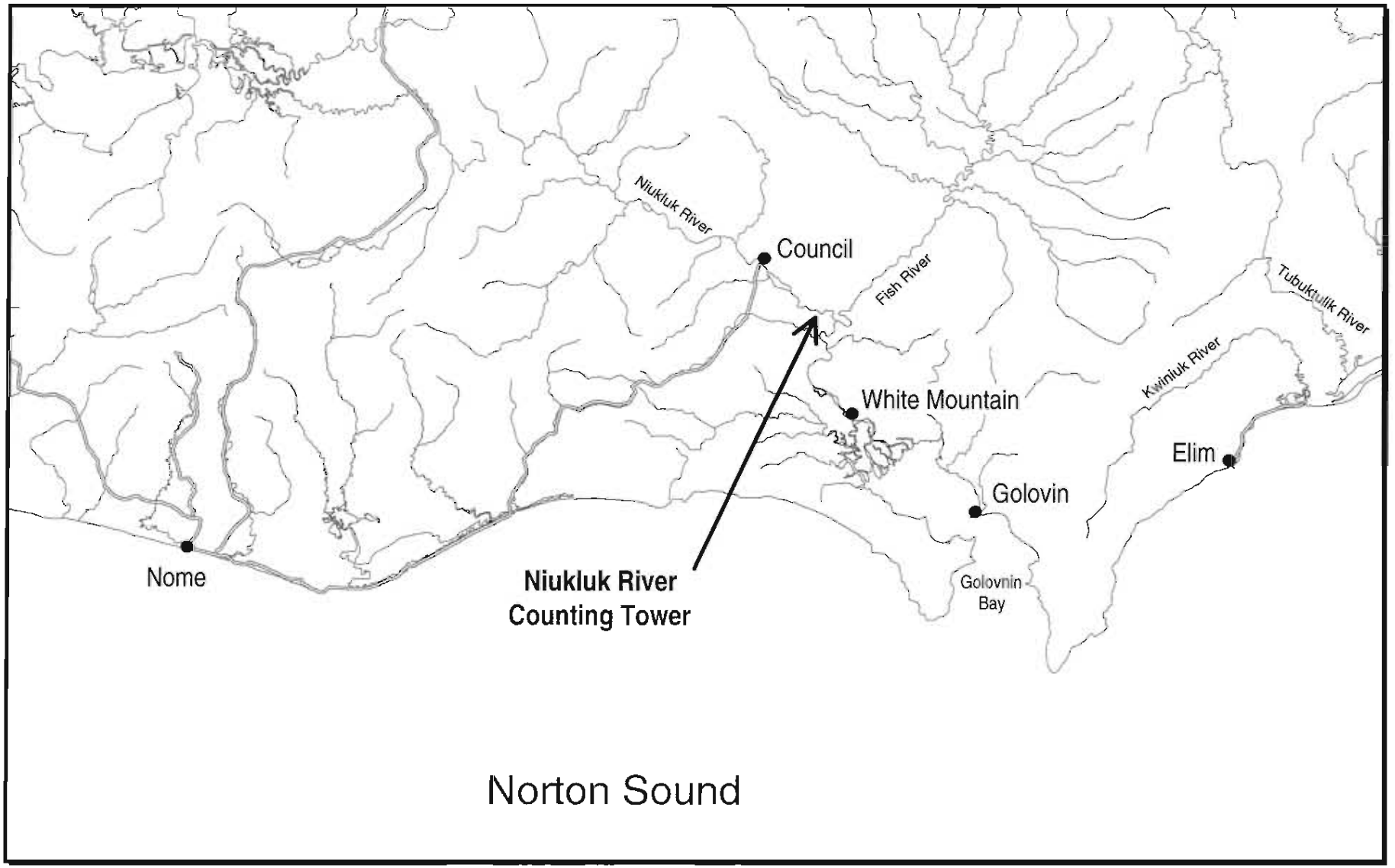

Figure 2. Cumulative passage of all salmonid species past the Niukluk River counting tower, Norton Sound, 1997.

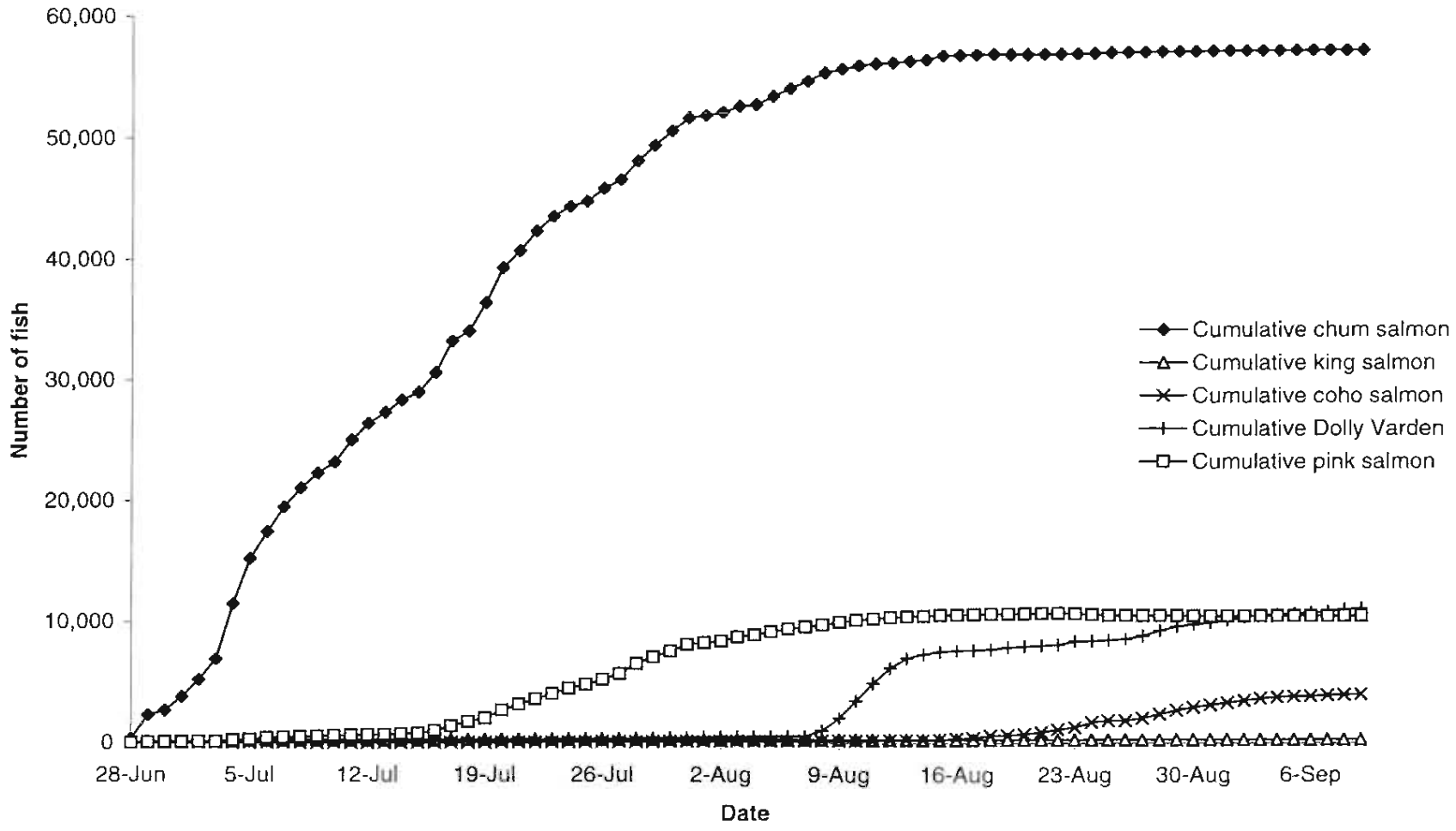

Figure 3. Daily chum salmon migration past the Niukluk River counting tower, Norton Sound, 1997.

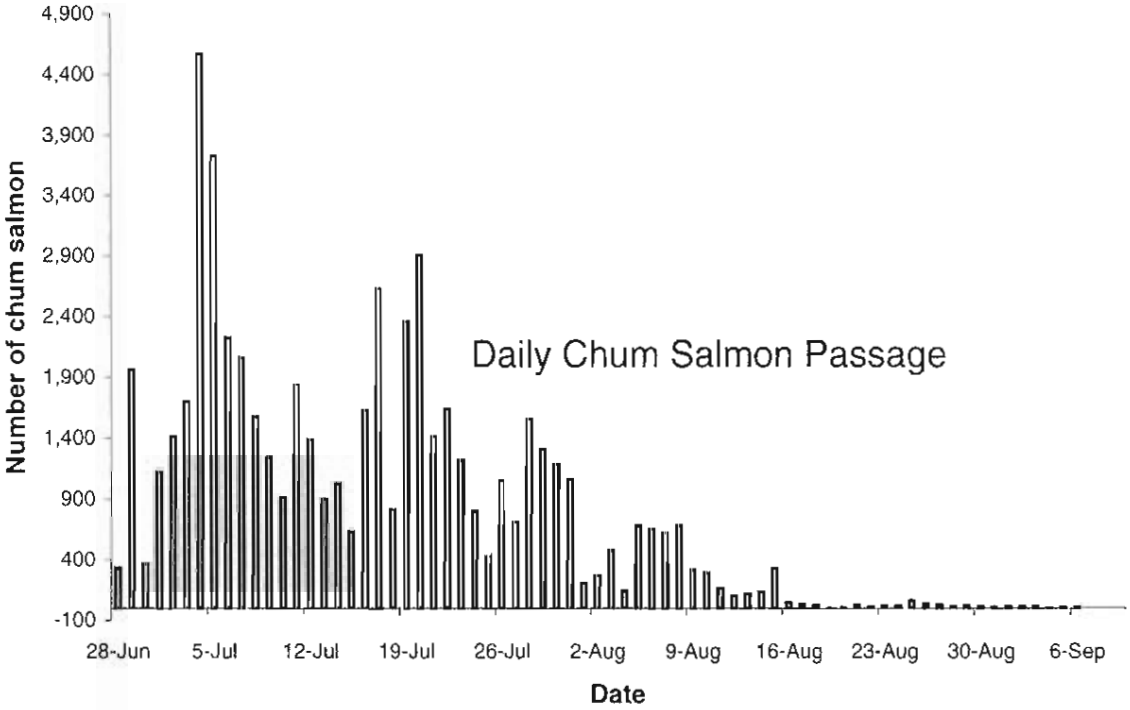

Figure 4. Cumulative chum salmon migration past the Niukluk River counting tower, Norton Sound, 1997.

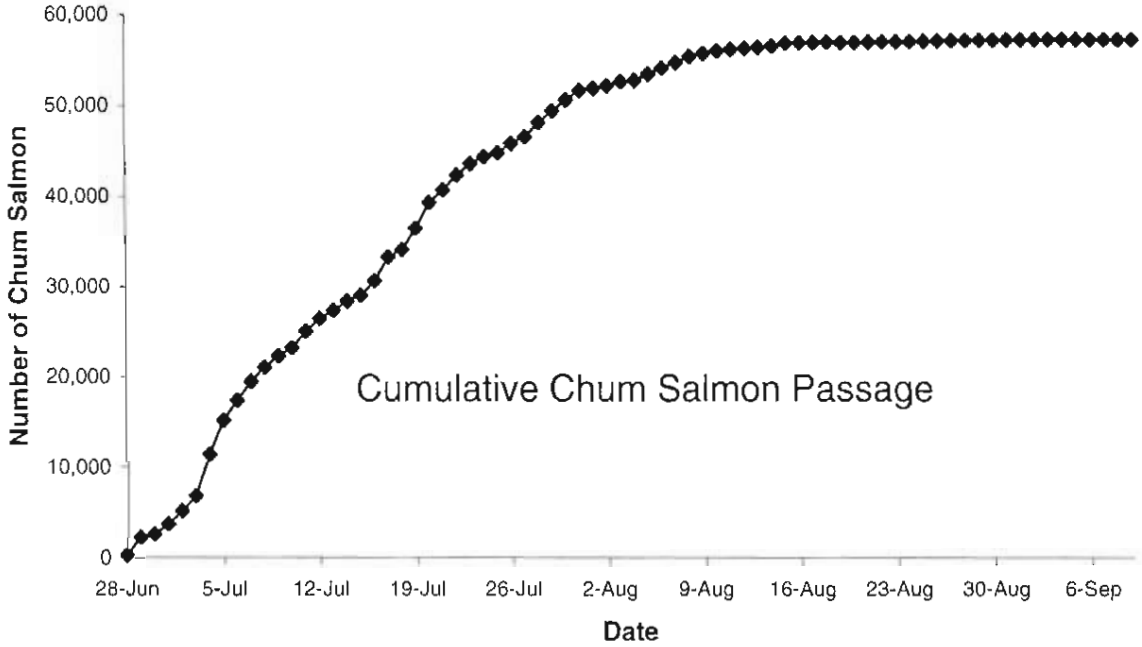

Figure 5. Daily pink salmon migration past the Niukluk River counting tower, Norton Sound, 1997.

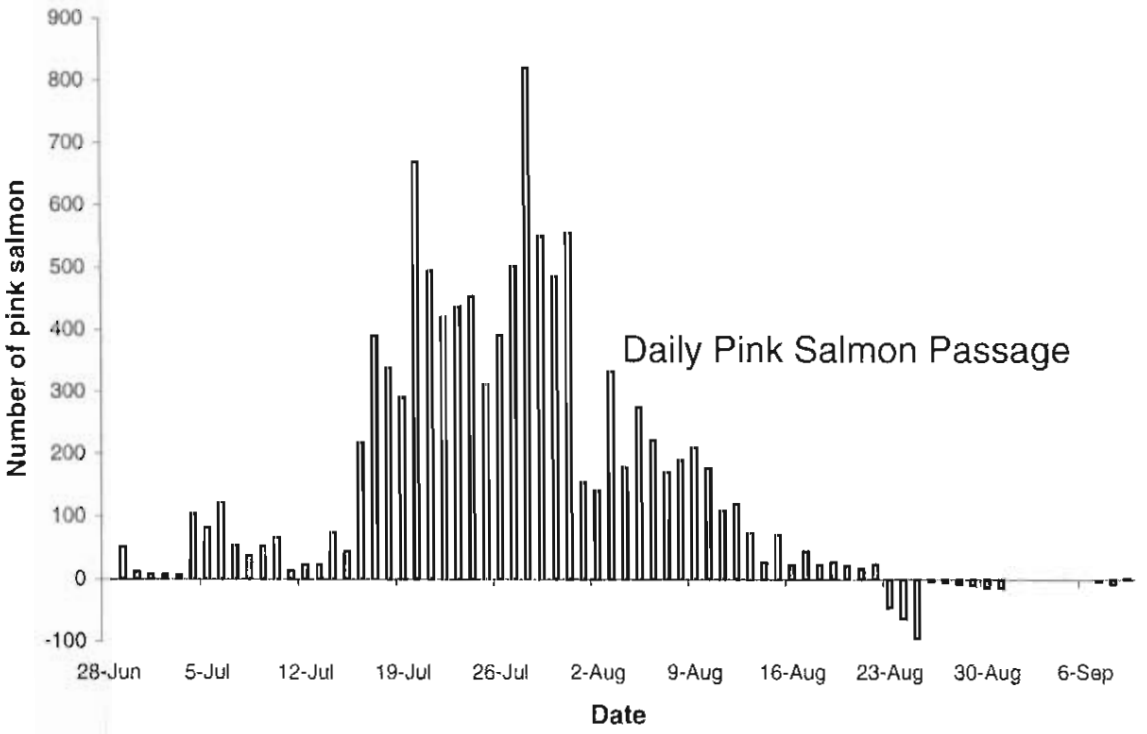

Figure 6. Cumulative pink salmon migration past the Niukluk River counting tower, Norton Sound, 1997.

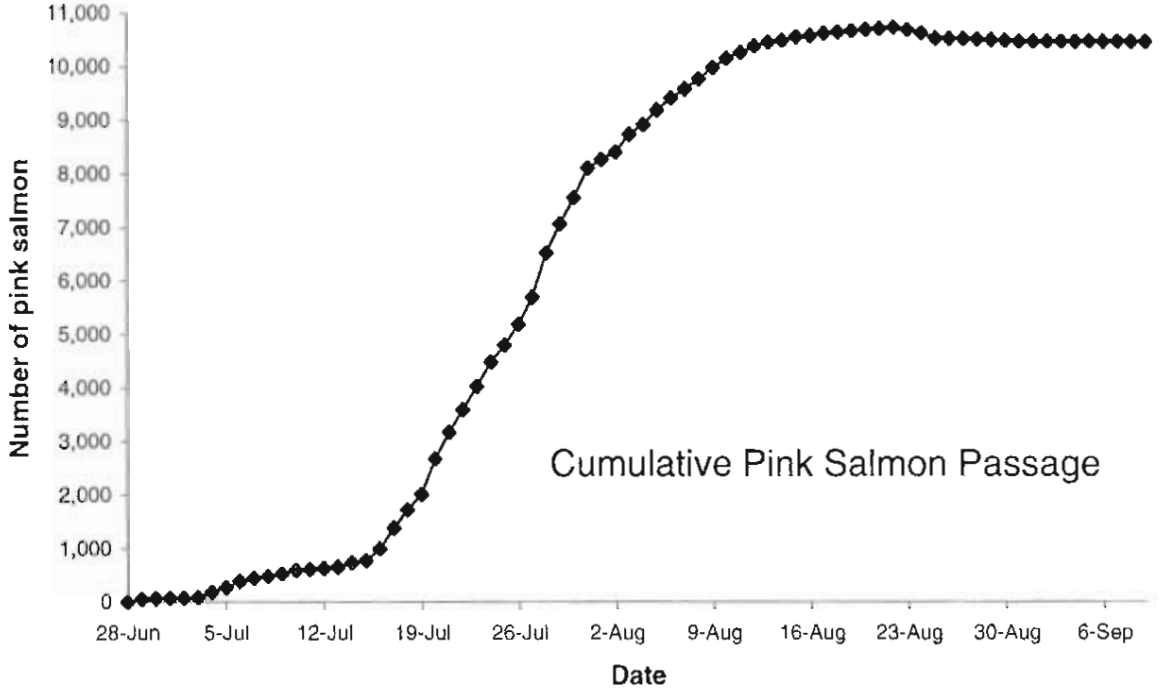

Figure 7. Daily king salmon migration past the Niukluk River counting tower, Norton Sound, 1997.

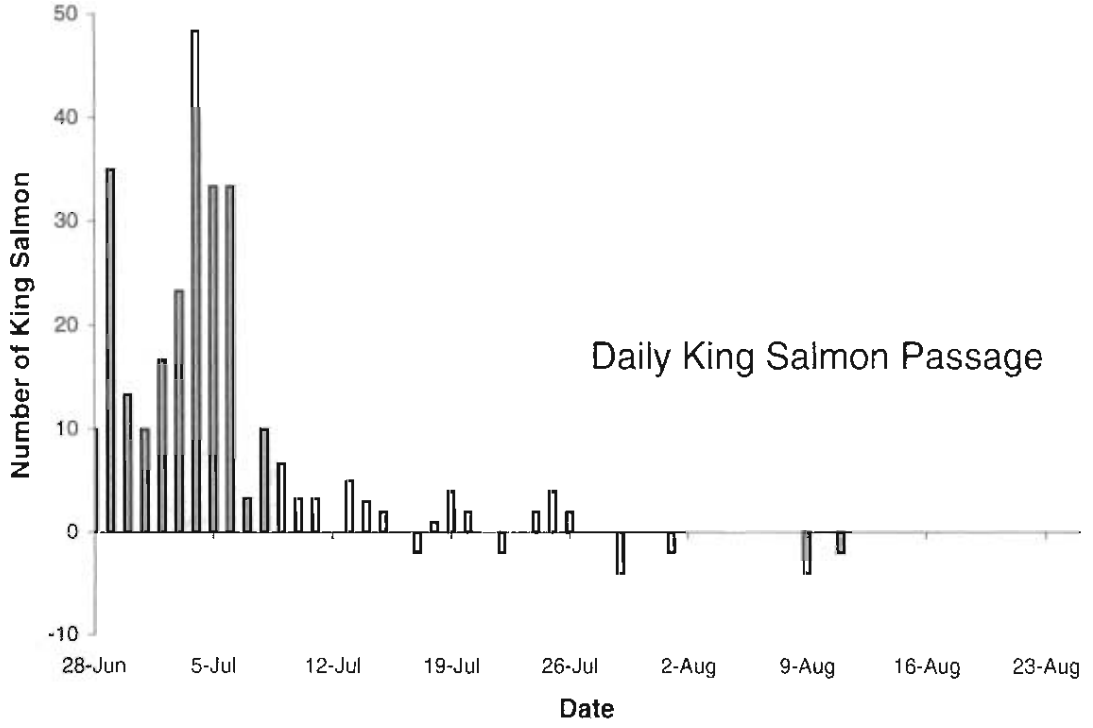

Figure 8. Cumulative king salmon migration past the Niukluk River counting tower, Norton Sound, 1997.

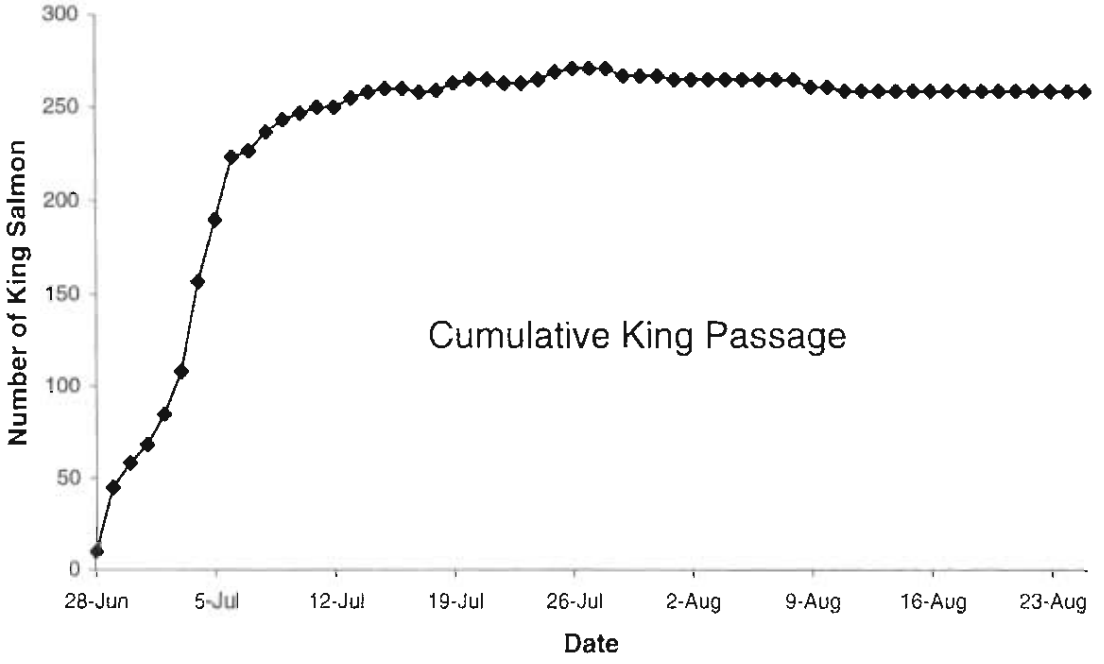

Figure 9. Daily coho salmon migration past the Niukluk River counting tower, Norton Sound, 1997.

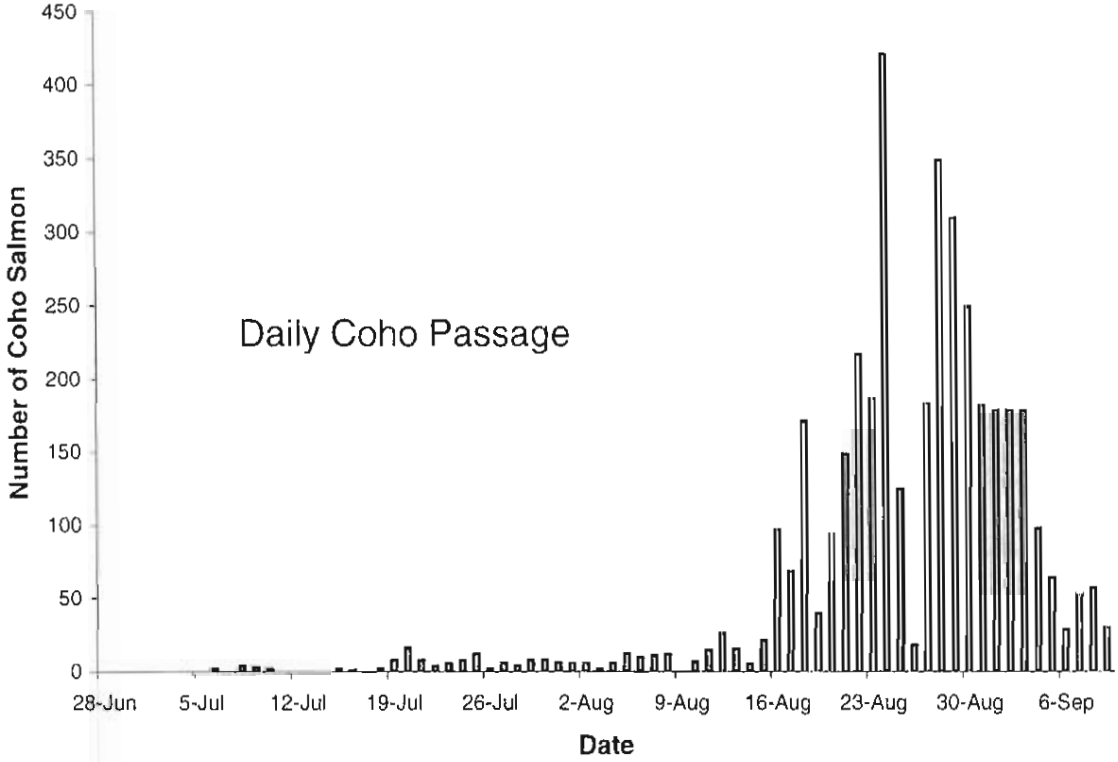

Figure 10. Cumulative coho salmon migration past the Niukluk River counting tower, Norton Sound, 1997.

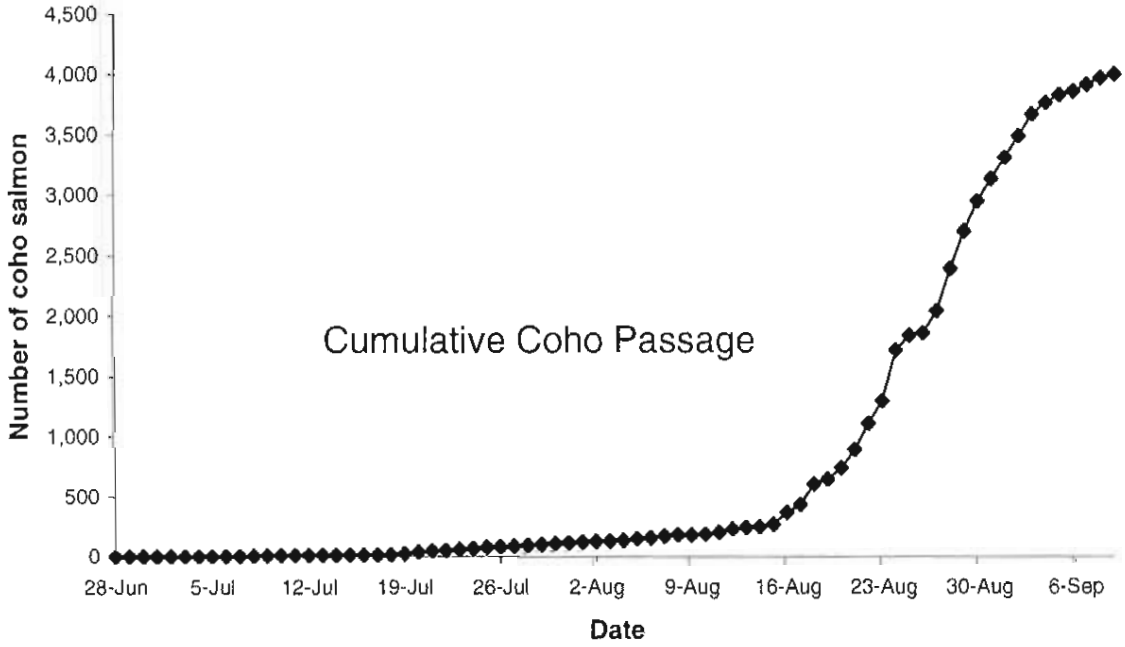

Figure 15. Diurnal pattern of king salmon migration past the Niukluk River counting tower, Norton Sound, 1997.

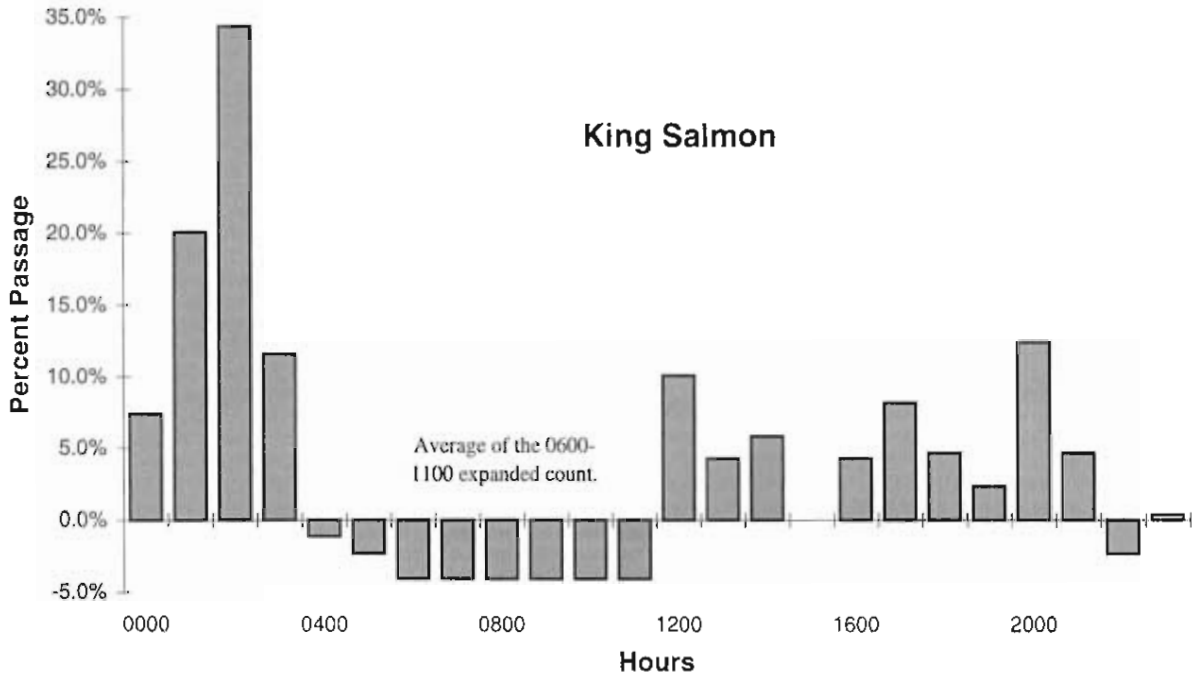

Figure 16. Diurnal pattern of coho salmon migration past the Niukluk River counting tower, Norton Sound, 1997.

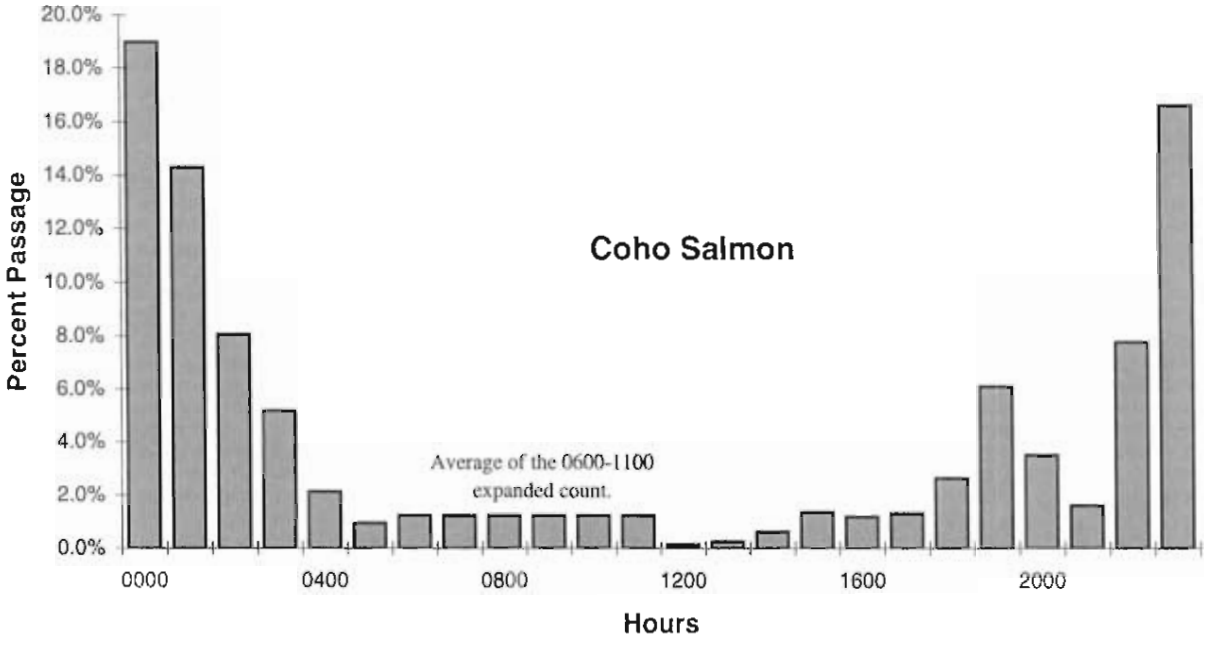

Figure 17. Diurnal pattern of Dolly Varden migration past the Niukluk River counting tower, Norton Sound, 1997.

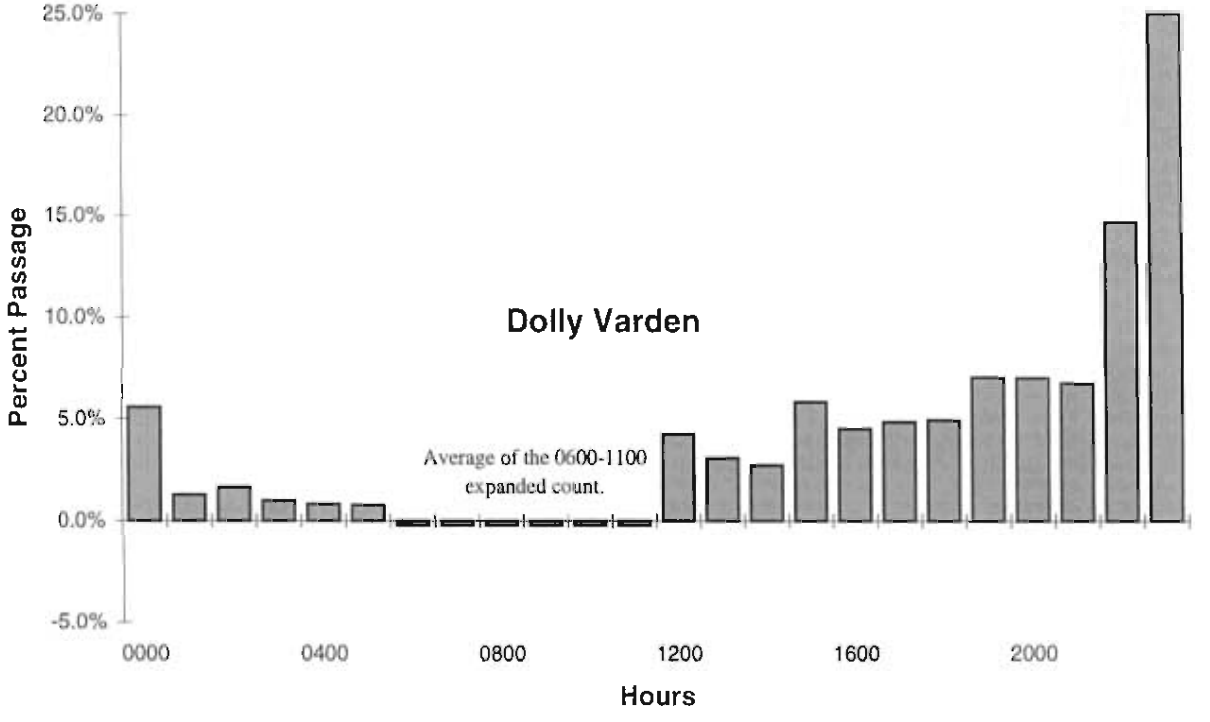

Figure 18. Chum salmon run-timing, Niukluk River counting tower, Norton Sound, 1995-1997.

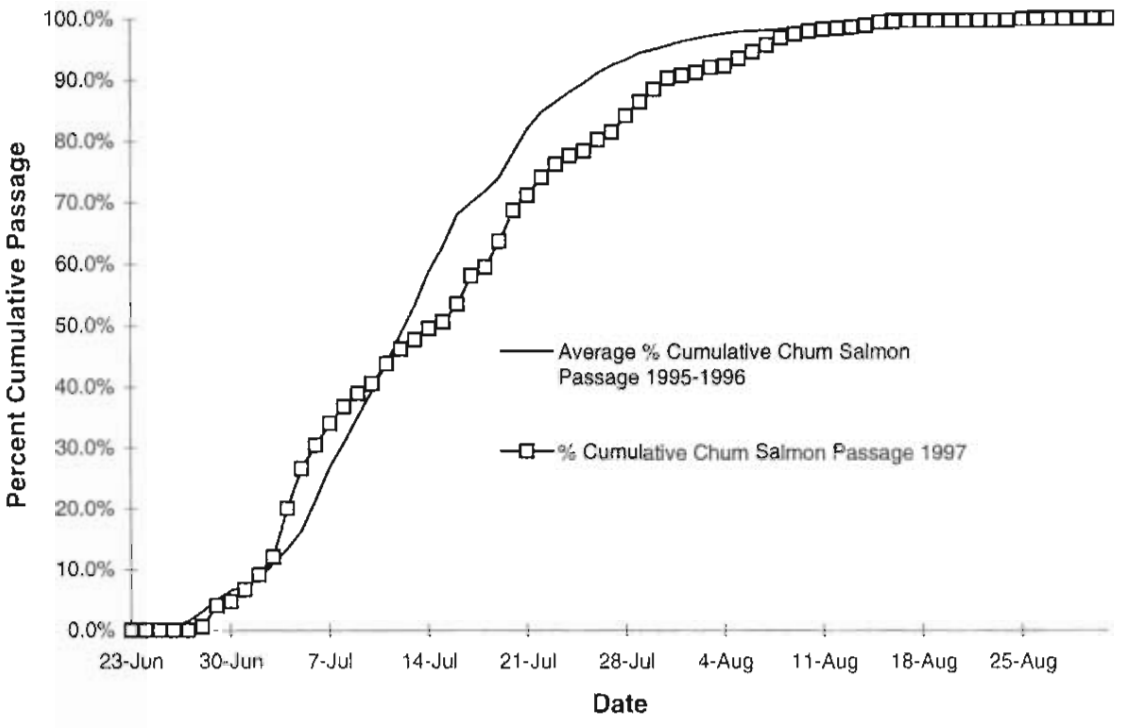

Figure 19. Pink salmon run-timing, Niukluk River counting tower, Norton Sound, 1995-1997.

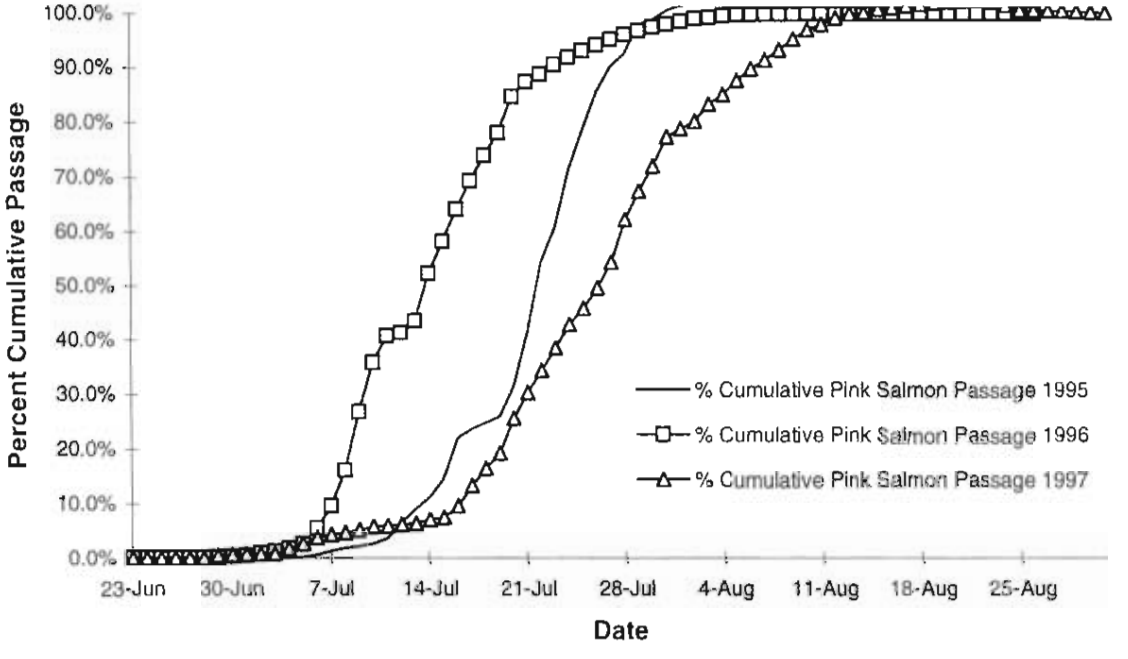

Figure 20. King salmon run-timing, Niukluk River counting tower, Norton Sound, 1995-1997.

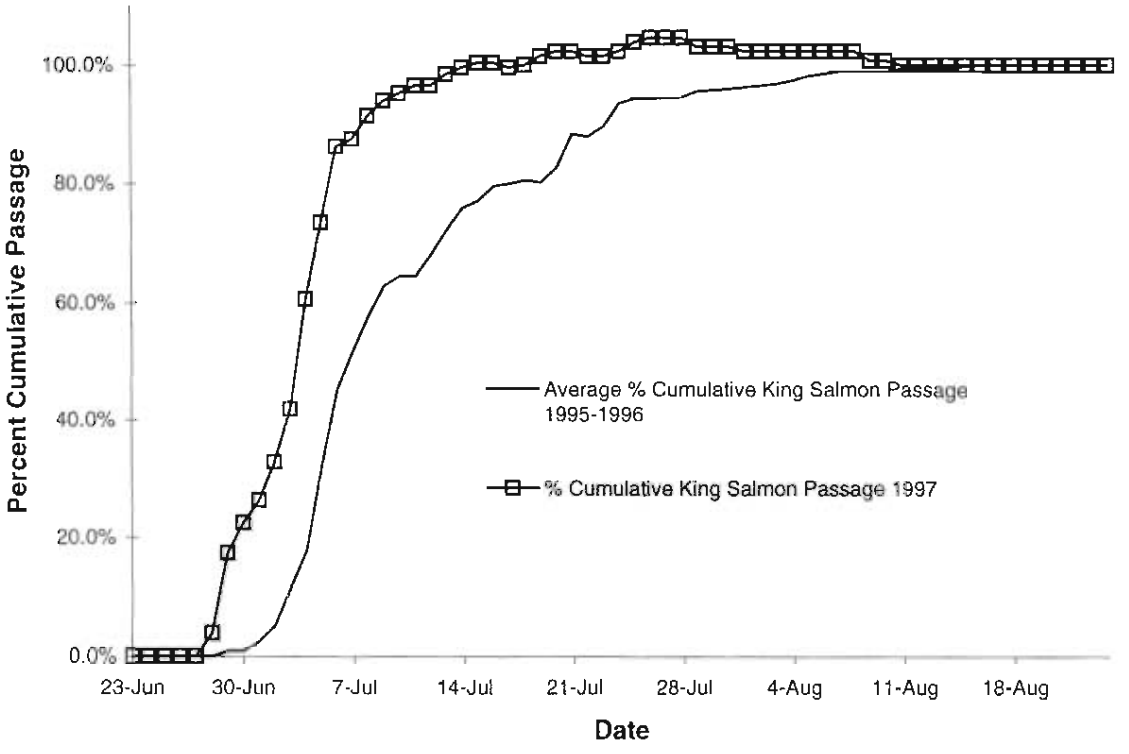

Figure 21. Coho salmon run-timing, Niukluk River counting tower, Norton Sound, 1995-1997.

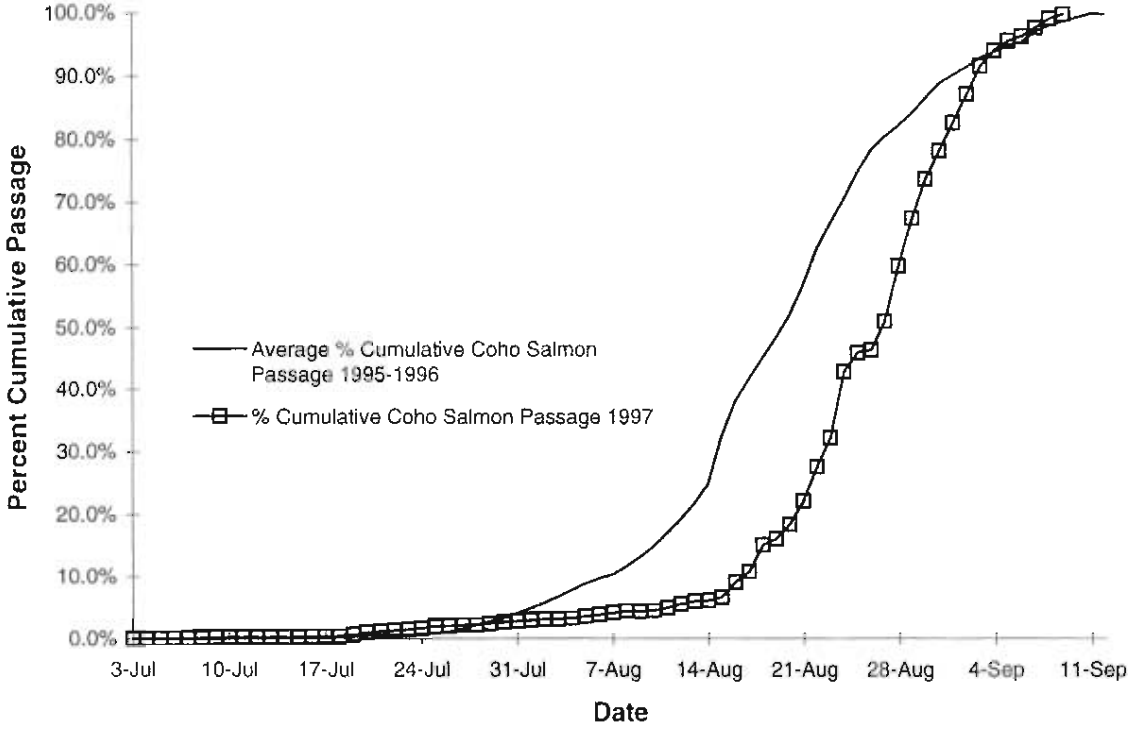

Figure 22. Dolly Varden run-timing, Niukluk River counting tower, Norton Sound, 1996-1997.

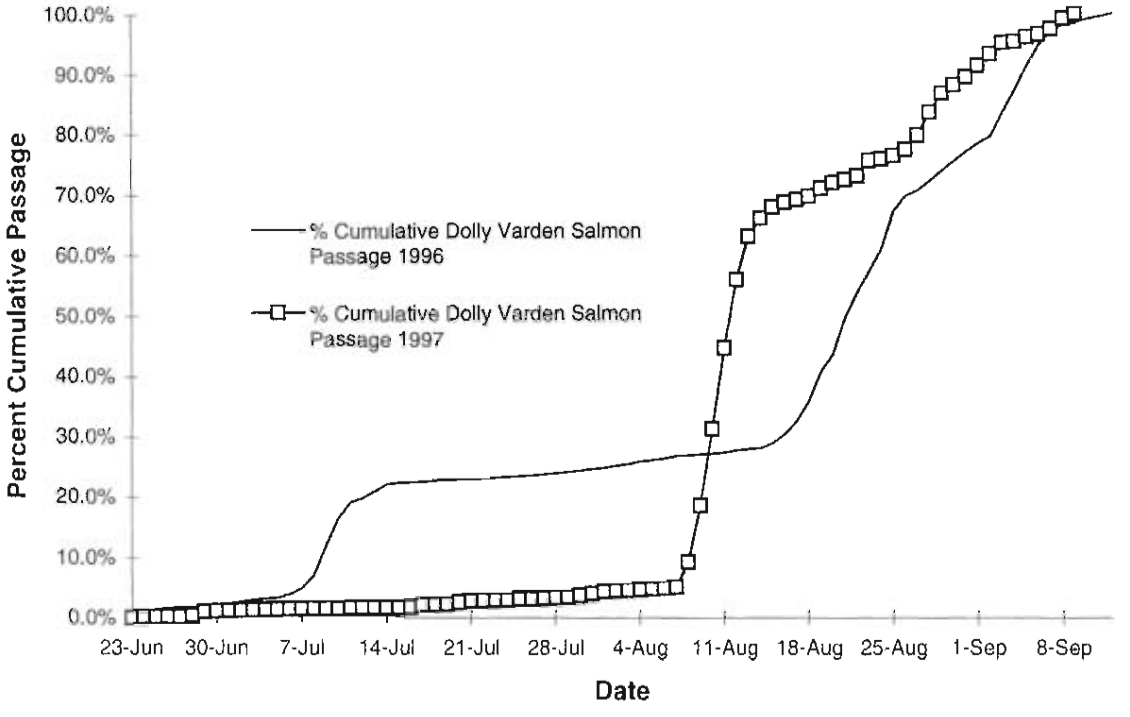

Figure 23. Cumulative chum salmon passage past the Niukluk River counting tower, Norton Sound, 1995-1997.

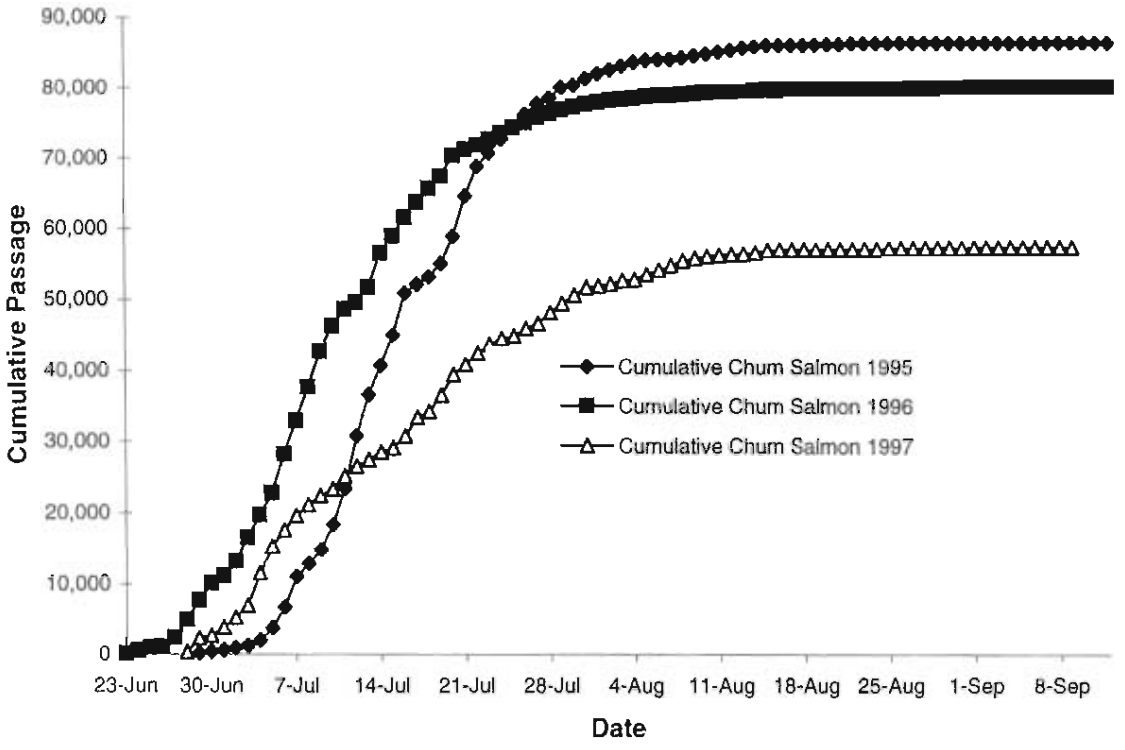

Figure 24. Odd year cumulative pink salmon passage past the Niukluk River counting tower, Norton Sound, 1995-1997.

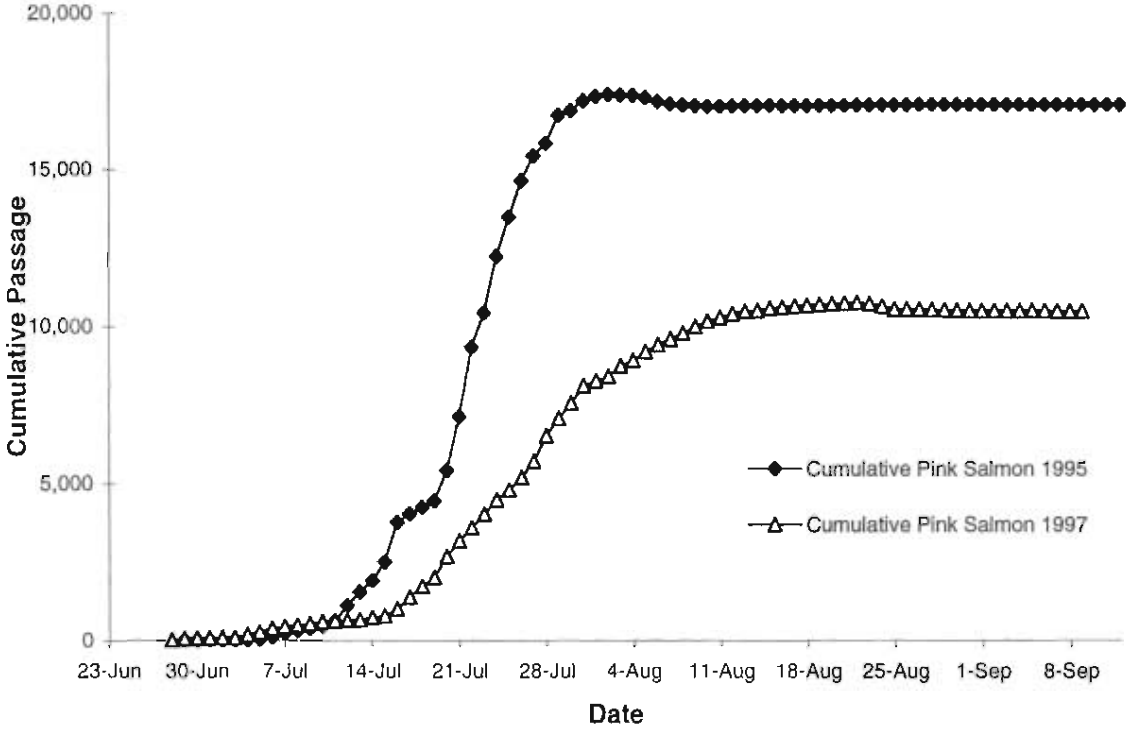

Figure 25. Cumulative king salmon passage past the Niukluk River counting tower, Norton Sound, 1995-1997.

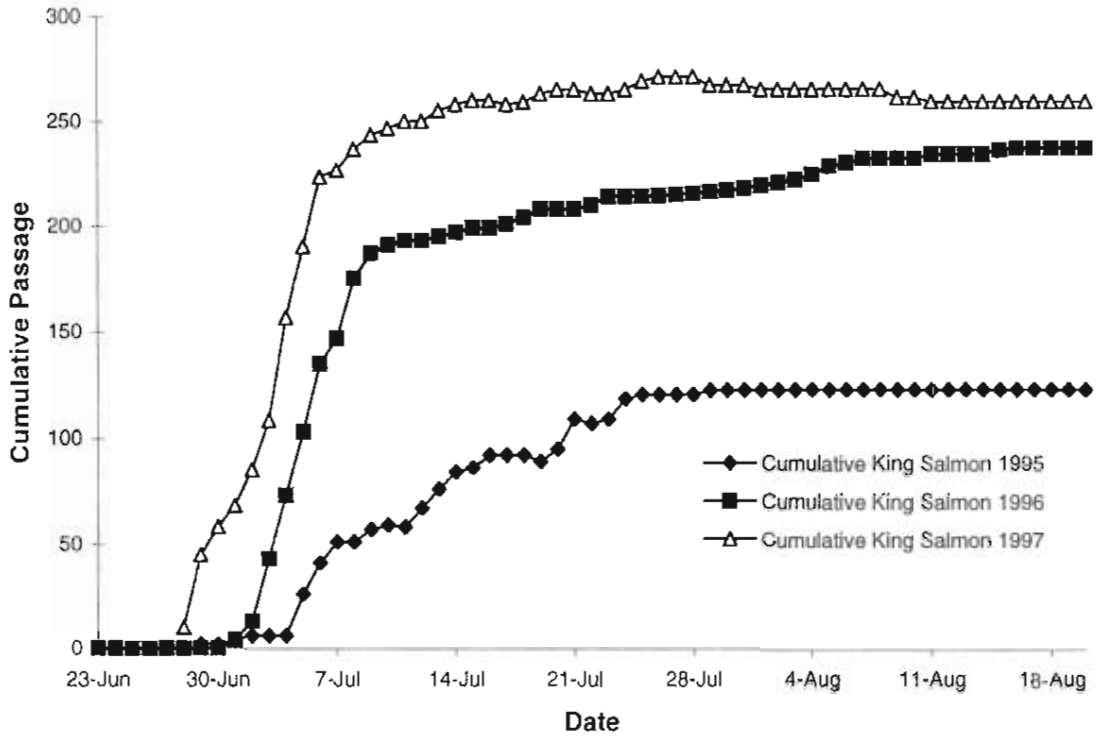

Figure 26. Cumulative coho salmon passage past the Niukluk River counting tower, Norton Sound, 1995-1997.

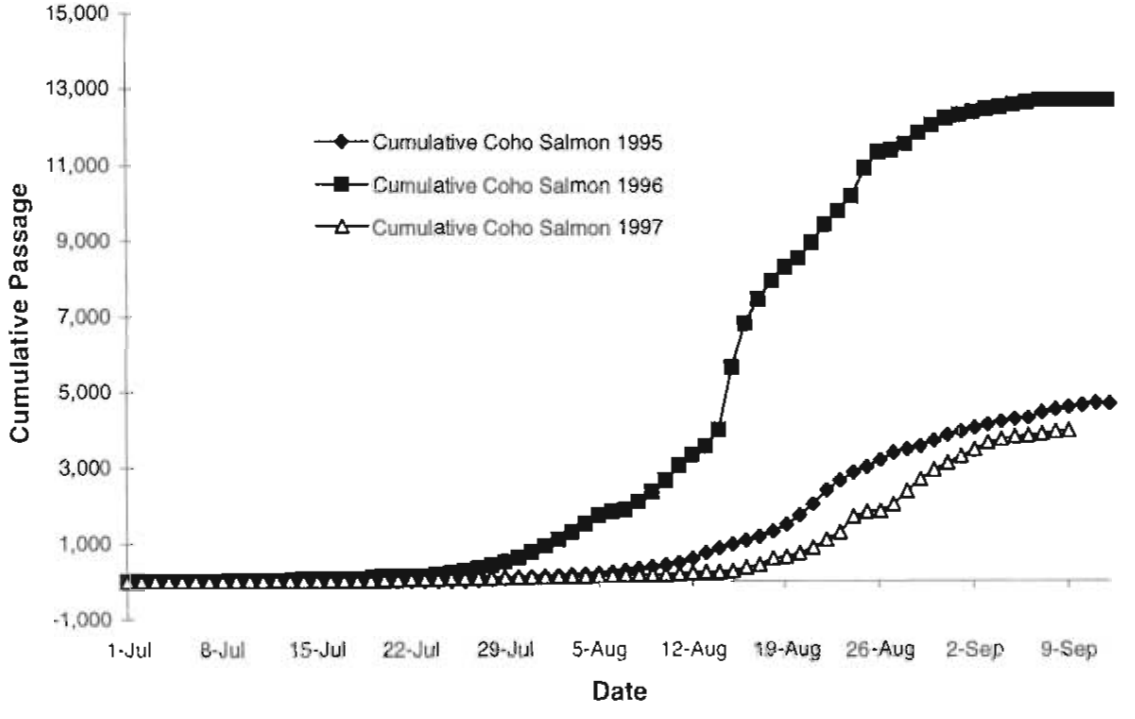
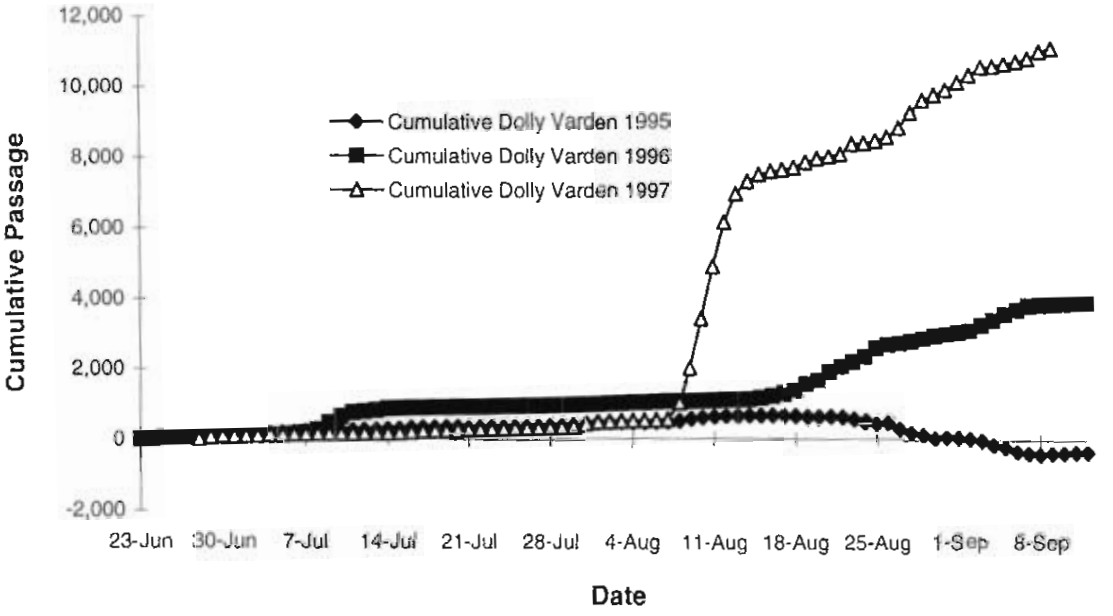
Figure 27. Cumulative Dolly Varden passage past the Niukluk River counting tower, Norton Sound, 1995-1997.