

AN ESTIMATE OF THE MIGRATORY TIMING AND ABUNDANCE OF
SOCKEYE SALMON INTO UPPER COOK INLET, ALASKA, IN 1995

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ABSTRACT

During the 1995 Upper Cook Inlet, Alaska commercial salmon fishing season a test fishery was used to estimate the timing of the sockeye salmon *Oncorhynchus nerka*, run as it passed a transect along the southern boundary of the management area. The test fishery operated from 1 July to 30 July and captured 2,720 sockeye salmon representing 1,712 CPUE points. Mean date of the run was 15 July, and the test fishery encompassed approximately 93.7% of the total run.

KEY WORDS: Salmon, *Oncorhynchus*, Upper Cook Inlet, Alaska, test fishery, migratory behavior

INTRODUCTION

In 1979 the Alaska Department of Fish and Game (ADF&G) began a test fishing project near the southern boundary of the Upper Cook Inlet (UCI) salmon management area (Figure 1). The objective of this project was to estimate the total run of sockeye salmon *Oncorhynchus nerka*, to UCI before salmon reached commercial harvest areas. Such information has helped ADF&G management biologists set commercial fishing times and areas to harvest sockeye salmon surplus to spawning needs. Test fishing results have been reported annually since 1979 (Waltemyer 1983a, 1983b, 1986a, 1986b, Hilsinger and Waltemyer 1987, Hilsinger 1988, Tarbox and Waltemyer 1989, Tarbox 1990, 1992, 1994, 1995). This report presents the results of the 1995 test fishing project.

METHODS

Test Fishing

Sockeye salmon returning to Upper Cook Inlet were sampled by fishing geographically fixed stations between Anchor Point and Red River Delta (Figure 1). Stations were numbered consecutively from east to west. Station locations were determined from LORAN C coordinates. A chartered test fishing vessel sampled stations 4 - 8 daily. To increase sampling power an additional station (6.5) was sampled every other day.

Sampling started on 1 July and continued through 30 July. The chartered vessel, *F/V Corrina Kay*, fished 366 m (1,200 ft) of 2.1 cm (5 1/8 in) multifilament gill net during test fishing. Drift gill net web had a filament size number of 53/S6F, was 45 meshes deep, and was constructed of double knot Super Crystal shade number 1.

All salmon captured were identified to species. All sockeye salmon were measured for length (mid-eye to fork-of-tail in mm). The number of each species caught at each station was expressed as a catch per unit of effort (CPUE) statistic:

$$CPUE_s = \frac{100 \text{ fm} \times 60 \text{ min} \times \text{number of fish}}{\text{fm of gear} \times \text{MFT}}, \quad (1)$$

where: $CPUE_s$ = CPUE for station s, and
MFT = mean fishing time.

Mean fishing time was calculated as:

$$\text{MFT} = (C - B) + \frac{[B - A] + [D - C]}{2} \quad , \quad (2)$$

where: A = time net deployment started,
B = time net fully deployed,
C = time net retrieval started, and
D = time net fully retrieved.

Once deployed at a station, gill nets were fished 30 min before retrieval started.

Daily CPUE (CPUE_d) was calculated as:

$$\text{CPUE}_d = \sum_{s=1}^n \text{CPUE}_s \quad (3)$$

The following physical and chemical measurements were taken at the start of each set: air temperature, water temperature (at 1 m below the surface), wind velocity and direction, tide stage, water depth, and water clarity. Air and water temperatures were measured using a YSI salinity/temperature meter. Unfortunately, the salinity meter malfunctioned during the project. Wind speed was measured in knots and direction was recorded as 0 (no wind), 1 (north), 2 (northeast), 3 (east), 4 (southeast), 5 (south), 6 (southwest), 7 (west), or 8 (northwest). Tide stage was classed as flood, ebb or slack by observing the movement of the vessel while drifting with the gill net. Water depth was measured in fm using a Simrad echo sounder, and water clarity was measured in m using a 17.5 cm secchi disk.

Describing the Salmon Migration

Catchability, the fraction of the available population taken by a defined unit of fishing effort, was estimated as:

$$q_d = c_d/r_d \quad , \quad (4)$$

where: q_d = estimated catchability on day d ,
 r_d = adjusted cumulative total return on day d , and
 c_d = cumulative CPUE on day d .

Passage rate, the expansion factor used to convert CPUE into estimated numbers of salmon passing the test fishing transect, was calculated as:

$$PR = 1/q_d = \text{passage rate} \quad (5)$$

Since the test fishery did not encompass the entire sockeye salmon run, the total CPUE for the test fishery was estimated after the season using the following relationship:

$$CPUE_t = CPUE_f \times \frac{H_t}{H_{(f+2)}}, \quad (6)$$

where: $CPUE_t$ = total estimated CPUE for the season,
 $CPUE_f$ = cumulative CPUE through final day, f , of test fishing,
 H_t = total commercial harvest for the season
 $H_{(f+2)}$ = total commercial catch through final day of test fishery ($f+2$), and
 2 = number of days it took salmon to travel from test fishery to commercial harvest areas.

Estimates of $CPUE_t$ and $CPUE_d$ values were used to estimate daily and cumulative proportions of $CPUE_t$, based on a non-linear model:

$$y_d = 1/(1 + e^{-(a+bd)}) \quad (7)$$

where: y_d = cumulative proportion of CPUE or return on day d ,
 a and b = coefficients of model,
 d = day of observation.

To calculate mean date of return, the following formula was used:

$$M = a/b \tag{8}$$

where: M = mean date of return.

RESULTS AND DISCUSSION

A total of 2,720 sockeye salmon, 155 pink salmon *O. gorbuscha*, 1129 chum salmon *O. keta*, 941 coho salmon *O. kisutch*, and 3 chinook salmon *O. tshawytscha*, were captured during the 1995 test fishery (Table 1, Appendices A-D). Daily sockeye salmon catches ranged from 4 to 600 fish (Table 1).

Sockeye salmon daily CPUE values ranged from 3.2 on 26 July to 269.7 on 15 July. Cumulative total CPUE for the duration of the project was 1,711.5 (Table 1). Using post season commercial harvest figures, test fishing spanned approximately 93.7% of the total run. Therefore, total CPUE for the test fishery would have been 1,827 if test fishing had continued throughout the duration of the run.

Sockeye salmon catches along the transect were similar to the distribution of CPUE values (Tables 2 and 3).

Examination of daily and cumulative proportions (estimated post season) of the sockeye salmon run to UCI suggested that 4.8% of the run had passed the transect prior to the start of test fishing on 1 July and that the run was 96% completed at project termination (Appendix E; Figure 2). The mean date of the run was 15 July which was on time relative to the historic average (Table 4).

The total sockeye salmon run to UCI in 1995 was estimated to be 4.6 million fish of which 2.9 million were harvested in the commercial fishery (Table 5). Estimated passage rate for the season was 2,517 sockeye salmon per CPUE index point.

Water temperatures measured along the transect generally increased during the season from a low of 7.0°C early in July to a high of 11.0°C toward the end of July (Appendix F). Air temperatures fluctuated between 11°C and 19°C during the project (Appendix F). Wind velocities were generally low to moderate. However, winds of 20 knots or greater were recorded on seven days (Appendix F). Wind direction was variable.

During the commercial salmon fishing season eight formal estimates of the sockeye salmon total run were made (Appendix G). Past studies suggested that the initial best fit estimate was not accurate in predicting total run during the season and that the second or third best fit estimate was usually more useful. This pattern was evident in 1995. However, the first estimates on 17 July

indicated a run between 4.6 and 5.9 million sockeye salmon. During the remainder of the season, the estimates generally indicated a run between 4 and 5 million fish (Appendix G).

The objective of the offshore test fish program is to provide UCI management biologists with early total run and timing estimates for sockeye salmon. This information, used with age, sex, size and stock identification data; harvest and escapement data; and observations on fishing patterns combine to formulate a management strategy during the fishing season. It is in this context that the data must be viewed.

The 1995 UCI commercial salmon fishery proceeded in an orderly fashion early in the season and run size estimates were not a significant factor until after 15 July (Ruesch, personal communication, ADF&G, Soldotna).

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Table 1. Summary of sockeye salmon fishing effort, daily and cumulative catch, and daily and cumulative CPUE, Upper Cook Inlet offshore test fish project, 1995.

Date	Number of Stations	Mean Fishing Time (min)	Catch		CPUE		Mean Length (mm)
			Daily	Cumul.	Daily	Cumul.	
01-Jul	6	228.5	23	23	17.9	17.9	528
02-Jul	5	188.0	10	33	7.7	25.6	525
03-Jul	6	230.0	96	129	64.7	90.3	
04-Jul	5	190.0	30	159	22.0	112.3	525
05-Jul	6	230.5	8	167	5.9	118.2	535
06-Jul	5	200.0	88	255	61.8	180.0	528
07-Jul	6	231.5	67	322	50.6	230.6	542
08-Jul	5	190.5	51	373	39.6	270.2	530
09-Jul	6	238.5	107	480	68.4	338.5	543
10-Jul	5	184.0	135	615	100.3	438.9	541
11-Jul	6	244.0	271	886	169.7	608.6	561
12-Jul	5	195.5	52	938	37.6	646.2	563
13-Jul	6	253.0	139	1077	81.1	727.3	564
14-Jul	5	207.0	104	1181	74.1	801.4	535
15-Jul	5	264.0	600	1781	269.7	1071.2	558
16-Jul	5	189.5	64	1845	47.1	1118.3	573
17-Jul	6	255.0	118	1963	62.5	1180.8	558
18-Jul	5	196.5	62	2025	43.0	1223.8	557
19-Jul	6	225.5	44	2069	33.1	1256.9	555
20-Jul	5	189.0	48	2117	33.0	1289.9	567
21-Jul	6	249.0	132	2249	83.3	1373.2	572
22-Jul	5	218.0	108	2357	69.9	1443.1	
23-Jul	6	239.0	68	2425	49.4	1492.5	550
24-Jul	5	198.5	104	2529	73.1	1565.5	564
25-Jul	6	235.0	43	2572	31.9	1597.5	566
26-Jul	5	163.0	4	2576	3.2	1600.7	520
27-Jul	6	231.5	53	2629	39.2	1639.9	561
28-Jul	5	183.5	20	2649	16.2	1656.1	563
29-Jul	1	43.0	28	2677	19.5	1675.6	569
30-Jul	5	179.0	43	2720	36.0	1711.5	566

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Table 2. Estimated sockeye salmon catch by date and station, Upper Cook Inlet offshore test fish project, 1995.

Date	Station Number						Total
	4	5	6	6.5	7	8	
01-Jul	0	5	15	0	3	0	23
02-Jul	0	0	2		7	1	10
03-Jul	0	10	84	0	0	2	96
04-Jul	0	4	24		0	2	30
05-Jul	0	0	8	0	0	0	8
06-Jul	1	21	46		15	5	88
07-Jul	10	0	30	25	2	0	67
08-Jul	16	2	10		21	2	51
09-Jul	12	44	26	24	1	0	107
10-Jul	0	126	6		2	1	135
11-Jul	35	185	3	38	7	3	271
12-Jul	15	10	26		0	1	52
13-Jul	13	103	12	6	3	2	139
14-Jul	27	46	14		17	0	104
15-Jul	7	42	289	244	18		600
16-Jul	1	5	7		44	7	64
17-Jul	6	14	94	0	3	1	118
18-Jul	1	15	43		1	2	62
19-Jul	0	19	25	0	0	0	44
20-Jul	0	48	0		0	0	48
21-Jul	0	2	38	85	2	5	132
22-Jul	3	48	41		14	2	108
23-Jul	4	4	5	23	24	8	68
24-Jul	1	0	61		18	24	104
25-Jul	13	13	9	0	7	1	43
26-Jul	0	1	2		1	0	4
27-Jul	2	16	23	1	5	6	53
28-Jul	0	20	0		0	0	20
29-Jul		28					28
30-Jul	1	0	0		35	7	43
Total	168	831	943	446	250	82	2720
%	6.2	30.6	34.7	16.4	9.2	3.0	100.0

Table 3. Estimated sockeye salmon CPUE by date and station, Upper Cook Inlet offshore test fish project, 1995.

Date	Station Number						Total
	4	5	6	6.5	7	8	
01-Jul	0.0	3.9	11.5	0.0	2.5	0.0	17.9
02-Jul	0.0	0.0	1.5		5.4	0.8	7.7
03-Jul	0.0	7.7	55.4	0.0	0.0	1.6	64.7
04-Jul	0.0	3.0	17.3		0.0	1.7	22.0
05-Jul	0.0	0.0	5.9	0.0	0.0	0.0	5.9
06-Jul	0.9	15.3	30.7		11.0	3.9	61.8
07-Jul	8.0	0.0	22.2	18.9	1.5	0.0	50.6
08-Jul	12.6	1.6	7.8		16.1	1.5	39.6
09-Jul	9.5	20.9	19.0	18.2	0.8	0.0	68.4
10-Jul	0.0	93.3	4.6		1.6	0.8	100.3
11-Jul	24.7	106.7	2.3	28.2	5.3	2.5	169.7
12-Jul	11.4	7.9	17.5		0.0	0.8	37.6
13-Jul	9.7	54.2	8.5	4.7	2.4	1.6	81.1
14-Jul	20.2	32.1	9.1		12.7	0.0	74.1
15-Jul	5.4	30.0	102.0	117.1	15.2		269.7
16-Jul	0.9	3.8	5.6		31.4	5.4	47.1
17-Jul	4.7	10.2	44.4	0.0	2.4	0.8	62.5
18-Jul	0.8	11.5	28.3		0.8	1.6	43.0
19-Jul	0.0	14.6	18.5	0.0	0.0	0.0	33.1
20-Jul	0.0	33.0	0.0		0.0	0.0	33.0
21-Jul	0.0	1.7	27.4	49.0	1.5	3.7	83.3
22-Jul	2.2	30.0	27.0		9.2	1.5	69.9
23-Jul	3.1	3.1	3.7	16.2	16.9	6.4	49.4
24-Jul	0.9	0.0	41.1		13.8	17.3	73.1
25-Jul	9.7	9.5	6.8	0.0	5.1	0.8	31.9
26-Jul	0.0	0.8	1.6		0.8	0.0	3.2
27-Jul	1.7	12.1	15.8	0.8	3.9	4.9	39.2
28-Jul	0.0	16.2	0.0		0.0	0.0	16.2
29-Jul		19.5					19.5
30-Jul	0.9	0.0	0.0		29.5	5.6	36.0
Total	127.3	542.6	535.5	253.1	189.8	63.3	1711.5
%	7.4	31.7	31.3	14.8	11.1	3.7	100.0

Table 4. Mean date of the sockeye salmon run across Anchor Point transect, Upper Cook Inlet offshore test fish project, 1979-1995.

Year	Mean Date ^a	
	Coded	Calendar
1979	18.4	July 11
1980	22.7	July 15
1981	13.2	July 06
1982	24.2	July 17
1983	22.6	July 15
1984	18.4	July 11
1985	22.7	July 15
1986	23.0	July 16
1987	25.7	July 18
1988	20.6	July 13
1989	21.6	July 14
1990	25.6	July 18
1991	24.3	July 17
1992	24.3	July 17
1993	21.4	July 14
1994	26.2	July 19
1995	22.1	July 15
1979-1994	22.2	July 15

^a Day (1) = June 24. File 95otft4.doc

Table 5. The 1995 Upper Cook Inlet commercial salmon harvest.

Date	Number of Deliveries	CPUE			CATCH (number)		
		Daily	Cum	Cum%	Daily	Cum	Cum%
6-02 Fri	9	53.00	53.00	.93	477	477	.02
6-05 Mon	78	21.04	74.04	1.30	1,641	2,118	.07
6-07 Wed	6	67.50	141.54	2.49	405	2,523	.09
6-09 Fri	12	89.83	231.37	4.08	1,078	3,601	.12
6-12 Mon	9	35.11	266.48	4.70	316	3,917	.13
6-16 Fri	9	26.33	292.82	5.16	237	4,154	.14
6-19 Mon	10	23.00	315.82	5.57	230	4,384	.15
6-21 Wed	1	66.00	381.82	6.73	66	4,450	.15
6-23 Fri	8	13.38	395.19	6.97	107	4,557	.16
6-26 Mon	97	43.99	439.18	7.74	4,267	8,824	.30
6-30 Fri	448	56.77	495.95	8.74	25,434	34,258	1.17
7-03 Mon	805	90.53	586.48	10.34	72,873	107,131	3.67
7-07 Fri	835	287.13	873.60	15.40	239,750	346,881	11.89
7-10 Mon	918	273.73	1147.33	20.22	251,284	598,165	20.50
7-14 Fri	809	51.52	1198.86	21.13	41,681	639,846	21.93
7-16 Sun	9	30.33	1229.19	21.66	273	640,119	21.94
7-17 Mon	1163	540.71	1769.90	31.19	628,850	1,268,969	43.49
7-18 Tue	200	360.42	2130.33	37.55	72,085	1,341,054	45.96
7-19 Wed	173	362.35	2492.68	43.93	62,686	1,403,740	48.11
7-20 Thu	170	187.79	2680.46	47.24	31,924	1,435,664	49.21
7-21 Fri	1222	381.98	3062.45	53.98	466,784	1,902,448	65.21
7-23 Sun	27	365.11	3427.56	60.41	9,858	1,912,306	65.54
7-24 Mon	995	262.58	3690.14	65.04	261,268	2,173,574	74.50
7-25 Tue	753	86.95	3777.09	66.57	65,472	2,239,046	76.74
7-27 Thu	746	108.00	3885.09	68.47	80,568	2,319,614	79.51
7-28 Fri	1109	207.74	4092.83	72.14	230,386	2,550,000	87.40
7-29 Sat	474	59.16	4151.99	73.18	28,040	2,578,040	88.36
7-30 Sun	456	72.78	4224.77	74.46	33,188	2,611,228	89.50
7-31 Mon	1006	106.67	4331.43	76.34	107,308	2,718,536	93.18
8-01 Tue	377	37.37	4368.81	77.00	14,089	2,732,625	93.66
8-02 Wed	16	193.81	4562.62	80.42	3,101	2,735,726	93.77
8-04 Fri	803	82.99	4645.60	81.88	66,637	2,802,363	96.05
8-05 Sat	293	37.91	4683.51	82.55	11,107	2,813,470	96.43
8-07 Mon	545	64.76	4748.27	83.69	35,296	2,848,766	97.64
8-09 Wed	15	266.07	5014.34	88.38	3,991	2,852,757	97.78
8-11 Fri	388	57.64	5071.98	89.39	22,363	2,875,120	98.55
8-14 Mon	269	85.83	5157.81	90.91	23,088	2,898,208	99.34
8-16 Wed	15	125.67	5283.47	93.12	1,885	2,900,093	99.40
8-18 Fri	117	39.13	5322.60	93.81	4,578	2,904,671	99.55
8-21 Mon	92	51.66	5374.26	94.72	4,753	2,909,424	99.72
8-23 Wed	32	83.06	5457.33	96.19	2,658	2,912,082	99.81
8-25 Fri	61	33.89	5491.21	96.78	2,067	2,914,149	99.88
8-28 Mon	40	38.00	5529.21	97.45	1,520	2,915,669	99.93
8-30 Wed	5	97.60	5626.81	99.17	488	2,916,157	99.95
9-01 Fri	30	46.97	5673.78	100.00	1,409	2,917,566	100.00

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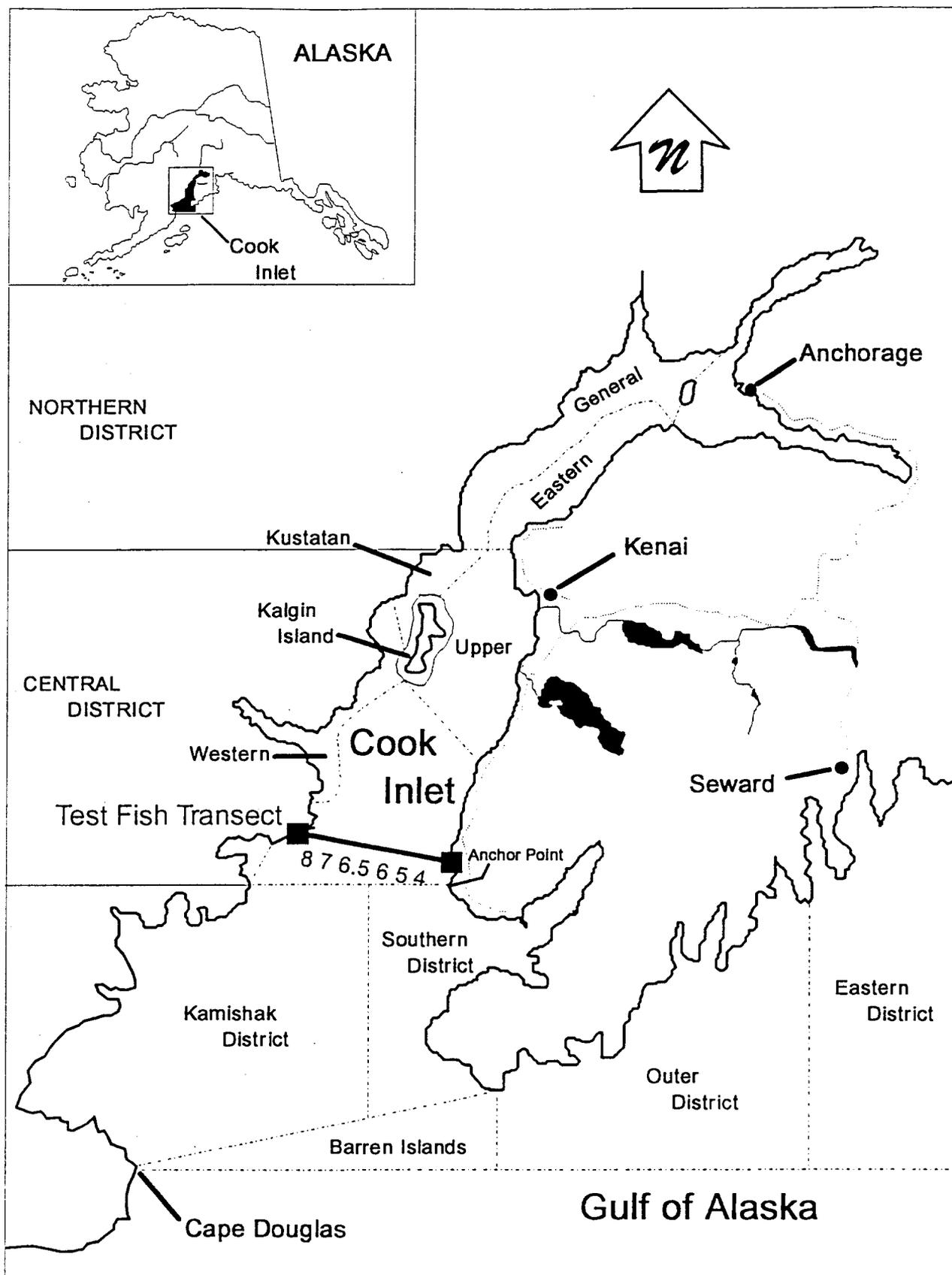


Figure 1. Location of fishing districts and offshore test fish transect in Cook Inlet, Alaska, 1995.

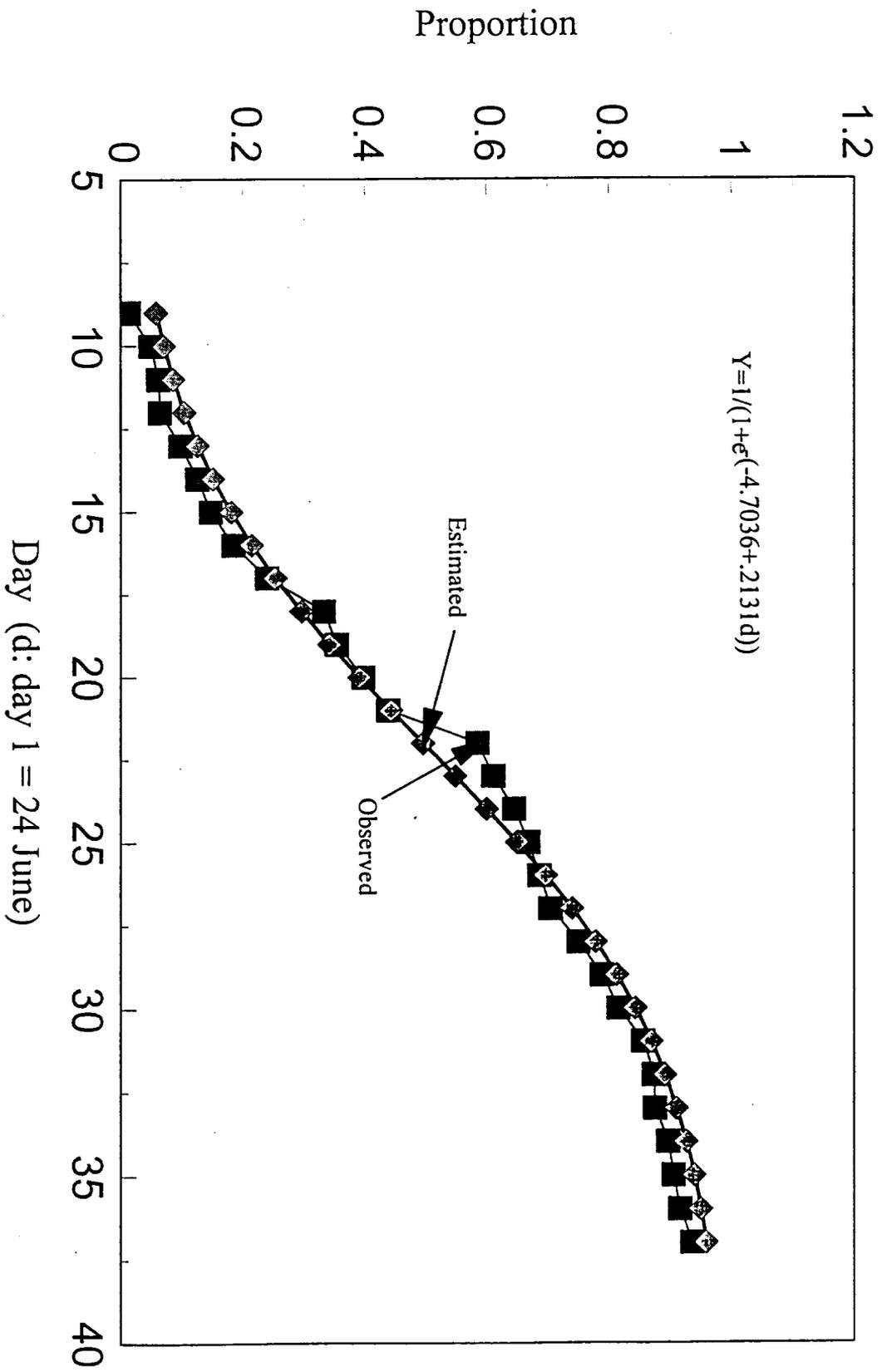


Figure 2. Cumulative proportions estimated for the sockeye salmon return to Upper Cook Inlet, Alaska, 1995.

Appendix A1. Summary of pink salmon fishing effort, daily and cumulative catch, and daily and cumulative CPUE, Upper Cook Inlet offshore test fish project, 1995.

Date	Number of Stations	Mean Fishing Time (min)	Catch		CPUE	
			Daily	Cumul.	Daily	Cumul.
01-Jul	6	228.5	0	0	0.0	0.0
02-Jul	5	188.0	0	0	0.0	0.0
03-Jul	6	230.0	0	0	0.0	0.0
04-Jul	5	190.0	1	1	0.7	0.7
05-Jul	6	230.5	3	4	2.3	3.0
06-Jul	5	200.0	2	6	1.5	4.5
07-Jul	6	231.5	2	8	1.5	6.0
08-Jul	5	190.5	2	10	1.6	7.6
09-Jul	6	238.5	1	11	0.7	8.3
10-Jul	5	184.0	0	11	0.0	8.3
11-Jul	6	244.0	1	12	0.6	8.9
12-Jul	5	195.5	0	12	0.0	8.9
13-Jul	6	253.0	5	17	3.1	12.1
14-Jul	5	207.0	5	22	3.4	15.5
15-Jul	5	264.0	42	64	19.1	34.6
16-Jul	5	189.5	7	71	6.0	40.5
17-Jul	6	255.0	15	86	8.4	48.9
18-Jul	5	196.5	4	90	3.1	52.0
19-Jul	6	225.5	2	92	1.5	53.5
20-Jul	5	189.0	2	94	1.4	54.9
21-Jul	6	249.0	20	114	12.2	67.2
22-Jul	5	218.0	9	123	6.0	73.2
23-Jul	6	239.0	7	130	5.0	78.2
24-Jul	5	198.5	6	136	4.5	82.7
25-Jul	6	235.0	1	137	0.8	83.5
26-Jul	5	163.0	0	137	0.0	83.5
27-Jul	6	231.5	8	145	6.1	89.6
28-Jul	5	183.5	4	149	3.2	92.8
29-Jul	1	43.0	4	153	2.8	95.6
30-Jul	5	179.0	2	155	1.7	97.3

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Appendix A2. Estimated pink salmon catch by date and station, Upper Cook Inlet offshore test fish project, 1995.

Date	Station Number						Total
	4	5	6	6.5	7	8	
01-Jul	0	0	0	0	0	0	0
02-Jul	0	0	0	0	0	0	0
03-Jul	0	0	0	0	0	0	0
04-Jul	0	0	1	0	0	0	1
05-Jul	1	0	1	1	0	0	3
06-Jul	0	1	0	0	0	1	2
07-Jul	0	0	2	0	0	0	2
08-Jul	0	0	1	0	0	1	2
09-Jul	0	0	1	0	0	0	1
10-Jul	0	0	0	0	0	0	0
11-Jul	0	1	0	0	0	0	1
12-Jul	0	0	0	0	0	0	0
13-Jul	1	3	0	0	0	1	5
14-Jul	0	2	2	0	1	0	5
15-Jul	1	1	21	16	3	0	42
16-Jul	4	1	0	0	1	1	7
17-Jul	2	0	11	0	1	1	15
18-Jul	1	0	0	0	3	0	4
19-Jul	0	2	0	0	0	0	2
20-Jul	0	2	0	0	0	0	2
21-Jul	0	0	4	15	1	0	20
22-Jul	0	2	2	0	4	1	9
23-Jul	0	0	0	5	1	1	7
24-Jul	0	1	1	0	3	1	6
25-Jul	0	0	0	0	0	1	1
26-Jul	0	0	0	0	0	0	0
27-Jul	0	3	1	2	2	0	8
28-Jul	0	0	2	0	2	0	4
29-Jul	0	4	0	0	0	0	4
30-Jul	0	0	0	0	2	0	2
Total	10	23	50	39	24	9	155
%	6.5	14.8	32.3	25.2	15.5	5.8	100.0

Appendix A3. Estimated pink salmon CPUE by date and station,
Upper Cook Inlet offshore test fish project,
1995.

Date	Station Number						Total
	4	5	6	6.5	7	8	
01-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02-Jul	0.0	0.0	0.0		0.0	0.0	0.0
03-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
04-Jul	0.0	0.0	0.7		0.0	0.0	0.7
05-Jul	0.8	0.0	0.7	0.8	0.0	0.0	2.3
06-Jul	0.0	0.7	0.0		0.0	0.8	1.5
07-Jul	0.0	0.0	1.5	0.0	0.0	0.0	1.5
08-Jul	0.0	0.0	0.8		0.0	0.8	1.6
09-Jul	0.0	0.0	0.7	0.0	0.0	0.0	0.7
10-Jul	0.0	0.0	0.0		0.0	0.0	0.0
11-Jul	0.0	0.6	0.0	0.0	0.0	0.0	0.6
12-Jul	0.0	0.0	0.0		0.0	0.0	0.0
13-Jul	0.7	1.6	0.0	0.0	0.0	0.8	3.1
14-Jul	0.0	1.4	1.3		0.7	0.0	3.4
15-Jul	0.8	0.7	7.4	7.7	2.5		19.1
16-Jul	3.7	0.8	0.0		0.7	0.8	6.0
17-Jul	1.6	0.0	5.2	0.0	0.8	0.8	8.4
18-Jul	0.8	0.0	0.0		2.3	0.0	3.1
19-Jul	0.0	1.5	0.0	0.0	0.0	0.0	1.5
20-Jul	0.0	1.4	0.0		0.0	0.0	1.4
21-Jul	0.0	0.0	2.9	8.6	0.7	0.0	12.2
22-Jul	0.0	1.3	1.3		2.6	0.8	6.0
23-Jul	0.0	0.0	0.0	3.5	0.7	0.8	5.0
24-Jul	0.0	0.8	0.7		2.3	0.7	4.5
25-Jul	0.0	0.0	0.0	0.0	0.0	0.8	0.8
26-Jul	0.0	0.0	0.0		0.0	0.0	0.0
27-Jul	0.0	2.2	0.7	1.6	1.6	0.0	6.1
28-Jul	0.0	0.0	1.6		1.6	0.0	3.2
29-Jul		2.8					2.8
30-Jul	0.0	0.0	0.0		1.7	0.0	1.7
Total	8.4	15.8	25.6	22.2	18.3	7.1	97.3
%	8.6	16.2	26.3	22.8	18.8	7.3	100.0

Appendix B1. Summary of chum salmon fishing effort, daily and cumulative catch, and daily and cumulative CPUE, Upper Cook Inlet offshore test fish project, 1995.

Date	Number of Stations	Mean Fishing Time (min)	Catch		CPUE	
			Daily	Cumul.	Daily	Cumul.
01-Jul	6	228.5	0	0	0.0	0.0
02-Jul	5	188.0	2	2	1.5	1.5
03-Jul	6	230.0	11	13	8.4	9.9
04-Jul	5	190.0	12	25	9.1	19.0
05-Jul	6	230.5	6	31	4.5	23.5
06-Jul	5	200.0	11	42	7.7	31.1
07-Jul	6	231.5	9	51	6.9	38.0
08-Jul	5	190.5	8	59	6.2	44.3
09-Jul	6	238.5	3	62	2.2	46.5
10-Jul	5	184.0	4	66	2.9	49.4
11-Jul	6	244.0	6	72	3.6	53.0
12-Jul	5	195.5	8	80	5.9	58.9
13-Jul	6	253.0	48	128	28.8	87.6
14-Jul	5	207.0	177	305	120.8	208.5
15-Jul	5	264.0	244	549	102.3	310.8
16-Jul	5	189.5	14	563	18.8	329.6
17-Jul	6	255.0	128	691	64.2	393.8
18-Jul	5	196.5	27	718	18.6	412.4
19-Jul	6	225.5	18	736	13.4	425.9
20-Jul	5	189.0	18	754	13.3	439.2
21-Jul	6	249.0	108	862	67.2	506.4
22-Jul	5	218.0	80	942	52.3	558.7
23-Jul	6	239.0	68	1010	40.2	598.9
24-Jul	5	198.5	32	1042	22.2	621.1
25-Jul	6	235.0	42	1084	31.1	652.2
26-Jul	5	163.0	1	1085	0.8	653.1
27-Jul	6	231.5	17	1102	12.2	665.3
28-Jul	5	183.5	5	1107	4.0	669.3
29-Jul	1	43.0	5	1112	3.5	672.8
30-Jul	5	179.0	17	1129	14.3	687.0

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Appendix B2. Estimated chum salmon catch by date and station, Upper Cook Inlet offshore test fish project, 1995.

Date	Station Number						Total
	4	5	6	6.5	7	8	
01-Jul	0	0	0	0	0	0	0
02-Jul	0	0	0		2	0	2
03-Jul	0	10	1	0	0	0	11
04-Jul	0	5	4		3	0	12
05-Jul	0	0	3	3	0	0	6
06-Jul	0	2	7		1	1	11
07-Jul	2	0	4	3	0	0	9
08-Jul	0	1	2		5	0	8
09-Jul	0	0	1	2	0	0	3
10-Jul	0	4	0		0	0	4
11-Jul	1	5	0	0	0	0	6
12-Jul	1	4	3		0	0	8
13-Jul	1	34	1	12	0	0	48
14-Jul	11	8	79		79	0	177
15-Jul	2	2	173	50	17		244
16-Jul	1	5	1		2	5	14
17-Jul	4	7	115	0	2	0	128
18-Jul	0	4	21		2	0	27
19-Jul	0	0	17	1	0	0	18
20-Jul	0	10	8		0	0	18
21-Jul	0	4	10	78	10	6	108
22-Jul	1	17	24		37	1	80
23-Jul	3	7	0	17	41	0	68
24-Jul	0	2	22		2	6	32
25-Jul	10	0	4	3	24	1	42
26-Jul	0	0	0		1	0	1
27-Jul	0	3	11	0	0	3	17
28-Jul	0	5	0		0	0	5
29-Jul		5					5
30-Jul	1	0	0		14	2	17
Total	38	144	511	169	242	25	1129
%	3.4	12.8	45.3	15.0	21.4	2.2	100.0

Appendix B3. Estimated chum salmon CPUE by date and station,
Upper Cook Inlet offshore test fish project,
1995.

Date	Station Number						Total
	4	5	6	6.5	7	8	
01-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02-Jul	0.0	0.0	0.0		1.5	0.0	1.5
03-Jul	0.0	7.7	0.7	0.0	0.0	0.0	8.4
04-Jul	0.0	3.8	2.9		2.4	0.0	9.1
05-Jul	0.0	0.0	2.2	2.3	0.0	0.0	4.5
06-Jul	0.0	1.5	4.7		0.7	0.8	7.7
07-Jul	1.6	0.0	3.0	2.3	0.0	0.0	6.9
08-Jul	0.0	0.8	1.6		3.8	0.0	6.2
09-Jul	0.0	0.0	0.7	1.5	0.0	0.0	2.2
10-Jul	0.0	2.9	0.0		0.0	0.0	2.9
11-Jul	0.7	2.9	0.0	0.0	0.0	0.0	3.6
12-Jul	0.8	3.1	2.0		0.0	0.0	5.9
13-Jul	0.7	18.0	0.7	9.3	0.0	0.0	28.8
14-Jul	8.2	5.6	51.5		55.5	0.0	120.8
15-Jul	1.5	1.4	61.0	24.0	14.4		102.3
16-Jul	0.9	3.8	8.8		1.4	3.9	18.8
17-Jul	3.2	5.1	54.3	0.0	1.6	0.0	64.2
18-Jul	0.0	3.0	14.0		1.6	0.0	18.6
19-Jul	0.0	0.0	12.6	0.8	0.0	0.0	13.4
20-Jul	0.0	6.9	6.4		0.0	0.0	13.3
21-Jul	0.0	3.3	7.2	45.0	7.3	4.4	67.2
22-Jul	0.7	10.7	15.8		24.3	0.8	52.3
23-Jul	2.3	5.5	0.0	12.0	20.4	0.0	40.2
24-Jul	0.0	1.6	14.8		1.5	4.3	22.2
25-Jul	7.5	0.0	3.0	2.3	17.5	0.8	31.1
26-Jul	0.0	0.0	0.0		0.8	0.0	0.8
27-Jul	0.0	2.2	7.6	0.0	0.0	2.4	12.2
28-Jul	0.0	4.0	0.0		0.0	0.0	4.0
29-Jul		3.5					3.5
30-Jul	0.9	0.0	0.0		11.8	1.6	14.3
Total	29.1	97.3	275.5	99.5	166.6	19.0	687.0
%	4.2	14.2	40.1	14.5	24.2	2.8	100.0

Appendix C1. Summary of coho salmon fishing effort, daily and cumulative catch, and daily and cumulative CPUE, Upper Cook Inlet offshore test fish project, 1995.

Date	Number of Stations	Mean Fishing Time (min)	Catch	CPUE
			Daily	Daily
			Cumul.	Cumul.
01-Jul	6	228.5	3	2.3
02-Jul	5	188.0	8	3.8
03-Jul	6	230.0	11	2.4
04-Jul	5	190.0	20	6.6
05-Jul	6	230.5	25	3.7
06-Jul	5	200.0	44	13.6
07-Jul	6	231.5	58	10.6
08-Jul	5	190.5	72	10.8
09-Jul	6	238.5	111	28.6
10-Jul	5	184.0	115	2.9
11-Jul	6	244.0	132	12.4
12-Jul	5	195.5	139	4.8
13-Jul	6	253.0	212	41.9
14-Jul	5	207.0	314	73.2
15-Jul	5	264.0	495	74.9
16-Jul	5	189.5	515	15.1
17-Jul	6	255.0	600	43.0
18-Jul	5	196.5	620	13.9
19-Jul	6	225.5	642	16.7
20-Jul	5	189.0	668	18.9
21-Jul	6	249.0	706	24.8
22-Jul	5	218.0	763	37.2
23-Jul	6	239.0	791	20.7
24-Jul	5	198.5	806	10.4
25-Jul	6	235.0	888	61.1
26-Jul	5	163.0	894	5.7
27-Jul	6	231.5	927	24.4
28-Jul	5	183.5	930	2.4
29-Jul	1	43.0	934	2.8
30-Jul	5	179.0	941	5.9

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Appendix C2. Estimated coho salmon catch by date and station, Upper Cook Inlet offshore test fish project, 1995.

Date	Station Number						Total
	4	5	6	6.5	7	8	
01-Jul	0	0	3	0	0	0	3
02-Jul	0	0	0		5	0	5
03-Jul	0	2	0	0	1	0	3
04-Jul	0	0	7		2	0	9
05-Jul	0	0	3	2	0	0	5
06-Jul	0	2	7		8	2	19
07-Jul	1	2	3	4	4	0	14
08-Jul	0	0	1		12	1	14
09-Jul	2	7	25	5	0	0	39
10-Jul	0	4	0		0	0	4
11-Jul	1	2	1	4	8	1	17
12-Jul	1	0	6		0	0	7
13-Jul	2	59	0	7	3	2	73
14-Jul	0	5	30		67	0	102
15-Jul	0	3	127	42	9		181
16-Jul	0	1	3		8	8	20
17-Jul	0	3	76	0	5	1	85
18-Jul	1	4	13		2	0	20
19-Jul	0	4	13	5	0	0	22
20-Jul	0	21	4		0	1	26
21-Jul	0	0	4	20	4	10	38
22-Jul	0	21	14		20	2	57
23-Jul	6	0	9	5	5	3	28
24-Jul	0	0	10		4	1	15
25-Jul	1	39	17	11	13	1	82
26-Jul	1	3	1		0	1	6
27-Jul	1	5	17	1	8	1	33
28-Jul	0	1	0		0	2	3
29-Jul		4					4
30-Jul	1	0	0		5	1	7
Total	18	192	394	106	193	38	941
%	1.9	20.4	41.9	11.3	20.5	4.0	100.0

Appendix C3. Estimated coho salmon CPUE by date and station.
Upper Cook Inlet offshore test fish project,
1995.

Date	Station Number						Total
	4	5	6	6.5	7	8	
01-Jul	0.0	0.0	2.3	0.0	0.0	0.0	2.3
02-Jul	0.0	0.0	0.0		3.8	0.0	3.8
03-Jul	0.0	1.5	0.0	0.0	0.9	0.0	2.4
04-Jul	0.0	0.0	5.0		1.6	0.0	6.6
05-Jul	0.0	0.0	2.2	1.5	0.0	0.0	3.7
06-Jul	0.0	1.5	4.7		5.8	1.6	13.6
07-Jul	0.8	1.6	2.2	3.0	3.0	0.0	10.6
08-Jul	0.0	0.0	0.8		9.2	0.8	10.8
09-Jul	1.6	4.9	18.3	3.8	0.0	0.0	28.6
10-Jul	0.0	2.9	0.0		0.0	0.0	2.9
11-Jul	0.7	1.1	0.8	3.0	6.0	0.8	12.4
12-Jul	0.8	0.0	4.0		0.0	0.0	4.8
13-Jul	1.5	31.0	0.0	5.4	2.4	1.6	41.9
14-Jul	0.0	3.5	19.5		50.2	0.0	73.2
15-Jul	0.0	2.1	45.0	20.2	7.6	0.0	74.9
16-Jul	0.0	0.8	2.4		5.7	6.2	15.1
17-Jul	0.0	2.2	36.0	0.0	4.0	0.8	43.0
18-Jul	0.8	3.0	8.5		1.6	0.0	13.9
19-Jul	0.0	3.0	9.6	4.1	0.0	0.0	16.7
20-Jul	0.0	14.5	3.6		0.0	0.8	18.9
21-Jul	0.0	0.0	2.9	11.5	3.0	7.4	24.8
22-Jul	0.0	13.3	9.2		13.2	1.5	37.2
23-Jul	4.6	0.0	6.7	3.5	3.5	2.4	20.7
24-Jul	0.0	0.0	6.7		3.0	0.7	10.4
25-Jul	0.7	28.5	12.9	8.6	9.5	0.8	61.1
26-Jul	0.8	2.4	0.8		0.0	1.7	5.7
27-Jul	0.8	3.8	11.7	0.8	6.4	0.8	24.4
28-Jul	0.0	0.8	0.0		0.0	1.6	2.4
29-Jul	^a	2.8	^a		^a	^a	2.8
30-Jul	0.9	0.0	0.0		4.2	0.8	5.9
Total	14.0	125.2	215.7	65.4	144.6	30.5	595.4
%	2.4	21.0	36.2	11.0	24.3	5.1	100.0

^a Indicates station not sampled.

Appendix D1. Summary of chinook salmon fishing effort, daily and cumulative catch, and daily and cumulative CPUE, Upper Cook Inlet offshore test fish project, 1995.

Date	Number of Stations	Mean Fishing Time (min)	Catch		CPUE	
			Daily	Cumul.	Daily	Cumul.
01-Jul	6	228.5	0	0	0.0	0.0
02-Jul	5	188.0	0	0	0.0	0.0
03-Jul	6	230.0	0	0	0.0	0.0
04-Jul	5	190.0	1	1	0.8	0.8
05-Jul	6	230.5	1	2	0.8	1.5
06-Jul	5	200.0	0	2	0.0	1.5
07-Jul	6	231.5	0	2	0.0	1.5
08-Jul	5	190.5	0	2	0.0	1.5
09-Jul	6	238.5	0	2	0.0	1.5
10-Jul	5	184.0	0	2	0.0	1.5
11-Jul	6	244.0	0	2	0.0	1.5
12-Jul	5	195.5	0	2	0.0	1.5
13-Jul	6	253.0	0	2	0.0	1.5
14-Jul	5	207.0	0	2	0.0	1.5
15-Jul	5	264.0	0	2	0.0	1.5
16-Jul	5	189.5	0	2	0.0	1.5
17-Jul	6	255.0	0	2	0.0	1.5
18-Jul	5	196.5	0	2	0.0	1.5
19-Jul	6	225.5	0	2	0.0	1.5
20-Jul	5	189.0	0	2	0.0	1.5
21-Jul	6	249.0	0	2	0.0	1.5
22-Jul	5	218.0	0	2	0.0	1.5
23-Jul	6	239.0	1	3	0.8	2.3
24-Jul	5	198.5	0	3	0.0	2.3
25-Jul	6	235.0	0	3	0.0	2.3
26-Jul	5	163.0	0	3	0.0	2.3
27-Jul	6	231.5	0	3	0.0	2.3
28-Jul	5	183.5	0	3	0.0	2.3
29-Jul	1	43.0	0	3	0.0	2.3
30-Jul	5	179.0	0	3	0.0	2.3

Appendix D2. Estimated chinook salmon catch by date and station, Upper Cook Inlet offshore test fish project, 1995.

Date	Station Number						Total
	4	5	6	6.5	7	8	
01-Jul	0	0	0	0	0	0	0
02-Jul	0	0	0		0	0	0
03-Jul	0	0	0	0	0	0	0
04-Jul	0	1	0		0	0	1
05-Jul	0	0	0	1	0	0	1
06-Jul	0	0	0		0	0	0
07-Jul	0	0	0	0	0	0	0
08-Jul	0	0	0		0	0	0
09-Jul	0	0	0	0	0	0	0
10-Jul	0	0	0		0	0	0
11-Jul	0	0	0	0	0	0	0
12-Jul	0	0	0		0	0	0
13-Jul	0	0	0	0	0	0	0
14-Jul	0	0	0		0	0	0
15-Jul	0	0	0	0	0		0
16-Jul	0	0	0		0	0	0
17-Jul	0	0	0	0	0	0	0
18-Jul	0	0	0		0	0	0
19-Jul	0	0	0	0	0	0	0
20-Jul	0	0	0		0	0	0
21-Jul	0	0	0	0	0	0	0
22-Jul	0	0	0		0	0	0
23-Jul	0	1	0	0	0	0	1
24-Jul	0	0	0		0	0	0
25-Jul	0	0	0	0	0	0	0
26-Jul	0	0	0		0	0	0
27-Jul	0	0	0	0	0	0	0
28-Jul	0	0	0		0	0	0
29-Jul		0					0
30-Jul	0	0	0		0	0	0
Total	0	2	0	1	0	0	3
%	0.0	66.7	0.0	33.3	0.0	0.0	100.0

Appendix D3. Estimated chinook salmon CPUE by date and station,
Upper Cook Inlet offshore test fish project, 1995.

Date	Station Number						Total
	4	5	6	6.5	7	8	
01-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02-Jul	0.0	0.0	0.0		0.0	0.0	0.0
03-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
04-Jul	0.0	0.8	0.0		0.0	0.0	0.8
05-Jul	0.0	0.0	0.0	0.8	0.0	0.0	0.8
06-Jul	0.0	0.0	0.0		0.0	0.0	0.0
07-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
08-Jul	0.0	0.0	0.0		0.0	0.0	0.0
09-Jul	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
11-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12-Jul	0.0	0.0	0.0		0.0	0.0	0.0
13-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14-Jul	0.0	0.0	0.0		0.0	0.0	0.0
15-Jul	0.0	0.0	0.0	0.0	0.0		0.0
16-Jul	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
18-Jul	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
20-Jul	0.0	0.0	0.0		0.0	0.0	0.0
21-Jul	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
23-Jul	0.0	0.8	0.0	0.0	0.0	0.0	0.8
24-Jul	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
26-Jul	0.0	0.0	0.0		0.0	0.0	0.0
27-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28-Jul	0.0	0.0	0.0		0.0	0.0	0.0
29-Jul		0.0					0.0
30-Jul	0.0	0.0	0.0		0.0	0.0	0.0
Total	0.0	1.6	0.0	0.8	0.0	0.0	2.3
%	0.0	67.2	0.0	32.8	0.0	0.0	100.0

Appendix E1. Entry pattern of sockeye salmon into Upper Cook Inlet, Alaska, 1995, estimated from daily CPUE measured at the latitude of Anchor Point.

Day	Date	Input Y	Estimated Y	Residual	Change in Y	Change in estimated Y
9	702	0.014	0.0581	-0.0441	0.0042	0.0106
10	703	0.0494	0.071	-0.0215	0.0354	0.0128
11	704	0.0615	0.0864	-0.0249	0.012	0.0154
12	705	0.0647	0.1047	-0.04	0.0032	0.0184
13	706	0.0985	0.1264	-0.0279	0.0338	0.0217
14	707	0.1262	0.1519	-0.0257	0.0277	0.0255
15	708	0.1479	0.1815	-0.0336	0.0217	0.0295
16	709	0.1853	0.2153	-0.03	0.0374	0.0338
17	710	0.2402	0.2535	-0.0133	0.0549	0.0382
18	711	0.3331	0.2959	0.0372	0.0929	0.0424
19	712	0.3537	0.3421	0.0116	0.0206	0.0462
20	713	0.3981	0.3916	0.0065	0.0444	0.0494
21	714	0.4387	0.4433	-0.0047	0.0406	0.0518
22	715	0.5863	0.4964	0.0899	0.1476	0.053
23	716	0.6121	0.5495	0.0626	0.0258	0.0531
24	717	0.6463	0.6015	0.0448	0.0342	0.052
25	718	0.6698	0.6513	0.0185	0.0235	0.0498
26	719	0.688	0.6981	-0.0101	0.0181	0.0467
27	720	0.706	0.741	-0.035	0.0181	0.0429
28	721	0.7516	0.7798	-0.0282	0.0456	0.0388
29	722	0.7898	0.8142	-0.0244	0.0383	0.0344
30	723	0.8169	0.8443	-0.0274	0.027	0.0301
31	724	0.8569	0.8703	-0.0134	0.04	0.026
32	725	0.8744	0.8925	-0.0182	0.0175	0.0222
33	726	0.8761	0.9113	-0.0352	0.0018	0.0188
34	727	0.8976	0.9271	-0.0295	0.0214	0.0158
35	728	0.9064	0.9403	-0.0338	0.0089	0.0132
36	729	0.9171	0.9512	-0.0341	0.0107	0.0109
37	730	0.9368	0.9602	-0.0234	0.0197	0.009

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Appendix F1. Chemical and physical observations made in Upper Cook Inlet, Alaska during the conduct of the 1995 offshore test fish project.

Date	Station	Air Temp. (c)	Water Temp. (c)	Wind Vel. (knots)	Wind Dir*	Tide Stage	Salinity (ppt)	Water Depth (f)	Secchi (m)
01-Jul	4	12	8	0	0	3	30	25	10
	5	12	9	0	0	3	28.5	40	3.5
	6	13	9	0	0	2	29	44	3
	6.5	13	8	0	0	4	29	42	4
	7	12	7	2	1	4	30	46	3.5
	8	13	8	0	0	4	29.5	29	3
02-Jul	8	11	8.5	0	0	4	29	25.5	3.5
	7	11	8.5	0	0	1	29	45	5
	6	12	7	0	0	3	31	49	8.5
	5	13	7.5	0	0	3	31.5	35	9.5
	4	12	8	0	0	3	30	23.5	12
03-Jul	4	11	8	0	0	3	29.5	24	7
	5	11	8	10	5	3	30.5	37	5
	6	11	8	5	5	3	30	46	3
	6.5	12	9	0	0	2	28	41	3
	7	11	8	8	5	4	29.5	43	2.5
	8	12	9	10	4	4	28	25	2
04-Jul	8	11	8.5	8	4	4	28.5	27	2.5
	7	11	7	10	4	4	30	46	3
	6	12	9	8	4	4	28.5	47	4
	5	12	8	8	4	4	30	37	7
	4	12	8	5	4	3	30	25	9.5
05-Jul	4	11	8.5	12	4	1	29	26	9
	5	14	8	12	4	3	29.5	37	9
	6	16	9.5	12	4	3	28	49	5
	6.5	18	8.5	12	4	3	29	45	4
	7	14	10	14	4	3	28	45	3.5
	8	14	10	12	4	4	28	26	2
06-Jul	8	13	9	20	4	4	28	30	2
	7	13	9.5	15	4	4	28	45	3
	6	12	10	12	4	4	28	49	4
	5	13	8.5	5	6	4	27	37.5	8
	4	14	8.5	5	6	1	29.5	24.5	14
07-Jul	4	13	8.5	5	8	4	28	25	8.5
	5	12	9	5	6	4	28.5	38	8
	6	13	10	5	6	4	28	48	5
	6.5	13	10	5	6	1	27	43	4
	7	16	11	0	0	3	27	45	4
	8	17	10	0	0	3	27.5	27	4

-continued-

Appendix F1. (p 2 of 4)

Date	Station	Air Temp. (c)	Water Temp. (c)	Wind Vel. (knots)	Wind Dir*	Tide Stage	Salinity (ppt)	Water Depth (f)	Secchi (m)
08-Jul	8	11	10	5	5	3	26.5	29	2.5
	7	12	7	15	6	3	29	42.5	3
	6	12	9	15	6	3	29	47	4.5
	5	13	9	8	6	4	29	38.5	6
	4	14	9	5	6	4	28.5	27.5	7
09-Jul	4	15	9	0	0	4	28	25	8
	5	15	8.5	0	0	4	28.5	37.5	7
	6	13	7.5	0	0	4	29.5	47.5	8
	6.5	13	10	0	0	1	27.5	44.5	4
	7	13	10	5	6	3	27	43	4
	8	13	10	0	0	3	27.5	26	3
10-Jul	8	11	8.5	0	0	3	28	30	2.5
	7	11	9.5	8	8	3	26.5	42.5	3
	6	13	9	10	8	3	27.5	46.5	3.5
	5	13	9	10	8	4	28	40	6
	4	12	8.5	10	8	4	28	24.5	8
11-Jul	4	14	9	0	0	2	28	26	6.5
	5	14	8	0	0	4	28.5	40	6.5
	6	14	8	0	0	4	30	49	4
	6.5	15	9	5	8	4	28	44	5
	7	14	8	5	8	4	29	45	5
	8	13	9	0	0	4	28	32	4
12-Jul	8	13	10	10	1	3	27	26	3.5
	7	12	10	10	1	3	27	45	3
	6	13	7	10	1	3	30	46	6
	5	11	9	0	0	3	28	36	5
	4	12	9	5	1	3	28	25	5
13-Jul	4	14	9	5	1	3	27.5	24	4
	5	15	9	5	2	3	28	40	4
	6	15	10	0	0	4	27	45	2
	6.5	14	9	0	0	4	28	43	2.5
	7	13	9.5	0	0	4	27.5	46	3
	8	14	10	5	2	4	27	28	2.5
14-Jul	8	11	10	15	4	3	27	28	2
	7	11	10	15	4	3	27	44	2
	6	11	9.5	15	4	3	27	46	2.5
	5	14	9	10	4	3	27.5	39	2.5
	4	14	8.5	0	0	2	28.5	23	5
15-Jul	4	14	9	20	8	3	27.5	26.5	6
	5	13	9	20	8	3	27	34	4
	6	13	9	18	8	3	27	46	2

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Appendix F1. (p 3 of 4)

Date	Station	Air Temp. (c)	Water Temp. (c)	Wind Vel. (knots)	Wind Dir	Tide Stage	Salinity (ppt)	Water Depth (f)	Secchi (m)
15-Jul	6.5	13	10	25	8	4	26.5	45	2
	7	12	10	25	1	4	27.5	48	2.5
16-Jul	8	11	10	20	8	4	26	30	2
	7	11	9	20	8	4	27	46	4
	6	11	9	20	8	4	27	46	4.5
	5	12	9	20	8	3	27	38	5
	4	12	8.5	25	8	3	28	24	7
17-Jul	4	14	8	0	0	3	27.5	25.5	8
	5	16	10	0	0	3	26	40.5	5
	6	18	10	0	0	3	26	48	3
	6.5	15	10.5	5	4	2	25	43	2.5
	7	14	10	10	4	3	26	45	1.5
	8	14	9	20	6	4	27	31	1.5
18-Jul	8	12	10	10	4	4	25	31	1.5
	7	12	10	10	4	4	26	45	2
	6	12	10	10	4	4	25.5	50	2.5
	5	16	7.5	5	4	4	28	37	7
	4	13	8	5	4	3	27	24	11
19-Jul	4	13	9	0	0	1	26	25	8
	5	15	10	5	4	3	26	37	7
	6	15	10	5	4	3	25	50	2.5
	6.5	17	11	5	4	3	24.5	46.5	2.5
	7	19	11	0	0	3	25	44	3
	8	17	10.5	0	0	3	25	24.5	3
20-Jul	8	13	11	0	0	2	24.5	30.5	2.5
	7	13	10.5	0	0	4	25	42	2.5
	6	13	10	0	0	4	25	49	3
	5	13	9	0	0	4	26	37	5
	4	13	11.5	0	0	4	26	25	8
21-Jul	4	14	10	0	0	4	26	26	8
	5	13	10	0	0	4	24.5	37	7
	6	13	12	10	5	4	23	48	2.5
	6.5	13	12	20	5	1	22.5	42	2.5
	7	12	11	22	5	3	23	44	3
	8	13	11	20	4	3	24	31	2.5
22-Jul	8	13	10.5	30	6	3	23	29.5	3
	7	13	11	25	6	3	22.5	44	2.5
	6	14	11	20	6	3	22.5	46	2.5
	5	14	11	20	6	4	25	36	3
	4	13	10	20	5	4	25	25	10
23-Jul	4	12	10	15	8	4	23.5	26	5.5

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Appendix F1. (p 4 of 4)

Date	Station	Air Temp. (c)	Water Temp. (c)	Wind Vel. (knots)	Wind Dir [^]	Tide Stage	Salinity (ppt)	Water Depth (f)	Secchi (m)
23-Jul	5	12	10	15	1	4	24	36	7
	6	12	10	18	2	1	24	46	5
	6.5	12	10	15	2	4	25	44	3
	7	12	10.5	18	1	4	23	45	3
	8	12	10.5	15	1	1	24	27	3
24-Jul	8	12	8.5	18	1	2	24	30	3
	7	12	11	10	1	3	22.5	45	2.5
	6	12	11	8	1	3	23	46	3.5
	5	12	10	5	1	3	24.5	39	8
	4	12	11	5	1	3	24	24	7
25-Jul	4	14	10	0	0	4	24	26.5	8
	5	11	10	0	0	4	24	43	7
	6	13	10	5	6	4	24	49	4
	6.5	14	11	10	6	4	24	43	2.5
	7	13	11	5	6	1	23.5	47	2.5
	8	14	11	5	6	1	23	27	3
26-Jul	8	12	11	5	6	1	23	28	3
	7	12	11	5	6	3	23	45	3
	6	12	10	0	0	3	23.5	45	3.5
	5	13	10.5	5	6	3	23.5	37	4
	4	14	10	5	6	3	25	24.5	7
27-Jul	4	14	10	10	4	3	27	27	7
	5	16	10	10	4	2	24.5	38	7
	6	17	10	5	4	4	24.5	47	6
	6.5	16	10	5	4	4	24	42	3.5
	7	16	11	10	4	4	24	45	3
	8	16	11	5	4	4	23	27	2.5
28-Jul	8	13	11	20	6	1	22.5	30	2.5
	7	12	11	20	6	3	23	45	3
	6	13	11	10	6	3	23	47	2.5
	5	14	11	5	6	3	23	37	3
	4	15	10	5	6	3	24	24	8
29-Jul	5	12	10	25	8	3	24	38	5
30-Jul	8	12	10.5	5	1	4	22.5	30	3
	7	12	10	5	1	1	22.5	46	3
	6	13	10	5	1	3	23	47	4
	5	13	10	0	0	3	23.5	39	8
	4	13	10	0	0	3	23.5	25	8

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[^] Wind direction code 1=north, 2=northeast, 3=east, 4=southeast,
5=south, 6=southwest, 7=west, 8=northwest
- Tide stage code 1=high, 2=low, 3=ebb, 4=flood

APPENDIX G

UPPER COOK INLET RUN SUMMARY THROUGH 17 JULY 1995			
Commercial Harvest		1254000	
Residual in District		760000	
Escapement		240000	
Total		2254000	
Otf index		1181	
Passage Rate		1908.552	(note: passage rate on 10 July - 2300 on 14 July estimated 1809)
Run estimates			
1990	5900000		
1991	4600000		(note - all estimates of total index points are dropping which suggest that the estimates could be high)
1992	4900000		

UPPER COOK INLET RUN SUMMARY THROUGH 19 JULY 1995			
Commercial Harvest		1402877	
Residual in District		600000	
Escapement		400000	
Total		2402877	
Otf index		1256	
Passage Rate		1913.119	(note: passage rate on 10 July - 2300 on 14 July estimated 1809)
Run estimates			
1991	4500000		(note - all estimates of total index points are dropping which suggest that the estimates could be high)
1992	4700000		

UPPER COOK INLET RUN SUMMARY THROUGH 21 JULY 1995						
Commercial Harvest		1887000				
Residual in District		545000				
Escapement		525000				
Total		2957000				
Otf index		1373				
Passage Rate		2153.678		(note: passage rate on 10 July - 2300 on 14 July estimated 1809 on 17 July 1908)		
Run estimates						
1983	1956	4212594	(note - all estimates except 1993 and 82-87 average of total index			
1986	2024	4359044	points are dropping which suggest			
1987	2509	5403578	that the estimates could be high)			
1991	2235	4813471				
1992	2256	4858698				
1993	1779	3831393				
1994	2590	5578026				
1982-87	1971	4244899				

UPPER COOK INLET RUN SUMMARY THROUGH 23 JULY 1995				
Commercial Harvest		1904148		
Residual in District		500000		
Escapement		847000		
Total		3251148		
Otf index		1566		
Passage Rate		2076.084	(note: passage rate on 10 July - 2300 on 14 July estimated 1809 on 17 July 1908)	
Run estimates				
1983	1938	4023451	-10	(note - all estimates except 1993 and 82-87 average of total index points are dropping which suggest that the estimates could be high; 1983 best estimate)
1986	2015	4183310	-7	
1987	2431	5046961	-3	
1991	2176	4517559	-36	
1992	0	0	-26	
1993	1784	3703734	5	
1994	2520	5231732	-32	
1982-87	1964	4077430	-2	

UPPER COOK INLET RUN SUMMARY THROUGH 24 JULY 1995				
Commercial Harvest		2152000		
Residual in District		265000		
Escapement		885000		
Total		3302000		
Otf index		1566		
Passage Rate		2108.557	(note: passage rate on 10 July - 2300 on 14 July estimated 1809 on 17 July 1908)	
Run estimates				
1983	1938	4086383	-10	(note - all estimates except 1993 and 82-87 average of total index points are dropping which suggest that the estimates could be high; 1983 best estimate)
1986	2015	4248742	-7	
1987	2431	5125902	-3	
1991	2176	4588220	-36	
1992	0	0	-26	
1993	1784	3761665	5	
1994	2520	5313563	-32	
1982-87	1964	4141206	-2	

UPPER COOK INLET RUN SUMMARY THROUGH 25 JULY 1995						
Commercial Harvest		2200000				
Residual in District		180000				
Escapement		951000				
Total		3331000				
Otf index		1597				
Passage Rate		2085.786		(note: passage rate on 10 July - 2300 on 14 July estimated 1809 on 17 July 1908, on 21 July 2108)		
Run estimates						
1983	1919	4002623	-11	(note - all estimates of total index		
1986	1999	4169486	-10	points are dropping which suggest		
1987	2357	4916197	-38	that the estimates could be high; 1983 best estimate)		
1991	2123	4428123	-27			
1992	0	0	-26			
1993	1785	3723128	-2			
1994	2448	5106004	-38			
1982-87	1952	4071454	-9			

Sheet1

UPPER COOK INLET RUN SUMMARY THROUGH 28 JULY 1995				
Commercial Harvest		2539000		
Residual in District		231000		
Escapement		1152000		
Total		3922000		
Otf index		1657		
Passage Rate		2366.928	(note: passage rate on 10 July - 2300 on 14 July estimated 1809 on 17 July 1908, on 21 July 2108)	
Run estimates				
1983	1902	4501897	-9	(note - all estimates of total index
1986	1981	4688885	-10	points are dropping which suggest
1987	2289	5417899	-33	that the estimates could be high; 1983 best estimate
1991	2076	4913743	-23	at .0016 mss, 1993 next best at .0020 mss)
1992	0	0	0	
1993	1785	4224967	-1	
1994	2378	5628555	-35	
1982-87	1938	4587107	-6	

UPPER COOK INLET RUN SUMMARY THROUGH 30 JULY 1995				
Commercial Harvest		2600000		
Residual in District		100000		
Escapement		1200000		
Total		3900000		
Otf index		1711		
Passage Rate		2279	(note: passage rate on 10 July - 2300 on 14 July estimated 1809 on 17 July 1908, on 21 July 2108)	
Run estimates				
1983	1888	4303448	-6	(note - all estimates of total index
1986	1965	4478960	-7	points are dropping which suggest
1987	0	0	0	that the estimates could be high; 1983 best estimate
1991	0	0	0	at .0016 mss, 1993 next best at .0019 mss
1992	0	0	0	The 1993 estimate is most stable
1993	1786	4070953	2	
1994	0	0	0	
1982-87	1925	4387785	-5	