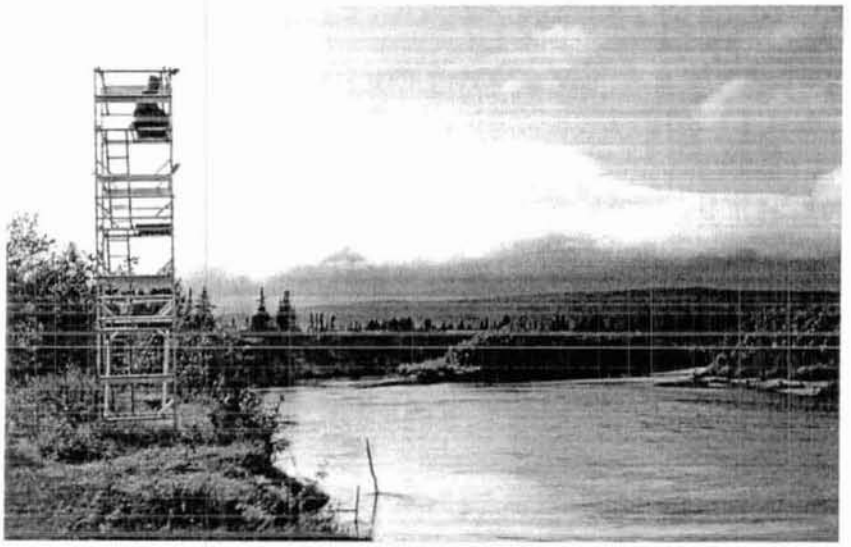
KWINIUK RIVER SALMON COUNTING TOWER PROJECT, 2001

By

Tom Kohler

and

Gary Knuepfer



Regional Informational Report[1] No. 3A02-12

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

October 2001

[1]The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports.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 Division.

AUTHORS

Tom Kohler is a Fishery Biologist for the Alaska Department of Fish and Game, Commercial Fisheries Division, Nome, Alaska.

Gary Knuepfer is a Fishery Biologist for the Alaska Department of Fish and Game, Commercial Fisheries Division, Nome, Alaska.

ACKNOWLEDGMENTS

The crewleader for the season was Larry Neff. Joel Saccheus was crewmember. The Norton Sound Economic Development Corporation (NSEDC) provided funding for one crewmember through its intern program. Susan McNeil and Linda Brannian reviewed a draft of this report.

OEO/ADA STATEMENT

The Alaska Department of Fish and Game administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972. If you believe you have been discriminated against in any program, activity, or facility, or if you desire further information please write to ADF&G, P.O. Box 25526, Juneau, AK 99802-5526; U.S. Fish and Wildlife Service, 4040 N. Fairfield Drive, Suite 300, Arlington, VA 22203; or O.E.O., U.S. Department of the Interior, Washington DC 20240. For information on alternative formats for this and other department publications, please contact the department ADA Coordinator at (voice) 907-465-4120, (TDD) 907-465-3646, or (FAX) 907-465-2440.

TABLE OF CONTENTS

	Page
LIST OF TABLES	iv
LIST OF FIGURES	v
LIST OF APPENDICIES	vii
ABSTRACT	viii
INTRODUCTION	1
OBJECTIVES	1
METHODS	1
RESULTS	3
DISCUSSION	3
LITERATURE CITED	5
TABLES	6
FIGURES	13
APPENDICES	27

LIST OF TABLES

Table		Page
1.	Expanded daily and cumulative migration of all salmon species past the Kwiniuk River counting tower, Norton Sound, 2001	6
2.	Expanded daily hourly chum salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	7
3.	Expanded daily hourly pink salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	8
4.	Expanded daily hourly chinook salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	9
5.	Expanded daily hourly coho salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	10
6.	Age, sex and length composition of chum salmon samples, Kwiniuk River counting tower, Norton Sound, 2001	11
7.	Age, sex and length composition of coho salmon samples, Kwiniuk River counting tower, Norton Sound, 2001	12

LIST OF FIGURES

Figure		Page
1.	Area location map of the Kwiniuk River counting tower project site, Norton Sound, 2001	13
2.	Daily chum salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	14
3.	Cumulative chum salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	14
4.	Daily pink salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	15
5.	Cumulative pink salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	15
6.	Daily chinook salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	16
7.	Cumulative chinook salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	16
8.	Daily coho salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	17
9.	Cumulative coho salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	17
10.	Diurnal pattern of chum salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	18
11.	Diurnal pattern of pink salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	18
12.	Diurnal pattern of chinook salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	19
13.	Diurnal pattern of coho salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001	19

LIST OF FIGURES (Continued)

Figure		Page
14.	Annual chum salmon passage at the Kwiniuk River counting tower, Norton Sound, 1965-2001	20
15.	Chum salmon run-timing models for the Kwiniuk River, Norton Sound, 1965-2001	21
16.	Percent cumulative 2001 chum salmon passage compared to the normal year run-timing model, 1965-1998, Kwiniuk River counting tower, Norton Sound	22
17.	Annual pink salmon passage at the Kwiniuk River counting tower, Norton Sound, 1981-2001	23
18.	Pink salmon run-timing, Kwiniuk River counting tower, Norton Sound, 1981-2001	24
19.	Annual chinook salmon passage at the Kwiniuk River counting tower, Norton Sound, 1981-2001	25
20.	Chinook salmon run-timing, Kwiniuk River counting tower, Norton Sound, 1981-2001	26

LIST OF APPENDICIES

Appendix		Page
1.	Cumulative expanded daily chum salmon migration past the Kwiniuk River counting tower, Norton Sound, 1965-2001	27
2.	Cumulative percent daily chum salmon run-timing at the Kwiniuk River counting tower, Norton Sound, 1965-2001	31
3.	Kwiniuk River counting tower chum salmon run-timing models, percent passage by day, Norton Sound, 1965-2001	35
4.	Expanded daily and percent cumulative pink salmon migration past the Kwiniuk River counting tower, Norton Sound, 1981-2001	36
5.	Expanded daily and percent cumulative chinook salmon migration past the Kwiniuk River counting tower, Norton Sound, 1981-2001	40
6.	Reported hourly chum salmon observations at the Kwiniuk River counting tower, Norton Sound, 2001	44
7.	Reported hourly pink salmon observations at the Kwiniuk River counting tower, Norton Sound, 2001	45
8.	Reported hourly chinook salmon observations at the Kwiniuk River counting tower, Norton Sound, 2001	46
9.	Reported hourly coho salmon observations at the Kwiniuk River counting tower, Norton Sound, 2001	47
10.	Reported hourly Dolly Varden observations at the Kwiniuk River counting tower, Norton Sound, 2001	48
11.	Historical salmon escapement at the Kwiniuk River counting tower, 1995-2001	49
12.	Percentage of salmon counts estimated at the Kwiniuk River counting tower, 1995-2001	50

ABSTRACT

The Kwiniuk River drains into Norton Sound just east of the village of Moses Point, approximately 160 km east of Nome. The Alaska Dept. of Fish and Game has operated a salmon counting tower on the Kwiniuk River since 1965. The project operates to obtain timely and accurate escapement information required to actively manage the stocks throughout the season. The objectives were to obtain daily and seasonal estimates of the timing and magnitude of the salmon escapement by species; and to collect age, sex, and length composition samples from the chum and coho salmon escapement to the Kwiniuk River. A weir was built to ensure that all fish passed over the flash panel. The escapement of chum salmon of 16,598 in 2001 was at the lower end of the current tower goal range of 15,600-31,200 and only about 64% of the average chum salmon tower count since 1965. The chum salmon escapement was almost a week ahead of the normal year timing model. The pink salmon escapement of 8,423 was the third poorest recorded and only 9% of the odd year average since 1981. The 258 escapement of chinook salmon was 53% of the average since 1981. For the first time in project history, counting continued into September to enumerate coho salmon escapement and 9,532 coho salmon were counted.

Key Words: chum salmon, Dolly Varden, chinook salmon, pink salmon, coho salmon, counting tower, Kwiniuk River, *Oncorhynchus*

INTRODUCTION

The Kwiniuk River drains into Norton Sound just east of the village of Moses Point, approximately 160 km east of Nome. The Kwiniuk and Tubutulik Rivers are the primary tributaries for salmon spawning in the Moses Point Subdistrict. In 1962 commercial salmon fishing began in the Moses Point Subdistrict. The last significant chum salmon commercial harvest occurred in 1988 (Bue and Lean 1997). The 2001 harvest consisted of 1,696 coho salmon, 681 chum salmon, and 7 chinook salmon.

Since 1965, a salmon counting tower has been operated on the Kwiniuk River (see Lean 1994, and Rob 1996a, 1996b, 1997, 1998, 1999, and Kohler 2000, 2001 for recent years results). The project operates to obtain timely and accurate escapement information that is required to actively manage the stocks throughout the season.

OBJECTIVES

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

2. Collect age, sex, and length composition samples from the chum and coho salmon escapement to the Kwiniuk River.

METHODS

The Kwiniuk River tower camp is approximately 6 km upstream from the mouth of the river, on land leased to the Alaska Department of Fish & Game (ADF&G) by Hans Jemewouk of Moses Point (Figure 1).

The crew began working on 25 June, 2001. After inventorying equipment and purchasing supplies in Nome, they ferried equipment by air to Moses Point and by boat to the tower site. The camp was set up and radio communication with Nome established.

A 15 m (50-foot) vinyl canvas flash panel placed on the river bottom provided a contrasting background where fish species could easily be identified. The flash panel covered approximately half the width of the river. The shore end of the flash panel was placed next to the cut bank on the camp side of the river. An aircraft cable threaded through grommets along the upstream edge of the flash panel was staked at each end to hold the panel in place. Sandbags placed at intervals

along the cable edge of the panel held it down on the stream bottom to prevent fish from moving under the panel.

A 6 m high aluminum scaffold was assembled on the bank directly in line with the flash panel and about one m from the edge of the river. The scaffold was used as a tower from which fish were observed and enumerated as they passed over the flash panel. The tower was guyed by aircraft cables tied off to stakes in the ground. Planks were used as footings and sandbags placed on boards set across the lowest rungs of the scaffolding provided a low center of gravity and stability.

A weir was built from the midstream end of the flash panel to the shore opposite the tower. The weir ensured that all fish passed over the flash panel. The weir was built of steel pipe posts, aluminum angle stringers and aluminum conduit pickets.

A 12-volt lighting system was installed to illuminate the flash panel during dark periods. These lights were powered by an automotive battery that was recharged using a portable generator.

The counting schedule began at 1900 hours on 27 June. The three person crew counted 24 twenty-minute counts from midnight to midnight the following day. The daily counts considered in this report ran from midnight to midnight the following day. No counts were made on 4 July and 18-hour counts were made for the period from 7 August to 14 August.

The counts for each twenty-minute shift were tripled to estimate hourly counts for each species. Each day the estimated hourly counts were added to produce a daily total. The daily and cumulative totals for each species were relayed to the Nome office by radio.

The expanded counts for this report were calculated as follows. The 18-hour counts were estimated by adding the hourly counts of the day before to the hourly counts of the day following and dividing the result by two, giving expanded hourly counts for the 18 hours. Next an expansion factor was calculated to compensate for the 6 hours not counted. This factor was derived from the weekly 24-hour count by dividing the total count from 0600 hours to 1200 hours during the 24-hour count by the total normal 18-hour count during the 24-hour count. The expansion factor was applied to data from the three days before and after each 24-hour count by multiplying each days 18-hour total by the 24-hour expansion factor, and adding that number to the 18-hour count for each day. This expansion was done for all species counted.

Scales were taken, sex identified, and lengths measured (ASL sampling) from chum and coho salmon that were collected by beach seine from the Kwiniuk River. Age was determined from scales removed from the left side of the fish in an area above the lateral line (2-3 scale rows) crossed by a diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin. Scales were mounted on gum cards and impressions were later made in cellulose acetate cards with a scale press. The scales were read with the aid of a microfiche reader and ages were reported in European notation (the first digit refers to the freshwater age and does not include the year spent in the gravel; the second digit refers to the ocean age) (Koo 1962). Sex was determined by examining external characteristics, such as: snout, vent, and body symmetry. Fish length was

measured to the nearest five mm from mid-eye to fork-of-tail (fork length, FL). ASL samples for both chum and coho salmon were divided into three segments by time to track changes in age and sex composition.

RESULTS

The expanded daily and cumulative totals for each salmon species are shown in Table 1. The expanded counts were: 16,598 chum salmon, 8,423 pink salmon, 258 chinook salmon, and 9,532 coho salmon (Tables 2-5). The expanded daily migration by year and species are shown in Appendix Tables 1-5. The reported total hourly counts were: 14,961 chum salmon, 8,286 pink salmon, 252 chinook salmon, and 9,078 coho salmon (Appendix Tables 6-9). Figures 2-9 show graphs of the expanded daily totals and the cumulative expanded daily totals for each species counted. The historical escapement at the Kwiniuk River counting tower is shown in Appendix 11. The percentage of the counts that are estimates from 1995 to 2001 are shown in Appendix 12.

Counting began on 27 June. Chum and chinook salmon were observed on the second day of counting, pink salmon on the sixth day and coho salmon on the fourteenth day. The daily peak of 3,240 chum salmon occurred on 3 July, the daily peak of 1,128 pink salmon occurred on 21 July, the daily peak of 60 chinook salmon occurred on 15 July, and the daily peak of 741coho salmon occured on 29 August (Table 1).

All species counted exhibited a diurnal pattern of migration past the counting tower. The greatest salmon migration occurred during the morning and evening hours. Tables 2 through 5 and Figures 10 through 13 show the hourly migration of each species of salmon.

A total of 763 usable chum salmon samples were collected during the period from 30 June to 15 July, 2001. The samples were divided into three strata. The age, sex and mean length composition of the samples by strata is presented in Table 6. Analysis of the chum salmon scale samples showed that for the season total 2.6% of the escapment was age-0.2, 7.6% was age-0.3, 88.8% was age-0.4, and 1.0% was age-0.5 (Table 6).

A total of 211 usable coho salmon samples were collected during the period from 30 July to 9 September, 2001. The age, sex and mean length composition of the samples is presented in Table 7. Analysis of the coho salmon scale samples showed that 27.0% of the fish sampled were age-1.1, 66.8% were age-2.1, and 6.2% were age-3.1 (Table 7).

DISCUSSION

The Kwiniuk River tower project has been operated since 1965. The project ran well this year and provided timely escapement information that was useful for inseason fisheries management.

The Kwiniuk River counting tower was the only escapement project operating in the Moses Point subdistrict during 2001.

The escapement of chum salmon of 16,598 in 2001 was at the lower end of the current tower goal range of 15,600-31,200 and was 64% of the the average chum salmon tower count since 1965 (Figure 14). The chum salmon escapement was almost a week ahead of the normal year timing model (Figures 15 and 16). The escapement of pink salmon was the third poorest recorded and only 9% of the odd year average since 1981 (Figure 17). The pink salmon escapement was much later than the odd year pink salmon run-timing model (Figure 18). The escapement of chinook salmon was 53% of the average since 1981 (Figure 19). Chinook salmon timing was also later than the chinook salmon run-timing model (Figure 20).

In an effort to get accurate coho salmon escapement data the counting tower was operated through 15 September. The coho counts cannot be compared with previous years as the latest the project previously operated was 9 August in 1994 (Appendix 9).

The reported hourly observations of Dolly Varden are presented in Appendix 10. These observations should be used with caution as extremely large numbers of migrating whitefish made species differentiation difficult.

River conditions for observation of fish passage were good to excellent for the entire season. Water levels and conditions did not adversely impact fish observation.

LITERATURE CITED

Bue, F. and Lean, C. 1997. Norton Sound District Salmon Report to the Alaska Board of Fisheries. Alaska Department of Fish & Game, Commercial Fisheries Division, Regional Information Report No. 3A97-39, Anchorage.

Kohler. T. 2001. Kwiniuk River Salmon Counting Tower Project Summary Report, 2000. Alaska Department of Fish & Game, Commercial Fisheries Division, Regional Information Report No. 3A01-17, Anchorage.

_____. 2000. Kwiniuk River Salmon Counting Tower Project Summary Report, 1999. Alaska Department of Fish & Game, Commercial Fisheries Division, Regional Information Report No. 3A00-08, Anchorage.

Koo, T. S. Y. 1962. Age designation in salmon. Pages 41-47. Age and Growth Studies of Red Salmon Scales by Graphical Means. Pages 54-57 *in* T. S. Y. Koo, editor. Studies of Alaska Red Salmon. University of Washington Press. Seattle.

Lean, C. 1994. Kwiniuk River Salmon Counting Tower Project, 1993. Alaska Department of Fish & Game, Commercial Fisheries Division, Regional Information Report No. 3A94-08, Anchorage.

Rob, P. 1996a. Kwiniuk River Salmon Counting Tower Project Summary Report, 1994. Alaska Department of Fish & Game, Commercial Fisheries Division, Regional Information Report No. 3A96-05, Anchorage.

Rob, P. 1996b. Kwiniuk River Salmon Counting Tower Project Summary Report, 1995. Alaska Department of Fish & Game, Commercial Fisheries Division, AYK Region, Regional Information Report No. 3A96-08, Anchorage.

_____.1997. Kwiniuk River Salmon Counting Tower Project Summary Report, 1996. Alaska Department of Fish & Game, Commercial Fisheries Division, Regional Information Report No. 3A97-01, Anchorage.

_____.1998. Kwiniuk River Salmon Counting Tower Project Summary Report, 1997. Alaska Department of Fish & Game, Commercial Fisheries Division, Regional Information Report No. 3A98-04, Anchorage.

_____.1999. Kwiniuk River Salmon Counting Tower Project Summary Report, 1999. Alaska Department of Fish & Game, Commercial Fisheries Division, Regional Information Report No. 3A99-14, Anchorage.

Table 1. Expanded daily and cumulative migration of all salmon species past the Kwiniuk River counting tower, Norton Sound, 2001.

Date	Daily chum salmon	Cumulative chum	Daily pink	Cumulative pink	Daily chinook	Cumulative	Daily coho	Cumulative coho	Daily Dolly	Cumulative
27-Jun	0	0	0	0	0	0	0	0	0	0
28-Jun	348	348	0	0	18	18	0	0	0	0
29-Jun	2,358	2,706	0	0	12	30	0	0	0	0
30-Jun	96	2,802	0	0	0	30	0	0	0	0
1-Jul	189	2,991	0	0	0	30	0	0	12	12
2-Jul	1,632	4,623	0	0	3	33	0	0	30	42
3-Jul	3,240	7,863	24	24	12	45	0	0	6	48
4-Jul	1,625	9,488	12	36	6	51	0	0	3	51
5-Jul	9	9,497	0	36	0	51	0	0	0	51
6-Jul	315	9,812	0	36	-3	48	0	0	3	54
7-Jul	594	10,406	0	36	6	54	0	0	0	54
8-Jul	753	11,159	0	36	6	60	0	0	0	54
9-Jul	741	11,900	300	336	0	60	0	0	0	54
10-Jul	438	12,338	60	396	-6	54	0	0	9	63
11-Jul	138	12,476	27	423	3	57	3	3	-174	-111
12-Jul	171	12,647	17	440	0	57	0	3	-4	-115
13-Jul	246	12,893	9	449	15	72	3	6	9	-106
14-Jul	897	13,790	81	530	21	93	0	6	0	-106
15-Jul	1,095	14,885	6	536	60	153	3	9	3	-103
16-Jul	408	15,293	96	632	18	171	0	9	6	-97
17-Jul	279	15,572	150	782	21	192	0	9	3	-94
18-Jul	105	15,677	57	839	15	207	0	9	-852	-946
19-Jul	255	15,932	384	1,223	21	228	0	9	3	-943
20-Jul	81	16,013	381	1,604	0	228	0	9	3	-940
21-Jul	105	16,118	1,128	2,732	6	234	12	21	0	-940
22-Jul	105	16,223	1,080	3,812	3	237	9	30	0	-940
23-Jul	15	16,238	687	4,499	0	237	36	66	3	-937
24-Jul	24	16,262	408	4,907	-3	234	18	84	0	-937
25-Jul	18	16,280	162	5,069	6	240	18	102	0	-937
26-Jul	18	16,298	132	5,201	6	246	0	102	-18	-955
27-Jul	75	16,373	231	5,432	6	252	9	111	3	-952
28-Jul	21	16,394	321	5,753	3	255	6	117	6	-946
29-Jul	18	16,412	564	6,317	0	255	27	144	15	-931
30-Jul	27	16,439	444	6,761	3	258	9	153	15	-916
31-Jul	12	16,451	180	6,941	0	258	9	162	9	-907
1-Aug	30	16,481	333	7,274	0	258	18	180	6	-901
2-Aug	3	16,484	90	7,364	0	258	3	183	12	-889
3-Aug	12	16,496	141	7,505	0	258	21	204	0	-889
4-Aug	15	16,511	90	7,595	0	258	0	204	-3	-892
5-Aug	3	16,514	138	7,733	0	258	0	204	3	-889
6-Aug	39	16,553	165	7,898	0	258	57	261	15	-874
7-Aug	6	16,559	42	7,940	0	258	36	297	5	-869
8-Aug	0	16,559	39	7,979	0	258	24	321	10	-859
9-Aug	-3	16,556	52	8,031	0	258	72	393	5	-854
10-Aug	3	16,559	32	8,063	0	258	153	546	10	-844
11-Aug	6	16,565	25	8,088	0	258	144	690	0	-844
12-Aug	3	16,568	84	8,172	0	258	177	867	0	-844
13-Aug	0	16,568	105	8,277	0	258	698	1,565	0	-844
14-Aug	0	16,568	77	8,354	0	258	398	1,963	0	-844
15-Aug	3	16,571	21	8,375	0	258	351	2,314	6	-838
16-Aug	0	16,571	3	8,378	0	258	258	2,572	3	-835
17-Aug	0	16,571	6	8,384	0	258	264	2,836	3	-832
18-Aug	6	16,577	-3	8,381	0	258	405	3,241	9	-823
19-Aug	0	16,577	0	8,381	0	258	96	3,337	0	-823
20-Aug	3	16,580	6	8,387	0	258	270	3,607	0	-823
21-Aug	0	16,580	6	8,393	0	258	279	3,886	12	-811
22-Aug	12	16,592	3	8,396	0	258	150	4,036	15	-796
23-Aug	0	16,592	0	8,396	0	258	321	4,357	-72	-868
24-Aug	0	16,592	12	8,408	0	258	330	4,687	12	-856
25-Aug	0	16,592	3	8,411	0	258	330	5,017	-39	-895
26-Aug	0	16,592	0	8,411	0	258	465	5,482	-9	-904
27-Aug	3	16,595	6	8,417	0	258	654	6,136	-48	-952
28-Aug	0	16,595	3	8,420	0	258	198	6,334	-147	-1,099
29-Aug	0	16,595	0	8,420	0	258	741	7,075	-36	-1,135
30-Aug	0	16,595	0	8,420	0	258	441	7,516	-9	-1,144
31-Aug	3	16,598	0	8,420	0	258	417	7,933	-144	-1,288
1-Sep	0	16,598	0	8,420	0	258	168	8,101	0	-1,288
2-Sep	0	16,598	0	8,420	0	258	87	8,188	0	-1,288
3-Sep	0	16,598	0	8,420	0	258	93	8,281	6	-1,282
4-Sep	0	16,598	0	8,420	0	258	219	8,500	3	-1,279
5-Sep	0	16,598	0	8,420	0	258	231	8,731	-81	-1,360
6-Sep	0	16,598	0	8,420	0	258	60	8,791	0	-1,360
7-Sep	0	16,598	0	8,420	0	258	120	8,911	-3	-1,363
8-Sep	0	16,598	0	8,420	0	258	72	8,983	-27	-1,390
9-Sep	0	16,598	0	8,420	0	258	384	9,367	-63	-1,453
10-Sep	0	16,598	0	8,420	0	258	27	9,394	-81	-1,534
11-Sep	0	16,598	0	8,420	0	258	9	9,403	-57	-1,591
12-Sep	0	16,598	3	8,423	0	258	36	9,439	0	-1,591
13-Sep	0	16,598	0	8,423	0	258	24	9,463	0	-1,591
14-Sep	0	16,598	0	8,423	0	258	9	9,472	0	-1,591
15-Sep	0	16,598	0	8,423	0	258	60	9,532	0	-1,591
Total	16,598		8,423		258		9,532		-1,591	

Table 2. Expanded daily hourly chum salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

Outlined areas indicate hours not counted. Numbers in outlined areas indicate estimated passage.

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-Jun																				0	0	0	0	0	0	0.0%
28-Jun	0	0	0	0	0	12	3	-3	-9	0	0	0	0	0	0	0	0	9	222	63	12	0	12	27	348	2.1%
29-Jun	42	48	372	177	165	93	-12	3	0	0	3	0	0	0	0	0	0	0	3	108	483	0	588	285	2,356	14.2%
30-Jun	33	69	15	6	0	18	3	-30	3	9	-6	0	-27	0	0	-12	-6	0	0	0	0	0	0	21	96	0.6%
1-Jul	9	18	0	0	24	54	-30	0	0	0	0	0	-6	0	0	0	0	24	63	15	0	15	3	0	189	1.1%
2-Jul	24	33	54	174	156	48	-6	9	0	0	0	-6	0	0	0	0	6	3	300	204	0	66	144	423	1,632	9.8%
3-Jul	9	159	321	81	111	69	72	114	-3	3	-6	99	0	0	63	105	141	426	99	246	150	309	372	300	3,240	19.5%
4-Jul	-2	80	155	24	50	33	36	57	-3	0	-3	50	0	0	30	53	68	213	50	128	120	159	191	140	1,625	9.8%
5-Jul	-12	0	-12	-33	-12	-3	0	0	-3	-3	0	0	0	0	-3	0	-6	0	0	9	90	9	9	-21	9	0.1%
6-Jul	0	0	0	0	0	3	6	-6	0	-3	0	0	0	0	-3	0	0	0	-6	75	42	9	18	180	315	1.9%
7-Jul	99	207	48	18	60	21	0	0	3	0	3	0	0	0	0	0	0	3	0	0	3	12	0	117	594	3.6%
8-Jul	24	24	27	243	66	27	0	-18	0	0	-6	0	0	0	0	0	0	90	6	6	12	57	135	60	753	4.5%
9-Jul	162	111	0	186	51	108	12	15	0	0	0	-3	0	0	0	0	0	0	0	0	9	3	24	63	741	4.5%
10-Jul	18	84	126	108	6	6	6	0	0	0	0	0	-3	0	-6	0	-12	0	60	39	12	0	0	-6	438	2.6%
11-Jul	27	36	0	0	12	0	0	0	-9	-6	0	0	0	0	-6	0	-3	0	3	0	0	3	9	72	138	0.8%
12-Jul	3	90	45	2	12	-2	3	9	0	0	0	3	-3	0	0	-3	3	3	0	9	0	0	-3	0	171	1.0%
13-Jul	6	0	6	3	12	-3	18	0	0	0	0	-9	0	0	0	3	0	0	36	12	0	27	12	123	246	1.5%
14-Jul	90	0	291	189	78	30	48	12	-6	0	0	0	0	3	0	0	0	0	0	0	57	12	18	75	897	5.4%
15-Jul	273	210	207	108	174	45	48	18	3	0	0	0	0	3	0	0	3	0	0	0	3	0	0	0	1,095	6.6%
16-Jul	3	18	9	15	48	21	3	0	12	-9	3	0	0	0	0	3	0	90	63	48	24	9	0	48	408	2.5%
17-Jul	12	30	60	0	42	6	9	0	6	27	18	15	33	0	0	0	0	0	0	0	3	0	0	18	279	1.7%
18-Jul	9	0	30	15	12	0	-3	-3	-15	0	0	0	0	0	0	0	3	3	3	0	18	3	3	27	105	0.6%
19-Jul	21	60	24	30	12	33	15	12	0	0	0	6	-3	3	-3	0	-3	0	3	6	18	9	0	12	255	1.5%
20-Jul	6	18	0	0	3	0	0	0	0	0	0	-3	0	0	6	0	0	0	3	0	6	9	6	27	81	0.5%
21-Jul	6	9	30	9	0	0	0	0	0	0	0	0	0	-9	0	0	-3	0	0	0	30	6	18	9	105	0.6%
22-Jul	33	12	9	21	3	0	0	0	3	0	0	0	0	-3	0	3	6	3	6	3	0	3	3	0	105	0.6%
23-Jul	0	0	0	0	0	0	-3	0	0	0	0	0	0	0	0	-3	0	9	6	0	0	0	6	0	15	0.1%
24-Jul	3	15	3	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	-9	6	0	0	0	0	24	0.1%
25-Jul	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	3	6	0	0	0	0	0	0	0	18	0.1%
26-Jul	9	6	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0.1%
27-Jul	6	15	33	6	6	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	3	75	0.5%
28-Jul	3	9	0	3	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	21	0.1%
29-Jul	0	6	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0.1%
30-Jul	3	3	3	3	9	-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	6	27	0.2%
31-Jul	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	12	0.1%
1-Aug	3	9	3	3	6	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0.2%
2-Aug	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.0%
3-Aug	0	3	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	12	0.1%
4-Aug	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	3	0	0	15	0.1%
5-Aug	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	3	0.0%
6-Aug	6	9	3	3	3	12	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	0.2%
7-Aug	0	3	0	0	0	0						0	0	0	0	0	3	0	0	0	0	0	0	0	6	0.0%
8-Aug	0	0	0	-3	0	0						0	0	0	0	0	0	0	0	3	0	0	0	0	0	0.0%
9-Aug	0	0	0	0	-3	0						0	0	0	0	0	0	0	0	0	0	0	0	0	-3	0.0%
10-Aug	0	0	0	0	0	0						0	0	0	0	0	0	0	0	0	3	0	0	0	3	0.0%
11-Aug	0	3	0	0	0	0						0	0	0	0	0	0	0	0	3	0	0	0	0	6	0.0%
12-Aug	0	0	0	0	0	0						0	0	3	0	0	0	0	0	0	0	0	0	0	3	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	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	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	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	0	0	0	0.0%
18-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	6	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	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	0	0	0	0.0%
22-Aug	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	0	12	0.1%
23-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%
24-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%
25-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%
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%
27-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	3	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	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	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	0	0	0	0.0%
31-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	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	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	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	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	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	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	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	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%
10-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%
11-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%
12-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%
13-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%
14-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%
15-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%
Totals	935	1,409	1,868	1,412	1,112	641	231	192	-15	18	9	152	-6	3	78	164	218	879	911	989	1,095	723	1,577	2,009	16,598	100%
	5.6%	8.5%	11.3%	8.5%	6.7%	3.9%	1.4%	1.2%	-0.1%	0.1%	0.1%	0.9%	0.0%	0.0%	0.5%	1.0%	1.3%	5.3%	5.5%	6.0%	6.6%	4.4%	9.5%	12.1%	100%	

Table 3. Expanded daily hourly pink salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

Outlined areas indicate hours not counted. Numbers in outlined areas indicate estimated passage.

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-Jun																				0	0	0	0	0	0	0.0%
28-Jun	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%
29-Jun	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%
30-Jun	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%
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	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%
3-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	0	6	3	6	24	0.3%
4-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	0	3	1	3	12	0.1%
5-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%
6-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%
7-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%
8-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%
9-Jul	42	15	69	33	18	69	33	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	300	3.6%
10-Jul	6	36	0	3	0	3	3	6	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	60	0.7%
11-Jul	9	0	0	0	6	0	0	0	0	0	0	-3	0	0	0	0	0	0	0	0	0	0	6	9	27	0.3%
12-Jul	9	3	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0.2%
13-Jul	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	9	0.1%
14-Jul	0	0	15	27	9	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	9	12	81	1.0%
15-Jul	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0.1%
16-Jul	0	-6	-3	0	6	0	0	0	0	0	-3	0	0	0	0	0	0	12	18	9	45	6	0	12	96	1.1%
17-Jul	12	12	6	3	3	0	0	0	0	24	0	0	12	0	3	0	6	6	6	3	15	6	0	33	150	1.8%
18-Jul	6	9	-3	0	18	6	3	-3	-3	0	0	0	0	0	0	0	0	0	0	0	15	0	3	6	57	0.7%
19-Jul	9	27	9	24	6	48	24	12	0	0	9	0	3	6	0	24	9	6	6	15	90	15	27	15	384	4.6%
20-Jul	30	60	12	9	24	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	3	27	96	108	381	4.5%
21-Jul	219	132	96	30	18	27	48	21	0	0	-3	-9	0	-12	0	0	0	0	0	6	66	120	165	204	1,128	13.4%
22-Jul	342	72	42	42	24	3	0	6	0	0	0	9	0	-3	0	21	72	66	90	57	15	111	99	12	1,080	12.8%
23-Jul	96	99	6	24	36	42	6	0	0	-3	6	3	0	0	3	-39	12	39	129	30	72	51	72	3	687	8.2%
24-Jul	45	78	36	21	60	18	6	0	0	3	0	0	0	0	0	3	-6	0	0	36	3	0	51	54	408	4.8%
25-Jul	0	147	30	-9	0	0	-15	0	0	0	0	0	-9	0	0	3	3	-3	0	6	-3	9	0	3	162	1.9%
26-Jul	75	-9	12	6	6	0	3	3	0	0	0	0	0	0	9	-3	0	6	0	0	0	0	6	18	132	1.6%
27-Jul	6	117	21	24	21	0	0	0	0	0	-3	0	0	0	0	0	0	0	0	12	-3	15	9	12	231	2.7%
28-Jul	21	33	27	39	21	3	18	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	24	132	321	3.8%
29-Jul	36	75	54	54	3	0	3	6	0	0	0	0	0	0	0	3	0	21	12	3	6	54	117	117	564	6.7%
30-Jul	81	141	54	51	24	0	3	0	3	0	0	0	0	0	3	0	0	0	0	3	12	3	3	63	444	5.3%
31-Jul	18	63	21	12	24	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	15	0	21	0	180	2.1%
1-Aug	12	96	45	54	48	0	21	0	0	0	0	0	0	0	0		0	9	0	3	9	6	0	30	333	4.0%
2-Aug	12	48	18	3	0	0	3	3	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	6	0	90	1.1%
3-Aug	3	36	15	24	30	12	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	15	141	1.7%
4-Aug	9	18	6	3	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	12	15	3	6	90	1.1%
5-Aug	12	9	18	12	27	0	3	0	3	6	3	9	0	0	6	0	6	-3	9	0	9	0	0	9	138	1.6%
6-Aug	33	24	3	24	21	9	6	0	3	3	0	0	0	0	0	3	-3	12	3	6	3	6	9	0	165	2.0%
7-Aug	6	3	6	9	12	0						3	0	0	0	3	0	-3	3	0	0	0	0	0	42	0.5%
8-Aug	0	6	6	3	9	0						3	0	-3	0	3	6	0	0	3	6	0	0	-3	39	0.5%
9-Aug	3	0	6	0	6	3						4	0	0	6	0	-3	18	0	3	3	0	3	0	52	0.6%
10-Aug	3	9	6	0	6	-3						2	0	0	-3	0	3	0	0	0	6	0	3	0	32	0.4%
11-Aug	0	-3	6	3	0	0						7	0	0	3	0	0	0	3	0	0	0	6	0	25	0.3%
12-Aug	9	6	9	12	3	-3						24	6	6	0	0	0	0	0	3	0	0	9	0	84	1.0%
13-Aug	9	12	3	0	6	-3						30	0	0	0	6	9	9	15	0	3	0	6	0	105	1.2%
14-Aug	0	9	6	3	12	0						22	2	0	0	6	5	4	8	0	0	0	0	0	77	0.9%
15-Aug	0	0	0	0	0	0	0	3	0	3	3	-3	3	0	0	6	0	0	0	0	6	0	0	0	21	0.2%
16-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	0.0%
17-Aug	0	0	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	6	0.1%
18-Aug	0	0	0	0	0	0	0	0	3	0	0	-3	0	0	0	0	-3	0	0	0	0	0	0	0	-3	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	6	0.1%
21-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	0	6	0.1%
22-Aug	0	0	0	0	0	0	0	0	0	0	0	0	-6	0	6	0	3	0	0	0	0	0	0	0	3	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	0	0	0	0.0%
24-Aug	0	0	0	0	0	0	0	0	0	0	3	3	0	0	3	0	0	0	0	3	0	0	0	0	12	0.1%
25-Aug	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	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%
27-Aug	0	0	3	0	3	0	0	3	-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0.1%
28-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3	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	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	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	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	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	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	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	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	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	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	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%
10-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%
11-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%
12-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0.0%
13-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%
14-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%
15-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%
Totals	1,179	1,377	663	543	518	240	174	87	12	36	18	104	11	-3	45	39	140	210	309	209	408	456	760	888	8,423	100%
	14.0%	16.3%	7.9%	6.4%	6.1%	2.8%	2.1%	1.0%	0.1%	0.4%	0.2%	1.2%	0.1%	0.0%	0.5%	0.5%	1.7%	2.5%	3.7%	2.5%	4.8%	5.4%	9.0%	10.5%	100%	

Table 4. Expanded daily hourly chinook salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

Outlined areas indicate hours not counted. Numbers in outlined areas indicate estimated passage.

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-Jun																				0	0	0	0	0	0	0.0%
28-Jun	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6	0	0	0	6	18	7.0%
29-Jun	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	3	0	0	0	12	4.7%
30-Jun	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%
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	1.2%
3-Jul	0	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	3	6	0	6	0	0	0	0	12	4.7%
4-Jul	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	0	2	3	0	3	0	0	0	0	6	2.3%
5-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%
6-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	-3	-1.2%
7-Jul	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	6	2.3%
8-Jul	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	6	2.3%
9-Jul	0	3	0	0	0	0	0	0	0	0	0	-6	0	0	0	0	0	0	0	0	0	0	0	3	0	0.0%
10-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-6	0	0	0	0	0	0	0	-6	-2.3%
11-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3	1.2%
12-Jul	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	0	0	0	0	3	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	12	0	0	0	0	3	15	5.8%
14-Jul	0	0	0	6	0	0	3	0	-3	0	0	0	0	0	-3	18	0	0	0	0	0	0	0	0	21	8.1%
15-Jul	15	9	27	9	0	3	0	3	-3	0	0	-6	0	3	0	0	3	0	0	0	0	-3	0	0	60	23.3%
16-Jul	0	0	-3	-3	6	0	0	0	3	0	0	0	0	0	0	0	0	3	0	3	3	6	0	0	18	7.0%
17-Jul	0	0	3	0	0	0	0	3	0	0	0	3	3	0	3	0	-3	0	0	0	6	0	3	0	21	8.1%
18-Jul	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3	15	5.8%
19-Jul	6	6	0	0	0	3	0	0	0	0	0	0	0	-3	0	3	0	3	3	0	0	0	0	0	21	8.1%
20-Jul	0	0	0	0	0	-3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
21-Jul	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	6	2.3%
22-Jul	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1.2%
23-Jul	-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	-3	0	0	0	0	0	0	0	0	0.0%
24-Jul	0	0	0	0	3	-3	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	0	-3	-1.2%
25-Jul	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2.3%
26-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	6	2.3%
27-Jul	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	6	0	0	6	2.3%
28-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	1.2%
29-Jul	0	0	0	0	0	0	0	0	0	0	0	0	3	0	-3	0	0	0	0	0	0	0	0	0	0	0.0%
30-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	1.2%
31-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%
1-Aug	0	3	0	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	0	0	0	0	0.0%
2-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%
3-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%
4-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	-3	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	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%
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
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	0	0	0	0.0%
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	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	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	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	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	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%
21-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%
22-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%
23-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%
24-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%
25-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%
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%
27-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%
28-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%
29-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%
30-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%
31-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%
1-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%
2-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%
3-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%
4-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%
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	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	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	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%
10-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%
11-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%
12-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%
13-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%
14-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%
15-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%
Totals	24	30	30	15	12	3	3	6	-3	3	3	-9	1	3	0	27	-4	18	21	27	12	6	6	24	258	100%
	9.3%	11.6%	11.6%	5.8%	4.7%	1.2%	1.2%	2.3%	-1.2%	1.2%	1.2%	-3.5%	0.4%	1.2%	0.0%	10.5%	-1.6%	7.0%	8.1%	10.5%	4.7%	2.3%	2.3%	9.3%	100%	

Table 5. Expanded daily hourly coho salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

Outlined areas indicate hours not counted. Numbers in outlined areas indicate estimated passage.

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	Total
27-Jun																				0	0	0	0	0	0	0.0%
28-Jun	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%
29-Jun	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%
30-Jun	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%
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	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%
3-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%
4-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%
5-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%
6-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%
7-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%
8-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%
9-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%
10-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%
11-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	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	0	0	0	0.0%
13-Jul	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	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	0	0	0	0.0%
15-Jul	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.0%
16-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%
17-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%
18-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%
19-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%
20-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%
21-Jul	9	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0.1%
22-Jul	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	9	0.1%
23-Jul	3	18	9	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	36	0.4%
24-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	15	0	18	0.2%
25-Jul	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	9	6	0	18	0.2%
26-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	3	0	0	0.0%
27-Jul	0	6	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	9	0.1%
28-Jul	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	6	0.1%
29-Jul	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	3	12	27	0.3%
30-Jul	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0.1%
31-Jul	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	9	0.1%
1-Aug	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	18	0.2%
2-Aug	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	-6	0	0	0	0	0	0	0	0	3	0.0%
3-Aug	0	3	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	9	21	0.2%
4-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%
5-Aug	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0.0%
6-Aug	6	3	0	0	0	0	0	0	0	0	0	0	0	0	6	9	3	0	3	0	3	9	6	9	57	0.6%
7-Aug	18	9	3	6	0	0						0	0	0	0	0	0	0	0	0	0	0	0	0	36	0.4%
8-Aug	3	0	3	12	0	3						0	0	0	0	-3	6	0	0	0	0	-3	3	0	24	0.3%
9-Aug	6	9	9	6	9	0						0	0	0	0	0	12	0	0	9	0	3	6	3	72	0.8%
10-Aug	21	24	36	12	21	12						0	0	0	0	3	0	3	0	0	0	0	21	0	153	1.6%
11-Aug	3	24	36	18	18	6						27	0	0	0	0	0	0	0	0	3	0	3	6	144	1.5%
12-Aug	36	12	33	18	12	6						33	0	6	0	0	0	3	0	0	0	0	12	6	177	1.9%
13-Aug	75	39	66	12	3	0						131	0	0	3	0	42	72	54	0	72	-3	105	27	698	7.3%
14-Aug	9	18	9	21	12	6						75	14	3	15	15	42	51	35	13	6	18	18	18	398	4.2%
15-Aug	0	3	6	6	0	3	9	12	9	0	30	6	27	6	27	30	42	30	15	27	33	24	0	6	351	3.7%
16-Aug	15	6	0	-9	-12	-15	0	-63	-12	0	0	-6	0	0	57	33	12	21	42	36	21	66	12	54	258	2.7%
17-Aug	36	12	45	42	12	-3	3	21	12	0	6	0	0	0	12	3	15	0	0	0	0	0	0	48	264	2.8%
18-Aug	39	45	60	33	24	6	-6	0	0	-3	0	0	0	0	6	39	30	69	0	6	27	0	15	15	405	4.2%
19-Aug	30	9	18	39	3	0	0	0	0	-3	0	0	0	0	0	0	0	-3	0	0	0	3	0	0	96	1.0%
20-Aug	27	21	15	21	21	6	6	0	0	0	0	0	0	0	0	0	0	6	3	78	3	0	0	63	270	2.8%
21-Aug	15	36	18	15	45	6	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	45	24	69	279	2.9%
22-Aug	6	21	9	39	15	15	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	30	150	1.6%
23-Aug	3	6	12	30	33	18	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	21	162	321	3.4%
24-Aug	81	45	48	39	33	12	0	0	0	0	0	0	6	6	0	3	0	0	0	0	0	12	0	45	330	3.5%
25-Aug	15	57	39	30	33	9	-3	0	0	0	0	12	39	30	3	0	0	0	18	0	0	12	9	27	330	3.5%
26-Aug	24	42	48	132	87	21	3	0	0	0	0	0	0	0	0	12	3	9	0	0	0	30	24	30	465	4.9%
27-Aug	48	129	198	168	48	27	-6	3	-3	-6	0	0	0	0	0	0	0	0	0	0	0	0	45	3	654	6.9%
28-Aug	45	15	57	9	15	12	6	0	0	0	6	0	0	-3	0	0	12	0	0	0	0	0	0	24	198	2.1%
29-Aug	18	63	51	72	18	3	9	9	0	0	0	0	0	0	27	108	51	9	0	0	3	6	3	291	741	7.8%
30-Aug	6	18	102	99	48	27	21	0	0	0	-9	0	6	0	0	0	0	0	0	0	0	57	9	57	441	4.6%
31-Aug	36	36	90	45	108	21	15	-9	-3	0	-15	-6	0	0	0	12	0	78	0	0	0	-3	-3	15	417	4.4%
1-Sep	63	69	21	-15	0	9	-3	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	21	168	1.8%
2-Sep	12	6	24	12	9	3	6	0	-6	0	0	0	0	3	0	0	0	0	6	0	0	0	0	12	87	0.9%
3-Sep	6	9	18	0	0	-3	0	0	0	0	0	0	0	0	0	3	0	0	0	18	0	0	42	0	93	1.0%
4-Sep	6	30	42	9	18	21	9	0	0	0	0	0	6	0	-15	18	0	-3	6	21	0	0	33	18	219	2.3%
5-Sep	45	42	72	24	18	0	9	0	-15	0	0	3	9	0	0	0	0	0	-6	0	0	0	15	15	231	2.4%
6-Sep	3	9	36	-3	21	9	6	0	0	0	0	0	0	0	-24	0	0	3	0	0	0	0	6	-6	60	0.6%
7-Sep	21	24	21	27	3	12	6	6	-12	0	0	0	0	0	0	0	0	0	0	0	0	0	9	3	120	1.3%
8-Sep	21	9	15	12	0	0	3	0	0	0	0	0	0	-6	0	0	0	6	-3	0	0	0	12	3	72	0.8%
9-Sep	18	27	0	-3	-3	-3	-3	-6	0	0	0	0	0	0	0	0	0	201	117	0	0	0	18	21	384	4.0%
10-Sep	15	6	0	3	-6	-6	0	-3	-6	0	0	0	0	3	0	0	0	0	0	0	0	0	12	9	27	0.3%
11-Sep	3	3	15	0	0	0	0	-6	-6	-3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	9	0.1%
12-Sep	18	3	3	0	9	0	-6	0	0	-3	0	0	0	0	0	0	0	0	0	0	0	0	9	3	36	0.4%
13-Sep	12	9	12	-3	-12	-3	0	-3	0	-3	0	0	0	0	0	0	0	6	0	0	0	0	6	3	24	0.3%
14-Sep	18	3	-9	27	-9	-36	-3	-27	-3	0	0	0	0	0	0	0	0	0	0	0	0	12	0	36	9	0.1%
15-Sep	24	12	15	3	6	-6	0	-6	-12	-3	0	0	0	0	0	0	0	0	3	0	0	6	3	15	60	0.6%
Totals	921	1,011	1,311	1,011	672	204	105	-69	-57	-18	18	275	110	51	117	282	270	567	296	211	192	333	531	1,188	9,532	100%
	9.7%	10.6%	13.8%	10.6%	7.0%	2.1%	1.1%	-0.7%	-0.6%	-0.2%	0.2%	2.9%	1.2%	0.5%	1.2%	3.0%	2.8%	5.9%	3.1%	2.2%	2.0%	3.5%	5.6%	12.5%	100%	

Table 6. Age, sex, and length composition of chum salmon samples, Kwiniuk River, Norton Sound, 2001.

		Brood Year and (Age Group)[2]				
		1999 (0.2)	1998 (0.3)	1997 (0.4)	1996 (0.5)	Total
Stratum Dates:	6/28-7/3					
Sampling Dates:	6/30-7/1			Stratum 1		
Sample Size:	203					
Male	Percent of Sample	0.0%	2.5%	57.1%	0.5%	60.1%
	Number in Sample	0	5	116	1	122
	Number in Escapement	0	194	4,493	39	4,726
	Avg. Length(mm)[1]	0	576	629	630	
Female	Percent of Sample	0.0%	0.5%	38.9%	0.5%	39.9%
	Number in Sample	0	1	79	1	81
	Number in Escapement	0	39	3,060	39	3,137
	Avg. Length(mm)[1]	0	595	591	565	
Total	Percent of Sample	0.0%	3.0%	96.1%	1.0%	100.0%
	Number in Sample	0	6	195	2	203
	Number in Escapement	0	232	7,553	77	7,863
Stratum Dates:	7/4-7/10			Stratum 2		
Sampling Dates:	7/5-7/10					
Sample Size:	292					
Male	Percent of Sample	1.0%	3.1%	38.7%	0.0%	42.8%
	Number in Sample	3	9	113	0	125
	Number in Escapement	46	138	1,732	0	1,916
	Avg. Length(mm)[1]	542	587	622		
Female	Percent of Sample	0.3%	4.1%	52.1%	0.7%	57.2%
	Number in Sample	1	12	152	2	167
	Number in Escapement	15	184	2,329	31	2,559
	Avg. Length(mm)[1]	490	574	587	608	
Total	Percent of Sample	1.4%	7.2%	90.8%	0.7%	100.0%
	Number in Sample	4	21	265	2	292
	Number in Escapement	61	322	4,061	31	4,475
Stratum Dates:	7/11-8/31			Stratum 3		
Sampling Dates:	7/11-7/19					
Sample Size:	268					
Male	Percent of Sample	3.4%	4.9%	29.5%	1.1%	38.8%
	Number in Sample	9	13	79	3	104
	Number in Escapement	143	207	1,256	48	1,653
	Avg. Length(mm)[1]	532	576	614	618	
Female	Percent of Sample	5.2%	11.6%	44.0%	0.4%	61.2%
	Number in Sample	14	31	118	1	164
	Number in Escapement	223	493	1,876	16	2,607
	Avg. Length(mm)[1]	538	554	581	607	
Total	Percent of Sample	8.6%	16.4%	73.5%	1.5%	100.0%
	Number in Sample	23	44	197	4	268
	Number in Escapement	366	699	3,131	64	4,260
Stratum Dates:	6/28-8/31					
Sampling Dates:	6/30-8/14			Season Total		
Sample Size:	763					
Male	Percent of Escapement	1.1%	3.2%	45.1%	0.5%	50.0%
	Number in Escapement	189	538	7,481	86	8,294
	Avg. Length(mm)[1]	534	579	623	621	
Female	Percent of Escapement	1.4%	4.3%	43.8%	0.5%	50.0%
	Number in Escapement	238	715	7,265	85	8,304
	Avg. Length(mm)[1]	535	559	586	590	
Total	Percent of Escapement	2.6%	7.6%	88.8%	1.0%	100.0%
	Number in Escapement	427	1,254	14,746	172	16,598

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

[2] The number of fish in each stratum age and sex category are derived from the sample percentages.

3 The number of fish in total are the stratum sums; total percentages are derived from the sums.

Table 7. Age, sex, and length composition of coho salmon samples, Kwiniuk River counting tower, Norton Sound, 2001.

		Brood Year and Age Group			
		1998(1.1)	1997(2.1)	1996(3.1)	
Sample Dates:	7/30-8/21				
Sample Size:	94				
Male	Number in sample	5	29	7	41
	Percent of sample	5.3%	30.9%	7.4%	43.6%
	Avg. Length(mm)	627	596	590	
Female	Number in sample	9	42	2	53
	Percent of sample	9.6%	44.7%	2.1%	56.4%
	Avg. Length(mm)	588	592	543	
Total	Number in sample	14	71	9	94
	Percent of sample	14.9%	75.5%	9.6%	100.0%
Sample Dates:	8/25-8/31				
Sample Size:	59				
Male	Number in sample	7	20	1	28
	Percent of sample	11.9%	33.9%	1.7%	47.5%
	Avg. Length(mm)	587	607	575	
Female	Number in sample	11	19	1	31
	Percent of sample	18.6%	32.2%	1.7%	52.5%
	Avg. Length(mm)	608	599	600	
Total	Number in sample	18	39	2	59
	Percent of sample	30.5%	66.1%	3.4%	100.0%
Sample Dates:	9/3-9/9				
Sample Size:	58				
Male	Number in sample	14	13	1	28
	Percent of sample	24.1%	22.4%	1.7%	48.3%
	Avg. Length(mm)	616	630	620	
Female	Number in sample	11	18	1	30
	Percent of sample	19.0%	31.0%	1.7%	51.7%
	Avg. Length(mm)	614	615	610	
Total	Number in sample	25	31	2	58
	Percent of sample	43.1%	53.4%	3.4%	100.0%
Sample Dates:	7/30-9/9				
Sample Size:	211		Season Total		
Male	Number in sample	26	62	9	97
	Percent of sample	12.3%	29.4%	4.3%	46.0%
	Avg. Length(mm)	616	630	620	
Female	Number in sample	31	79	4	114
	Percent of sample	14.7%	37.4%	1.9%	54.0%
	Avg. Length(mm)	614	615	610	
Total	Number in sample	57	141	13	211
	Percent of sample	27.0%	66.8%	6.2%	100.0%

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

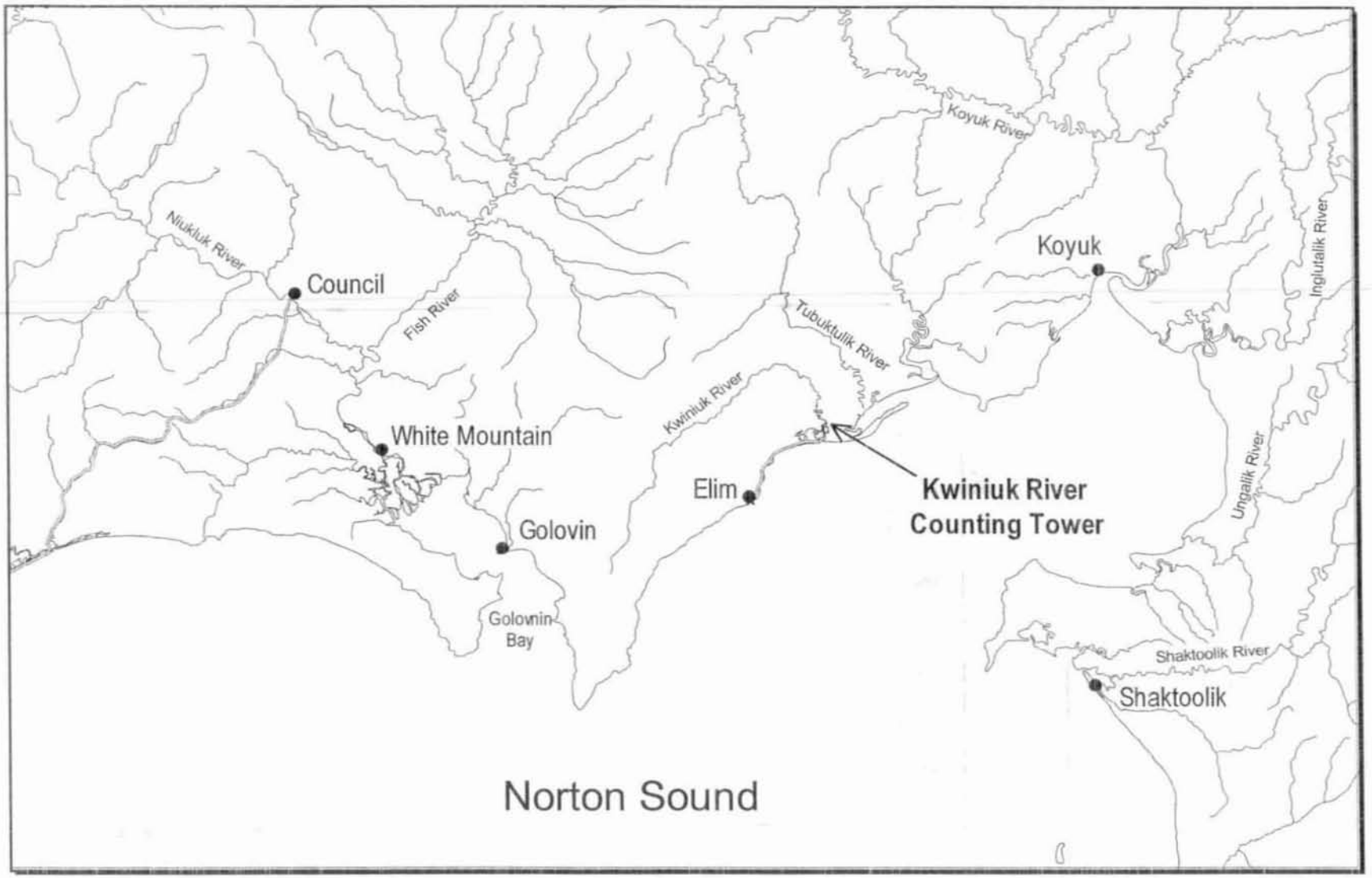


Figure 1. Area location map of the Kwiniuk River counting tower project site, Norton Sound, 2001.

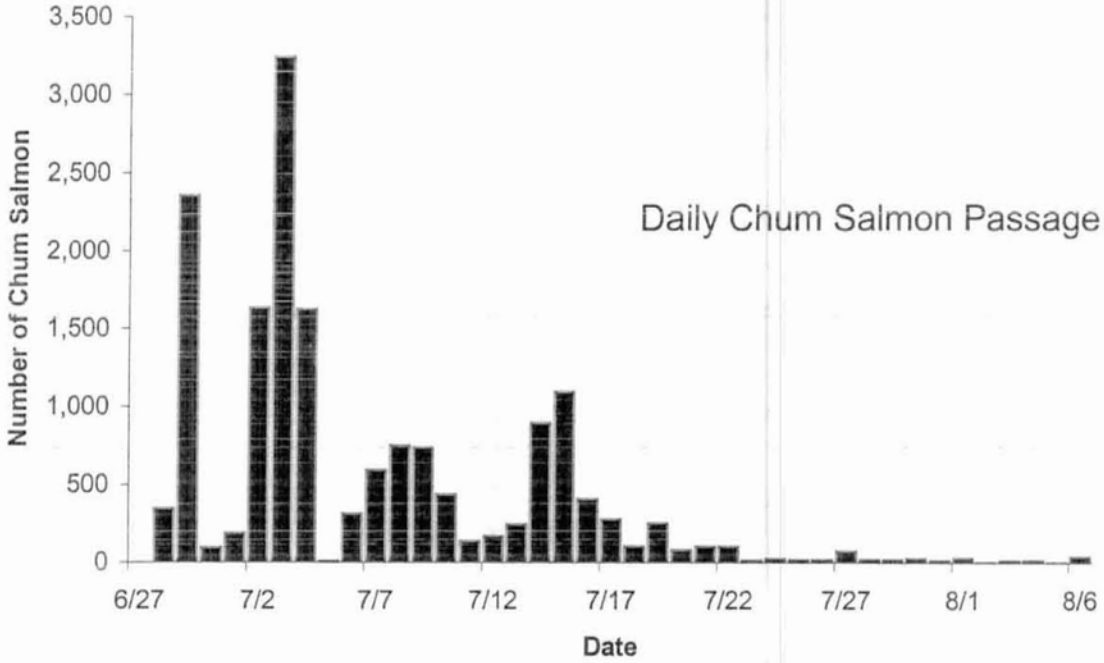


Figure 2. Daily chum salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

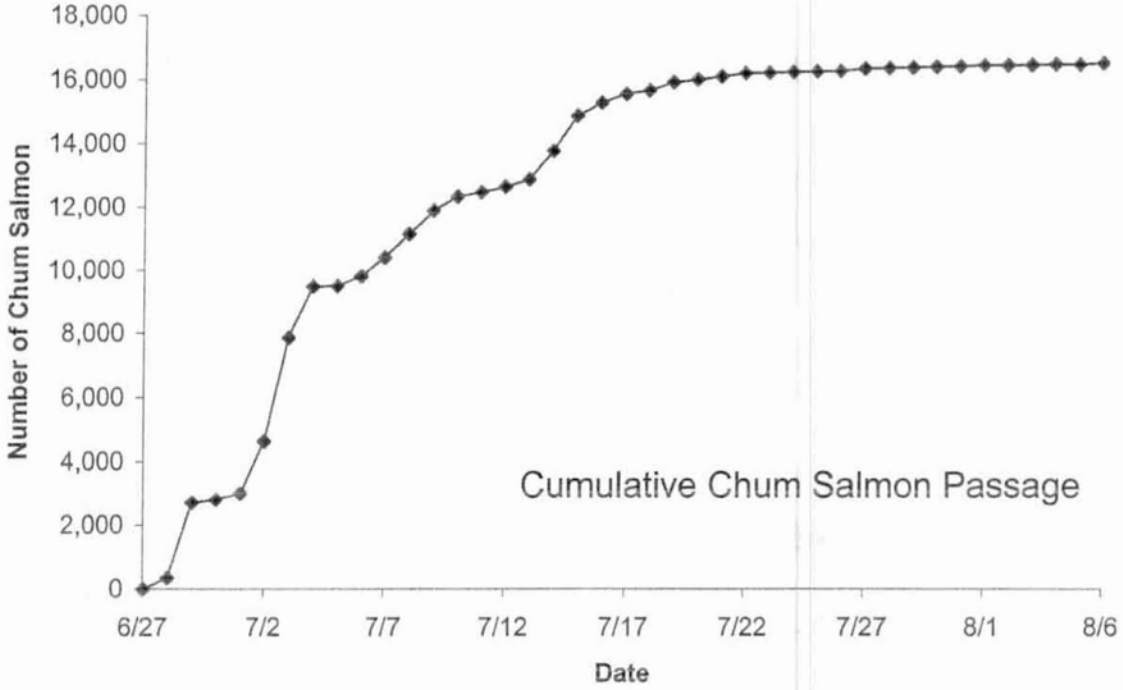


Figure 3. Cumulative chum salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

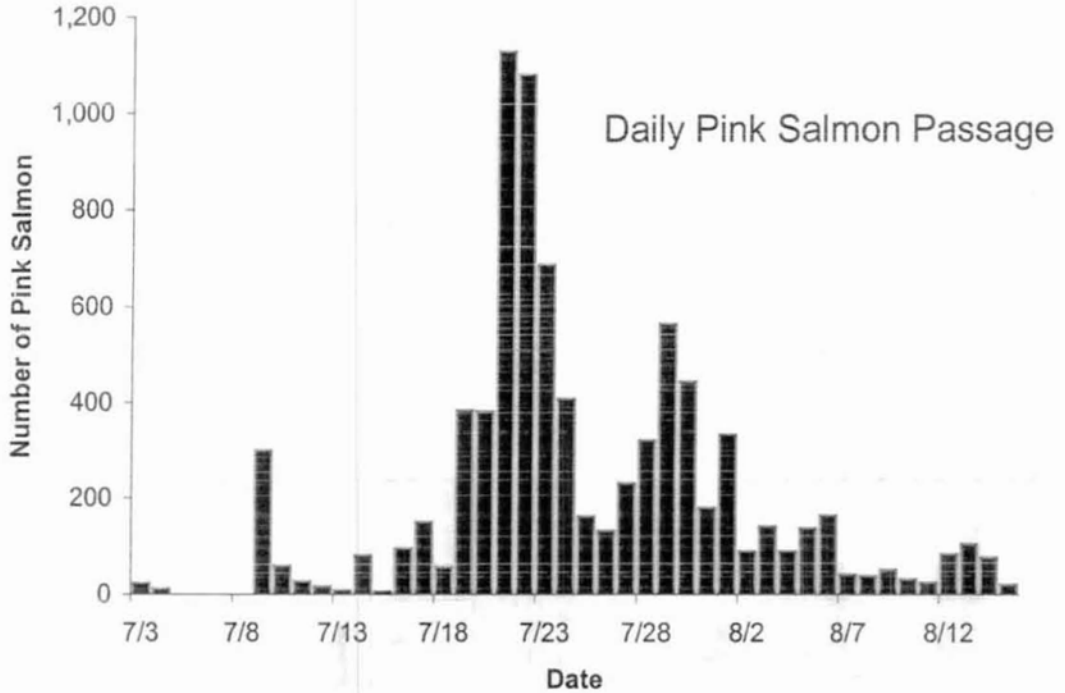


Figure 4. Daily pink salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

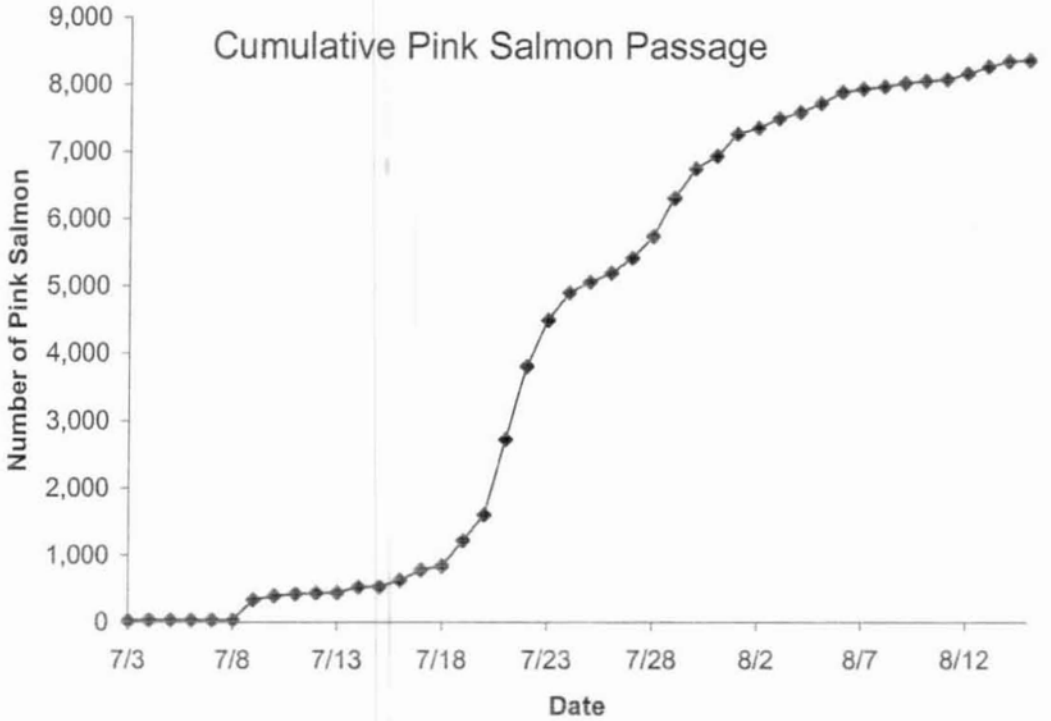


Figure 5. Cumulative pink salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

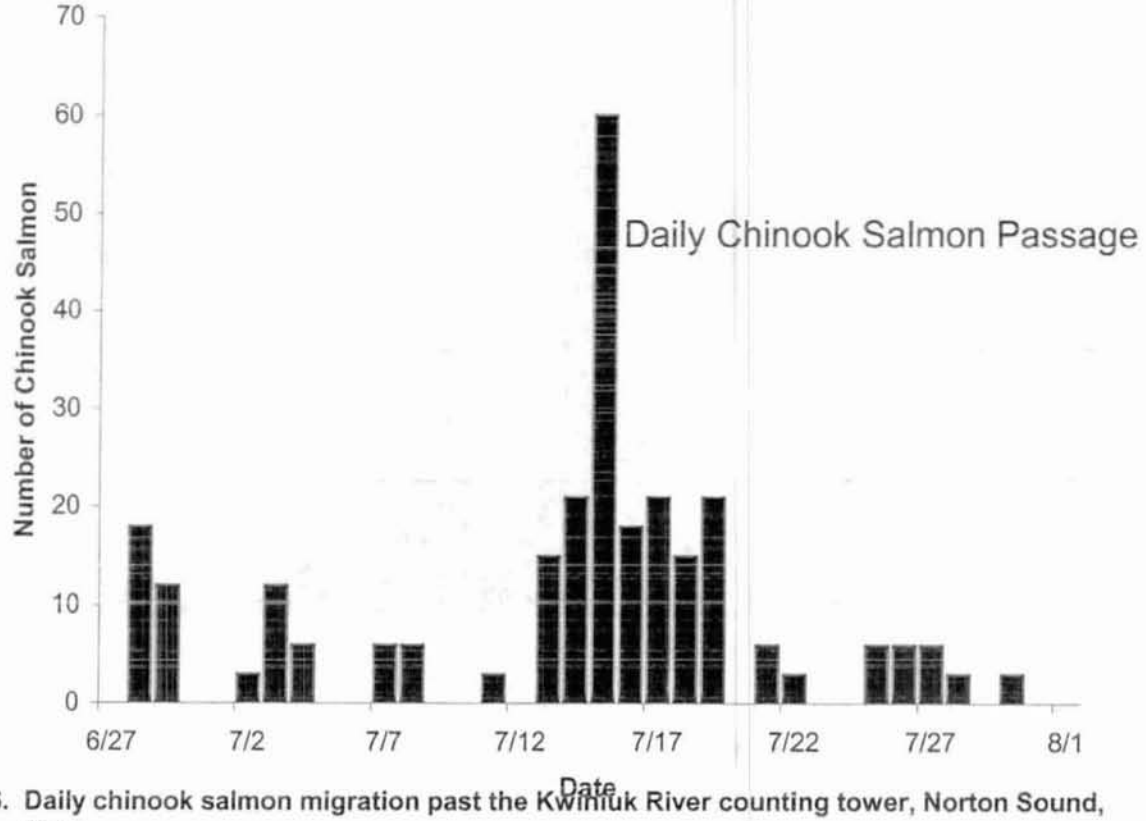


Figure 6. Daily chinook salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

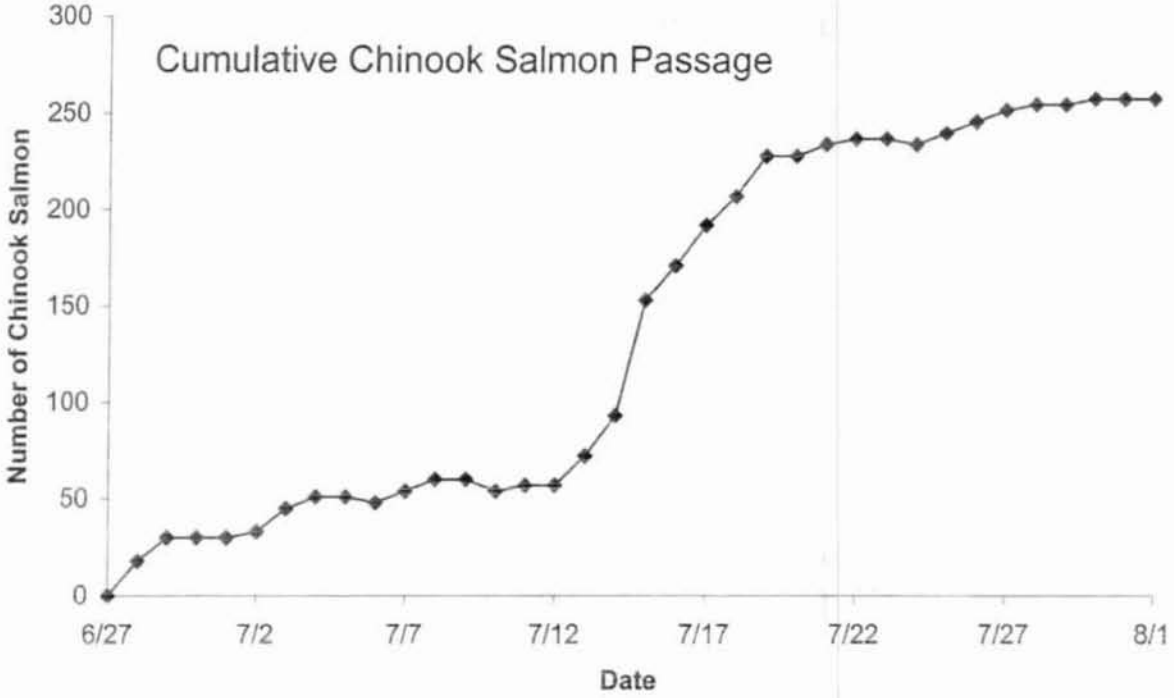


Figure 7. Cumulative chinook salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

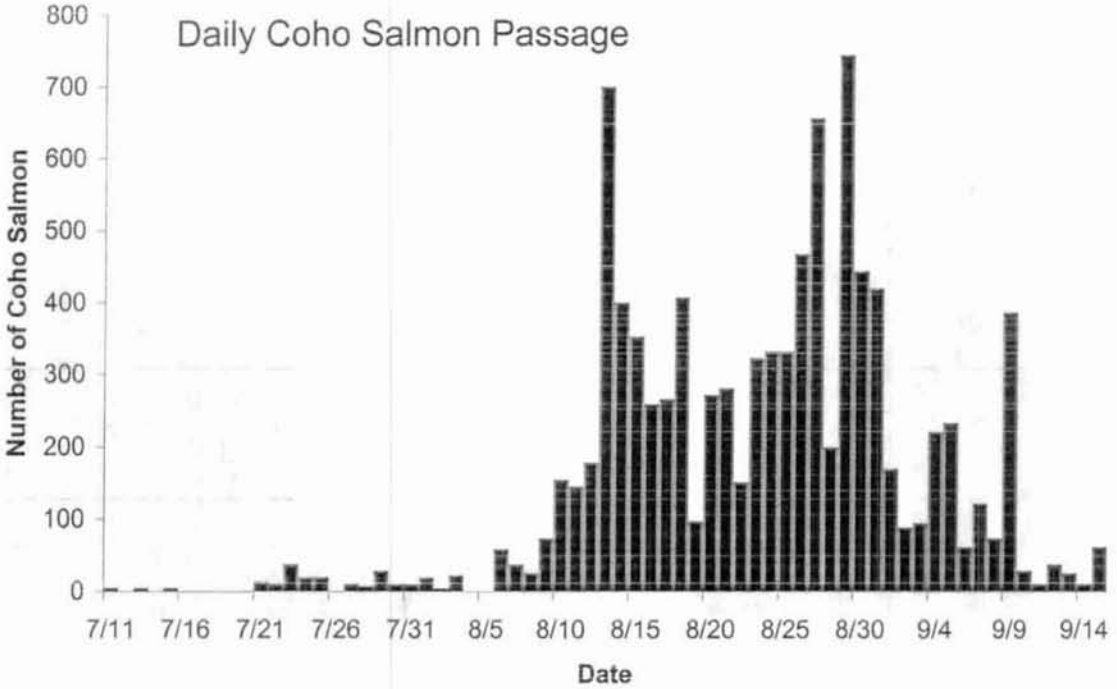


Figure 8. Daily coho salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

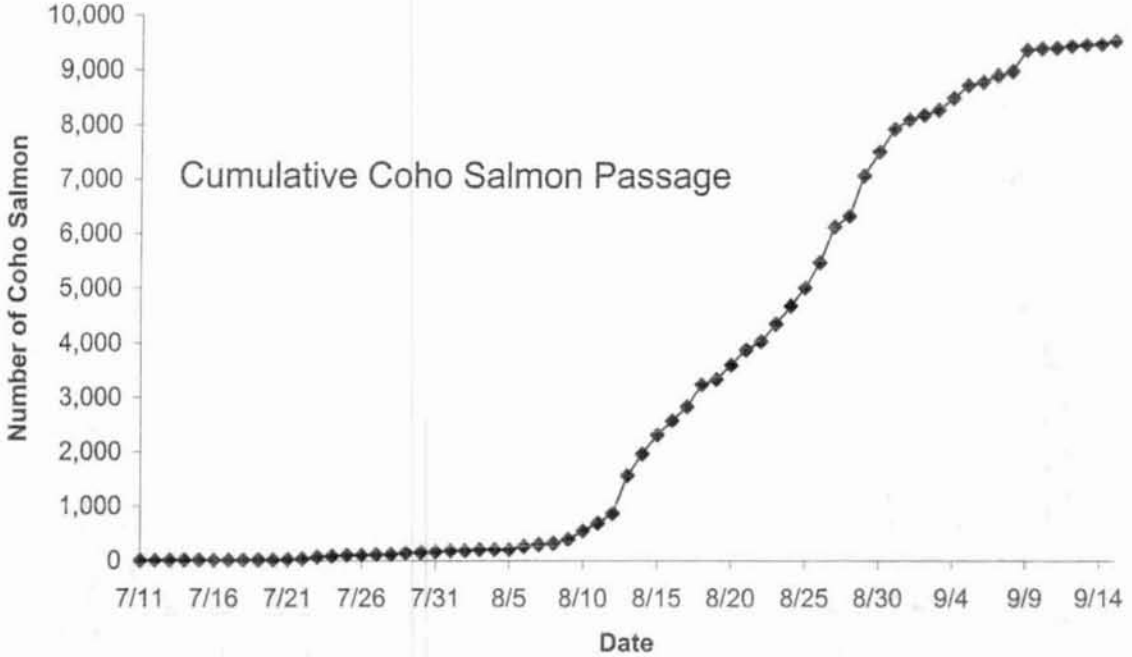


Figure 9. Cumulative coho salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

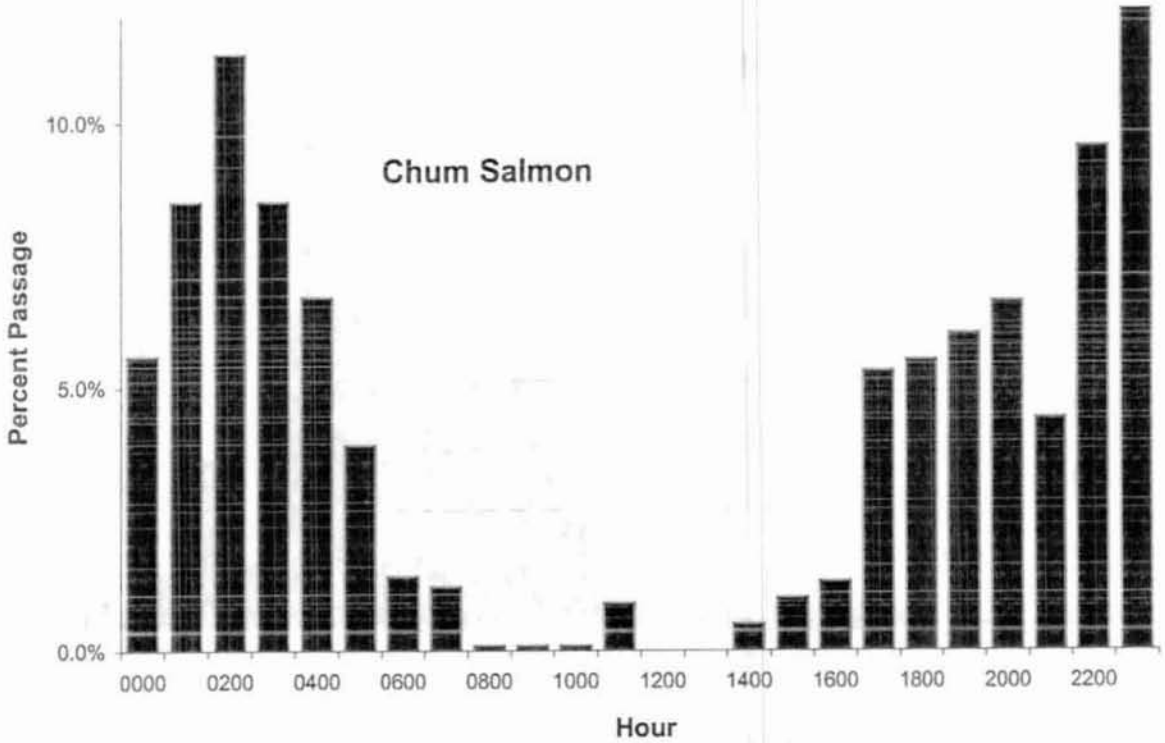


Figure 10. Diurnal pattern of chum salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

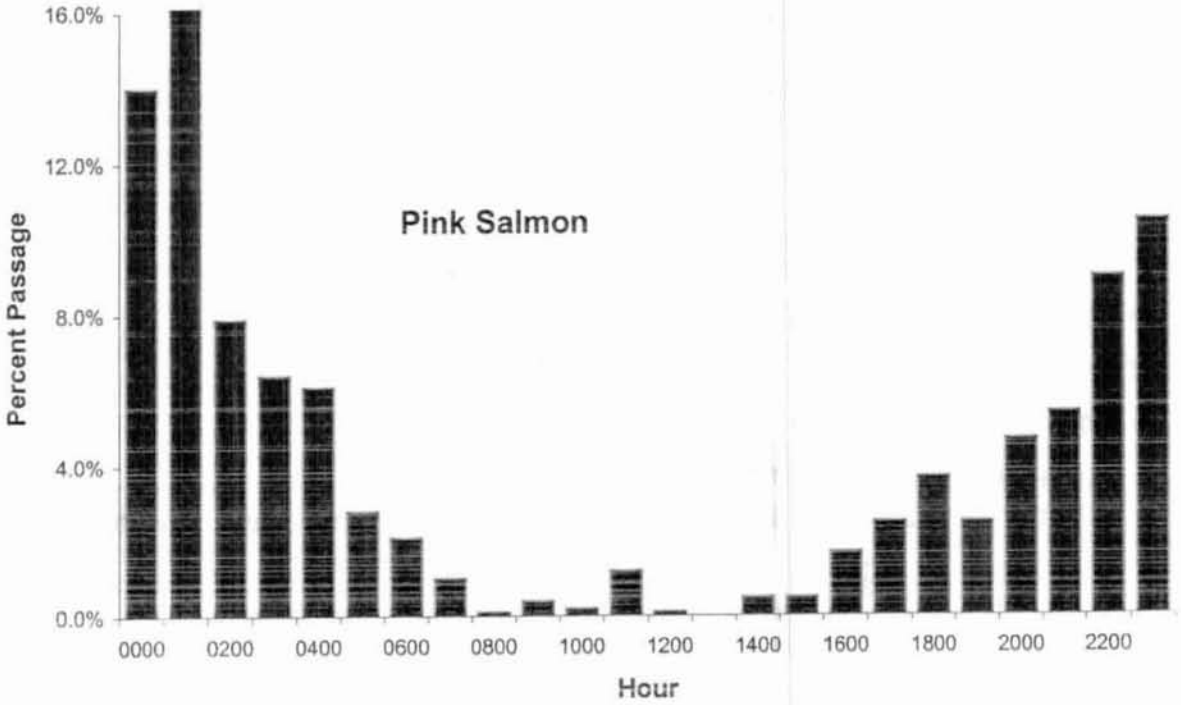


Figure 11. Diurnal pattern of pink salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

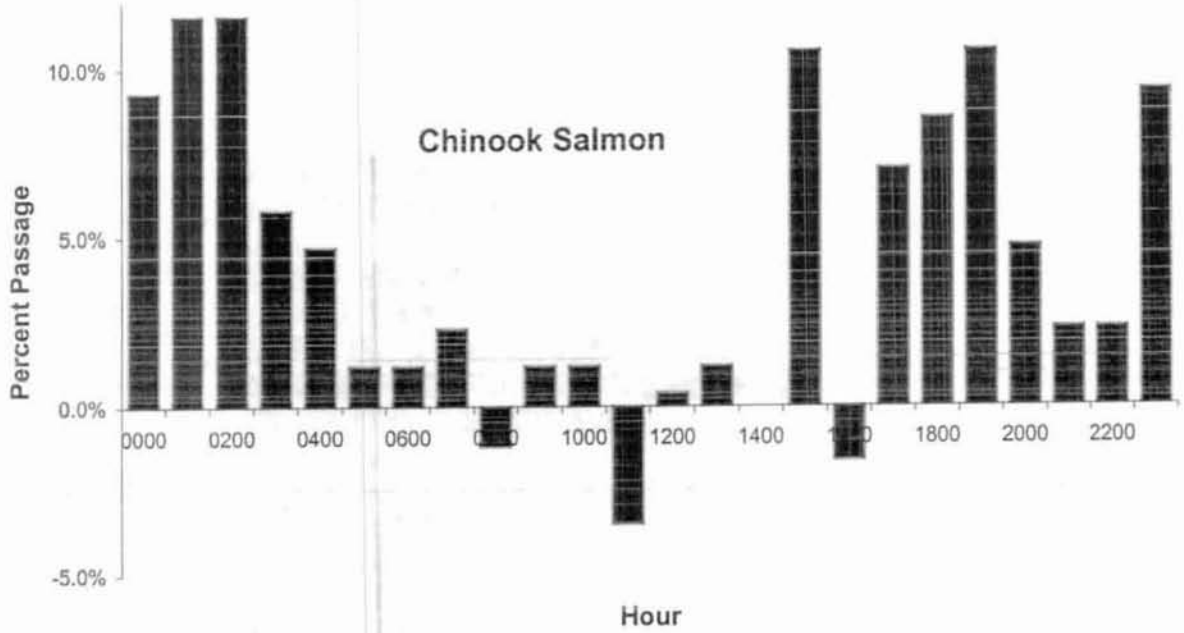


Figure 12. Diurnal pattern of chinook salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001.

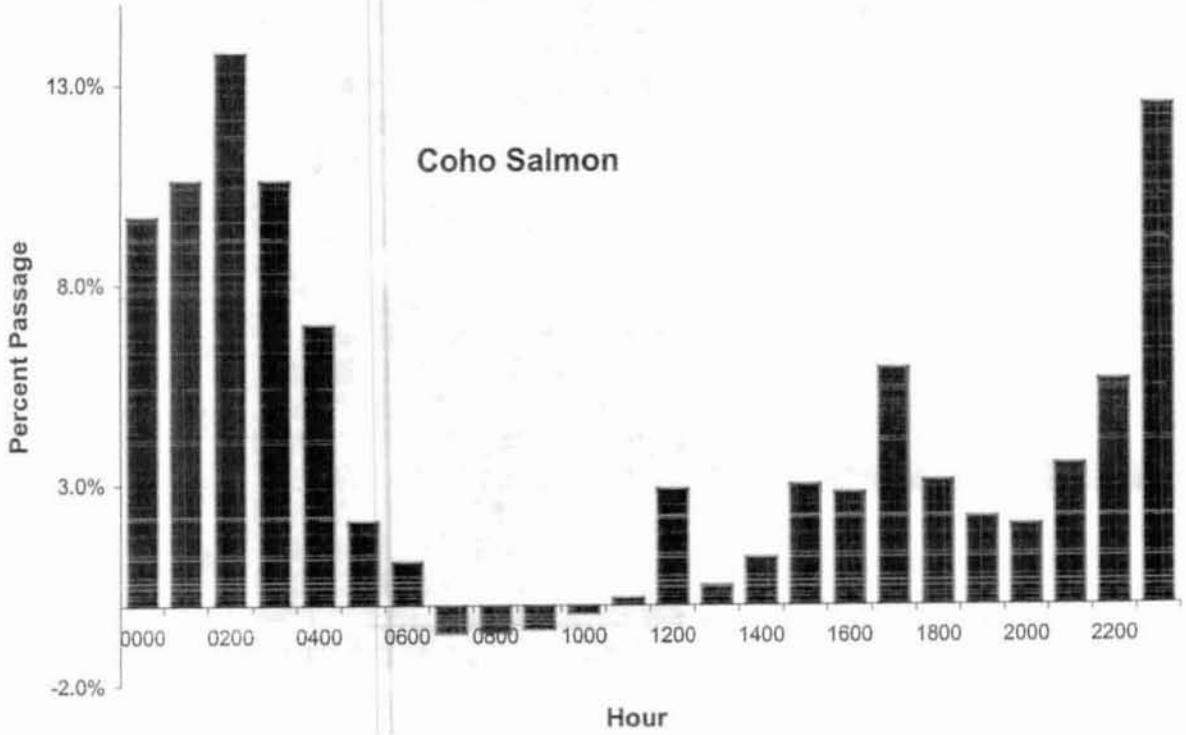


Figure 13. Diurnal pattern of coho salmon migration past the Kwiniuk River counting tower, Norton Sound, 2001,

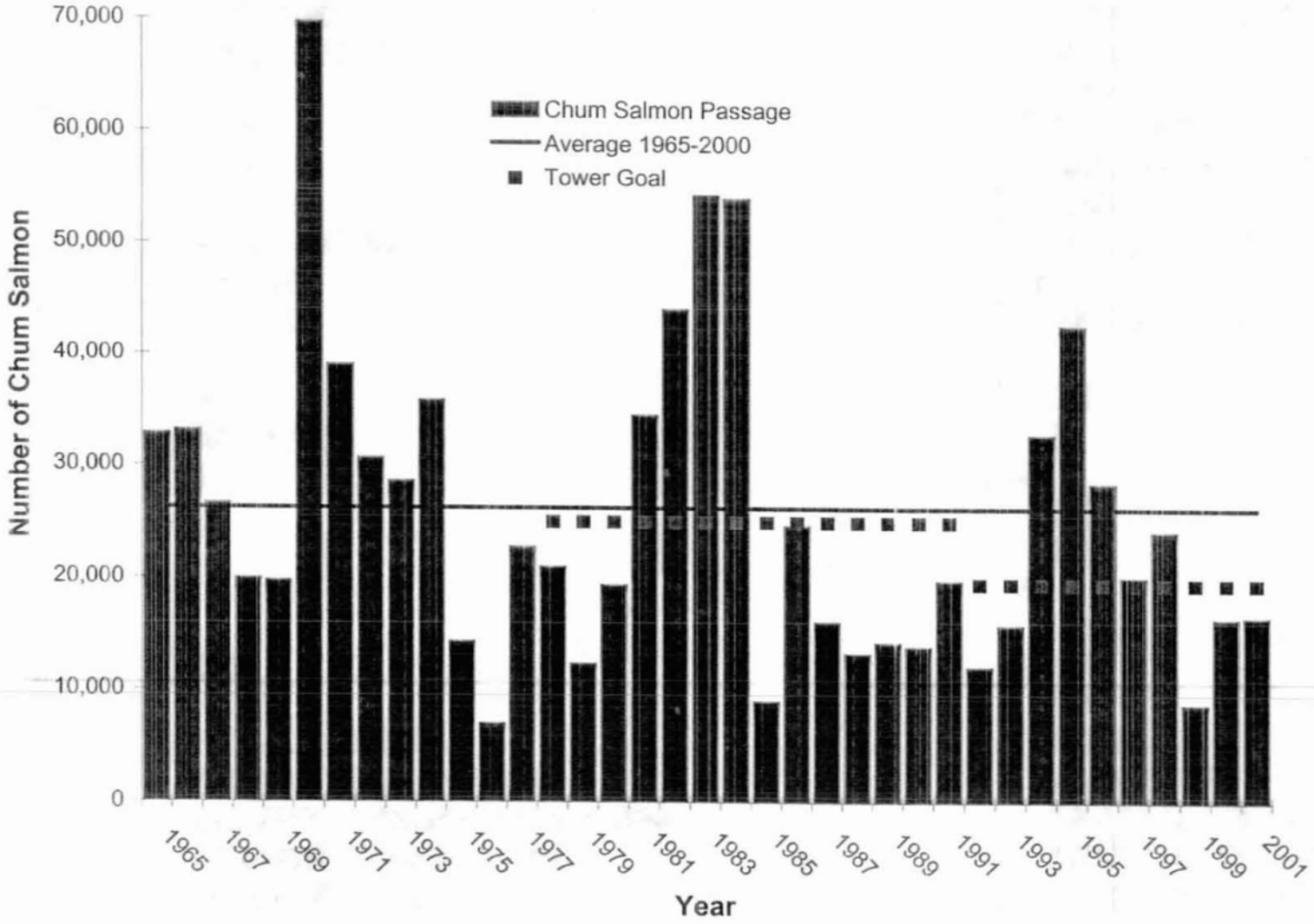


Figure 14. Annual chum salmon passage at the Kwiniuk River counting tower, Norton Sound, 1965-2001.

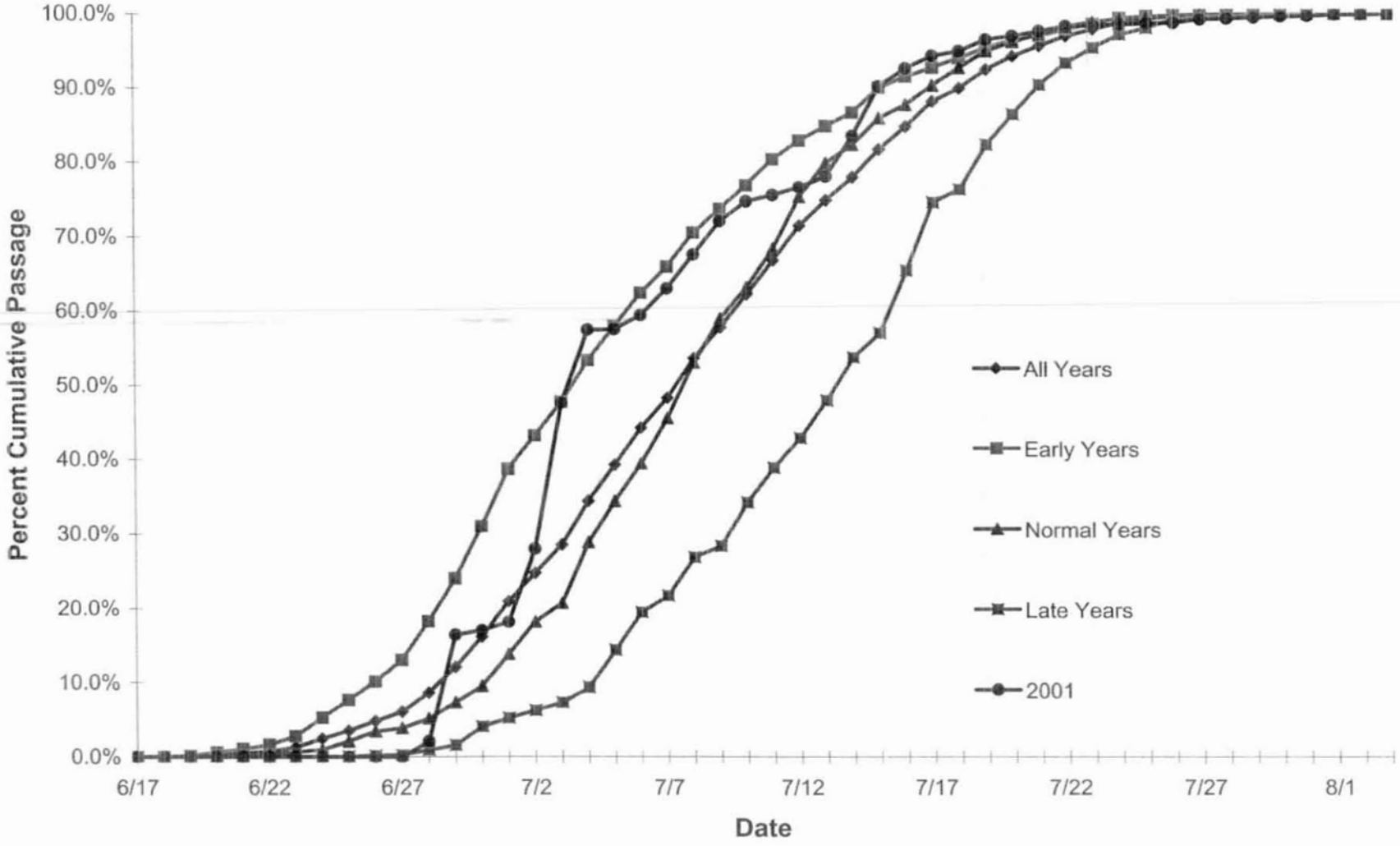


Figure 15. Chum salmon run-timing models for the Kwiniuk River, Norton Sound, 1965 - 2001.

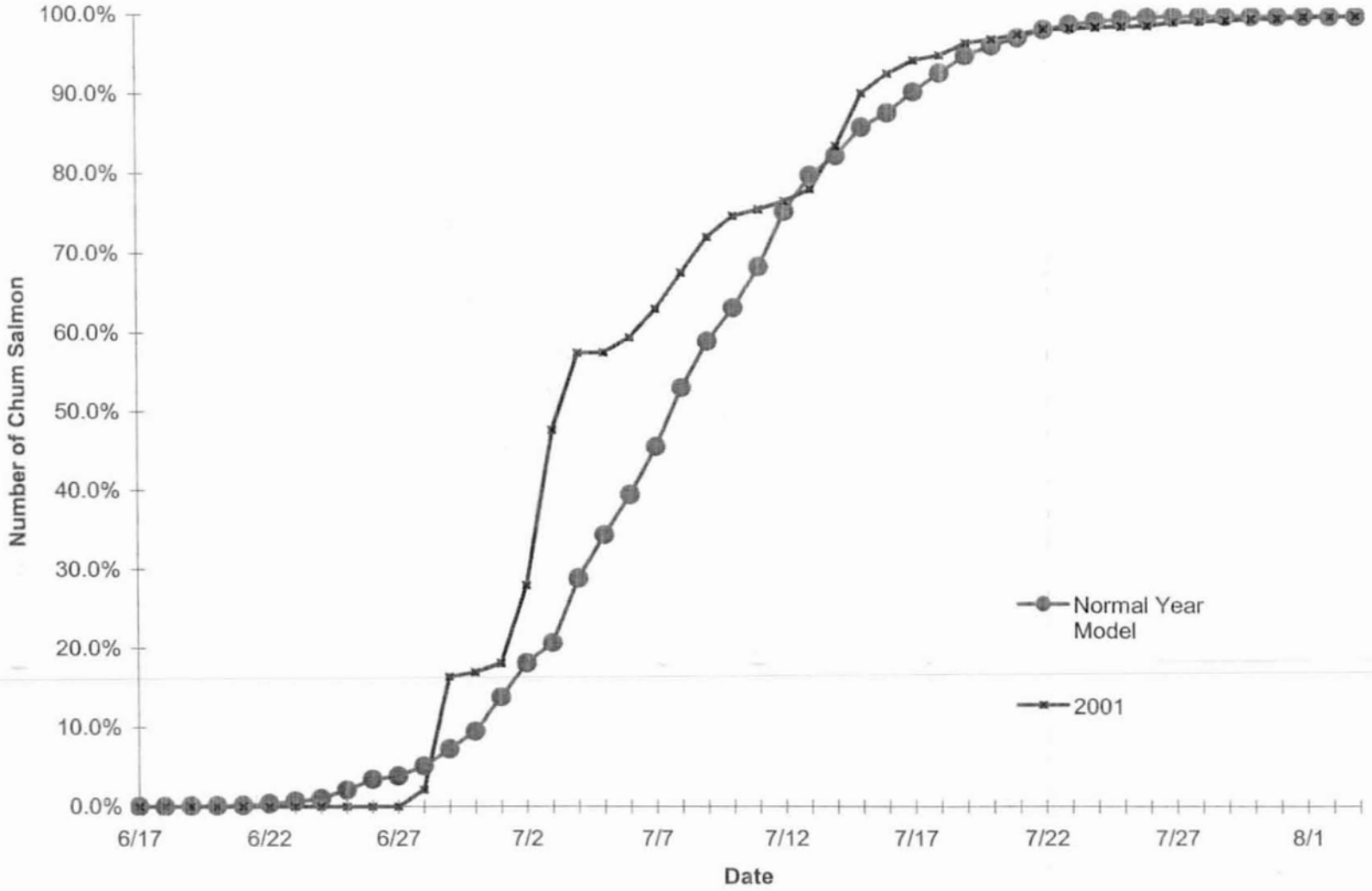


Figure 16. Percent cumulative 2001 chum salmon passage compared to the normal year run-timing model, 1965-1998, Kwiniuk River counting tower, Norton Sound.

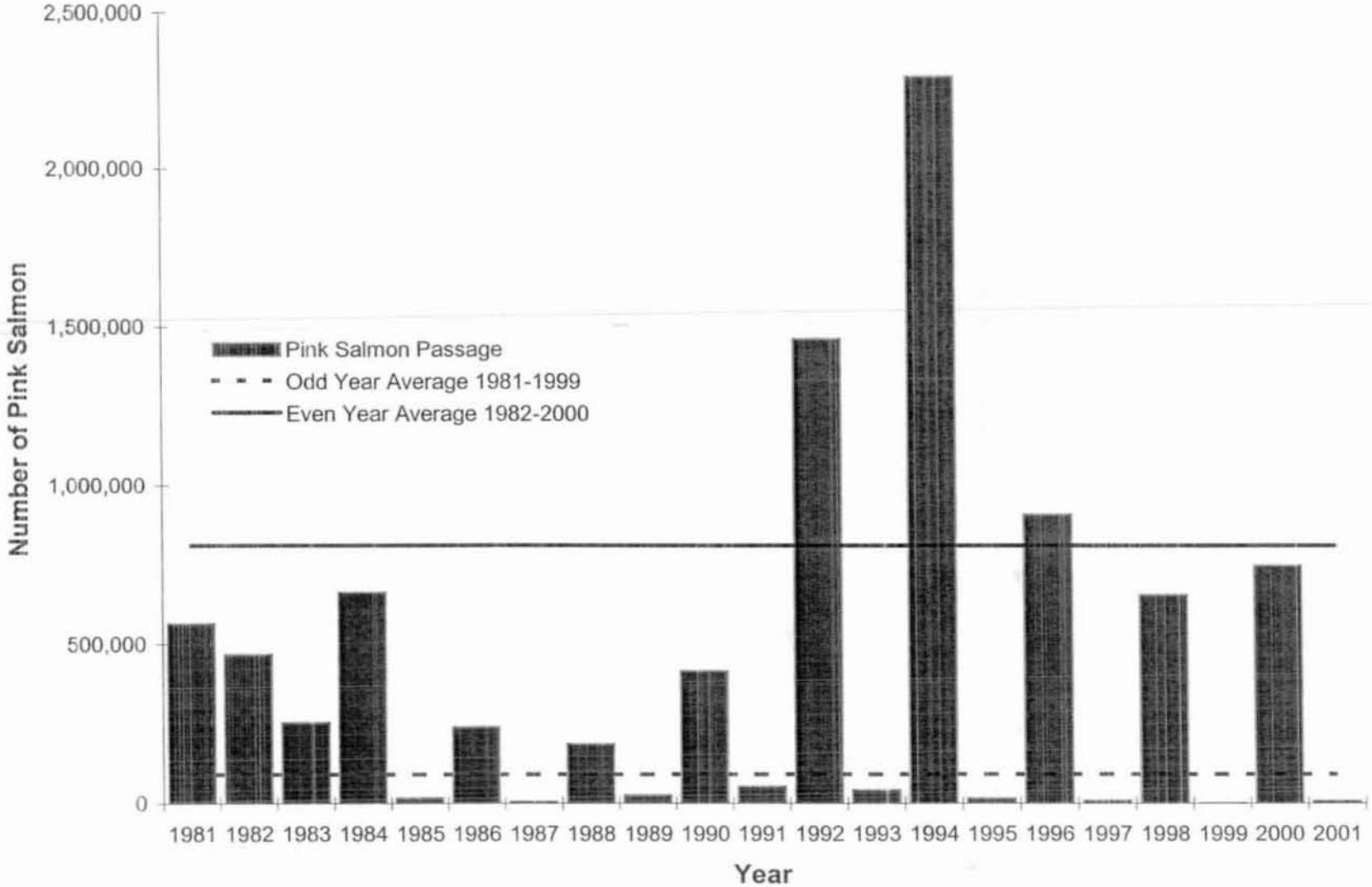


Figure 17. Annual pink salmon passage at the Kwiniuk River counting tower, Norton Sound, 1981-2001.

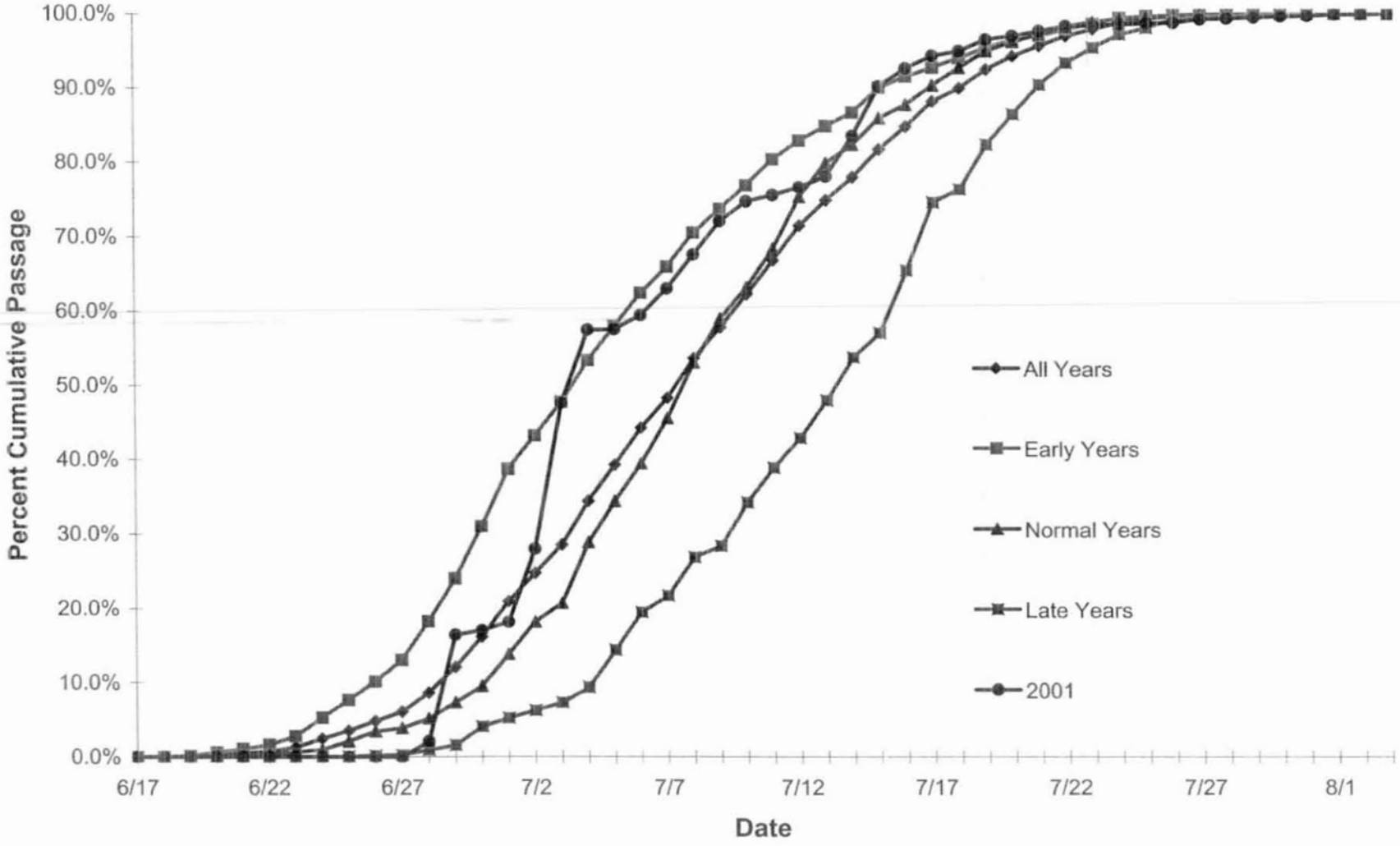


Figure 15. Chum salmon run-timing models for the Kwiniuk River, Norton Sound, 1965 - 2001.

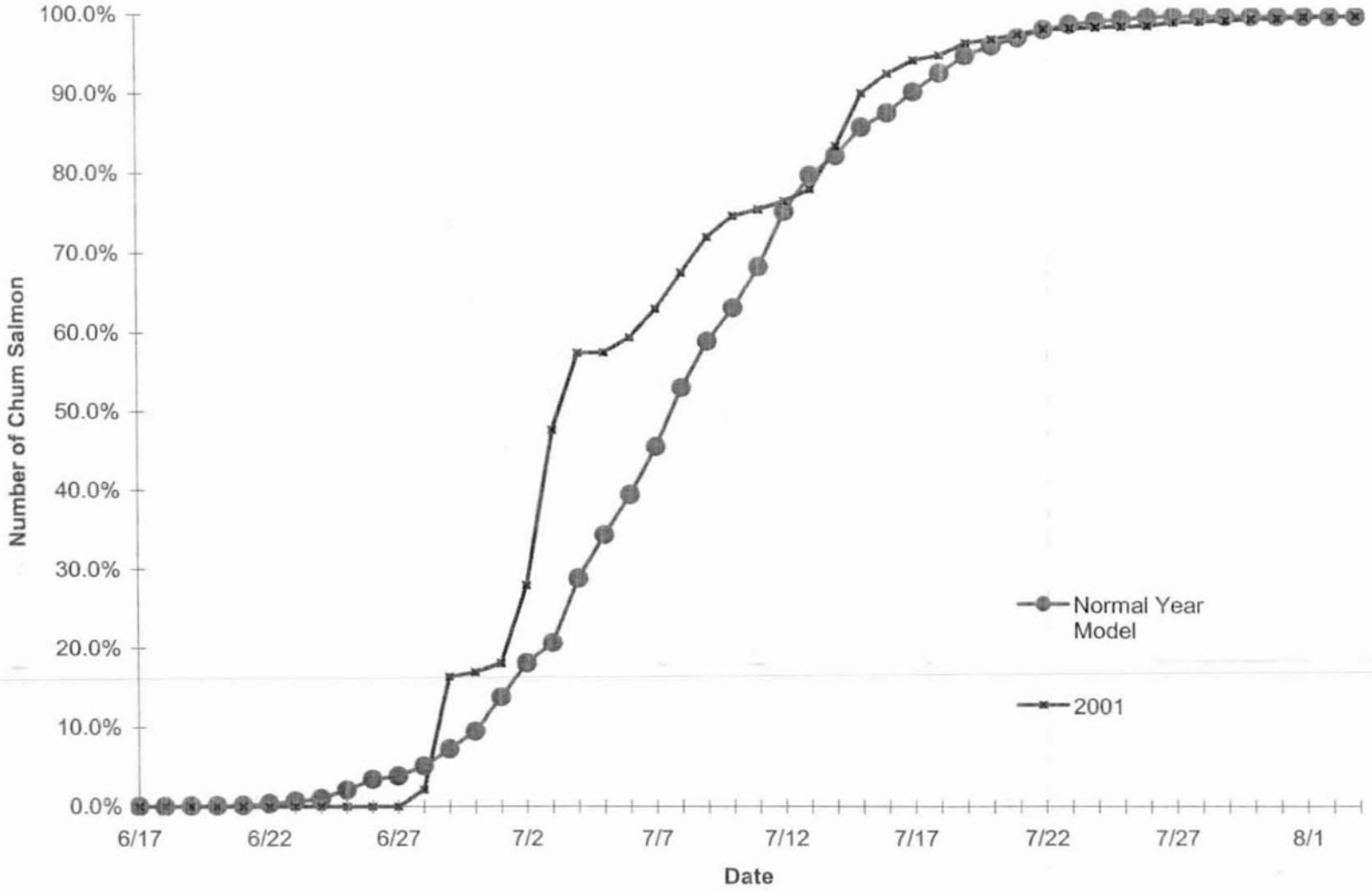


Figure 16. Percent cumulative 2001 chum salmon passage compared to the normal year run-timing model, 1965-1998, Kwiniuk River counting tower, Norton Sound.

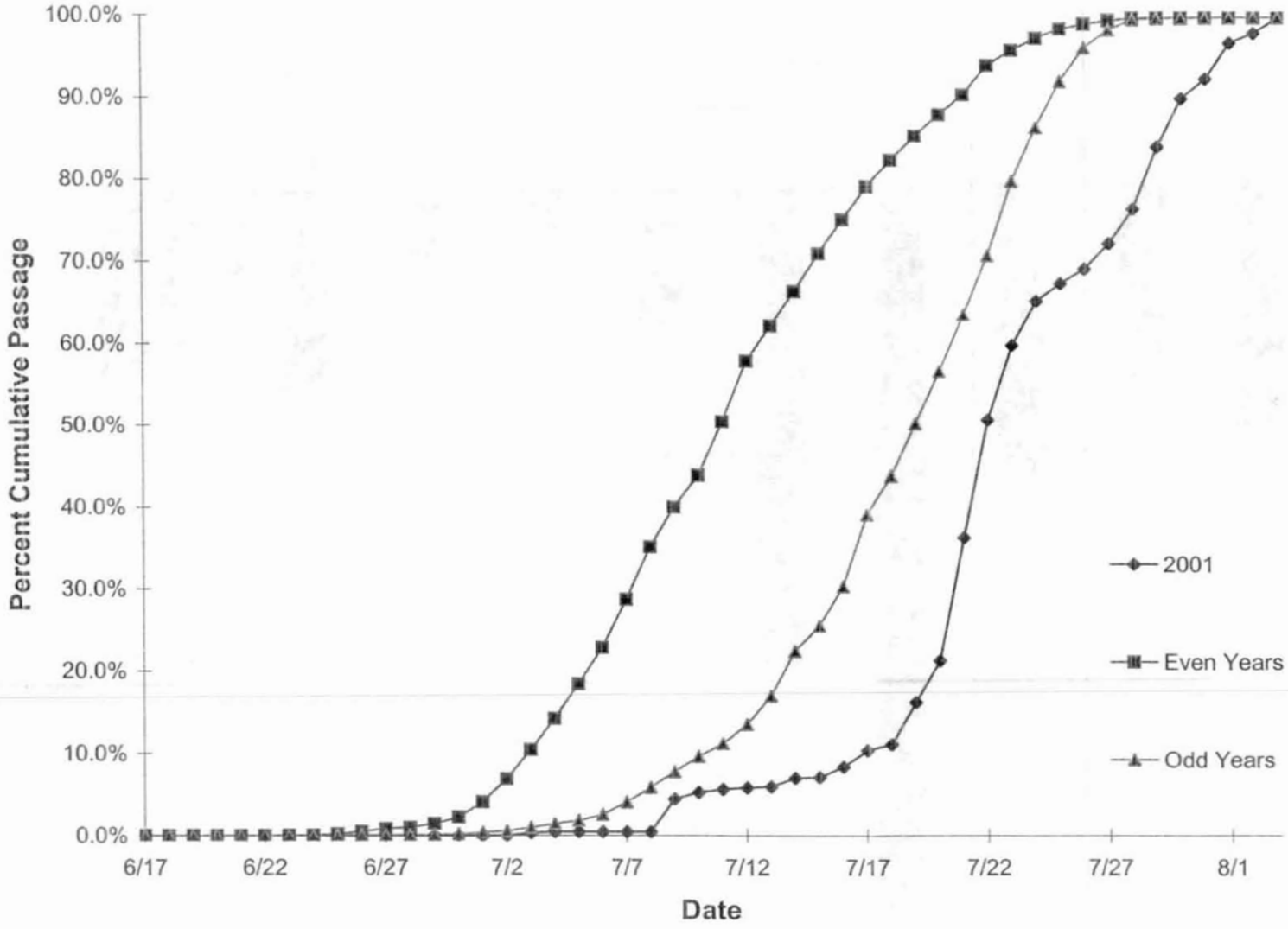


Figure 18. Pink salmon run-timing, Kwiniuk River counting tower, Norton Sound, 1981-2001.

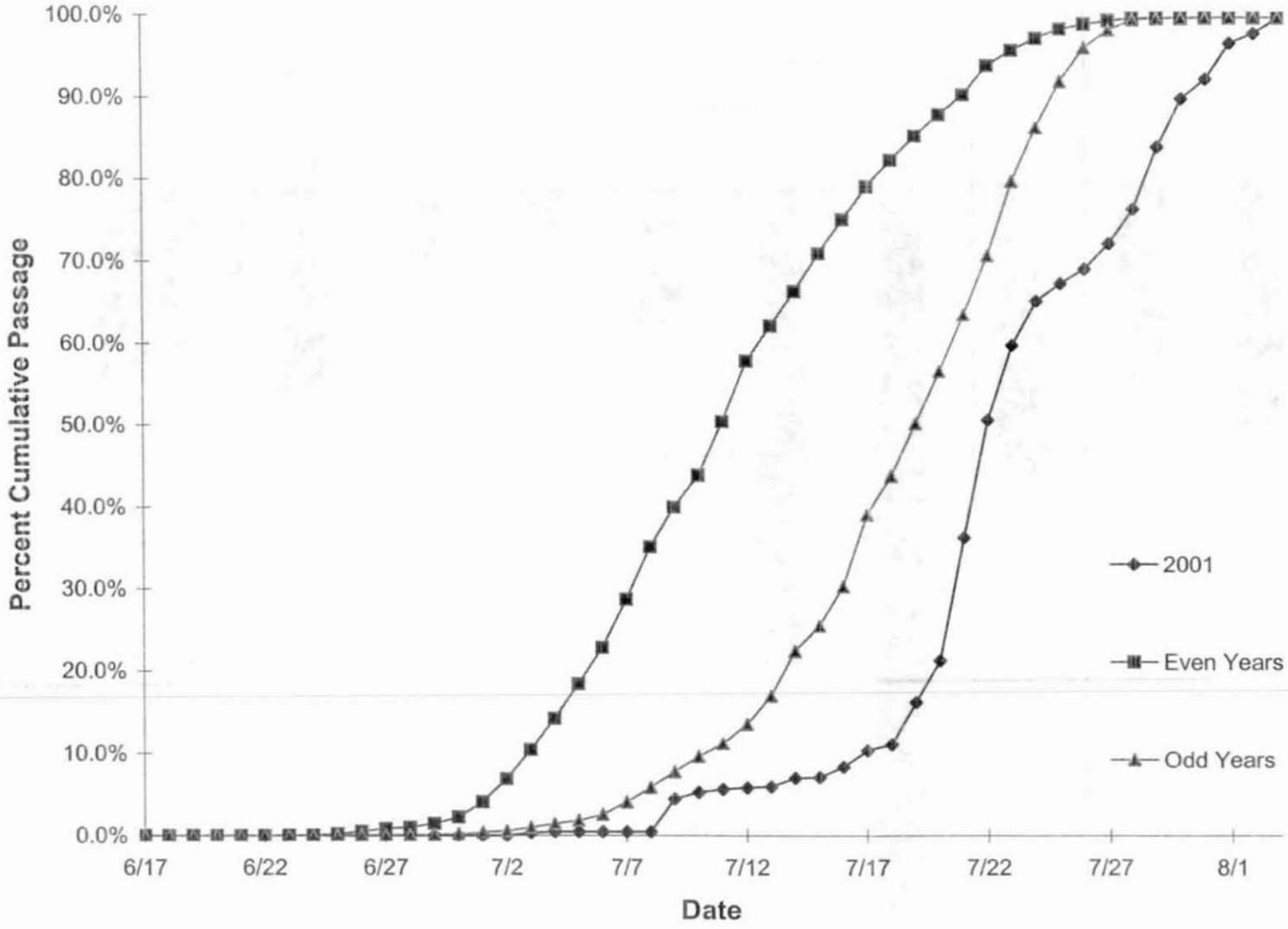


Figure 18. Pink salmon run-timing, Kwiniuk River counting tower, Norton Sound, 1981-2001.

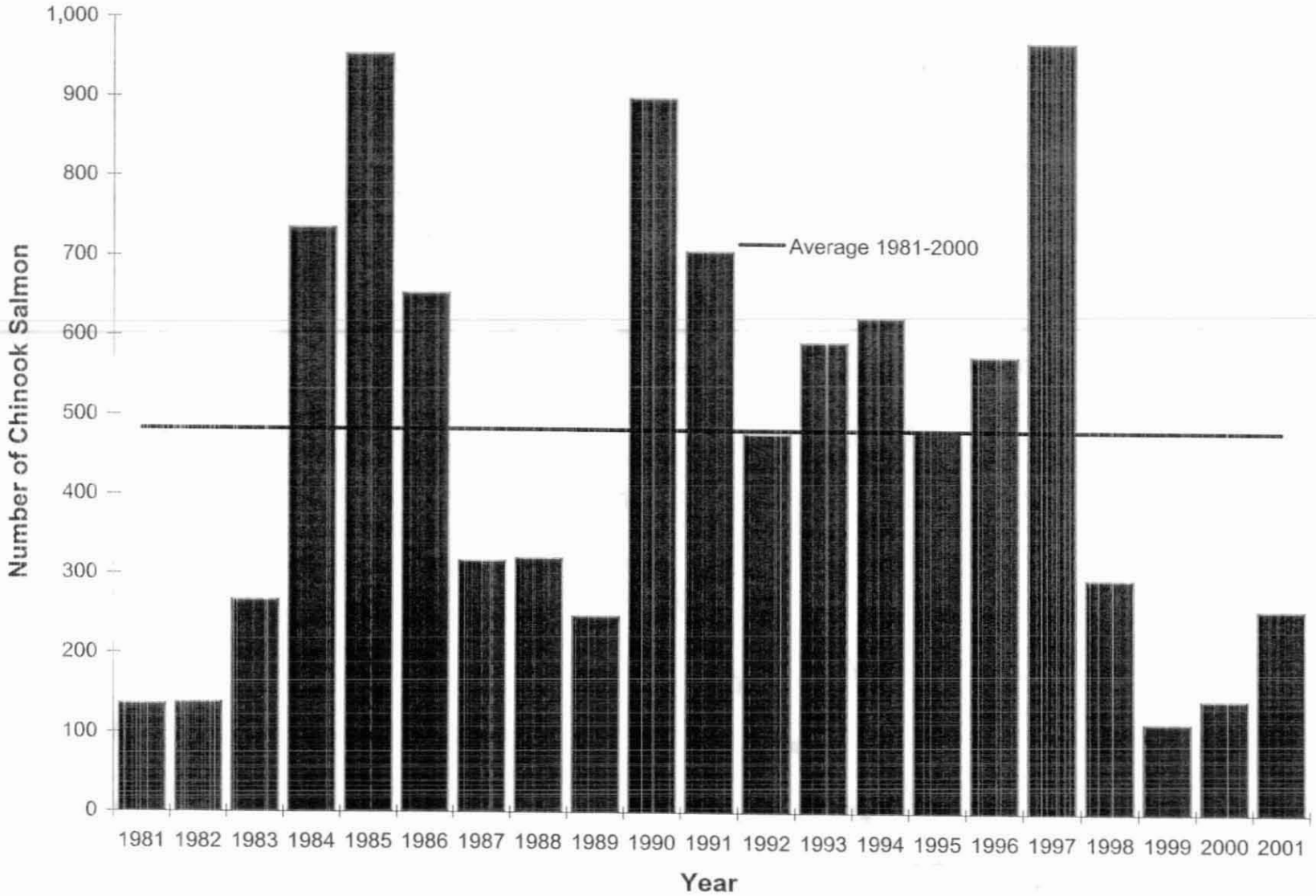


Figure 19. Annual chinook salmon passage at the Kwiniuk River counting tower, Norton Sound, 1981-2001.

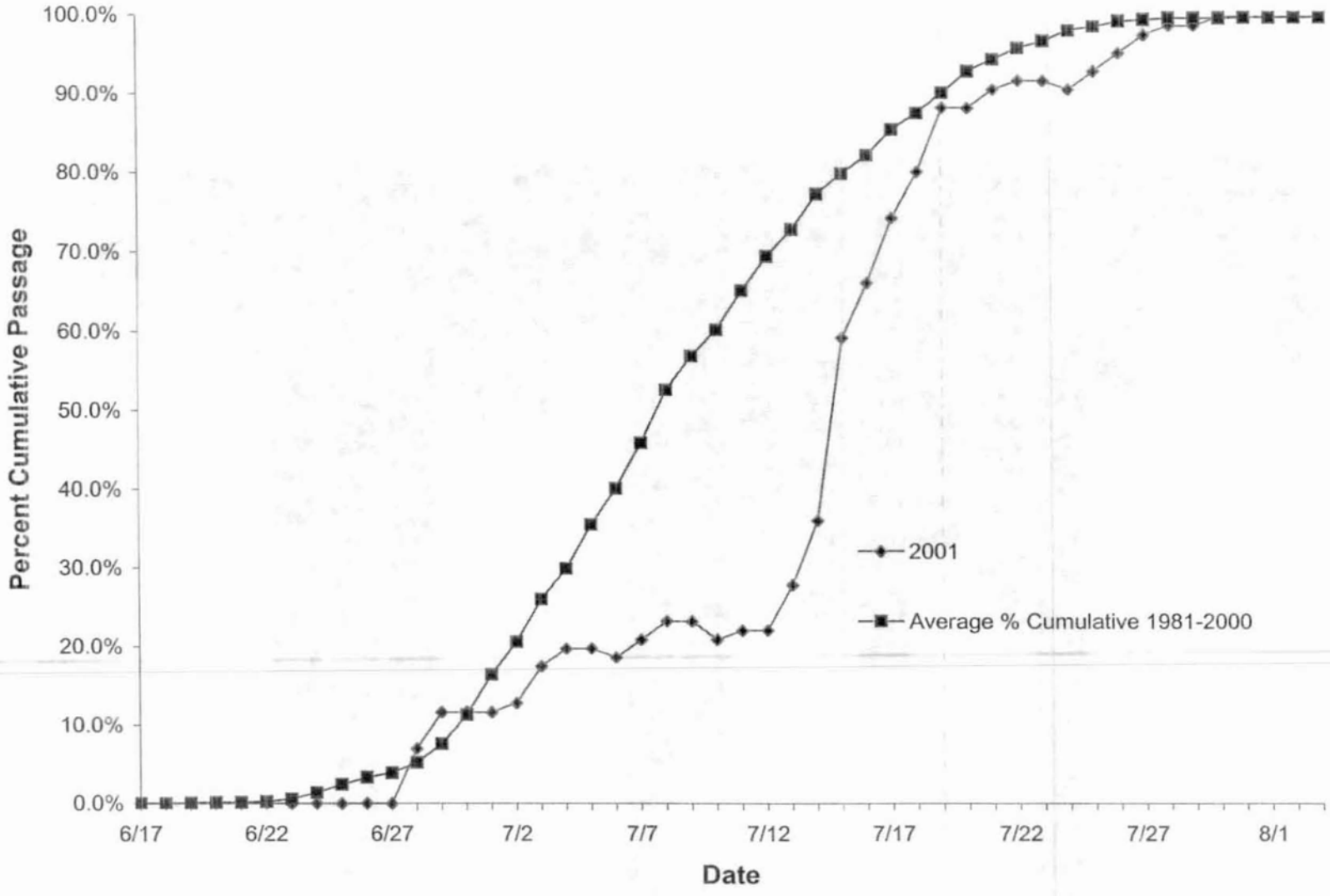


Figure 20. Chinook salmon run-timing, Kwiniuk River counting tower, Norton Sound, 1981-2001.

Appendix Table 1. Cumulative expanded daily chum salmon migration past the Kwiniuk River counting tower, Norton Sound, 1965-2001.

Timing Date	Day	Normal 1965a	Normal 1966b	Normal 1967b	Early 1968	Normal 1969	Normal 1970cd	Late 1971d	Normal 1972d	Late 1973d	Early 1974d
17-Jun	1										
18-Jun	2	6									
19-Jun	3	6	24								16
20-Jun	4	6	50								81
21-Jun	5	6	158								82
22-Jun	6	6	506								206
23-Jun	7	6	759								489
24-Jun	8	6	1,048	5							970
25-Jun	9	6	597	24	66		2			11	1,136
26-Jun	10	6	1,060	77	231	57	17	23		13	3,386
27-Jun	11	6	1,189	270	1,066	113	682	32		17	5,153
28-Jun	12	218	1,697	315	1,812	427	1,772	97	34	17	7,088
29-Jun	13	983	1,768	1,455	2,838	571	2,413	142	52	17	8,534
30-Jun	14	2,576	2,180	2,148	3,509	1,475	4,105	200	161	26	10,011
1-Jul	15	3,445	3,728	2,739	4,443	2,057	5,152	461	610	99	11,503
2-Jul	16	7,741	7,619	3,027	5,971	2,744	8,309	743	1,404	211	14,065
3-Jul	17	3,794	8,054	3,491	5,914	3,861	16,525	1,206	1,641	410	16,003
4-Jul	18	9,988	10,050	5,647	8,427	6,056	23,066	3,433	2,852	1,546	17,342
5-Jul	19	11,050	11,958	6,157	9,409	7,137	29,014	4,883	4,230	4,640	18,349
6-Jul	20	12,078	13,184	9,605	10,247	8,107	32,993	6,308	5,426	5,037	19,461
7-Jul	21	12,502	13,703	13,088	12,428	9,314	33,883	6,668	9,472	3,140	19,888
8-Jul	22	13,445	15,703	15,691	15,033	10,368	37,178	10,901	12,354	8,673	20,181
9-Jul	23	13,824	17,703	18,513	16,720	11,727	42,607	11,781	14,686	9,056	20,549
10-Jul	24	15,630	17,472	21,487	18,003	12,197	42,964	13,682	16,583	15,337	20,774
11-Jul	25	19,147	19,551	23,459	18,284	12,577	46,862	17,257	17,905	15,659	22,087
12-Jul	26	22,518	25,549	25,165	18,349	13,200	50,053	19,087	22,191	16,645	23,223
13-Jul	27	23,491	27,225	26,473	18,415	14,198	50,495	19,752	23,480	17,128	24,179
14-Jul	28	26,444	27,579	26,459	18,431	14,379	53,115	20,998	25,523	19,342	25,611
15-Jul	29	32,026	28,604	26,532	18,564	15,057	59,893	21,296	25,922	20,079	31,899
16-Jul	30	32,190	28,336	26,584	18,590	16,634	63,295	22,369	25,836	20,561	32,855
17-Jul	31	32,437	28,384	26,398	18,601	17,117	65,645	27,521	26,682	22,866	33,254
18-Jul	32	32,503	29,965	26,625	18,636	18,345	66,144	27,910	27,857	24,581	34,089
19-Jul	33	32,861	31,884	26,631	18,760	18,707	66,714	31,324	28,581	25,757	34,603
20-Jul	34		32,154	26,631	18,315	18,918	68,806	34,510	28,967	26,541	34,800
21-Jul	35		32,389		18,347	19,233	68,851	35,197	29,101	27,877	34,927
22-Jul	36		32,723		18,907	19,373	69,203	35,977	29,629	27,915	35,014
23-Jul	37		32,938		18,951	19,390	69,320	36,256	30,077	28,149	35,404
24-Jul	38		33,000		19,976	19,525	69,483	36,945	30,381	28,596	35,714
25-Jul	39		33,137			19,534	69,697	37,735	30,625	28,618	35,868
26-Jul	40		33,153			19,749	69,736	38,471	30,686		35,899
27-Jul	41		33,153				69,752	38,907			
28-Jul	42		33,184				69,755	38,988			
29-Jul	43						69,758	39,046			
30-Jul	44										
31-Jul	45										
1-Aug	46										
2-Aug	47										
3-Aug	48										
Total		32,861	33,184	26,631	19,976	19,749	69,758	39,046	30,686	28,618	35,899

[a] Although no counts were made from 6/19-6/27, crew notes indicted that few salmon passed during this period.

[b] The last daily count was dropped because it resulted in a net decrease in escapement, probably caused by downstream movement of post-spawning salmon.

[c] Counts for 6/27-6/28 estimated from the 1965-1993 "Normal" run-timing model. This year was excluded from the computation of mean run-timing models.

[d] Reported counts are observed 18-hour counts expanded by 2.1%, based upon a comparison of 18-hour and 24-hour counts made from 1965 to 1969.

- continued -

Appendix Table 1. (Page 2 of 4).

Timing Date	Day	Late 1975d	Late 1976d	Normal 1977d	Early 1978def	Late 1979de	Normal 1980d	Normal 1981g	Early 1982g	Early 1983g	Early 1984g
17-Jun	1				0						
18-Jun	2				3						
19-Jun	3				44			96		0	0
20-Jun	4				135			155		86	0
21-Jun	5				242			187	0	2,536	2
22-Jun	6				352		0	469	377	3,882	35
23-Jun	7				465		10	948	548	4,418	55
24-Jun	8				678		55	2,400	578	6,728	328
25-Jun	9				1,385		205	3,426	6,080	9,313	1,199
26-Jun	10				2,091		346	4,558	10,014	10,166	3,419
27-Jun	11			12	2,589	14	398	5,125	11,026	10,434	5,352
28-Jun	12		6	277	3,220	192	652	5,185	11,537	13,406	6,941
29-Jun	13		32	478	4,261	300	1,006	5,656	12,137	13,832	9,221
30-Jun	14		34	692	5,769	1,963	1,122	7,037	12,914	14,800	15,109
1-Jul	15		107	2,139	7,561	2,231	3,654	7,772	12,301	23,056	17,735
2-Jul	16		137	2,985	8,749	2,365	3,603	7,975	13,831	23,215	22,830
3-Jul	17		199	4,220	9,815	2,642	3,508	11,630	16,723	25,632	28,207
4-Jul	18	74	437	4,704	10,418	2,902	3,728	13,514	19,691	27,176	30,500
5-Jul	19	371	762	6,192	11,344	2,945	5,379	13,307	22,421	31,905	31,922
6-Jul	20	743	903	7,197	13,044	3,296	6,862	15,130	22,943	34,050	35,755
7-Jul	21	853	1,118	8,469	14,106	3,478	8,219	16,458	26,528	37,315	32,972
8-Jul	22	1,006	1,547	12,200	15,247	3,669	11,195	16,801	31,371	42,605	34,269
9-Jul	23	1,160	1,656	14,988	16,055	4,603	11,812	19,792	34,300	44,551	35,110
10-Jul	24	1,476	1,813	16,547	16,770	5,326	12,357	20,322	34,630	46,222	40,961
11-Jul	25	1,927	2,205	18,498	17,468	5,532	12,968	20,721	35,015	47,120	47,847
12-Jul	26	2,089	2,694	19,669	18,753	5,644	14,090	22,904	36,681	47,392	49,289
13-Jul	27	2,403	3,413	19,853	19,189	6,367	15,793	23,864	38,306	48,120	49,972
14-Jul	28	3,502	3,532	20,284	19,461	7,010	15,542	25,647	38,790	48,368	51,207
15-Jul	29	3,217	3,953	21,034	20,202	8,312	15,782	27,207	39,609	48,798	51,683
16-Jul	30	7,550	4,328	21,151	20,505	9,389	16,081	28,049	39,959	49,885	52,049
17-Jul	31	9,696	4,910	21,440	20,601	9,962	16,852	28,758	40,270	51,320	53,274
18-Jul	32	10,662	5,002	21,691	20,872	9,097	17,521	29,665	41,059	51,480	53,314
19-Jul	33	12,169	5,219	21,943	20,869	10,488	18,118	30,142	41,791	52,552	53,339
20-Jul	34	12,942	5,533	22,098	20,935	10,912	18,656	31,362	43,007	54,298	53,490
21-Jul	35	13,717	5,894	22,273	20,997	11,512	19,078	32,159	43,400	55,088	53,707
22-Jul	36	14,099	6,147	22,547	21,002	12,189	19,165	32,352	43,600	55,504	53,722
23-Jul	37	14,255	6,432	22,655		12,280	19,291	33,355	43,939	56,360	53,897
24-Jul	38	14,328	6,518	22,722		12,322	19,329	33,936	43,917	56,625	53,970
25-Jul	39	14,344	6,620	22,757		12,355	19,358	34,226	43,995	56,688	54,043
26-Jul	40		6,815				19,362	34,307	44,099	56,763	
27-Jul	41		6,873				19,369	34,417		56,907	
28-Jul	42		6,912				19,372	34,417			
29-Jul	43		6,947					34,518			
30-Jul	44		6,956					34,537			
31-Jul	45		6,978					34,548			
1-Aug	46							34,561			
2-Aug	47							34,566			
3-Aug	48										
Total		14,344	6,978	22,757	21,002	12,355	19,372	34,566	44,099	56,907	54,043

[d] Reported counts are observed 18-hour counts expanded by 2.1%, based upon a comparison of 18-hour and 24-hour counts made from 1965 to 1969.

[e] Some missed counts were estimated. This footnote taken from the tower report. Estimation details not known.

[f] Counts prior to 7/4 estimated from 1963-1993 "Early" run-timing model. This year was excluded from the computation of the mean run-timing models.

[g] Reported counts are observed 18-hour counts expanded by weekly 24-hour counts.

- continued -

Appendix Table 1. (Page 3 of 4).

Timing		Late	Early	Normal	Early	Early	Early	Late	Normal	Normal	Early
Date	Day	1985g	1986g	1987g	1988g	1989g	1990g	1991g	1992g	1993g	1994gh
17-Jun	1										
18-Jun	2				16			0			
19-Jun	3		0		241			0			
20-Jun	4		42		676			0			
21-Jun	5		44		682		18	0			
22-Jun	6		323		595		88	12			
23-Jun	7		879		623		100	36		7	58
24-Jun	8		1,137		775		206	22		5	158
25-Jun	9		1,017	92	1,993		406	63		17	562
26-Jun	10	0	1,101	228	2,881		530	239		351	1,046
27-Jun	11	0	1,396	238	3,439	0	528	335	0	463	1,018
28-Jun	12	6	2,771	749	3,722	0	558	900	0	585	2,422
29-Jun	13	119	3,807	1,761	6,336	0	1,142	1,309	803	563	3,772
30-Jun	14	168	5,035	1,851	7,495	2,318	2,716	1,913	1,021	1,287	5,392
1-Jul	15	169	6,325	2,709	8,317	6,203	4,040	2,714	1,173	1,459	8,974
2-Jul	16	169	7,888	2,847	8,891	6,684	5,112	3,620	1,876	2,311	10,650
3-Jul	17	220	9,642	4,095	9,217	7,130	5,948	3,992	2,209	3,276	12,977
4-Jul	18	103	11,299	6,555	9,262	7,898	6,975	3,948	3,562	3,857	15,953
5-Jul	19	987	12,860	7,976	9,478	8,136	7,719	4,692	4,590	4,054	16,395
6-Jul	20	2,563	14,050	8,351	9,878	8,240	8,709	5,831	5,291	4,657	19,085
7-Jul	21	3,703	14,601	9,137	9,966	9,352	9,125	6,535	5,663	5,326	19,668
8-Jul	22	3,332	15,263	10,055	10,409	10,284	9,407	6,805	6,219	5,632	19,971
9-Jul	23	2,032	15,493	11,255	10,549	10,803	9,554	9,008	7,525	5,743	21,434
10-Jul	24	2,255	15,573	11,253	10,759	10,909	9,652	9,336	8,250	7,558	22,843
11-Jul	25	3,111	16,888	11,885	11,038	10,959	10,294	9,742	8,637	9,114	24,107
12-Jul	26	3,945	16,995	12,392	11,532	11,569	10,500	10,066	9,014	10,412	26,013
13-Jul	27	4,966	17,170	12,774	11,655	12,447	10,483	10,558	9,381	11,888	26,867
14-Jul	28	6,139	18,130	13,219	11,926	12,771	10,607	11,030	9,613	12,663	27,452
15-Jul	29	6,371	19,874	14,288	12,177	13,149	10,950	11,483	9,843	13,002	29,161
16-Jul	30	6,996	20,216	14,376	12,303	13,436	11,512	12,147	10,159	13,087	30,259
17-Jul	31	7,956	20,603	15,412	12,303	13,631	11,856	12,965	10,466	13,270	31,083
18-Jul	32	8,153	20,906	15,522	12,358	13,851	12,704	13,373	10,810	13,713	31,633
19-Jul	33	8,342	22,126	15,610	12,586	13,955	13,037	13,787	11,013	14,415	31,881
20-Jul	34	8,434	22,840	15,675	12,775	13,999	13,325	14,427	11,075	14,712	31,948
21-Jul	35	8,556	23,047	15,733	12,885	14,057	13,443	15,357	11,207	14,991	32,025
22-Jul	36	8,626	23,600	16,078	13,067	14,081	13,594	16,576	11,506	15,241	32,231
23-Jul	37	8,700	24,038	16,134	13,191	14,111	13,778	17,784	11,619	15,421	32,251
24-Jul	38	8,800	24,519		13,257	14,148	13,889	18,894	11,724	15,508	32,270
25-Jul	39	8,836	24,649		13,296	14,206	13,957	19,260	11,869	15,607	32,288
26-Jul	40	8,907	24,705		13,302	14,224		19,756	11,973	15,718	32,378
27-Jul	41	8,990				14,282		19,800	12,035	15,823	32,616
28-Jul	42	9,013							12,077		32,747
29-Jul	43										32,783
30-Jul	44										32,810
31-Jul	45										32,828
1-Aug	46										32,834
2-Aug	47										32,837
3-Aug	48										32,837
Total		9,013	24,705	16,134	13,302	14,282	13,957	19,800	12,077	15,823	32,837

[g] Reported counts are observed 18-hour counts expanded by weekly 24-hour counts.

[h] Count cut off on 8/3/94 for formatting purposes. 38 more chum salmon counted through 8/9/94.

- continued -

Appendix Table 1. (Page 4 of 4).

Timing Date	Day	Early 1995[i]	Early 1996[i]	Normal 1997	Normal 1998	1999[j]	Early 2000	Late 2001[k]
17-Jun	1							
18-Jun	2			0	0			
19-Jun	3			140	0			
20-Jun	4		707	220	0			
21-Jun	5	345	889	270	-13			
22-Jun	6	248	1,689	416	52		0	
23-Jun	7	1,314	3,218	789	194		348	
24-Jun	8	1,742	5,477	1,389	261		2,706	
25-Jun	9	1,534	5,661	1,793	236	0	2,802	
26-Jun	10	1,536	5,675	2,293	292	0	2,991	
27-Jun	11	3,910	6,036	2,492	290	8	4,623	0
28-Jun	12	7,121	8,796	3,028	942	12	7,863	348
29-Jun	13	10,016	12,014	3,443	1337	12	9,488	2,706
30-Jun	14	15,564	14,860	4,257	1477	26	9,497	2,802
1-Jul	15	18,262	16,445	5,471	3949	28	9,812	2,991
2-Jul	16	18,110	16,767	6,115	4480	98	10,406	4,623
3-Jul	17	18,935	16,945	6,854	5519	128	11,159	7,863
4-Jul	18	19,827	19,299	8,718	7644	477	11,900	9,488
5-Jul	19	24,763	20,321	9,435	9573	928	12,338	9,497
6-Jul	20	27,913	22,286	10,349	11292	1,480	12,476	9,812
7-Jul	21	29,315	23,804	11,432	12802	1,659	12,647	10,406
8-Jul	22	30,414	24,819	12,684	13506	1,787	12,893	11,159
9-Jul	23	31,212	25,331	13,062	13916	2,293	13,790	11,900
10-Jul	24	32,931	25,660	13,185	14370	3,978	14,885	12,338
11-Jul	25	35,198	26,026	13,288	16038	5,186	15,293	12,476
12-Jul	26	36,696	26,388	13,327	18240	5,911	15,572	12,647
13-Jul	27	38,699	26,630	14,189	19335	6,153	15,677	12,893
14-Jul	28	39,724	26,917	14,828	19323	6,450	15,932	13,790
15-Jul	29	40,372	27,087	15,244	19863	6,703	16,013	14,885
16-Jul	30	40,644	27,139	15,523	21777	6,833	16,118	15,293
17-Jul	31	40,764	27,397	17,109	22947	7,076	16,223	15,572
18-Jul	32	41,049	27,499	17,438	23133	7,278	16,238	15,677
19-Jul	33	41,372	27,718	18,331	23417	7,595	16,262	15,932
20-Jul	34	41,714	27,971	18,884	23683	8,027	16,280	16,013
21-Jul	35	42,012	28,075	19,266	23931	8,086	16,298	16,118
22-Jul	36	42,234	28,232	19,478	24117	8,136	16,373	16,223
23-Jul	37	42,378	28,442	19,796	24164	8,181	16,394	16,238
24-Jul	38	42,578	28,465	20,053	24192	8,214	16,412	16,262
25-Jul	39	42,703	28,493	20,081	24204	8,541	16,439	16,280
26-Jul	40			20,087	24216	8,694	16,451	16,298
27-Jul	41			20,118	24248	8,672	16,481	16,373
28-Jul	42					8,763		16,394
29-Jul	43							16,412
30-Jul	44							16,439
31-Jul	45							16,451
1-Aug	46							16,481
2-Aug	47							16,484
3-Aug	48							16,496
Total		42,703	28,493	20,118	24,248	8,763	16,481	16,496

[i] First days count is an aerial survey count

[j] 1999 was not used in run timing calculations due to extremely low run.

[k] Count cut off on 8/3/01 for formatting purposes. 102 more chum salmon counted through 8/22/01.

Appendix Table 2. Cumulative percent daily chum salmon run-timing at the Kwiniuk River counting tower, Norton Sound, 1965-2001.

Timing Date	Day	Normal 1965a	Normal 1966	Normal 1967	Early 1968	Normal 1969	Normal 1970[b]	Late 1971	Normal 1972	Late 1973	Early 1974
17-Jun	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
18-Jun	2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
19-Jun	3	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
20-Jun	4	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
21-Jun	5	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
22-Jun	6	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
23-Jun	7	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%
24-Jun	8	0.0%	3.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%
25-Jun	9	0.0%	1.8%	0.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	3.2%
26-Jun	10	0.0%	3.2%	0.3%	1.2%	0.3%	0.0%	0.1%	0.0%	0.0%	9.4%
27-Jun	11	0.0%	3.6%	1.0%	5.3%	0.6%	1.0%	0.1%	0.0%	0.1%	14.4%
28-Jun	12	0.7%	5.1%	1.2%	9.1%	2.2%	2.5%	0.2%	0.1%	0.1%	19.7%
29-Jun	13	3.0%	5.3%	5.5%	14.2%	2.9%	3.5%	0.4%	0.2%	0.1%	23.8%
30-Jun	14	7.8%	6.6%	8.1%	17.6%	7.5%	5.9%	0.5%	0.5%	0.1%	27.9%
1-Jul	15	10.5%	11.2%	10.3%	22.2%	10.4%	7.4%	1.2%	2.0%	0.3%	32.0%
2-Jul	16	23.6%	23.0%	11.4%	29.9%	13.9%	11.9%	1.9%	4.6%	0.7%	39.2%
3-Jul	17	11.5%	24.3%	13.1%	29.6%	19.6%	23.7%	3.1%	5.3%	1.4%	44.6%
4-Jul	18	30.4%	30.3%	21.2%	42.2%	30.7%	33.1%	8.8%	9.3%	5.4%	48.3%
5-Jul	19	33.6%	36.0%	23.1%	47.1%	36.1%	41.6%	12.5%	13.8%	16.2%	51.1%
6-Jul	20	36.8%	39.7%	36.1%	51.3%	41.1%	47.3%	16.2%	17.7%	17.6%	54.2%
7-Jul	21	38.0%	41.3%	49.1%	62.2%	47.2%	48.6%	17.1%	30.9%	11.0%	55.4%
8-Jul	22	40.9%	47.3%	58.9%	75.3%	52.5%	53.3%	27.9%	40.3%	30.3%	56.2%
9-Jul	23	42.1%	53.3%	69.5%	83.7%	59.4%	61.1%	30.2%	47.9%	31.6%	57.2%
10-Jul	24	47.6%	52.7%	80.7%	90.1%	61.8%	61.6%	35.0%	54.0%	53.6%	57.9%
11-Jul	25	58.3%	58.9%	88.1%	91.5%	63.7%	67.2%	44.2%	58.3%	54.7%	61.5%
12-Jul	26	68.5%	77.0%	94.5%	91.9%	66.8%	71.8%	48.9%	72.3%	58.2%	64.7%
13-Jul	27	71.5%	82.0%	99.4%	92.2%	71.9%	72.4%	50.6%	76.5%	59.9%	67.4%
14-Jul	28	80.5%	83.1%	99.4%	92.3%	72.8%	76.1%	53.8%	83.2%	67.6%	71.3%
15-Jul	29	97.5%	86.2%	99.6%	92.9%	76.2%	85.9%	54.5%	84.5%	70.2%	88.9%
16-Jul	30	98.0%	85.4%	99.8%	93.1%	84.2%	90.7%	57.3%	84.2%	71.8%	91.5%
17-Jul	31	98.7%	85.5%	99.1%	93.1%	86.7%	94.1%	70.5%	87.0%	79.9%	92.6%
18-Jul	32	98.9%	90.3%	100.0%	93.3%	92.9%	94.8%	71.5%	90.8%	85.9%	95.0%
19-Jul	33	100.0%	96.1%	100.0%	93.9%	94.7%	95.6%	80.2%	93.1%	90.0%	96.4%
20-Jul	34	100.0%	96.9%	100.0%	91.7%	95.8%	98.6%	88.4%	94.4%	92.7%	96.9%
21-Jul	35	100.0%	97.6%	100.0%	91.8%	97.4%	98.7%	90.1%	94.8%	97.4%	97.3%
22-Jul	36	100.0%	98.6%	100.0%	94.6%	98.1%	99.2%	92.1%	96.6%	97.5%	97.5%
23-Jul	37	100.0%	99.3%	100.0%	94.9%	98.2%	99.4%	92.9%	98.0%	98.4%	98.6%
24-Jul	38	100.0%	99.4%	100.0%	100.0%	98.9%	99.6%	94.6%	99.0%	99.9%	99.5%
25-Jul	39	100.0%	99.9%	100.0%	100.0%	98.9%	99.9%	96.6%	99.8%	100.0%	99.9%
26-Jul	40	100.0%	99.9%	100.0%	100.0%	100.0%	100.0%	98.5%	100.0%	100.0%	100.0%
27-Jul	41	100.0%	99.9%	100.0%	100.0%	100.0%	100.0%	99.6%	100.0%	100.0%	100.0%
28-Jul	42	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.9%	100.0%	100.0%	100.0%
29-Jul	43	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
30-Jul	44	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
31-Jul	45	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
1-Aug	46	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
2-Aug	47	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
3-Aug	48	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

[a] Although no counts were made from 6/19-6/27, crew notes indicate that few salmon passed during this period.

[b] Counts for 6/27-6/28 estimated from the 1965-1992 "Normal" run-timing curve. This year was excluded from the computation of the "Normal" run-timing curve.

- continued -

Appendix Table 2. (Page 2 of 4).

Timing Date	Day	Late 1975	Late 1976	Normal 1977	Early 1978[c]	Late 1979	Normal 1980	Normal 1981	Early 1982	Early 1983	Early 1984
17-Jun	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
18-Jun	2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
19-Jun	3	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
20-Jun	4	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.4%	0.0%	0.2%	0.0%
21-Jun	5	0.0%	0.0%	0.0%	1.2%	0.0%	0.0%	0.5%	0.0%	4.5%	0.0%
22-Jun	6	0.0%	0.0%	0.0%	1.7%	0.0%	0.0%	1.4%	0.9%	6.8%	0.1%
23-Jun	7	0.0%	0.0%	0.0%	2.2%	0.0%	0.1%	2.7%	1.2%	7.8%	0.1%
24-Jun	8	0.0%	0.0%	0.0%	3.2%	0.0%	0.3%	6.9%	1.3%	11.8%	0.6%
25-Jun	9	0.0%	0.0%	0.0%	6.6%	0.0%	1.1%	9.9%	13.8%	16.4%	2.2%
26-Jun	10	0.0%	0.0%	0.0%	10.0%	0.0%	1.8%	13.2%	22.7%	17.9%	6.3%
27-Jun	11	0.0%	0.0%	0.1%	12.3%	0.1%	2.1%	14.8%	25.0%	18.3%	9.9%
28-Jun	12	0.0%	0.1%	1.2%	15.3%	1.6%	3.4%	15.0%	26.2%	23.6%	12.8%
29-Jun	13	0.0%	0.5%	2.1%	20.3%	2.4%	5.2%	16.4%	27.5%	24.3%	17.1%
30-Jun	14	0.0%	0.5%	3.0%	27.5%	15.9%	5.8%	20.4%	29.3%	26.0%	28.0%
1-Jul	15	0.0%	1.5%	9.4%	36.0%	18.1%	18.9%	22.5%	27.9%	40.5%	32.8%
2-Jul	16	0.0%	2.0%	13.1%	41.7%	19.1%	18.6%	23.1%	31.4%	40.8%	42.2%
3-Jul	17	0.0%	2.9%	18.5%	46.7%	21.4%	18.1%	33.6%	37.9%	45.0%	52.2%
4-Jul	18	0.5%	6.3%	20.7%	49.6%	23.5%	19.2%	39.1%	44.7%	47.8%	56.4%
5-Jul	19	2.6%	10.9%	27.2%	54.0%	23.8%	27.8%	38.5%	50.8%	56.1%	59.1%
6-Jul	20	5.2%	12.9%	31.6%	62.1%	26.7%	35.4%	43.8%	52.0%	59.8%	66.2%
7-Jul	21	5.9%	16.0%	37.2%	67.2%	28.1%	42.4%	47.6%	60.2%	65.6%	61.0%
8-Jul	22	7.0%	22.2%	53.6%	72.6%	29.7%	57.8%	48.6%	71.1%	74.9%	63.4%
9-Jul	23	8.1%	23.7%	65.9%	76.4%	37.3%	61.0%	57.3%	77.8%	78.3%	65.0%
10-Jul	24	10.3%	26.0%	72.7%	79.8%	43.1%	63.8%	58.8%	78.5%	81.2%	75.8%
11-Jul	25	13.4%	31.6%	81.3%	83.2%	44.8%	66.9%	59.9%	79.4%	82.8%	88.5%
12-Jul	26	14.6%	38.6%	86.4%	89.3%	45.7%	72.7%	66.3%	83.2%	83.3%	91.2%
13-Jul	27	16.8%	48.9%	87.2%	91.4%	51.5%	81.5%	69.0%	86.9%	84.6%	92.5%
14-Jul	28	24.4%	50.6%	89.1%	92.7%	56.7%	80.2%	74.2%	88.0%	85.0%	94.8%
15-Jul	29	22.4%	56.7%	92.4%	96.2%	67.3%	81.5%	78.7%	89.8%	85.8%	95.6%
16-Jul	30	52.6%	62.0%	92.9%	97.6%	76.0%	83.0%	81.1%	90.6%	87.7%	96.3%
17-Jul	31	67.6%	70.4%	94.2%	98.1%	80.6%	87.0%	83.2%	91.3%	90.2%	98.6%
18-Jul	32	74.3%	71.7%	95.3%	99.4%	73.6%	90.4%	85.8%	93.1%	90.5%	98.7%
19-Jul	33	84.8%	74.8%	96.4%	99.4%	84.9%	93.5%	87.2%	94.8%	92.3%	98.7%
20-Jul	34	90.2%	79.3%	97.1%	99.7%	88.3%	96.3%	90.7%	97.5%	95.4%	99.0%
21-Jul	35	95.6%	84.5%	97.9%	100.0%	93.2%	98.5%	93.0%	98.4%	96.8%	99.4%
22-Jul	36	98.3%	88.1%	99.1%	100.0%	98.7%	98.9%	93.6%	98.9%	97.5%	99.4%
23-Jul	37	99.4%	92.2%	99.6%	100.0%	99.4%	99.6%	96.5%	99.6%	99.0%	99.7%
24-Jul	38	99.9%	93.4%	99.8%	100.0%	99.7%	99.8%	98.2%	99.6%	99.5%	99.9%
25-Jul	39	100.0%	94.9%	100.0%	100.0%	100.0%	99.9%	99.0%	99.8%	99.6%	100.0%
26-Jul	40	100.0%	97.7%	100.0%	100.0%	100.0%	99.9%	99.3%	100.0%	99.7%	100.0%
27-Jul	41	100.0%	98.5%	100.0%	100.0%	100.0%	100.0%	99.6%	100.0%	100.0%	100.0%
28-Jul	42	100.0%	99.1%	100.0%	100.0%	100.0%	100.0%	99.6%	100.0%	100.0%	100.0%
29-Jul	43	100.0%	99.6%	100.0%	100.0%	100.0%	100.0%	99.9%	100.0%	100.0%	100.0%
30-Jul	44	100.0%	99.7%	100.0%	100.0%	100.0%	100.0%	99.9%	100.0%	100.0%	100.0%
31-Jul	45	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.9%	100.0%	100.0%	100.0%
1-Aug	46	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
2-Aug	47	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
3-Aug	48	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

[c] Counts prior to 7/4 estimated from the 1965-1992 "Normal" run-timing curve. This year was excluded from the computation of the "Normal" run-timing curve.

- continued -

Appendix Table 2. (Page 3 of 4).

Timing Date	Day	Late 1085	Early 1986	Normal 1987	Early 1988	Early 1989	Early 1990	Late 1991	Normal 1992	Normal 1993	Early 1994[d]
17-Jun	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
18-Jun	2	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
19-Jun	3	0.0%	0.0%	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
20-Jun	4	0.0%	0.2%	0.0%	5.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
21-Jun	5	0.0%	0.2%	0.0%	5.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
22-Jun	6	0.0%	1.3%	0.0%	4.5%	0.0%	0.6%	0.1%	0.0%	0.0%	0.0%
23-Jun	7	0.0%	3.6%	0.0%	4.7%	0.0%	0.7%	0.2%	0.0%	0.0%	0.2%
24-Jun	8	0.0%	4.6%	0.0%	5.8%	0.0%	1.5%	0.1%	0.0%	0.0%	0.5%
25-Jun	9	0.0%	4.1%	0.6%	15.0%	0.0%	2.9%	0.3%	0.0%	0.1%	1.7%
26-Jun	10	0.0%	4.5%	1.4%	21.7%	0.0%	3.8%	1.2%	0.0%	2.2%	3.2%
27-Jun	11	0.0%	5.7%	1.5%	25.9%	0.0%	3.8%	1.7%	0.0%	2.9%	3.1%
28-Jun	12	0.1%	11.2%	4.6%	28.0%	0.0%	4.0%	4.5%	0.0%	3.7%	7.4%
29-Jun	13	1.3%	15.4%	10.9%	47.6%	0.0%	8.2%	6.6%	6.6%	3.6%	11.5%
30-Jun	14	1.9%	20.4%	11.5%	56.3%	16.2%	19.5%	9.7%	8.5%	8.1%	16.4%
1-Jul	15	1.9%	25.6%	16.8%	62.5%	43.4%	28.9%	13.7%	9.7%	9.2%	27.3%
2-Jul	16	1.9%	31.9%	17.6%	66.8%	46.8%	36.6%	18.3%	15.5%	14.6%	32.4%
3-Jul	17	2.4%	39.0%	25.4%	69.3%	49.9%	42.6%	20.2%	18.3%	20.7%	39.5%
4-Jul	18	1.1%	45.7%	40.6%	69.6%	55.3%	50.0%	19.9%	29.5%	24.4%	48.6%
5-Jul	19	11.0%	52.1%	49.4%	71.3%	57.0%	55.3%	23.7%	38.0%	25.6%	49.9%
6-Jul	20	28.4%	56.9%	51.8%	74.3%	57.7%	62.4%	29.4%	43.8%	29.4%	58.1%
7-Jul	21	41.1%	59.1%	56.6%	74.9%	65.5%	65.4%	33.0%	46.9%	33.7%	59.9%
8-Jul	22	37.0%	61.8%	62.3%	78.3%	72.0%	67.4%	34.4%	51.5%	35.6%	60.8%
9-Jul	23	22.5%	62.7%	69.8%	79.3%	75.6%	68.5%	45.5%	62.3%	36.3%	65.3%
10-Jul	24	25.0%	63.0%	69.7%	80.9%	76.4%	69.2%	47.2%	68.3%	47.8%	69.6%
11-Jul	25	34.5%	68.4%	73.7%	83.0%	76.7%	73.8%	49.2%	71.5%	57.6%	73.4%
12-Jul	26	43.8%	68.8%	76.8%	86.7%	81.0%	75.2%	50.8%	74.6%	65.8%	79.2%
13-Jul	27	55.1%	69.5%	79.2%	87.6%	87.2%	75.1%	53.3%	77.7%	75.1%	81.8%
14-Jul	28	68.1%	73.4%	81.9%	89.7%	89.4%	76.0%	55.7%	79.6%	80.0%	83.6%
15-Jul	29	70.7%	80.4%	88.6%	91.5%	92.1%	78.5%	58.0%	81.5%	82.2%	88.8%
16-Jul	30	77.6%	81.8%	89.1%	92.5%	94.1%	82.5%	61.3%	84.1%	82.7%	92.1%
17-Jul	31	88.3%	83.4%	95.5%	92.5%	95.4%	84.9%	65.5%	86.7%	83.9%	94.7%
18-Jul	32	90.5%	84.6%	96.2%	92.9%	97.0%	91.0%	67.5%	89.5%	86.7%	96.3%
19-Jul	33	92.6%	89.6%	96.8%	94.6%	97.7%	93.4%	69.6%	91.2%	91.1%	97.1%
20-Jul	34	93.6%	92.5%	97.2%	96.0%	98.0%	95.5%	72.9%	91.7%	93.0%	97.3%
21-Jul	35	94.9%	93.3%	97.5%	96.9%	98.4%	96.3%	77.6%	92.8%	94.7%	97.5%
22-Jul	36	95.7%	95.5%	99.7%	98.2%	98.6%	97.4%	83.7%	95.3%	96.3%	98.2%
23-Jul	37	96.5%	97.3%	100.0%	99.2%	98.8%	98.7%	89.8%	96.2%	97.5%	98.2%
24-Jul	38	97.6%	99.2%	100.0%	99.7%	99.1%	99.5%	95.4%	97.1%	98.0%	98.3%
25-Jul	39	98.0%	99.8%	100.0%	100.0%	99.5%	100.0%	97.3%	98.3%	98.6%	98.3%
26-Jul	40	98.8%	100.0%	100.0%	100.0%	99.6%	100.0%	99.8%	99.1%	99.3%	98.6%
27-Jul	41	99.7%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.7%	100.0%	99.3%
28-Jul	42	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.7%
29-Jul	43	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.8%
30-Jul	44	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.9%
31-Jul	45	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
1-Aug	46	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
2-Aug	47	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
3-Aug	48	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

[d] Count cut off on 8/3/94 for formatting purposes. 38 more chum salmon counted through 8/9/94.

- continued -

Appendix Table 2. (Page 4 of 4).

Timing Date	Day	Early 1995[e]	Early 1996[e]	Normal 1997	Normal 1998	1999[f]	Early 2000	Late 2001
17-Jun	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
18-Jun	2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
19-Jun	3	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%
20-Jun	4	0.0%	2.5%	1.1%	0.0%	0.0%	0.0%	0.0%
21-Jun	5	0.8%	3.1%	1.3%	-0.1%	0.0%	0.0%	0.0%
22-Jun	6	0.6%	5.9%	2.1%	0.2%	0.0%	0.0%	0.0%
23-Jun	7	3.1%	11.3%	3.9%	0.8%	0.0%	2.1%	0.0%
24-Jun	8	4.1%	19.2%	6.9%	1.1%	0.0%	16.4%	0.0%
25-Jun	9	3.6%	19.9%	8.9%	1.0%	0.0%	17.0%	0.0%
26-Jun	10	3.6%	19.9%	11.4%	1.2%	0.0%	18.1%	0.0%
27-Jun	11	9.2%	21.2%	12.4%	1.2%	0.1%	28.1%	0.0%
28-Jun	12	16.7%	30.9%	15.1%	3.9%	0.1%	47.7%	2.1%
29-Jun	13	23.5%	42.2%	17.1%	5.5%	0.1%	57.6%	16.4%
30-Jun	14	36.4%	52.2%	21.2%	6.1%	0.3%	57.6%	17.0%
1-Jul	15	42.8%	57.7%	27.2%	16.3%	0.3%	59.5%	18.1%
2-Jul	16	42.4%	58.8%	30.4%	18.5%	1.1%	63.1%	28.0%
3-Jul	17	44.3%	59.5%	34.1%	22.8%	1.5%	67.7%	47.7%
4-Jul	18	46.4%	67.7%	43.3%	31.5%	5.4%	72.2%	57.5%
5-Jul	19	58.0%	71.3%	46.9%	39.5%	10.6%	74.9%	57.6%
6-Jul	20	65.4%	78.2%	51.4%	46.6%	16.9%	75.7%	59.5%
7-Jul	21	68.6%	83.5%	56.8%	52.8%	18.9%	76.7%	63.1%
8-Jul	22	71.2%	87.1%	63.0%	55.7%	20.4%	78.2%	67.6%
9-Jul	23	73.1%	88.9%	64.9%	57.4%	26.2%	83.7%	72.1%
10-Jul	24	77.1%	90.1%	65.5%	59.3%	45.4%	90.3%	74.8%
11-Jul	25	82.4%	91.3%	66.1%	66.1%	59.2%	92.8%	75.6%
12-Jul	26	85.9%	92.6%	66.2%	75.2%	67.5%	94.5%	76.7%
13-Jul	27	90.6%	93.5%	70.5%	79.7%	70.2%	95.1%	78.2%
14-Jul	28	93.0%	94.5%	73.7%	79.7%	73.6%	96.7%	83.6%
15-Jul	29	94.5%	95.1%	75.8%	81.9%	76.5%	97.2%	90.2%
16-Jul	30	95.2%	95.2%	77.2%	89.8%	78.0%	97.8%	92.7%
17-Jul	31	95.5%	96.2%	85.0%	94.6%	80.7%	98.4%	94.4%
18-Jul	32	96.1%	96.5%	86.7%	95.4%	83.1%	98.5%	95.0%
19-Jul	33	96.9%	97.3%	91.1%	96.6%	86.7%	98.7%	96.6%
20-Jul	34	97.7%	98.2%	93.9%	97.7%	91.6%	98.8%	97.1%
21-Jul	35	98.4%	98.5%	95.8%	98.7%	92.3%	98.9%	97.7%
22-Jul	36	98.9%	99.1%	96.8%	99.5%	92.9%	99.3%	98.3%
23-Jul	37	99.2%	99.8%	98.4%	99.7%	93.4%	99.5%	98.4%
24-Jul	38	99.7%	99.9%	99.7%	99.8%	93.7%	99.6%	98.6%
25-Jul	39	100.0%	100.0%	99.8%	99.8%	97.5%	99.7%	98.7%
26-Jul	40	100.0%	100.0%	99.8%	99.9%	99.2%	99.8%	98.8%
27-Jul	41	100.0%	100.0%	100.0%	100.0%	99.0%	100.0%	99.3%
28-Jul	42	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.4%
29-Jul	43	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.5%
30-Jul	44	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.7%
31-Jul	45	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.7%
1-Aug	46	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.9%
2-Aug	47	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.9%
3-Aug	48	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

[e] First days count is an aerial survey count

[f] 1999 was not used in run timing calculations due to extremely low run.

Appendix Table 3. Kwiniuk River counting tower chum salmon run-timing models, percent passage by day, Norton Sound, 1965-2001.

The run-timing expressed in numbers of chum reflects the tower passage goal of 19,500 chum salmon established in 1992.

		All Years		Early Model[a]		Normal Model[b]		Late Model[c]		Tower Goal	
Date	Day	Percent	Number	Percent	Number	Percent	Number	Percent	Number	2001	
17-Jun	1	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	19,500
18-Jun	2	0.0%	1	0.0%	2	0.0%	0	0.0%	0	0.0%	19,500
19-Jun	3	0.1%	17	0.2%	30	0.1%	12	0.0%	0	0.0%	19,500
20-Jun	4	0.3%	55	0.6%	122	0.1%	19	0.0%	0	0.0%	19,500
21-Jun	5	0.5%	92	1.1%	211	0.1%	27	0.0%	0	0.0%	19,500
22-Jun	6	0.8%	148	1.6%	319	0.4%	70	0.0%	2	0.0%	19,500
23-Jun	7	1.3%	255	2.8%	541	0.6%	126	0.0%	5	0.0%	19,500
24-Jun	8	2.4%	476	5.3%	1,028	1.0%	192	0.0%	3	0.0%	19,500
25-Jun	9	3.5%	687	7.7%	1,501	2.1%	410	0.1%	10	0.0%	19,500
26-Jun	10	4.8%	941	10.2%	1,984	3.4%	668	0.2%	37	0.0%	19,500
27-Jun	11	6.1%	1,187	13.1%	2,546	3.9%	754	0.3%	54	0.0%	19,500
28-Jun	12	8.6%	1,686	18.2%	3,558	5.2%	1,009	0.9%	183	2.1%	19,500
29-Jun	13	12.1%	2,364	24.1%	4,691	7.3%	1,431	1.6%	313	16.4%	19,500
30-Jun	14	16.2%	3,151	31.1%	6,056	9.5%	1,858	4.1%	794	17.0%	19,500
1-Jul	15	21.0%	4,091	38.7%	7,550	13.8%	2,696	5.2%	1,022	18.1%	19,500
2-Jul	16	24.8%	4,832	43.3%	8,437	18.2%	3,541	6.3%	1,223	28.0%	19,500
3-Jul	17	28.6%	5,573	47.8%	9,319	20.7%	4,044	7.3%	1,431	47.7%	19,500
4-Jul	18	34.5%	6,726	53.5%	10,424	28.9%	5,636	9.4%	1,826	57.5%	19,500
5-Jul	19	39.3%	7,663	58.0%	11,308	34.5%	6,719	14.4%	2,805	57.6%	19,500
6-Jul	20	44.3%	8,640	62.5%	12,182	39.5%	7,701	19.5%	3,801	59.5%	19,500
7-Jul	21	48.3%	9,427	66.0%	12,871	45.6%	8,897	21.8%	4,241	63.1%	19,500
8-Jul	22	53.7%	10,478	70.6%	13,766	53.1%	10,359	26.9%	5,250	67.6%	19,500
9-Jul	23	57.9%	11,282	73.8%	14,385	59.0%	11,512	28.4%	5,542	72.1%	19,500
10-Jul	24	62.3%	12,145	76.9%	15,001	63.3%	12,335	34.3%	6,691	74.8%	19,500
11-Jul	25	66.9%	13,037	80.4%	15,684	68.5%	13,349	38.9%	7,590	75.6%	19,500
12-Jul	26	71.5%	13,951	82.9%	16,173	75.4%	14,703	42.9%	8,372	76.7%	19,500
13-Jul	27	75.0%	14,617	84.9%	16,558	79.9%	15,588	48.0%	9,362	78.2%	19,500
14-Jul	28	78.1%	15,220	86.7%	16,913	82.4%	16,068	53.9%	10,501	83.6%	19,500
15-Jul	29	81.8%	15,948	90.1%	17,566	86.0%	16,764	57.1%	11,136	90.2%	19,500
16-Jul	30	84.9%	16,548	91.6%	17,856	87.8%	17,116	65.5%	12,780	92.7%	19,500
17-Jul	31	88.2%	17,202	92.8%	18,102	90.4%	17,629	74.7%	14,562	94.4%	19,500
18-Jul	32	90.0%	17,548	94.1%	18,352	92.8%	18,093	76.4%	14,904	95.0%	19,500
19-Jul	33	92.6%	18,047	95.5%	18,620	95.0%	18,531	82.4%	16,072	96.6%	19,500
20-Jul	34	94.4%	18,401	96.5%	18,817	96.3%	18,771	86.5%	16,865	97.1%	19,500
21-Jul	35	95.7%	18,671	97.1%	18,929	97.2%	18,962	90.5%	17,643	97.7%	19,500
22-Jul	36	97.0%	18,921	97.9%	19,098	98.3%	19,165	93.5%	18,223	98.3%	19,500
23-Jul	37	98.0%	19,105	98.7%	19,239	98.9%	19,289	95.5%	18,623	98.4%	19,500
24-Jul	38	98.8%	19,266	99.5%	19,401	99.3%	19,366	97.2%	18,961	98.6%	19,500
25-Jul	39	99.3%	19,361	99.7%	19,448	99.6%	19,422	98.1%	19,133	98.7%	19,500
26-Jul	40	99.7%	19,436	99.8%	19,466	99.8%	19,471	99.3%	19,355	98.8%	19,500
27-Jul	41	99.9%	19,471	99.9%	19,490	100.0%	19,493	99.7%	19,441	99.3%	19,500
28-Jul	42	99.9%	19,487	100.0%	19,496	100.0%	19,500	99.8%	19,470	99.4%	19,500
29-Jul	43	100.0%	19,493	100.0%	19,498	100.0%	19,500	99.9%	19,488	99.5%	19,500
30-Jul	44	100.0%	19,496	100.0%	19,499	100.0%	19,500	100.0%	19,491	99.7%	19,500
31-Jul	45	100.0%	19,498	100.0%	19,500	100.0%	19,500	100.0%	19,500	99.7%	19,500
1-Aug	46	100.0%	19,499	100.0%	19,500	100.0%	19,500	100.0%	19,500	99.9%	19,500
2-Aug	47	100.0%	19,500	100.0%	19,500	100.0%	19,500	100.0%	19,500	99.9%	19,500
3-Aug	48	100.0%	19,500	100.0%	19,500	100.0%	19,500	100.0%	19,500	100.0%	19,500

[a] Includes 1968, 1974, 1982, 1984, 1986, 1988, 1989, 1990, 1994, 1995, 1996, and 2000.

[b] Includes 1965, 1966, 1967, 1969, 1972, 1977, 1980, 1981, 1987, 1992, 1993, 1997 and 1998.

[c] Includes 1971, 1973, 1975, 1976, 1979, 1985, and 1991.

[d] 1999 was not used in run timing calculations due to extremely low run.

Appendix Table 4. Expanded daily and percent cumulative pink salmon migration past the Kwiniuk River counting tower, Norton Sound, 1981-2001.

	1981		1982		1983		1984		1985		1986	
Date	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative
17-Jun		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
18-Jun		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
19-Jun	16	0.0%		0.0%	0	0.0%	0	0.0%		0.0%	0	0.0%
20-Jun	40	0.0%		0.0%	0	0.0%	33	0.0%		0.0%	0	0.0%
21-Jun	-23	0.0%	3	0.0%	0	0.0%	31	0.0%		0.0%	0	0.0%
22-Jun	19	0.0%	159	0.0%	0	0.0%	24	0.0%		0.0%	32	0.0%
23-Jun	49	0.0%	66	0.0%	0	0.0%	25	0.0%		0.0%	64	0.0%
24-Jun	204	0.1%	57	0.1%	0	0.0%	92	0.0%		0.0%	76	0.1%
25-Jun	165	0.1%	6,104	1.4%	38	0.0%	592	0.1%		0.0%	48	0.1%
26-Jun	240	0.1%	10,838	3.7%	110	0.1%	1,954	0.4%	0	0.0%	65	0.1%
27-Jun	200	0.2%	12,476	6.3%	1	0.1%	3,320	0.9%	6	0.0%	204	0.2%
28-Jun	108	0.2%	3,473	7.1%	52	0.1%	1,246	1.1%	12	0.1%	807	0.5%
29-Jun	266	0.2%	4,936	8.1%	29	0.1%	1,355	1.3%	55	0.4%	913	0.9%
30-Jun	426	0.3%	7,690	9.8%	69	0.1%	9,597	2.8%	17	0.5%	1,031	1.3%
1-Jul	339	0.4%	-2,483	9.2%	1,732	0.8%	16,599	5.3%	2	0.5%	7,663	4.5%
2-Jul	309	0.4%	1,481	9.5%	80	0.8%	46,310	12.2%	0	0.5%	13,144	10.0%
3-Jul	1,563	0.7%	24,331	14.7%	972	1.2%	51,190	19.9%	2	0.5%	17,262	17.1%
4-Jul	2,763	1.2%	39,665	23.2%	468	1.4%	14,206	22.1%	16	0.6%	20,767	25.7%
5-Jul	-117	1.2%	32,835	30.2%	2,746	2.5%	37	22.1%	112	1.2%	24,272	35.8%
6-Jul	5,210	2.1%	10,011	32.3%	2,440	3.4%	6,116	23.0%	230	2.5%	17,475	43.0%
7-Jul	4,182	2.8%	60,379	45.1%	4,976	5.4%	-5,809	22.1%	602	5.8%	10,031	47.2%
8-Jul	4,007	3.5%	67,221	59.5%	8,767	8.8%	2,831	22.6%	-9	5.7%	10,249	51.4%
9-Jul	13,401	5.9%	52,049	70.5%	18,285	16.0%	3,640	23.1%	-882	0.9%	2,563	52.5%
10-Jul	2,844	6.4%	13,666	73.4%	19,726	23.8%	13,814	25.2%	133	1.6%	2,127	53.3%
11-Jul	5,935	7.4%	13,865	76.4%	14,696	29.5%	124,383	43.9%	353	3.6%	16,734	60.3%
12-Jul	14,111	9.9%	25,637	81.9%	8,011	32.7%	83,245	56.5%	576	6.7%	3,672	61.8%
13-Jul	8,951	11.5%	19,410	86.0%	8,341	36.0%	46,722	63.5%	1,605	15.5%	2,269	62.7%
14-Jul	16,695	14.5%	10,799	88.3%	1,919	36.7%	94,373	77.8%	3,691	35.8%	11,210	67.4%
15-Jul	21,549	18.3%	8,153	90.0%	1,711	37.4%	46,960	84.8%	962	41.0%	20,151	75.7%
16-Jul	32,659	24.0%	3,749	90.8%	5,480	39.5%	29,263	89.2%	1,874	51.3%	9,005	79.5%
17-Jul	35,565	30.3%	5,121	91.9%	14,266	45.1%	29,810	93.7%	2,688	66.0%	5,387	81.7%
18-Jul	31,503	35.9%	6,562	93.3%	4,891	47.1%	3,265	94.2%	824	70.6%	6,330	84.3%
19-Jul	18,367	39.1%	6,119	94.6%	20,022	54.9%	1,924	94.5%	924	75.6%	6,380	86.9%
20-Jul	49,831	47.9%	11,385	97.0%	25,257	64.9%	4,096	95.1%	796	80.0%	5,012	89.0%
21-Jul	43,404	55.6%	6,433	98.4%	25,582	74.9%	10,266	96.7%	807	84.4%	3,643	90.5%
22-Jul	27,813	60.5%	2,156	98.9%	14,330	80.5%	1,767	96.9%	410	86.7%	10,063	94.7%
23-Jul	69,683	72.8%	1,216	99.1%	29,715	92.2%	8,297	98.2%	240	88.0%	4,919	96.7%
24-Jul	81,808	87.2%	163	99.2%	12,499	97.1%	7,180	99.3%	304	89.7%	3,707	98.3%
25-Jul	48,678	95.8%	2,077	99.6%	1,768	97.8%	4,779	100.0%	280	91.2%	2,244	99.2%
26-Jul	3,893	96.5%	1,872	100.0%	2,846	98.9%		100.0%	445	93.6%	1,927	100.0%
27-Jul	6,089	97.6%		100.0%	2,713	100.0%		100.0%	729	97.6%		100.0%
28-Jul	-92	97.5%		100.0%		100.0%		100.0%	433	100.0%		100.0%
29-Jul	8,531	99.1%		100.0%		100.0%		100.0%		100.0%		100.0%
30-Jul	1,657	99.3%		100.0%		100.0%		100.0%		100.0%		100.0%
31-Jul	1,689	99.6%		100.0%		100.0%		100.0%		100.0%		100.0%
1-Aug	1,175	99.9%		100.0%		100.0%		100.0%		100.0%		100.0%
2-Aug	829	100.0%		100.0%		100.0%		100.0%		100.0%		100.0%
3-Aug		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%
Total	566,534		469,674		254,538		663,533		18,237		241,446	

Annual totals have been calculated using fractions which may cause minor discrepancies with historical data.

- continued -

Appendix Table 4. (Page 2 of 4).

	1987		1988		1989		1990		1991		1992	
Date	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative
17-Jun		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
18-Jun		0.0%	2	0.0%		0.0%		0.0%	0	0.0%		0.0%
19-Jun		0.0%	28	0.0%		0.0%		0.0%	0	0.0%		0.0%
20-Jun		0.0%	55	0.0%		0.0%		0.0%	0	0.0%		0.0%
21-Jun		0.0%	0	0.0%		0.0%	10	0.0%	0	0.0%		0.0%
22-Jun		0.0%	-11	0.0%		0.0%	2	0.0%	6	0.0%		0.0%
23-Jun		0.0%	23	0.1%		0.0%	0	0.0%	10	0.0%		0.0%
24-Jun		0.0%	16	0.1%		0.0%	20	0.0%	0	0.0%		0.0%
25-Jun	2	0.0%	120	0.1%		0.0%	40	0.0%	0	0.0%		0.0%
26-Jun	14	0.3%	143	0.2%		0.0%	50	0.0%	0	0.0%		0.0%
27-Jun	0	0.3%	165	0.3%	2	0.0%	22	0.0%	4	0.0%	0	0.0%
28-Jun	0	0.3%	167	0.4%	0	0.0%	52	0.0%	4	0.0%	0	0.0%
29-Jun	0	0.3%	2,980	2.0%	0	0.0%	269	0.1%	4	0.1%	2,537	0.2%
30-Jun	0	0.3%	3,871	4.0%	63	0.2%	2,807	0.8%	37	0.1%	2,038	0.3%
1-Jul	4	0.4%	9,525	9.1%	242	1.1%	12,328	3.7%	70	0.3%	1,267	0.4%
2-Jul	0	0.4%	10,952	14.9%	226	1.9%	21,849	9.0%	64	0.4%	3,979	0.7%
3-Jul	12	0.6%	12,379	21.5%	458	3.6%	22,332	14.4%	390	1.1%	5,044	1.0%
4-Jul	4	0.6%	2,483	22.8%	682	6.1%	39,003	23.7%	-74	1.0%	38,247	3.6%
5-Jul	45	1.5%	7,448	26.8%	80	6.4%	34,862	32.1%	85	1.1%	34,349	6.0%
6-Jul	55	2.4%	13,985	34.2%	70	6.6%	23,589	37.8%	216	1.5%	30,452	8.1%
7-Jul	171	5.5%	2,596	35.6%	794	9.5%	31,299	45.3%	198	1.9%	18,541	9.3%
8-Jul	77	6.9%	6,932	39.3%	2,574	18.9%	20,809	50.3%	179	2.2%	21,830	10.8%
9-Jul	226	11.0%	5,545	42.2%	1,557	24.5%	10,320	52.7%	1,533	5.1%	103,111	17.8%
10-Jul	0	11.0%	9,415	47.2%	539	26.5%	7,535	54.5%	771	6.5%	98,206	24.6%
11-Jul	46	11.8%	13,286	54.3%	174	27.1%	16,582	58.5%	714	7.9%	59,906	28.6%
12-Jul	92	13.4%	32,066	71.4%	926	30.5%	9,598	60.8%	631	9.1%	65,927	33.1%
13-Jul	90	15.1%	4,677	73.9%	1,340	35.4%	-502	60.7%	-2	9.0%	71,947	38.1%
14-Jul	90	16.7%	8,219	78.2%	964	38.9%	1,458	61.1%	389	9.8%	17,376	39.2%
15-Jul	314	22.3%	8,628	82.8%	1,394	44.0%	8,970	63.2%	781	11.2%	31,601	41.4%
16-Jul	370	29.0%	4,310	85.1%	1,576	49.7%	16,482	67.2%	2,836	16.5%	50,625	44.9%
17-Jul	1,508	56.1%	-8	85.1%	1,757	56.1%	12,999	70.3%	1,576	19.5%	126,030	53.5%
18-Jul	252	60.6%	670	85.5%	2,132	63.8%	23,693	76.0%	1,221	21.8%	140,589	63.1%
19-Jul	329	66.5%	2,862	87.0%	760	66.6%	19,937	80.8%	1,334	24.3%	79,465	68.5%
20-Jul	296	71.8%	3,553	88.9%	472	68.3%	14,003	84.1%	3,342	30.5%	18,342	69.7%
21-Jul	470	80.3%	3,727	90.9%	1,270	72.9%	8,256	86.1%	3,859	37.7%	78,120	75.1%
22-Jul	891	96.3%	4,687	93.4%	1,246	77.5%	14,074	89.5%	4,375	45.9%	120,281	83.3%
23-Jul	208	100.0%	4,451	95.7%	1,152	81.7%	19,893	94.3%	6,049	57.2%	50,140	86.7%
24-Jul		100.0%	4,214	98.0%	1,768	88.1%	16,516	98.2%	8,913	73.9%	55,111	90.5%
25-Jul		100.0%	3,216	99.7%	1,430	93.3%	7,355	100.0%	5,314	83.8%	60,936	94.6%
26-Jul		100.0%	614	100.0%	1,134	97.4%		100.0%	5,812	94.7%	39,490	97.3%
27-Jul		100.0%		100.0%	706	100.0%		100.0%	2,858	100.0%	18,044	98.6%
28-Jul		100.0%		100.0%		100.0%		100.0%		100.0%	21,185	100.0%
29-Jul		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%
30-Jul		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%
31-Jul		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%
1-Aug		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%
2-Aug		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%
3-Aug		100.0%		100.0%		100.0%		100.0%		100.0%		100.0%
Total	5,566		187,991		27,488		416,512		53,499		1,464,716	

Annual totals have been calculated using fractions which may cause minor discrepancies with historical data.

- continued -

Appendix Table 4. (Page 3 of 4).

	1993		1994[a]		1995		1996		1997		1998	
Date	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative
17-Jun		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
18-Jun		0.0%		0.0%		0.0%		0.0%	0	0.0%	0	0.0%
19-Jun		0.0%		0.0%		0.0%		0.0%	0	0.0%	4	0.0%
20-Jun		0.0%		0.0%		0.0%	130	0.0%	0	0.0%	0	0.0%
21-Jun		0.0%		0.0%	0	0.0%	46	0.0%	0	0.0%	2	0.0%
22-Jun		0.0%		0.0%	0	0.0%	121	0.0%	0	0.0%	15	0.0%
23-Jun	0	0.0%	24	0.0%	0	0.0%	314	0.1%	0	0.0%	28	0.0%
24-Jun	0	0.0%	46	0.0%	0	0.0%	506	0.1%	0	0.0%	2	0.0%
25-Jun	2	0.0%	72	0.0%	4	0.0%	154	0.1%	0	0.0%	-8	0.0%
26-Jun	6	0.0%	132	0.0%	8	0.1%	167	0.2%	0	0.0%	20	0.0%
27-Jun	4	0.0%	-24	0.0%	4	0.1%	350	0.2%	0	0.0%	65	0.0%
28-Jun	5	0.0%	223	0.0%	0	0.1%	429	0.2%	0	0.0%	276	0.1%
29-Jun	0	0.0%	384	0.0%	8	0.1%	2,989	0.6%	0	0.0%	144	0.1%
30-Jun	52	0.2%	187	0.0%	10	0.2%	10,749	1.8%	3	0.0%	12	0.1%
1-Jul	10	0.2%	3,883	0.2%	2	0.2%	10,455	2.9%	6	0.1%	2,287	0.4%
2-Jul	162	0.6%	2,830	0.3%	-1	0.2%	10,160	4.0%	46	0.6%	1,049	0.6%
3-Jul	139	0.9%	11,737	0.8%	-4	0.2%	2,765	4.3%	74	1.4%	6,463	1.6%
4-Jul	109	1.1%	20,644	1.7%	94	0.7%	18,838	6.4%	64	2.0%	5,645	2.4%
5-Jul	79	1.3%	5,741	2.0%	26	0.9%	37,349	10.5%	53	2.6%	14,396	4.6%
6-Jul	126	1.6%	20,537	2.9%	324	2.7%	67,926	18.0%	50	3.1%	48,332	12.0%
7-Jul	145	1.9%	18,667	3.7%	308	4.5%	89,625	27.9%	60	3.7%	82,268	24.5%
8-Jul	103	2.2%	14,339	4.3%	267	6.0%	94,440	38.3%	70	4.5%	36,454	30.1%
9-Jul	45	2.3%	44,261	6.3%	221	7.3%	99,256	49.2%	53	5.0%	46,445	37.2%
10-Jul	376	3.2%	75,598	9.5%	174	8.2%	42,444	53.9%	63	5.7%	34,536	42.4%
11-Jul	716	4.8%	75,770	12.8%	140	9.0%	69,116	61.5%	0	5.7%	21,589	45.7%
12-Jul	1,055	7.3%	150,944	19.4%	403	11.3%	44,221	66.4%	117	6.9%	41,422	52.1%
13-Jul	4,155	16.9%	177,123	27.1%	241	12.7%	38,966	70.7%	138	8.4%	22,693	55.5%
14-Jul	1,778	21.1%	196,786	35.7%	523	15.7%	52,897	76.5%	75	9.1%	3,964	56.1%
15-Jul	528	22.3%	316,264	49.5%	908	20.9%	28,870	79.7%	12	9.3%	17,121	58.7%
16-Jul	300	23.0%	362,910	65.3%	1,960	32.1%	4,844	80.2%	9	9.4%	41,951	65.1%
17-Jul	533	24.2%	269,451	77.0%	3,012	49.3%	20,016	82.4%	222	11.7%	38,769	71.0%
18-Jul	3,419	32.2%	175,992	84.7%	770	53.7%	6,130	83.1%	294	14.8%	21,332	74.3%
19-Jul	6,304	46.8%	115,883	89.7%	513	56.6%	25,524	85.9%	1,251	27.9%	31,999	79.2%
20-Jul	4,572	57.4%	15,884	90.4%	869	61.6%	53,438	91.8%	503	33.2%	35,595	84.6%
21-Jul	4,824	68.6%	17,012	91.1%	1,116	68.0%	23,359	94.3%	701	40.5%	39,192	90.6%
22-Jul	5,269	80.8%	54,172	93.5%	1,470	76.3%	23,937	97.0%	898	49.9%	45,485	97.5%
23-Jul	2,228	86.0%	16,721	94.2%	1,034	82.3%	24,516	99.7%	3,136	82.8%	3,137	98.0%
24-Jul	938	88.2%	12,680	94.8%	598	85.7%	1,737	99.9%	1,354	97.0%	2,402	98.3%
25-Jul	1,419	91.5%	8,640	95.1%	1,272	92.9%	1,109	100.0%	68	97.7%	1,626	98.6%
26-Jul	1,899	95.9%	14,792	95.8%	1,237	100.0%		100.0%	89	98.7%	3,616	99.1%
27-Jul	1,765	100.0%	45,610	97.8%		100.0%		100.0%	126	100.0%	5,606	100.0%
28-Jul		100.0%	28,491	99.0%		100.0%		100.0%		100.0%		100.0%
29-Jul		100.0%	9,034	99.4%		100.0%		100.0%		100.0%		100.0%
30-Jul		100.0%	6,929	99.7%		100.0%		100.0%		100.0%		100.0%
31-Jul		100.0%	4,824	99.9%		100.0%		100.0%		100.0%		100.0%
1-Aug		100.0%	530	99.9%		100.0%		100.0%		100.0%		100.0%
2-Aug		100.0%	589	100.0%		100.0%		100.0%		100.0%		100.0%
3-Aug		100.0%	646	100.0%		100.0%		100.0%		100.0%		100.0%
Total	43,065		2,296,957		17,509		907,894		9,536		655,933	

Annual totals have been calculated using fractions which may cause minor discrepancies with historical data.

[a] Count cut off on 8/3/94 for formatting purposes. 7,142 more pink salmon counted through 8/9/94.

- continued -

Appendix Table 4. (Page 4 of 4).

	1999		2000		2001[c]			Even Year	Odd Year
Date	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Date	Average % Cumulative[b]	Average % Cumulative[b]
17-Jun		0.0%		0.0%		0.0%	17-Jun	0.0%	0.0%
18-Jun		0.0%		0.0%		0.0%	18-Jun	0.0%	0.0%
19-Jun		0.0%		0.0%		0.0%	19-Jun	0.0%	0.0%
20-Jun		0.0%		0.0%		0.0%	20-Jun	0.0%	0.0%
21-Jun		0.0%		0.0%		0.0%	21-Jun	0.0%	0.0%
22-Jun		0.0%	4	0.0%		0.0%	22-Jun	0.0%	0.0%
23-Jun		0.0%	44	0.0%		0.0%	23-Jun	0.0%	0.0%
24-Jun		0.0%	427	0.1%		0.0%	24-Jun	0.0%	0.0%
25-Jun	0	0.0%	551	0.1%		0.0%	25-Jun	0.2%	0.0%
26-Jun	0	0.0%	610	0.2%		0.0%	26-Jun	0.5%	0.1%
27-Jun	0	0.0%	670	0.3%	0	0.0%	27-Jun	0.8%	0.1%
28-Jun	0	0.0%	2,072	0.6%	0	0.0%	28-Jun	1.0%	0.1%
29-Jun	0	0.0%	6,382	1.4%	0	0.0%	29-Jun	1.5%	0.1%
30-Jun	0	0.0%	1,730	1.7%	0	0.0%	30-Jun	2.3%	0.2%
1-Jul	0	0.0%	29,288	5.6%	0	0.0%	1-Jul	4.1%	0.4%
2-Jul	0	0.0%	17,890	8.0%	0	0.0%	2-Jul	6.9%	0.6%
3-Jul	0	0.0%	13,508	9.8%	24	0.3%	3-Jul	10.5%	1.0%
4-Jul	0	0.0%	9,126	11.0%	12	0.5%	4-Jul	14.3%	1.5%
5-Jul	0	0.0%	29,300	14.9%	0	0.5%	5-Jul	18.5%	1.9%
6-Jul	0	0.0%	21,941	17.8%	0	0.5%	6-Jul	22.9%	2.6%
7-Jul	0	0.0%	72,788	27.5%	0	0.5%	7-Jul	28.8%	4.1%
8-Jul	0	0.0%	134,054	45.4%	0	0.5%	8-Jul	35.2%	5.9%
9-Jul	0	0.0%	29,355	49.3%	300	4.5%	9-Jul	40.1%	7.8%
10-Jul	24	4.0%	44,265	55.2%	60	5.3%	10-Jul	43.9%	9.7%
11-Jul	12	5.9%	59,176	63.1%	27	5.6%	11-Jul	50.5%	11.3%
12-Jul	12	7.9%	99,252	76.3%	17	5.9%	12-Jul	58.0%	13.6%
13-Jul	12	9.9%	61,613	84.5%	9	6.0%	13-Jul	62.3%	17.0%
14-Jul	102	26.7%	1,276	84.7%	81	7.1%	14-Jul	66.5%	22.5%
15-Jul	18	29.7%	2,763	85.1%	6	7.1%	15-Jul	71.1%	25.6%
16-Jul	0	29.7%	2,943	85.5%	96	8.4%	16-Jul	75.3%	30.4%
17-Jul	25	33.8%	2,943	85.8%	150	10.4%	17-Jul	79.2%	39.2%
18-Jul	30	38.7%	4,700	86.5%	57	11.2%	18-Jul	82.5%	43.9%
19-Jul	37	44.8%	10,251	87.8%	384	16.3%	19-Jul	85.5%	50.3%
20-Jul	44	52.1%	18,734	90.3%	381	21.4%	20-Jul	88.1%	56.8%
21-Jul	12	54.0%	9,550	91.6%	1,128	36.4%	21-Jul	90.5%	63.7%
22-Jul	2	54.4%	36,385	96.5%	1,080	50.8%	22-Jul	94.1%	70.9%
23-Jul	14	56.7%	8,813	97.6%	687	59.9%	23-Jul	96.0%	80.0%
24-Jul	14	59.0%	6,553	98.5%	408	65.4%	24-Jul	97.5%	86.6%
25-Jul	113	77.6%	4,292	99.1%	162	67.5%	25-Jul	98.6%	92.2%
26-Jul	62	87.8%	4,541	99.7%	132	69.3%	26-Jul	99.2%	96.4%
27-Jul	12	89.8%	2,383	100.0%	231	72.4%	27-Jul	99.6%	98.5%
28-Jul	62	100.0%		100.0%	321	76.7%	28-Jul	99.9%	99.8%
29-Jul		100.0%		100.0%	564	84.2%	29-Jul	99.9%	99.9%
30-Jul		100.0%		100.0%	444	90.1%	30-Jul	100.0%	99.9%
31-Jul		100.0%		100.0%	180	92.5%	31-Jul	100.0%	100.0%
1-Aug		100.0%		100.0%	333	96.9%	1-Aug	100.0%	100.0%
2-Aug		100.0%		100.0%	90	98.1%	2-Aug	100.0%	100.0%
3-Aug		100.0%		100.0%	141	100.0%	3-Aug	100.0%	100.0%
Total	607		750,173		7,505		Total		

Annual totals have been calculated using fractions which may cause minor discrepancies with historical data.

[b] Does not include the current year

[c] Count cut off on 8/3/01 for formatting purposes. 918 more pink salmon counted through 8/25/01.

Appendix Table 5. Expanded daily and percent cumulative chinook salmon migration past the Kwiniuk River counting tower, Norton Sound, 1981-2001.

	1981		1982		1983		1984		1985		1986	
Date	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative
17-Jun		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
18-Jun		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
19-Jun	0	0.0%		0.0%	0	0.0%	0	0.0%		0.0%	0	0.0%
20-Jun	0	0.0%		0.0%	0	0.0%	0	0.0%		0.0%	0	0.0%
21-Jun	0	0.0%		0.0%	0	0.0%	0	0.0%		0.0%	0	0.0%
22-Jun	0	0.0%		0.0%	0	0.0%	0	0.0%		0.0%	2	0.3%
23-Jun	0	0.0%		0.0%	5	1.9%	1	0.1%		0.0%	4	0.9%
24-Jun	2	1.5%		0.0%	13	6.7%	0	0.1%		0.0%	0	0.9%
25-Jun	12	10.3%	7	5.1%	4	8.2%	0	0.1%		0.0%	0	0.9%
26-Jun	2	11.8%	6	9.4%	8	11.2%	3	0.5%	0	0.0%	0	0.9%
27-Jun	0	11.8%	4	12.3%	3	12.4%	3	1.0%	0	0.0%	0	0.9%
28-Jun	3	14.0%	4	15.2%	16	18.4%	1	1.1%	0	0.0%	0	0.9%
29-Jun	6	18.4%	-1	14.5%	1	18.7%	6	1.9%	9	0.9%	4	1.5%
30-Jun	6	22.8%	5	18.1%	12	23.2%	21	4.8%	0	0.9%	11	3.2%
1-Jul	2	24.3%	0	18.1%	61	46.1%	12	6.4%	1	1.0%	26	7.2%
2-Jul	4	27.2%	7	23.2%	3	47.2%	26	9.9%	2	1.3%	12	9.0%
3-Jul	19	41.2%	4	26.1%	19	54.3%	90	22.1%	0	1.3%	56	17.6%
4-Jul	15	52.2%	13	35.5%	11	58.4%	27	25.8%	0	1.3%	92	31.7%
5-Jul	1	52.9%	10	42.8%	25	67.8%	4	26.4%	0	1.3%	128	51.2%
6-Jul	9	59.6%	3	44.9%	16	73.8%	26	29.9%	2	1.5%	40	57.3%
7-Jul	4	62.5%	8	50.7%	7	76.4%	-21	27.0%	19	3.5%	41	63.6%
8-Jul	8	68.4%	28	71.0%	17	82.8%	13	28.8%	-2	3.2%	12	65.4%
9-Jul	16	80.1%	8	76.8%	5	84.6%	12	30.4%	-2	3.0%	10	67.0%
10-Jul	5	83.8%	0	76.8%	3	85.8%	139	49.3%	0	3.0%	5	67.7%
11-Jul	2	85.3%	1	77.5%	1	86.1%	217	78.8%	0	3.0%	37	73.4%
12-Jul	4	88.2%	5	81.2%	1	86.5%	67	87.9%	7	3.8%	6	74.3%
13-Jul	0	88.2%	5	84.8%	1	86.9%	20	90.6%	29	6.8%	2	74.6%
14-Jul	4	91.2%	3	87.0%	2	87.6%	27	94.3%	64	13.5%	21	77.8%
15-Jul	2	92.6%	2	88.4%	2	88.4%	9	95.5%	13	14.9%	40	83.9%
16-Jul	1	93.4%	4	91.3%	1	88.8%	17	97.8%	59	21.0%	48	91.3%
17-Jul	0	93.4%	0	91.3%	8	91.8%	5	98.5%	101	31.6%	2	91.6%
18-Jul	1	94.1%	2	92.8%	0	91.8%	0	98.5%	70	39.0%	12	93.4%
19-Jul	1	94.9%	4	95.7%	11	95.9%	1	98.6%	85	47.9%	12	95.3%
20-Jul	1	95.6%	3	97.8%	3	97.0%	2	98.9%	198	68.6%	12	97.1%
21-Jul	0	95.6%	0	97.8%	4	98.5%	2	99.2%	87	77.7%	11	98.8%
22-Jul	0	95.6%	0	97.8%	1	98.9%	2	99.5%	23	80.1%	2	99.1%
23-Jul	1	96.3%	0	97.8%	0	98.9%	1	99.6%	12	81.4%	6	100.0%
24-Jul	0	96.3%	1	98.6%	0	98.9%	2	99.9%	161	98.2%	-2	99.7%
25-Jul	0	96.3%	1	99.3%	0	98.9%	1	100.0%	11	99.4%	2	100.0%
26-Jul	2	97.8%	1	100.0%	2	99.6%	0	100.0%	7	100.1%	0	100.0%
27-Jul	0	97.8%	0	100.0%	1	100.0%	0	100.0%	-2	99.9%	0	100.0%
28-Jul	0	97.8%	0	100.0%	0	100.0%	0	100.0%	1	100.0%	0	100.0%
29-Jul	0	97.8%	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%
30-Jul	1	98.5%	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%
31-Jul	2	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%
1-Aug	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%
2-Aug	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%
3-Aug	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%
Total	136		138		267		736		955		654	

Annual totals have been calculated using fractions which may cause minor discrepancies with historical data.

- continued -

Appendix Table 5. (Page 2 of 4).

	1987		1988		1989		1990		1991		1992	
Date	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative
17-Jun		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
18-Jun		0.0%	0	0.0%		0.0%		0.0%	0	0.0%		0.0%
19-Jun		0.0%	1	0.3%		0.0%		0.0%	2	0.3%		0.0%
20-Jun		0.0%	2	0.9%		0.0%		0.0%	4	0.8%		0.0%
21-Jun		0.0%	0	0.9%		0.0%	0	0.0%	0	0.8%		0.0%
22-Jun		0.0%	-2	0.3%		0.0%	0	0.0%	6	1.7%		0.0%
23-Jun		0.0%	0	0.3%		0.0%	0	0.0%	2	2.0%		0.0%
24-Jun		0.0%	0	0.3%		0.0%	3	0.3%	1	2.1%		0.0%
25-Jun	0	0.0%	0	0.3%		0.0%	6	1.0%	2	2.4%		0.0%
26-Jun	0	0.0%	3	1.2%		0.0%	7	1.8%	4	3.0%		0.0%
27-Jun	0	0.0%	5	2.8%	0	0.0%	0	1.8%	10	4.4%		0.0%
28-Jun	2	0.6%	0	2.8%	0	0.0%	2	2.0%	16	6.6%		0.0%
29-Jun	3	1.6%	16	7.8%	2	0.8%	15	3.7%	55	14.4%	0	0.0%
30-Jun	0	1.6%	18	13.4%	10	4.8%	138	19.0%	68	24.0%	0	0.0%
1-Jul	2	2.2%	24	20.9%	12	9.7%	146	35.2%	82	35.6%	4	0.8%
2-Jul	0	2.2%	22	27.7%	15	15.7%	154	52.3%	75	46.2%	-2	0.4%
3-Jul	0	2.2%	20	34.0%	28	27.0%	56	58.6%	71	56.2%	5	1.5%
4-Jul	6	4.1%	0	34.0%	14	32.7%	65	65.8%	0	56.2%	8	3.1%
5-Jul	19	10.1%	14	38.3%	18	39.9%	138	81.1%	14	58.2%	14	6.1%
6-Jul	27	18.6%	6	40.2%	2	40.7%	42	85.8%	32	62.7%	21	10.4%
7-Jul	43	32.2%	-2	39.6%	22	49.6%	40	90.2%	21	65.7%	0	10.4%
8-Jul	23	39.4%	-3	38.6%	42	66.5%	21	92.6%	9	66.9%	18	14.2%
9-Jul	23	46.7%	8	41.1%	23	75.8%	2	92.8%	54	74.6%	55	25.7%
10-Jul	0	46.7%	28	49.8%	4	77.4%	-2	92.6%	40	80.2%	16	29.0%
11-Jul	0	46.7%	48	64.8%	2	78.2%	0	92.6%	36	85.3%	14	31.9%
12-Jul	7	48.9%	29	73.8%	6	80.6%	6	93.2%	0	85.3%	27	37.6%
13-Jul	11	52.4%	-3	72.9%	10	84.7%	-4	92.8%	4	85.9%	41	46.1%
14-Jul	20	58.7%	13	76.9%	14	90.3%	2	93.0%	14	87.9%	0	46.1%
15-Jul	46	73.2%	4	78.2%	6	92.7%	7	93.8%	24	91.2%	11	48.4%
16-Jul	4	74.4%	2	78.8%	5	94.8%	12	95.1%	17	93.6%	32	55.1%
17-Jul	4	75.7%	0	78.8%	3	96.0%	17	97.0%	28	97.6%	37	62.8%
18-Jul	26	83.9%	3	79.8%	4	97.6%	15	98.7%	11	99.2%	37	70.6%
19-Jul	29	93.1%	4	81.0%	2	98.4%	4	99.1%	-4	98.6%	24	75.6%
20-Jul	6	95.0%	4	82.2%	0	98.4%	6	99.8%	2	98.9%	10	77.7%
21-Jul	6	96.8%	0	82.2%	0	98.4%	0	99.8%	0	98.9%	20	81.8%
22-Jul	8	99.4%	14	86.6%	0	98.4%	1	99.9%	-2	98.6%	46	91.4%
23-Jul	2	100.0%	14	91.0%	0	98.4%	1	100.0%	6	99.4%	9	93.3%
24-Jul	0	100.0%	14	95.3%	0	98.4%	-2	99.8%	0	99.4%	15	96.5%
25-Jul	0	100.0%	1	95.6%	0	98.4%	2	100.0%	0	99.4%	0	96.5%
26-Jul	0	100.0%	14	100.0%	2	99.2%	0	100.0%	4	100.0%	5	97.5%
27-Jul	0	100.0%	0	100.0%	2	100.0%	0	100.0%	0	100.0%	9	99.4%
28-Jul	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%	3	100.0%
29-Jul	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%
30-Jul	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%
31-Jul	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%
1-Aug	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%
2-Aug	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%
3-Aug	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%	0	100.0%
Total	317		321		248		900		708		479	

Annual totals have been calculated using fractions which may cause minor discrepancies with historical data.

- continued -

Appendix Table 5. (Page 3 of 4).

	1993		1994		1995		1996		1997		1998	
Date	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative	Daily	Percent Cumulative
17-Jun		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
18-Jun		0.0%		0.0%		0.0%		0.0%	2	0.2%	0	0.0%
19-Jun		0.0%		0.0%		0.0%		0.0%	2	0.4%	0	0.0%
20-Jun		0.0%		0.0%		0.0%	2	0.3%	2	0.6%	0	0.0%
21-Jun		0.0%		0.0%	2	0.4%	0	0.3%	4	1.0%	-2	-0.7%
22-Jun		0.0%		0.0%	0	0.4%	8	1.7%	0	1.0%	-1	-1.0%
23-Jun	0	0.0%	0	0.0%	0	0.4%	6	2.8%	13	2.4%	0	-1.0%
24-Jun	0	0.0%	0	0.0%	24	5.4%	4	3.5%	26	5.0%	0	-1.0%
25-Jun	2	0.3%	0	0.0%	13	8.0%	0	3.5%	8	5.9%	0	-1.0%
26-Jun	12	2.4%	0	0.0%	2	8.5%	-2	3.1%	46	10.6%	0	-1.0%
27-Jun	16	5.1%	0	0.0%	2	8.9%	-6	2.1%	13	11.9%	2	-0.3%
28-Jun	2	5.4%	2	0.3%	24	13.8%	0	2.1%	53	17.4%	2	0.3%
29-Jun	-2	5.1%	2	0.6%	28	19.6%	14	4.5%	34	20.9%	2	1.0%
30-Jun	16	7.7%	0	0.6%	15	22.7%	46	12.5%	42	25.2%	2	1.7%
1-Jul	12	9.8%	12	2.6%	35	29.9%	21	16.1%	50	30.3%	10	5.1%
2-Jul	39	16.3%	4	3.2%	13	32.5%	-6	15.1%	103	40.9%	14	9.8%
3-Jul	32	21.7%	26	7.4%	-10	30.4%	26	19.6%	126	53.9%	4	11.2%
4-Jul	17	24.6%	48	15.0%	0	30.4%	9	21.2%	71	61.2%	0	11.2%
5-Jul	33	30.1%	18	17.9%	8	32.0%	78	34.7%	79	69.3%	9	14.1%
6-Jul	2	30.5%	26	22.1%	58	43.9%	97	51.5%	16	70.9%	19	20.6%
7-Jul	68	41.9%	8	23.4%	56	55.4%	83	65.9%	35	74.5%	30	30.7%
8-Jul	41	48.8%	4	24.0%	18	59.1%	54	75.3%	54	80.1%	49	47.4%
9-Jul	28	53.5%	49	31.8%	19	63.1%	26	79.8%	5	80.5%	11	51.0%
10-Jul	39	60.1%	40	38.2%	20	67.2%	0	79.8%	5	81.0%	13	55.4%
11-Jul	40	66.8%	29	42.9%	10	69.2%	12	81.9%	9	81.9%	10	58.7%
12-Jul	84	81.0%	43	49.8%	38	77.1%	19	85.1%	0	81.9%	14	63.5%
13-Jul	42	88.0%	73	61.4%	40	85.3%	0	85.1%	10	82.9%	7	65.8%
14-Jul	11	89.9%	39	67.7%	40	93.6%	16	87.9%	5	83.4%	4	67.2%
15-Jul	14	92.3%	53	76.2%	8	95.3%	8	89.3%	0	83.4%	0	67.2%
16-Jul	-4	91.6%	56	85.1%	4	96.1%	0	89.3%	14	84.9%	14	71.9%
17-Jul	6	92.6%	40	91.5%	0	96.1%	10	91.0%	50	90.0%	30	82.1%
18-Jul	6	93.6%	24	95.4%	0	96.1%	4	91.7%	14	91.5%	6	84.1%
19-Jul	27	98.1%	8	96.6%	2	96.5%	4	92.4%	22	93.7%	4	85.5%
20-Jul	6	99.2%	0	96.6%	2	96.9%	8	93.7%	14	95.2%	9	88.5%
21-Jul	2	99.5%	5	97.4%	2	97.3%	13	95.9%	7	95.9%	14	93.2%
22-Jul	2	99.8%	10	99.0%	4	98.1%	11	97.8%	0	95.9%	6	95.3%
23-Jul	0	99.8%	-6	98.1%	3	98.8%	10	99.6%	8	96.7%	12	99.3%
24-Jul	-2	99.5%	-2	97.8%	2	99.2%	0	99.6%	24	99.2%	2	100.0%
25-Jul	0	99.5%	2	98.1%	4	100.0%	3	100.0%	0	99.2%	0	100.0%
26-Jul	1	99.7%	0	98.1%	0	100.0%		100.0%	4	99.6%	0	100.0%
27-Jul	2	100.0%	2	98.4%		100.0%		100.0%	4	100.0%	0	100.0%
28-Jul	0	100.0%	0	98.4%		100.0%		100.0%		100.0%		100.0%
29-Jul	0	100.0%	0	98.4%		100.0%		100.0%		100.0%		100.0%
30-Jul	0	100.0%	0	98.4%		100.0%		100.0%		100.0%		100.0%
31-Jul	0	100.0%	0	98.4%		100.0%		100.0%		100.0%		100.0%
1-Aug	0	100.0%	1	98.6%		100.0%		100.0%		100.0%		100.0%
2-Aug	0	100.0%	3	99.0%		100.0%		100.0%		100.0%		100.0%
3-Aug	0	100.0%	6	100.0%		100.0%		100.0%		100.0%		100.0%
Total	594		625		485		577		972		296	

Annual totals have been calculated using fractions which may cause minor discrepancies with historical data.

- continued -

Appendix Table 5. (Page 4 of 4).

Date	1999 Daily	1999 Percent Cumulative	2000 Daily	2000 Percent Cumulative	2001 Daily	2001 Percent Cumulative	1981-2000 Average % Cumulative[b]
17-Jun		0.0%		0.0%		0.0%	0.0%
18-Jun		0.0%		0.0%		0.0%	0.0%
19-Jun		0.0%		0.0%		0.0%	0.1%
20-Jun		0.0%		0.0%		0.0%	0.1%
21-Jun		0.0%		0.0%		0.0%	0.1%
22-Jun		0.0%	0	0.0%		0.0%	0.2%
23-Jun		0.0%	2	1.4%		0.0%	0.6%
24-Jun		0.0%	2	2.8%		0.0%	1.4%
25-Jun	0	0.0%	0	2.8%		0.0%	2.4%
26-Jun	0	0.0%	0	2.8%		0.0%	3.3%
27-Jun	0	0.0%	0	2.8%	0	0.0%	3.9%
28-Jun	0	0.0%	0	2.8%	18	7.0%	5.2%
29-Jun	0	0.0%	18	15.3%	12	11.6%	7.6%
30-Jun	0	0.0%	6	19.4%	0	11.6%	11.3%
1-Jul	0	0.0%	10	26.4%	0	11.6%	16.4%
2-Jul	0	0.0%	8	31.9%	3	12.8%	20.6%
3-Jul	0	0.0%	4	34.7%	12	17.4%	26.0%
4-Jul	0	0.0%	0	34.7%	6	19.8%	30.0%
5-Jul	0	0.0%	2	36.1%	0	19.8%	35.5%
6-Jul	0	0.0%	4	38.9%	-3	18.6%	40.2%
7-Jul	0	0.0%	24	55.6%	6	20.9%	45.9%
8-Jul	0	0.0%	36	80.6%	6	23.3%	52.7%
9-Jul	0	0.0%	0	80.6%	0	23.3%	57.0%
10-Jul	2	1.7%	0	80.6%	-6	20.9%	60.3%
11-Jul	16	15.5%	4	83.3%	3	22.1%	65.2%
12-Jul	10	24.1%	6	87.5%	0	22.1%	69.6%
13-Jul	4	27.6%	12	95.8%	15	27.9%	72.9%
14-Jul	36	58.6%	0	95.8%	21	36.0%	77.4%
15-Jul	0	58.6%	2	97.2%	60	59.3%	80.0%
16-Jul	-4	55.2%	1	97.9%	18	66.3%	82.4%
17-Jul	10	63.8%	1	98.6%	21	74.4%	85.6%
18-Jul	0	63.8%	0	98.6%	15	80.2%	87.7%
19-Jul	8	70.7%	0	98.6%	21	88.4%	90.3%
20-Jul	16	84.5%	0	98.6%	0	88.4%	93.0%
21-Jul	3	87.1%	0	98.6%	6	90.7%	94.5%
22-Jul	2	88.8%	2	100.0%	3	91.9%	96.0%
23-Jul	0	88.8%	0	100.0%	0	91.9%	96.9%
24-Jul	0	88.8%	0	100.0%	-3	90.7%	98.2%
25-Jul	6	94.0%	0	100.0%	6	93.0%	98.7%
26-Jul	3	96.6%	0	100.0%	6	95.3%	99.4%
27-Jul	0	96.6%	0	100.0%	6	97.7%	99.6%
28-Jul	4	100.0%		100.0%	3	98.8%	99.8%
29-Jul		100.0%		100.0%	0	98.8%	99.8%
30-Jul		100.0%		100.0%	3	100.0%	99.8%
31-Jul		100.0%		100.0%	0	100.0%	99.9%
1-Aug		100.0%		100.0%	0	100.0%	99.9%
2-Aug		100.0%		100.0%	0	100.0%	100.0%
3-Aug		100.0%		100.0%	0	100.0%	100.0%
Total	116		144		258		

[b] Does not include the current year

Appendix Table 6. Reported hourly chum salmon observations at the Kwiniuk River counting tower, Norton Sound, 2001.

Outlined 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-Jun																				0	0	0	0	0	0	0.0%
28-Jun	0	0	0	0	0	12	3	-3	-9	0	0	0	0	0	0	0	0	9	222	63	12	0	12	27	348	2.3%
29-Jun	42	48	372	177	165	93	-12	3	0	0	3	0	0	0	0	0	0	0	3	108	483	0	588	285	2,358	15.8%
30-Jun	33	69	15	6	0	18	3	-30	3	9	-6	0	-27	0	0	-12	-6	0	0	0	0	0	0	21	96	0.6%
1-Jul	9	18	0	0	24	54	-30	0	0	0	0	0	-6	0	0	0	0	24	63	15	0	15	3	0	189	1.3%
2-Jul	24	33	54	174	156	48	-6	9	0	0	0	-6	0	0	0	0	6	3	300	204	0	66	144	423	1,632	10.9%
3-Jul	9	159	321	81	111	69	72	114	-3	3	-6	99	0	0	63	105	141	426	99	246	150	309	372	300	3,240	21.7%
4-Jul																									0	0.0%
5-Jul	-12	0	-12	-33	-12	-3	0	0	-3	-3	0	0	0	0	-3	0	-6	0	0	9	90	9	9	-21	9	0.1%
6-Jul	0	0	0	0	0	3	6	-6	0	-3	0	0	0	0	-3	0	0	0	-6	75	42	9	18	180	315	2.1%
7-Jul	99	207	48	18	60	21	0	0	3	0	3	0	0	0	0	0	0	3	0	0	3	12	0	117	594	4.0%
8-Jul	24	24	27	243	66	27	0	-18	0	0	-6	0	0	0	0	0	0	90	6	6	12	57	135	60	753	5.0%
9-Jul	162	111	0	186	51	108	12	15	0	0	0	-3	0	0	0	0	0	0	0	0	9	3	24	63	741	5.0%
10-Jul	18	84	126	108	6	6	6	0	0	0	0	0	-3	0	-6	0	-12	0	60	39	12	0	0	-6	438	2.9%
11-Jul	27	36	0	0	12	0	0	0	-9	-6	0	0	0	0	-6	0	-3	0	3	0	0	3	9	72	138	0.9%
12-Jul	3	90	45				3	9	0	0	0	3	-3	0	0	-3	3	3	0	9	0	0	-3	0	159	1.1%
13-Jul	6	0	6	3	12	-3	18	0	0	0	0	-9	0	0	0	3	0	0	36	12	0	27	12	123	246	1.6%
14-Jul	90	0	291	189	78	30	48	12	-6	0	0	0	0	3	0	0	0	0	0	0	57	12	18	75	897	6.0%
15-Jul	273	210	207	108	174	45	48	18	3	0	0	0	0	3	0	0	3	0	0	0	3	0	0	0	1,095	7.3%
16-Jul	3	18	9	15	48	21	3	0	12	-9	3	0	0	0	0	3	0	90	63	48	24	9	0	48	408	2.7%
17-Jul	12	30	60	0	42	6	9	0	6	27	18	15	33	0	0	0	0	0	0	0	3	0	0	18	279	1.9%
18-Jul	9	0	30	15	12	0	-3	-3	-15	0	0	0	0	0	0	0	3	3	3	0	18	3	3	27	105	0.7%
19-Jul	21	60	24	30	12	33	15	12	0	0	0	6	-3	3	-3	0	-3	0	3	6	18	9	0	12	255	1.7%
20-Jul	6	18	0	0	3	0	0	0	0	0	0	-3	0	0	6	0	0	0	3	0	6	9	6	27	81	0.5%
21-Jul	6	9	30	9	0	0	0	0	0	0	0	0	0	-9	0	0	-3	0	0	0	30	6	18	9	105	0.7%
22-Jul	33	12	9	21	3	0	0	0	3	0	0	0	0	-3	0	3	6	3	6	3	0	3	3	0	105	0.7%
23-Jul	0	0	0	0	0	0	-3	0	0	0	0	0	0	0	0	-3	0	9	6	0	0	0	6	0	15	0.1%
24-Jul	3	15	3	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	-9	6	0	0	0	0	24	0.2%
25-Jul	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	3	6	0	0	0	0	0	0	0	18	0.1%
26-Jul	9	6	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0.1%
27-Jul	6	15	33	6	6	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	3	75	0.5%
28-Jul	3	9	0	3	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	21	0.1%
29-Jul	0	6	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0.1%
30-Jul	3	3	3	3	9	-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	6	27	0.2%
31-Jul	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	12	0.1%
1-Aug	3	9	3	3	6	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0.2%
2-Aug	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.0%
3-Aug	0	3	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	12	0.1%
4-Aug	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	3	0	0	15	0.1%
5-Aug	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	3	0.0%
6-Aug	6	9	3	3	3	12	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	0.3%
7-Aug	0	3	0	0	0	0							0	0	0	0	3	0	0	0	0	0	0	0	6	0.0%
8-Aug	0	0	0	-3	0	0							0	0	0	0	0	0	0	3	0	0	0	0	0	0.0%
9-Aug	0	0	0	0	-3	0							0	0	0	0	0	0	0	0	0	0	0	0	-3	0.0%
10-Aug	0	0	0	0	0	0							0	0	0	0	0	0	0	0	3	0	0	0	3	0.0%
11-Aug	0	3	0	0	0	0							0	0	0	0	0	0	0	3	0	0	0	0	6	0.0%
12-Aug	0	0	0	0	0	0							0	3	0	0	0	0	0	0	0	0	0	0	3	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%
14-Aug	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	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	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	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	0	0	0	0.0%
18-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	6	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	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	0	0	0	0.0%
22-Aug	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	0	12	0.1%
23-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%
24-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%
25-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%
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%
27-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	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	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	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	0	0	0	0.0%
31-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	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	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	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	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	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	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	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	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%
10-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%
11-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%
12-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%
13-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%
14-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%
15-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%
Totals	938	1,329	1,713	1,386	1,050	609	195	135	-12	18	12	102	-6	3	48	111	150	666	861	861	975	564	1,386	1,869	14,961	100%
	6.3%	8.9%	11.4%	9.3%	7.0%	4.1%	1.3%	0.9%	-0.1%	0.1%	0.1%	0.7%	0.0%	0.0%	0.3%	0.7%	1.0%	4.5%	5.8%	5.8%	6.5%	3.8%	9.3%	12.5%	100%	

Appendix Table 7. Reported hourly pink salmon observations at the Kwiniuk River counting tower, Norton Sound, 2001.

Outlined 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-Jun																				0	0	0	0	0	0	0.0%
28-Jun	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%
29-Jun	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%
30-Jun	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%
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	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%
3-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	0	6	3	6	24	0.3%
4-Jul																									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	0	0	0	0.0%
6-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%
7-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%
8-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%
9-Jul	42	15	69	33	18	69	33	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	300	3.6%
10-Jul	6	36	0	3	0	3	3	6	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	60	0.7%
11-Jul	9	0	0	0	6	0	0	0	0	0	0	-3	0	0	0	0	0	0	0	0	0	0	6	9	27	0.3%
12-Jul	9	3	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0.1%
13-Jul	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	9	0.1%
14-Jul	0	0	15	27	9	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	9	12	81	1.0%
15-Jul	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0.1%
16-Jul	0	-6	-3	0	6	0	0	0	0	0	-3	0	0	0	0	0	0	12	18	9	45	6	0	12	96	1.2%
17-Jul	12	12	6	3	3	0	0	0	0	24	0	0	12	0	3	0	6	6	6	3	15	6	0	33	150	1.8%
18-Jul	6	9	-3	0	18	6	3	-3	-3	0	0	0	0	0	0	0	0	0	0	0	15	0	3	6	57	0.7%
19-Jul	9	27	9	24	6	48	24	12	0	0	9	0	3	6	0	24	9	6	6	15	90	15	27	15	384	4.6%
20-Jul	30	60	12	9	24	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	3	27	96	108	381	4.6%
21-Jul	219	132	96	30	18	27	48	21	0	0	-3	-9	0	-12	0	0	0	0	0	6	66	120	165	204	1,128	13.6%
22-Jul	342	72	42	42	24	3	0	6	0	0	0	9	0	-3	0	21	72	66	90	57	15	111	99	12	1,080	13.0%
23-Jul	96	99	6	24	36	42	6	0	0	-3	6	3	0	0	3	-39	12	39	129	30	72	51	72	3	687	8.3%
24-Jul	45	78	36	21	60	18	6	0	0	3	0	0	0	0	0	3	-6	0	0	36	3	0	51	54	408	4.9%
25-Jul	0	147	30	-9	0	0	-15	0	0	0	0	0	-9	0	0	3	3	-3	0	6	-3	9	0	3	162	2.0%
26-Jul	75	-9	12	6	6	0	3	3	0	0	0	0	0	0	9	-3	0	6	0	0	0	0	6	18	132	1.6%
27-Jul	6	117	21	24	21	0	0	0	0	0	-3	0	0	0	0	0	0	0	0	12	-3	15	9	12	231	2.8%
28-Jul	21	33	27	39	21	3	18	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	24	132	321	3.9%
29-Jul	36	75	54	54	3	0	3	6	0	0	0	0	0	0	0	3	0	21	12	3	6	54	117	117	564	6.8%
30-Jul	81	141	54	51	24	0	3	0	3	0	0	0	0	0	3	0	0	0	0	3	12	3	3	63	444	5.4%
31-Jul	18	63	21	12	24	0	0	3	0	0	0	0	0		0	3	0	0	0	0	15	0	21	0	180	2.2%
1-Aug	12	96	45	54	48	0	21	0	0	0	0	0	0	0	0		0	9	0	3	9	6	0	30	333	4.0%
2-Aug	12	48	18	3	0	0	3	3	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	6	0	90	1.1%
3-Aug	3	36	15	24	30	12	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	15	141	1.7%
4-Aug	9	18	6	3	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	12	15	3	6	90	1.1%
5-Aug	12	9	18	12	27	0	3	0	3	6	3	9	0	0	6	0	6	-3	9	0	9	0	0	9	138	1.7%
6-Aug	33	24	3	24	21	9	6	0	3	3	0	0	0	0	0	3	-3	12	3	6	3	6	9	0	165	2.0%
7-Aug	6	3	6	9	12	0							0	0	0	3	0	-3	3	0	0	0	0	0	39	0.5%
8-Aug	0	6	6	3	9	0							0	-3	0	3	6	0	0	3	6	0	0	-3	36	0.4%
9-Aug	3	0	6	0	6	3							0	0	6	0	-3	18	0	3	3	0	3	0	48	0.6%
10-Aug	3	9	6	0	6	-3							0	0	-3	0	3	0	0	0	6	0	3	0	30	0.4%
11-Aug	0	-3	6	3	0	0							0	0	3	0	0	0	3	0	0	0	6	0	18	0.2%
12-Aug	9	6	9	12	3	-3							6	6	0	0	0	0	0	3	0	0	9	0	60	0.7%
13-Aug	9	12	3	0	6	-3							0	0	0	6	9	9	15	0	3	0	6	0	75	0.9%
14-Aug	0	9	6	3	12	0															0	0	0	0	30	0.4%
15-Aug	0	0	0	0	0	0	0	3	0	3	3	-3	3	0	0	6	0	0	0	0	6	0	0	0	21	0.3%
16-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	0.0%
17-Aug	0	0	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	6	0.1%
18-Aug	0	0	0	0	0	0	0	0	3	0	0	-3	0	0	0	0	-3	0	0	0	0	0	0	0	-3	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	6	0.1%
21-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	0	6	0.1%
22-Aug	0	0	0	0	0	0	0	0	0	0	0	0	-6	0	6	0	3	0	0	0	0	0	0	0	3	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	0	0	0	0.0%
24-Aug	0	0	0	0	0	0	0	0	0	0	3	3	0	0	3	0	0	0	0	3	0	0	0	0	12	0.1%
25-Aug	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	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%
27-Aug	0	0	3	0	3	0	0	3	-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0.1%
28-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3	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	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	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	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	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	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	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	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	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	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	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%
10-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%
11-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%
12-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0.0%
13-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%
14-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%
15-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%
Totals	1,179	1,377	663	543	513	240	174	87	12	36	18	9	9	-3	45	33	135	204	300	207	408	453	759	885	8,286	100%
	14.2%	16.6%	8.0%	6.6%	6.2%	2.9%	2.1%	1.0%	0.1%	0.4%	0.2%	0.1%	0.1%	0.0%	0.5%	0.4%	1.6%	2.5%	3.6%	2.5%	4.9%	5.5%	9.2%	10.7%	100%	

Appendix Table 8. Reported hourly chinook salmon observations at the Kwiniuk River counting tower, Norton Sound, 2001.

Outlined 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-Jun																				0	0	0	0	0	0	0.0%
28-Jun	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6	0	0	0	6	18	7.1%
29-Jun	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	3	0	0	0	12	4.8%
30-Jun	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%
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	1.2%
3-Jul	0	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	3	6	0	6	0	0	0	0	12	4.8%
4-Jul																									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	0	0	0	0.0%
6-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	-3	-1.2%
7-Jul	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	6	2.4%
8-Jul	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	6	2.4%
9-Jul	0	3	0	0	0	0	0	0	0	0	0	-6	0	0	0	0	0	0	0	0	0	0	0	3	0	0.0%
10-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-6	0	0	0	0	0	0	0	-6	-2.4%
11-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3	1.2%
12-Jul	0	0	0				0	0	-3	0	0	0	0	0	0	0	0	0	0	3	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	12	0	0	0	0	3	15	6.0%
14-Jul	0	0	0	6	0	0	3	0	-3	0	0	0	0	0	-3	18	0	0	0	0	0	0	0	0	21	8.3%
15-Jul	15	9	27	9	0	3	0	3	-3	0	0	-6	0	3	0	0	3	0	0	0	0	-3	0	0	60	23.8%
16-Jul	0	0	-3	-3	6	0	0	0	3	0	0	0	0	0	0	0	0	3	0	3	3	6	0	0	18	7.1%
17-Jul	0	0	3	0	0	0	0	3	0	0	0	3	3	0	3	0	-3	0	0	0	6	0	3	0	21	8.3%
18-Jul	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3	15	6.0%
19-Jul	6	6	0	0	0	3	0	0	0	0	0	0	0	-3	0	3	0	3	3	0	0	0	0	0	21	8.3%
20-Jul	0	0	0	0	0	-3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
21-Jul	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	6	2.4%
22-Jul	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1.2%
23-Jul	-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	-3	0	0	0	0	0	0	0	0	0.0%
24-Jul	0	0	0	0	3	-3	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	0	-3	-1.2%
25-Jul	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2.4%
26-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	6	2.4%
27-Jul	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	6	0	0	6	2.4%
28-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	1.2%
29-Jul	0	0	0	0	0	0	0	0	0	0	0	0	3	0	-3	0	0	0	0	0	0	0	0	0	0	0.0%
30-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	1.2%
31-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%
1-Aug	0	3	0	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	0	0	0	0	0.0%
2-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%
3-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%
4-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	-3	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	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%
7-Aug	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%
9-Aug	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
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	0	0	0	0	0.0%
12-Aug	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%
14-Aug	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	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	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	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	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	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%
21-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%
22-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%
23-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%
24-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%
25-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%
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%
27-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%
28-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%
29-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%
30-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%
31-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%
1-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%
2-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%
3-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%
4-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%
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	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	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	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%
10-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%
11-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%
12-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%
13-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%
14-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%
15-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%
Totals	24	30	30	15	12	3	3	6	-3	3	3	-9	3	3	0	27	-6	15	21	24	12	6	6	24	252	100%
	9.5%	11.9%	11.9%	6.0%	4.8%	1.2%	1.2%	2.4%	-1.2%	1.2%	1.2%	-3.6%	1.2%	1.2%	0.0%	10.7%	-2.4%	6.0%	8.3%	9.5%	4.8%	2.4%	2.4%	9.5%	100%	

Appendix Table 9. Reported hourly coho salmon observations at the Kwiniuk River counting tower, Norton Sound, 2001.

Outlined 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-Jun																				0	0	0	0	0	0	0.0%
28-Jun	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%
29-Jun	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%
30-Jun	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%
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	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%
3-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%
4-Jul																									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	0	0	0	0.0%
6-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%
7-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%
8-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%
9-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%
10-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%
11-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	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	0.0%
13-Jul	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	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	0	0	0	0.0%
15-Jul	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.0%
16-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%
17-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%
18-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%
19-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%
20-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%
21-Jul	9	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0.1%
22-Jul	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	9	0.1%
23-Jul	3	18	9	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	36	0.4%
24-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	15	0	18	0.2%
25-Jul	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	9	6	0	18	0.2%
26-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	3	0	0	0.0%
27-Jul	0	6	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	9	0.1%
28-Jul	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	6	0.1%
29-Jul	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	3	12	27	0.3%
30-Jul	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0.1%
31-Jul	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	9	0.1%
1-Aug	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	18	0.2%
2-Aug	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	-6	0	0	0	0	0	0	0	0	3	0.0%
3-Aug	0	3	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	9	21	0.2%
4-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%
5-Aug	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0.0%
6-Aug	6	3	0	0	0	0	0	0	0	0	0	0	0	0	6	9	3	0	3	0	3	9	6	9	57	0.6%
7-Aug	18	9	3	6	0	0							0	0	0	0	0	0	0	0	0	0	0	0	36	0.4%
8-Aug	3	0	3	12	0	3							0	0	0	-3	6	0	0	0	0	-3	3	0	24	0.3%
9-Aug	6	9	9	6	9	0							0	0	0	0	12	0	0	9	0	3	6	3	72	0.8%
10-Aug	21	24	36	12	21	12							0	0	0	3	0	3	0	0	0	0	21	0	153	1.7%
11-Aug	3	24	36	18	18	6							0	0	0	0	0	0	0	0	3	0	3	6	117	1.3%
12-Aug	36	12	33	18	12	6							0	6	0	0	0	3	0	0	0	0	12	6	144	1.6%
13-Aug	75	39	66	12	3	0							0	0	3	0	42	72	54	0	72	-3	105	27	567	6.2%
14-Aug	9	18	9	21	12	6															6	18	18	18	135	1.5%
15-Aug	0	3	6	6	0	3	9	12	9	0	30	6	27	6	27	30	42	30	15	27	33	24	0	6	351	3.9%
16-Aug	15	6	0	-9	-12	-15	0	-63	-12	0	0	-6	0	0	57	33	12	21	42	36	21	66	12	54	258	2.8%
17-Aug	36	12	45	42	12	-3	3	21	12	0	6	0	0	0	12	3	15	0	0	0	0	0	0	48	264	2.9%
18-Aug	39	45	60	33	24	6	-6	0	0	-3	0	0	0	0	6	39	30	69	0	6	27	0	15	15	405	4.5%
19-Aug	30	9	18	39	3	0	0	0	0	-3	0	0	0	0	0	0	0	-3	0	0	0	3	0	0	96	1.1%
20-Aug	27	21	15	21	21	6	6	0	0	0	0	0	0	0	0	0	0	6	3	78	3	0	0	63	270	3.0%
21-Aug	15	36	18	15	45	6	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	45	24	69	279	3.1%
22-Aug	6	21	9	39	15	15	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	30	150	1.7%
23-Aug	3	6	12	30	33	18	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	21	162	321	3.5%
24-Aug	81	45	48	39	33	12	0	0	0	0	0	0	6	6	0	3	0	0	0	0	0	12	0	45	330	3.6%
25-Aug	15	57	39	30	33	9	-3	0	0	0	0	12	39	30	3	0	0	0	18	0	0	12	9	27	330	3.6%
26-Aug	24	42	48	132	87	21	3	0	0	0	0	0	0	0	0	12	3	9	0	0	0	30	24	30	465	5.1%
27-Aug	48	129	198	168	48	27	-6	3	-3	-6	0	0	0	0	0	0	0	0	0	0	0	0	45	3	654	7.2%
28-Aug	45	15	57	9	15	12	6	0	0	0	6	0	0	-3	0	0	12	0	0	0	0	0	0	24	198	2.2%
29-Aug	18	63	51	72	18	3	9	9	0	0	0	0	0	0	27	108	51	9	0	0	3	6	3	291	741	8.2%
30-Aug	6	18	102	99	48	27	21	0	0	0	-9	0	6	0	0	0	0	0	0	0	0	57	9	57	441	4.9%
31-Aug	36	36	90	45	108	21	15	-9	-3	0	-15	-6	0	0	0	12	0	78	0	0	0	-3	-3	15	417	4.6%
1-Sep	63	69	21	-15	0	9	-3	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	21	168	1.9%
2-Sep	12	6	24	12	9	3	6	0	-6	0	0	0	0	3	0	0	0	0	6	0	0	0	0	12	87	1.0%
3-Sep	6	9	18	0	0	-3	0	0	0	0	0	0	0	0	0	3	0	0	0	18	0	0	42	0	93	1.0%
4-Sep	6	30	42	9	18	21	9	0	0	0	0	0	6	0	-15	18	0	-3	6	21	0	0	33	18	219	2.4%
5-Sep	45	42	72	24	18	0	9	0	-15	0	0	3	9	0	0	0	0	0	-6	0	0	0	15	15	231	2.5%
6-Sep	3	9	36	-3	21	9	6	0	0	0	0	0	0	0	-24	0	0	3	0	0	0	0	6	-6	60	0.7%
7-Sep	21	24	21	27	3	12	6	6	-12	0	0	0	0	0	0	0	0	0	0	0	0	0	9	3	120	1.3%
8-Sep	21	9	15	12	0	0	3	0	0	0	0	0	0	-6	0	0	0	6	-3	0	0	0	12	3	72	0.8%
9-Sep	18	27	0	-3	-3	-3	-3	-6	0	0	0	0	0	0	0	0	0	201	117	0	0	0	18	21	384	4.2%
10-Sep	15	6	0	3	-6	-6	0	-3	-6	0	0	0	0	3	0	0	0	0	0	0	0	0	12	9	27	0.3%
11-Sep	3	3	15	0	0	0	0	-6	-6	-3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	9	0.1%
12-Sep	18	3	3	0	9	0	-6	0	0	-3	0	0	0	0	0	0	0	0	0	0	0	0	9	3	36	0.4%
13-Sep	12	9	12	-3	-12	-3	0	-3	0	-3	0	0	0	0	0	0	0	6	0	0	0	0	6	3	24	0.3%
14-Sep	18	3	-9	27	-9	-36	-3	-27	-3	0	0	0	0	0	0	0	0	0	0	0	0	12	0	36	9	0.1%
15-Sep	24	12	15	3	6	-6	0	-6	-12	-3	0	0	0	0	0	0	0	0	3	0	0	6	3	15	60	0.7%
Totals	921	1,011	1,311	1,011	672	204	105	-69	-57	-18	18	9	96	48	102	267	228	516	261	198	192	333	531	1,188	9,078	100%
	10.1%	11.1%	14.4%	11.1%	7.4%	2.2%	1.2%	-0.8%	-0.6%	-0.2%	0.2%	0.1%	1.1%	0.5%	1.1%	2.9%	2.5%	5.7%	2.9%	2.2%	2.1%	3.7%	5.8%	13.1%	100%	

Appendix Table 10. Reported hourly Dolly Varden observations at the Kwiniuk River counting tower, Norton Sound, 2001.

Outlined 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-Jun																				0	0	0	0	0	0	0.0%
28-Jun	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%
29-Jun	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%
30-Jun	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%
1-Jul	0	0	0	0	0	0	0	0	0	0	0	0	-6	0	0	0	3	0	3	0	12	0	0	0	12	-0.7%
2-Jul	9	0	3	0	0	0	0	0	-6	0	0	0	0	0	-3	0	0	3	3	21	0	0	0	0	30	-1.9%
3-Jul	0	0	0	0	0	0	0	6	0	-3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6	-0.4%
4-Jul																									0	0.0%
5-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	-3	0	6	0	0	-6	0	0	0.0%
6-Jul	0	0	0	0	0	0	0	0	0	0	-6	0	0	0	0	0	3	0	6	0	0	0	0	0	3	-0.2%
7-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%
8-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%
9-Jul	0	0	0	0	0	0	0	0	0	0	3	-3	-3	0	0	0	0	0	0	0	0	0	3	0	0	0.0%
10-Jul	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	-0.6%
11-Jul	0	0	0	0	0	0	0	0	-171	0	0	-3	0	3	-3	0	0	0	0	0	0	0	0	0	-174	10.8%
12-Jul	0	0	0				0	0	0	0	0	-3	3	0	-3	0	-3	0	0	0	0	0	0	0	-6	0.4%
13-Jul	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	9	-0.6%
14-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%
15-Jul	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	-0.2%
16-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	6	-0.4%
17-Jul	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	-0.2%
18-Jul	0	0	0	0	0	-6	-3	-3	0	-840	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-852	53.0%
19-Jul	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	-0.2%
20-Jul	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	-0.2%
21-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%
22-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%
23-Jul	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	-0.2%
24-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%
25-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%
26-Jul	0	6	0	0	0	0	0	0	0	0	0	-24	0	0	0	0	0	0	0	0	0	0	0	0	-18	1.1%
27-Jul	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	-0.2%
28-Jul	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	-0.4%
29-Jul	0	3	3	0	0	0	0	0	0	3	0	0	0	0	0	0	0	6	0	0	0	0	0	0	15	-0.9%
30-Jul	0	6	0	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	-0.9%
31-Jul	3	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	9	-0.6%
1-Aug	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	-0.4%
2-Aug	3	0	0	0	0	3	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	12	-0.7%
3-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%
4-Aug	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	0	0	0	0	0	0	-3	0.2%
5-Aug	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	-0.2%
6-Aug	6	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	3	0	0	0	15	-0.9%
7-Aug	0	0	0	0	0	0							0	0	0	0	0	3	0	0	0	0	0	0	3	-0.2%
8-Aug	0	0	0	0	3	0							0	0	3	0	0	0	0	0	0	0	0	0	6	-0.4%
9-Aug	0	3	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	3	-0.2%
10-Aug	0	3	0	0	0	0							0	0	0	0	0	0	0	0	3	0	0	0	6	-0.4%
11-Aug	0	0	0	0	0	0							0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
12-Aug	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%
14-Aug	0	0	0	0	0	0															0	0	0	0	0	0.0%
15-Aug	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	-0.4%
16-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3	-0.2%
17-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	-0.2%
18-Aug	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	9	-0.6%
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	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%
21-Aug	0	0	6	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	12	-0.7%
22-Aug	0	6	3	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	-0.9%
23-Aug	0	0	0	0	0	0	0	0	0	-15	-6	-51	0	0	0	0	0	0	0	0	0	0	0	0	-72	4.5%
24-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	0	12	-0.7%
25-Aug	0	0	0	0	0	0	0	0	0	0	0	0	-84	0	3	0	0	0	9	3	3	6	6	15	-39	2.4%
26-Aug	12	0	0	0	0	0	0	-24	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	-9	0.6%
27-Aug	0	0	0	0	0	0	-12	-21	-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-48	3.0%
28-Aug	0	0	0	0	-6	0	-9	0	-24	-21	0	0	0	-3	-84	0	0	0	0	0	0	0	0	0	-147	9.1%
29-Aug	0	0	0	0	0	0	-18	0	0	-27	0	0	0	0	0	0	0	0	0	3	0	0	6	0	-36	2.2%
30-Aug	0	0	0	0	0	0	0	0	0	-15	0	0	0	0	0	0	0	0	0	0	0	6	0	0	-9	0.6%
31-Aug	0	0	0	0	0	0	-9	0	-81	0	-33	-21	0	0	0	0	0	0	0	0	0	0	0	0	-144	9.0%
1-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0.0%
3-Sep	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	-0.4%
4-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	-0.2%
5-Sep	0	0	0	0	3	3	0	0	-15	-48	-33	0	0	0	0	0	0	0	0	0	0	0	9	0	-81	5.0%
6-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	-3	0	0	0	-3	0.2%
8-Sep	3	0	0	3	9	0	3	0	0	0	-24	-12	0	0	0	0	0	-9	0	0	0	0	0	0	-27	1.7%
9-Sep	27	6	0	0	3	-30	-33	0	-9	0	-21	0	0	0	0	0	0	0	-6	0	0	0	0	0	-63	3.9%
10-Sep	0	0	0	0	0	0	0	0	0	-51	-30	0	0	0	0	0	0	0	0	0	0	0	0	0	-81	5.0%
11-Sep	0	0	0	0	0	0	0	0	0	-12	-39	-6	0	0	0	0	0	0	0	0	0	0	0	0	-57	3.5%
12-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%
13-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%
14-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%
15-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%
Totals	66	36	15	12	21	-9	-69	-24	-318	-1,026	-177	-123	-87	9	-84	0	3	3	15	39	18	21	36	15	-1,608	100%
	-4.1%	-2.2%	-0.9%	-0.7%	-1.3%	0.6%	4.3%	1.5%	19.8%	63.8%	11.0%	7.6%	5.4%	-0.6%	5.2%	0.0%	-0.2%	-0.2%	-0.9%	-2.4%	-1.1%	-1.3%	-2.2%	-0.9%	100%	

Appendix 11. Historical salmon escapement at the Kwiniuk River counting tower, 1965-2001.

Year	Operating period	Chum		Pink	Chinook	Coho
1965	Jun 18-July 19	32,861				
1966	Jun 19-July 28	33,184				
1967	Jun 24-July 20	26,631				
1968	Jun 25-July 24	19,976				
1969	Jun 26-July 26	19,749				
1970	Jun 25-July 29	69,758				
1971	Jun 26-July 29	39,046				
1972	Jun 28-July 26	30,686				
1973	Jun 25-July 25	28,618				
1974	Jun 25-July 25	35,868				
1975	July 4-July 25	14,344				
1976	Jun 28-July 31	6,978				
1977	Jun 27-July 25	22,757				
1978	Jun 17-July 22	21,002				
1979	June 27-July 25	12,355				
1980	June 6-July 28	19,372				
1981	June 19-August 2	34,566		566,534	136	
1982	June 21-July 26	44,099		469,674	138	
1983	June 19-July 27	56,907		254,538	267	
1984	June 19-July 25	54,043		663,533	736	
1985	June 26-July 28	9,013		18,237	955	
1986	June 19-July 26	24,705		241,446	654	
1987	June 25-July 23	16,134		5,566	317	
1988	June 18-July 26	13,302		187,991	321	
1989	June 27-July 27	14,282		27,488	248	
1990	June 21-July 25	13,957		416,512	900	
1991	June 18-July 27	19,800		53,499	708	
1992	June 27-July 28	12,077		1,464,716	479	
1993	June 23-July 27	15,823		43,065	594	
1994	June 23-Aug 9	32,875		234,099	623	2,547
1995	June 21-July 25	42,703		17,509	485	114
1996	June 20-July 25	28,493		907,894	577	461
1997	June 18-July 27	20,118		9,536	972	0
1998	June 20-July 27	24,248		655,933	302	0
1999	June 25-July 28	8,763		608	115	0
2000	June 22-July 27	12,878		750,173	144	41
1965-2000 Average		25,888	1981-2000 Avg.	349,428	484	
2001	June 27-Sept 15	16,598		8,423	258	9,532

Appendix12. Percentage of salmon counts estimated at the Kwiniuk River counting tower project 1993-2001.

Year	Operating period	Chum	Pink	King	Coho
1993	June 23-July 27	17.3%	17.0%	24.2%	
1994	June 23-Aug 3	19.5%	28.4%	29.7%	65.6%
1995	June 21-July 25	28.2%	23.0%	15.5%	10.5%
1996	June 20-July 25	19.2%	14.7%	26.9%	21.5%
1997	June 18-July 27	18.0%	13.0%	21.6%	0.0%
1998	June 20-July 27	37.3%	15.4%	15.9%	0.0%
1999	June 25-July 28	22.3%	42.4%	18.3%	0.0%
2000	June 22-July 27	15.7%	26.2%	4.2%	21.4%
2001	June 27-Sept 15	9.9%	1.6%	2.3%	4.8%