NORTH RIVER SALMON COUNTING TOWER PROJECT, 2002–2004

by

Wesley W. Jones

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Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$log_{2,}$ etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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ABSTRACT

The North River is the largest of the five major tributaries of the Unalakleet River, which is the largest salmon producer in Norton Sound. The counting tower is located approximately 12 kilometers upstream from the village of Unalakleet in Eastern Norton Sound. The North River counting tower is a cooperative project operated by the Native of Village Unalakleet (Unalakleet IRA) with assistance provided by the Alaska Department of Fish & Game (ADF&G). Funding is provided by the Bering Sea Fishermen's Association (BSFA) and the Norton Sound Economic Development Corporation (NSEDC). This report documents the methodology and results of this project for the years 2002 to 2004. The objective of the project is to obtain daily and seasonal information concerning the timing and magnitude of the chum *Oncorhynchus keta*, pink *O. gorbuscha*, Chinook *O. tshawytscha* and coho salmon *O. kisutch* escapement to the North River. In 2002, counting began on 19 June and ended on 29 August. In 2003 and 2004, counting began on 15 June and ended on 13 September in 2003 and 14 September in 2004. The expanded counts for 2002 were: 6,143 chum salmon, 324,595 pink salmon, 1,505 Chinook salmon, and 3,210 coho salmon. The expanded counts for 2003 were: 9,859 chum salmon, 280,212 pink salmon, 1,452 Chinook salmon, and 5,837 coho salmon. The expanded counts for 2004 were: 10,036 chum salmon, 1,162,978 pink salmon, 1,125 Chinook salmon, and 11,187 coho salmon.

Key words: chum salmon, Chinook salmon, pink salmon, coho salmon, counting tower, North River, Unalakleet River, *Oncorhynchus*

INTRODUCTION

The North River is the largest of the five major tributaries of the Unalakleet River, which is the largest salmon producing system in Norton Sound. The North River salmon counting tower is located approximately three kilometers above its confluence with the Unalakleet River on Unalakleet Native Corporation land and has been in operation for nine consecutive years since 1996 (Kohler 2000, 2001, 2002; Rob 1997, 1998, 1999). From 1996 to 2001 Kawerak, Inc. ran the project. The Unalakleet IRA has operated the project since 2002.

A counting tower was previously operated by ADF&G on the North River for the three years from 1972 through 1974 near the North River Bridge (Cunningham 1974, 1975; Regnart and Trasky 1973) and for the three years from 1984 through 1986 (Lean 1985, 1986, 1987). Chum salmon were the primary species harvested by the Unalakleet Subdistrict commercial fishery during the early years of the project. The project was discontinued because of a lack of funding and because the small chum salmon run in the North River was not considered to be a reliable index of chum salmon abundance for the entire Unalakleet River system. However, the subsistence, commercial and sport importance of Chinook, pink, and coho salmon has increased since the project was last discontinued and there are relatively large runs of these species in the North River. These factors, in conjunction with the availability of funding, have once again reactivated this project.

OBJECTIVES

The objective of this project was to obtain daily and seasonal information concerning the timing and magnitude of the chum, pink, Chinook and coho salmon escapement in to the North River.

METHODS

A field camp with two weather port tents and an outhouse was established in mid-June each year. Scaffolding towers were erected on each bank of the river to serve as an observation platform. A 15 x 2.5 meter vinyl canvas flash panel was placed on the river bottom between the two towers.

An array of ten 120-volt lights was strung on a cable between the two towers to illuminate the flash panel during periods of darkness.

The 2004 season was the ninth year the North River tower project operated along this section of river (Figure 1). The tower location was moved down river approximately 100 yards before the 2001 season. The current tower site appears to be in a better location for counting with a smooth bottom and a consistent depth across the river. A diversionary weir was used on this project prior to 2002. At that time, a high percentage of the missed counting time was due to the crew having to spend time maintaining and replacing the weir after it had been washed out by high water. Since 2002, the weir was not installed. Instead a flash panel that spans the entire river was used and a second tower was set up on the bank opposite camp. This tower would only be used if conditions did not allow counting to be conducted from only one side of the River. Since 2002 all counts were conducted from the camp side of the river and use of this second tower has not been necessary.

In 2002, counting began on 19 June and ended on 29 August. In 2003, counting began on 15 June and ended on 13 September. In 2004, counting began on 15 June and ended on 14 September. The project design called for the crew to count 24 half-hour counts throughout the duration of the project. However, in 2003 and 2004 only 16 half-hour counts were scheduled on Saturdays due to budget constraints. The counts from each half-hour shift were doubled to estimate the hourly escapement for each species. The daily counts considered in this report run from 0000 hours to 2330 hours. Each day the reported hourly counts were added to produce a daily subtotal. Every day, the daily and cumulative subtotals for each species were relayed by radio to the Unalakleet ADF&G office.

When hourly counts were missed due to turbid water or other unexpected circumstances the expanded hourly counts for this report were calculated using the following methods. For the hours not counted, the 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 hours of the day not counted. The expanded counts for periods of time greater than one day missed were linearly interpolated in a similar manner (Rob 1997).

RESULTS

The expanded daily and cumulative totals for each salmon species in 2002 to 2004 are shown in Tables 1 to 3 respectively. The 2002 expanded counts were: 6,143 chum salmon, 324,595 pink salmon, 1,505 Chinook salmon, and 3,210 coho salmon (Table 1). The actual reported 2002 total hourly counts were: 5,930 chum salmon, 316,592 pink salmon, 1,480 Chinook salmon, and 3,038 coho salmon. The 2003 expanded counts were: 9,859 chum salmon, 280,212 pink salmon, 1,452 Chinook salmon, and 5,837 coho salmon (Table 2). The actual reported 2003 total hourly counts were: 8,680 chum salmon, 262,292 pink salmon, 1,222 Chinook salmon, and 3,968 coho salmon. The 2004 expanded counts were: 10,036 chum salmon, 1,162,978 pink salmon, 1,125 Chinook salmon, and 11,187 coho salmon (Table 3). The actual reported 2004 total hourly counts were: 9,634 chum salmon, 1,150,092 pink salmon, 1,104 Chinook salmon, and 9,652 coho salmon.

Tables containing the expanded hourly counts for each species and climatological data from 2002 to 2004 are in Appendix A1–A15.

In 2002, counting began on 19 June and ended on 29 August. On the first day of counting, Chinook and pink salmon were observed. Chum salmon were first observed on 20 June. Coho salmon were first observed on 9 July. The daily peak count of 254 chum salmon occurred on 31 July; the daily peak count of 32,552 pink salmon occurred on 2 July; the daily peak count of 184 Chinook salmon occurred on 3 July; the daily peak count of 306 coho salmon occurred on 18 August (Table 1).

In 2003, counting began on 15 June and ended on 13 September. Chinook salmon were observed on the first day of counting. Chum and pink salmon were first observed on 21 June. Coho salmon were first observed on 18 July. The daily peak count of 798 chum salmon occurred on 25 July; the daily peak count of 28,067 pink salmon occurred on 19 July; the daily peak of 152 Chinook salmon occurred on 1 July; the daily peak count of 437 coho salmon occurred on 28 July (Table 2).

In 2004, counting began on 15 June and ended on 14 September. Pink salmon were observed on the first day of counting. Chum salmon were first observed on 19 June and Chinook salmon on the following day. Coho salmon were first observed on 9 July. The daily peak count of 754 chum salmon occurred on 20 July; the daily peak count of 111,152 pink salmon occurred on 29 June; the daily peak of 154 Chinook salmon occurred on 11 July; the daily peak count of 560 coho salmon occurred on 8 August (Table 3).

DISCUSSION

In 2002, 2003 and 2004, 4.1%, 16.1% and 8.9% of the hourly counts respectively were calculated compared to the average from 1996 to 2001, when 27.4% of the hourly counts were calculated (Table 4). Removal of the partial weir and low water levels in 2002 to 2004 appear to have helped to reduce the number of hours when counts were not made.

In 2002, counts were missed due to high murky water on 6 July and 10 August to 11 August. The longest time missed counting was for a 16-hour period starting on 10 August. In 2003, counts were missed due to high murky water during the periods from 2 July to 3 July, 26 July to 28 July, 15 August to 16 August, and 24 August to 30 August. In 2004, counts were missed due to high murky water from 13 August to 17 August. From 2002 to 2004, all other multiple hour counts missed were due to crew schedules. Actual hours not counted are shown in the table of expanded hourly counts for each species from 2002 to 2004 in the Appendix A tables 1-12. With few hourly counts missed in 2002 to 2004, interpolations to estimate salmon abundance appear to be good approximations of escapement numbers.

Chum salmon escapement estimates were above the cumulative average from 2002 to 2004 (Figures 2 and 3). In 2002 and 2003 late season chum salmon passage was strong and accounted for the above average cumulative escapement. The early 2003 chum salmon passage was the lowest on record and lagged well behind average cumulative escapement until counts increased in mid-July. The 2004 chum salmon escapement was the largest count on record (Table 4).

Pink salmon escapement estimates were well above average from 2002 to 2004. North River pink salmon escapement has followed an even-odd cycle with high even-year returns and low odd-year returns. The 2002 pink salmon escapement was the largest return since 1996 (Table 4; Figures 4 and 5). A significant number of pink salmon may have been missed in 2002 when the tower started operation on 19 June. The 4,074 pink salmon count for that day was from only

9 hours of counting. The 2003 pink salmon escapement was the largest odd-year escapement on record and was the fifth largest passage in all years. The 2004 pink salmon escapement was the largest on record and over twice the pervious high.

Chinook salmon escapement estimates from 2002 to 2004 were below cumulative average (Figures 6 and 7). The 2002 and 2003 estimates were in the low end of the Sustainable Escapement Goal (SEG) range of 1,200 to 2,600, while the 2004 fell below the 1,200 low end. Escapement estimates have been below average and in the low end range or below for the last 5 years. From 2002 to 2004 no commercial fishing for Chinook salmon was allowed. In 2003 and 2004 sport and subsistence fishing were closed to the taking of Chinook salmon for most of July. Even with the fishing restrictions Chinook salmon escapement still was below average. North River Tower Chinook salmon count represents 40% of the Unalakleet drainage Chinook salmon escapement (Wuttig 1999). The Unalakleet drainage Chinook salmon escapement estimate for 2002 to 2004 is 3,763, 3,690 and 2,813 respectively (Table 5).

In 2002 the coho salmon escapement estimate was well below average while the 2003 and 2004 escapement estimates were average (Figures 8 and 9). The 2002 coho run started slow and continued to be slow until counting ended on 29 August. A significant number of coho may have passed after the end of counting in 2002. ADF&G test net and subsistence catches on the Unalakleet River increased dramatically during the first week of September 2002. In 2003 coho salmon escapement started out above average and then slowed to end around the cumulative average. In 2004 coho salmon escapement started early and ended as the second highest count on record (Table 4). In 2003 and 2004 the tower operated until mid September and it is believed that few coho passed uncounted.

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TABLES AND FIGURES

Table 1.–Expanded daily and cumulative migration of all salmon species past the North River counting tower, Norton Sound, 2002.

Date	Daily Chum	Cumulative Chum	Daily Pink	Cumulative Pink	Daily Chinook	Cumulative Chinook	Daily Coho	Cumulative Coho
19-Jun	0	0	4,074	4,074	8	8	0	0
20-Jun	18	18	7,778	11,852	6	14	0	0
21-Jun	8	26	6,594	18,446	0	14	0	0
22-Jun	20	46	6,096	24,542	4	18	0	0
23-Jun	54	100	12,070	36,612	14	32	0	0
24-Jun	62	162	9,482	46,094	8	40	0	0
25-Jun	34	196	3,188	49,282	8	48	0	0
26-Jun	66	262	7,184	56,466	16	64	0	0
27-Jun	94	356	6,514	62,980	28	92	0	0
28-Jun	146	502	16,948	79,928	80	172	0	0
29-Jun	58	560	4,922	84,850	76	248	0	0
30-Jun	26	586	8,262	93,112	48	296	0	0
1-Jul	78	664	12,898	106,010	38	334	0	0
2-Jul	96	760	32,552	138,562	66	400	0	0
3-Jul	66	826	32,072	170,634	184	584	0	0
4-Jul	130	956	17,506	188,140	38	622	0	0
5-Jul	58	1,014	23,506	211,646	86	708	0	0
6-Jul	32	1,046	11,290	222,936	55	763	0	0
7-Jul	20	1,066	6,710	229,646	4	767	0	0
8-Jul	28	1,094	7,640	237,286	34	801	0	0
9-Jul	78	1,172	8,022	245,308	52	853	20	20
10-Jul	144	1,316	11,152	256,460	66	919	22	42
11-Jul	170	1,486	12,096	268,556	118	1,037	20	62
12-Jul	42	1,528	8,426	276,982	38	1,075	2	64
13-Jul	122	1,650	8,544	285,526	76	1,151	4	68
14-Jul	96	1,746	7,388	292,914	20	1,171	0	68
15-Jul	138	1,884	6,460	299,374	42	1,213	0	68
16-Jul	248	2,132	7,406	306,780	66	1,279	0	68
17-Jul	175	2,307	4,959	311,739	36	1,315	0	68
18-Jul	182	2,489	3,332	315,071	38	1,353	0	68
19-Jul	224	2,713	3,220	318,291	36	1,389	0	68
20-Jul	153	2,866	2,113	320,404	20	1,409	0	68
21-Jul	136	3,002	1,238	321,642	22	1,431	0	68
22-Jul	62	3,064	986	322,628	14	1,445	0	68
23-Jul	76	3,140	376	323,004	2	1,447	0	68
24-Jul	150	3,290	388	323,392	6	1,453	0	68
25-Jul	106	3,396	596	323,988	6	1,459	0	68
26-Jul	62	3,458	116	324,104	8	1,467	2	70
27-Jul	81	3,539	121	324,225	12	1,479	2	72
28-Jul	138	3,677	184	324,409	10	1,489	8	80
29-Jul	250	3,927	84	324,493	4	1,493	4	84
30-Jul	128	4,055	54	324,547	6	1,499	32	116
31-Jul	254	4,309	22	324,569	4	1,503	30	146
1-Aug	252	4,561	14	324,583	2	1,505	48	194
2-Aug	184	4,745	12	324,595	0	1,505	56	250
3-Aug	136	4,881	0	324,595	0	1,505	48	298
4-Aug	138	5,019	0	324,595	0	1,505	96	394

-continued-

Table 1.–Page 2 of 2.

Date	Daily Chum	Cumulative Chum	Daily Pink	Cumulative Pink	Daily Chinook	Cumulative Chinook	Daily Coho	Cumulative Coho
5-Aug	188	5,207	0	324,595	0	1,505	130	524
6-Aug	178	5,385	0	324,595	0	1,505	156	680
7-Aug	122	5,507	0	324,595	0	1,505	76	756
8-Aug	102	5,609	0	324,595	0	1,505	52	808
9-Aug	94	5,703	0	324,595	0	1,505	48	856
10-Aug	47	5,750	0	324,595	0	1,505	113	969
11-Aug	43	5,793	0	324,595	0	1,505	137	1,106
12-Aug	38	5,831	0	324,595	0	1,505	178	1,284
13-Aug	36	5,867	0	324,595	0	1,505	60	1,344
14-Aug	26	5,893	0	324,595	0	1,505	72	1,416
15-Aug	34	5,927	0	324,595	0	1,505	216	1,632
16-Aug	14	5,941	0	324,595	0	1,505	156	1,788
17-Aug	56	5,997	0	324,595	0	1,505	252	2,040
18-Aug	90	6,087	0	324,595	0	1,505	306	2,346
19-Aug	16	6,103	0	324,595	0	1,505	178	2,524
20-Aug	22	6,125	0	324,595	0	1,505	70	2,594
21-Aug	18	6,143	0	324,595	0	1,505	84	2,678
22-Aug	0	6,143	0	324,595	0	1,505	52	2,730
23-Aug	0	6,143	0	324,595	0	1,505	10	2,740
24-Aug	0	6,143	0	324,595	0	1,505	24	2,764
25-Aug	0	6,143	0	324,595	0	1,505	108	2,872
26-Aug	0	6,143	0	324,595	0	1,505	76	2,948
27-Aug	0	6,143	0	324,595	0	1,505	102	3,050
28-Aug	0	6,143	0	324,595	0	1,505	106	3,156
29-Aug	0	6,143	0	324,595	0	1,505	54	3,210
Total	6,143		324,595		1,505		3,210	

Table 2.–Expanded daily and cumulative migration of all salmon species past the North River counting tower, Norton Sound, 2003.

Date	Daily Chum	Cumulative Chum	Daily Pink	Cumulative Pink	Daily Chinook	Cumulative Chinook	Daily Coho	Cumulative Coho
16-Jun	0	0	0	0	2	2	0	0
17-Jun	0	0	0	0	0	2	0	0
18-Jun	0	0	0	0	4	6	0	0
19-Jun	0	0	0	0	4	10	0	0
20-Jun	0	0	0	0	12	22	0	0
21-Jun	2	2	12	12	7	29	0	0
22-Jun	16	18	48	60	6	35	0	0
23-Jun	18	36	172	232	14	49	0	0
24-Jun	20	56	110	342	-2	47	0	0
25-Jun	4	60	50	392	6	53	0	0
26-Jun	2	62	22	414	0	53	0	0
27-Jun	6	68	100	514	10	63	0	0
28-Jun	0	68	78	592	10	73	0	0
29-Jun	18	86	111	703	11	84	0	0
30-Jun	4	90	34	737	6	90	0	0
1-Jul	40	130	190	927	152	242	0	0
2-Jul	25	155	111	1,038	81	323	0	0
3-Jul	23	178	103	1,141	76	399	0	0
4-Jul	12	190	118	1,259	8	407	0	0
5-Jul	5	195	300	1,559	12	419	0	0
6-Jul	14	209	458	2,017	14	433	0	0
7-Jul	26	235	1,606	3,623	18	451	0	0
8-Jul	94	329	6,568	10,191	58	509	0	0
9-Jul	122	451	8,468	18,659	78	587	0	0
10-Jul	88	539	5,078	23,737	42	629	0	0
11-Jul	192	731	6,796	30,533	60	689	0	0
12-Jul	148	879	5,442	35,975	34	723	0	0
13-Jul	176	1,055	12,038	48,013	100	823	0	0
14-Jul	234	1,289	11,684	59,697	56	879	0	0
15-Jul	80	1,369	21,204	80,901	34	913	0	0
16-Jul	22	1,391	6,518	87,419	0	913	0	0
17-Jul	150	1,541	18,500	105,919	54	967	0	0
18-Jul	336	1,877	18,174	124,093	96	1,063	8	8
19-Jul	699	2,576	28,067	152,160	78	1,141	26	34
20-Jul	334	2,910	17,240	169,400	56	1,197	124	158
21-Jul	202	3,112	12,704	182,104	48	1,245	106	264
22-Jul	122	3,234	10,624	192,728	48	1,293	52	316
23-Jul	146	3,380	5,814	198,542	20	1,313	86	402
24-Jul	554	3,934	8,838	207,380	16	1,329	134	536
25-Jul	798	4,732	14,577	221,957	47	1,376	127	663
26-Jul	597	5,329	12,760	234,717	15	1,391	240	903
27-Jul	373	5,702	8,505	243,222	15	1,406	309	1,212
28-Jul	140	5,842	3,540	246,762	14	1,420	437	1,649
29-Jul	266	6,108	9,604	256,366	10	1,430	212	1,861
30-Jul	270	6,378	10,201	266,567	2	1,432	115	1,976

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Table 2.–Page 2 of 2.

Date	Daily Chum	Cumulative Chum	Daily Pink	Cumulative Pink	Daily Chinook	Cumulative Chinook	Daily Coho	Cumulative Coho
31-Jul	174	6,552	2,600	269,167	2	1,434	80	2,056
1-Aug	162	6,714	3,334	272,501	6	1,440	106	2,162
2-Aug	100	6,814	1,551	274,052	0	1,440	66	2,228
3-Aug	78	6,892	916	274,968	0	1,440	32	2,260
4-Aug	2	6,894	558	275,526	-2	1,438	40	2,300
5-Aug	38	6,932	652	276,178	0	1,438	42	2,342
6-Aug	188	7,120	578	276,756	4	1,442	60	2,402
7-Aug	216	7,336	630	277,386	4	1,446	124	2,526
8-Aug	258	7,594	496	277,882	0	1,446	86	2,612
9-Aug	332	7,926	810	278,692	0	1,446	245	2,857
10-Aug	328	8,254	616	279,308	0	1,446	308	3,165
11-Aug	62	8,316	102	279,410	2	1,448	42	3,207
12-Aug	90	8,406	120	279,530	2	1,450	54	3,261
13-Aug	132	8,538	70	279,600	0	1,450	68	3,329
14-Aug	120	8,658	108	279,708	0	1,450	412	3,741
15-Aug	-17	8,641	92	279,800	0	1,450	271	4,012
16-Aug	9	8,650	68	279,868	0	1,450	173	4,185
17-Aug	-20	8,630	16	279,884	0	1,450	28	4,213
18-Aug	168	8,798	86	279,970	0	1,450	124	4,337
19-Aug	76	8,874	26	279,996	0	1,450	90	4,427
20-Aug	234	9,108	56	280,052	2	1,452	88	4,515
21-Aug	124	9,232	16	280,068	0	1,452	118	4,633
22-Aug	66	9,298	11	280,079	0	1,452	91	4,724
23-Aug	109	9,407	27	280,106	0	1,452	188	4,912
24-Aug	54	9,461	15	280,121	0	1,452	97	5,009
25-Aug	54	9,515	13	280,134	0	1,452	92	5,101
26-Aug	54	9,569	13	280,147	0	1,452	92	5,193
27-Aug	54	9,623	13	280,160	0	1,452	92	5,285
28-Aug	54	9,677	13	280,173	0	1,452	92	5,377
29-Aug	54	9,731	13	280,186	0	1,452	92	5,469
30-Aug	-2	9,729	0	280,186	0	1,452	13	5,482
31-Aug	12	9,741	5	280,191	0	1,452	36	5,518
1-Sep	32	9,773	6	280,197	0	1,452	28	5,546
2-Sep	16	9,789	-4	280,193	0	1,452	20	5,566
3-Sep	-2	9,787	10	280,203	0	1,452	28	5,594
4-Sep	18	9,805	4	280,207	0	1,452	40	5,634
5-Sep	5	9,810	2	280,209	0	1,452	19	5,653
6-Sep	1	9,811	5	280,214	0	1,452	22	5,675
7-Sep	4	9,815	4	280,218	0	1,452	26	5,701
8-Sep	4	9,819	0	280,218	0	1,452	34	5,735
9-Sep	18	9,837	-4	280,214	0	1,452	46	5,781
10-Sep	0	9,837	-2	280,212	0	1,452	6	5,787
11-Sep	6	9,843	0	280,212	0	1,452	32	5,819
12-Sep	10	9,853	0	280,212	0	1,452	8	5,827
13-Sep	6	9,859	0	280,212	0	1,452	10	5,837
Total	9,859		280,212		1,452		5,837	

Table 3.–Expanded daily and cumulative migration of all salmon species past the North River counting tower, Norton Sound, 2004.

Date	Daily Chum	Cumulative Chum	Daily Pink	Cumulative Pink	Daily Chinook	Cumulative Chinook	Daily Coho	Cumulative Coho
15-Jun	0	0	10	10	0	0		
16-Jun	0	0	366	376	0	0		
17-Jun	0	0	216	592	0	0		
18-Jun	0	0	84	676	0	0		
19-Jun	4	4	250	926	0	0		
20-Jun	0	4	1,386	2,312	4	4		
21-Jun	6	10	842	3,154	0	4		
22-Jun	4	14	904	4,058	0	4		
23-Jun	6	20	1,712	5,770	4	8		
24-Jun	8	28	2,312	8,082	2	10		
25-Jun	6	34	1,596	9,678	6	16		
26-Jun	24	58	4,263	13,941	40	56		
27-Jun	40	98	23,266	37,207	64	120		
28-Jun	104	202	69,800	107,007	76	196		
29-Jun	92	294	111,152	218,159	82	278		
30-Jun	50	344	48,714	266,873	14	292		
1-Jul	20	364	21,028	287,901	-6	286		
2-Jul	50	414	29,632	317,533	30	316		
3-Jul	16	430	3,366	320,899	4	320		
4-Jul	66	496	28,588	349,487	30	350		
5-Jul	110	606	10,896	360,383	10	360		
6-Jul	192	798	73,240	433,623	96	456		
7-Jul	100	898	34,716	468,339	86	542		
8-Jul	32	930	36,192	504,531	20	562		
9-Jul	80	1,010	11,700	516,231	32	594	8	8
10-Jul	496	1,506	53,893	570,124	31	625	33	41
11-Jul	530	2,036	74,302	644,426	154	779	14	55
12-Jul	314	2,350	93,770	738,196	58	837	42	97
13-Jul	442	2,792	98,084	836,280	60	897	40	137
14-Jul	508	3,300	104,650	940,930	78	975	42	179
15-Jul	334	3,634	44,670	985,600	42	1,017	58	237
16-Jul	90	3,724	17,300	1,002,900	10	1,027	56	293
17-Jul	156	3,880	12,648	1,015,548	7	1,034	52	345
18-Jul	568	4,448	21,020	1,036,568	8	1,042	82	427
19-Jul	316	4,764	16,270	1,052,838	16	1,058	82	509
20-Jul	754	5,518	30,966	1,083,804	24	1,082	178	687
21-Jul	652	6,170	21,632	1,105,436	12	1,094	192	879
22-Jul	322	6,492	14,590	1,120,026	6	1,100	216	1,095
23-Jul	162	6,654	5,688	1,125,714	2	1,102	170	1,265
24-Jul	348	7,002	7,802	1,133,516	2	1,104	214	1,479
25-Jul	278	7,280	4,582	1,138,098	2	1,106	148	1,627
26-Jul	126	7,406	3,270	1,141,368	4	1,110	116	1,743
27-Jul	74	7,480	1,242	1,142,610	4	1,114	76	1,819
28-Jul	214	7,694	2,896	1,145,506	0	1,114	160	1,979
29-Jul	176	7,870	2,538	1,148,044	4	1,118	170	2,149

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Table 3.–Page 2 of 2.

Date	Daily Chum	Cumulative Chum	Daily Pink	Cumulative Pink	Daily Chinook	Cumulative Chinook	Daily Coho	Cumulative Coho
30-Jul	192	8,062	2,172	1,150,216	2	1,120	316	2,465
31-Jul	123	8,185	2,130	1,152,346	3	1,123	243	2,708
1-Aug	92	8,277	1,366	1,153,712	2	1,125	102	2,810
2-Aug	128	8,405	1,134	1,154,846	0	1,125	74	2,884
3-Aug	74	8,479	1,000	1,155,846	0	1,125	108	2,992
4-Aug	70	8,549	1,128	1,156,974	2	1,127	134	3,126
5-Aug	82	8,631	918	1,157,892	-4	1,123	160	3,286
6-Aug	224	8,855	1,010	1,158,902	0	1,123	308	3,594
7-Aug	130	8,985	1,194	1,160,096	0	1,123	470	4,064
8-Aug	138	9,123	794	1,160,890	4	1,127	560	4,624
9-Aug	88	9,211	626	1,161,516	0	1,127	362	4,986
10-Aug	82	9,293	390	1,161,906	0	1,127	224	5,210
11-Aug	136	9,429	330	1,162,236	-2	1,125	266	5,476
12-Aug	112	9,541	178	1,162,414	0	1,125	386	5,862
13-Aug	59	9,600	98	1,162,512	0	1,125	296	6,158
14-Aug	59	9,659	98	1,162,610	0	1,125	296	6,454
15-Aug	59	9,718	98	1,162,708	0	1,125	296	6,750
16-Aug	59	9,777	98	1,162,806	0	1,125	296	7,046
17-Aug	55	9,832	85	1,162,891	0	1,125	270	7,316
18-Aug	16	9,848	34	1,162,925	0	1,125	206	7,522
19-Aug	24	9,872	42	1,162,967	0	1,125	210	7,732
20-Aug	14	9,886	0	1,162,967	0	1,125	168	7,900
21-Aug	1	9,887	11	1,162,978	0	1,125	164	8,064
22-Aug	6	9,893	-8	1,162,970	0	1,125	206	8,270
23-Aug	32	9,925	0	1,162,970	0	1,125	278	8,548
24-Aug	30	9,955	2	1,162,972	0	1,125	150	8,698
25-Aug	12	9,967	-18	1,162,954	0	1,125	154	8,852
26-Aug	0	9,967	14	1,162,968	0	1,125	52	8,904
27-Aug	-2	9,965	16	1,162,984	0	1,125	92	8,996
28-Aug	1	9,966	8	1,162,992	0	1,125	191	9,187
29-Aug	2	9,968	-6	1,162,986	0	1,125	142	9,329
30-Aug	-2	9,966	-4	1,162,982	0	1,125	76	9,405
31-Aug	2	9,968	0	1,162,982	0	1,125	152	9,557
1-Sep	18	9,986	0	1,162,982	0	1,125	186	9,743
2-Sep	6	9,992	-4	1,162,978	0	1,125	92	9,835
3-Sep	-4	9,988	-6	1,162,972	0	1,125	38	9,873
4-Sep	6	9,994	0	1,162,972	0	1,125	153	10,026
5-Sep	8	10,002	-4	1,162,968	0	1,125	104	10,130
6-Sep	10	10,012	4	1,162,972	0	1,125	98	10,228
7-Sep	4	10,016	0	1,162,972	0	1,125	192	10,420
8-Sep	2	10,018	0	1,162,972	0	1,125	54	10,474
9-Sep	8	10,026	0	1,162,972	0	1,125	218	10,692
10-Sep	4	10,030	4	1,162,976	0	1,125	106	10,798
11-Sep	4	10,034	0	1,162,976	0	1,125	113	10,911
12-Sep	0	10,034	0	1,162,976	0	1,125	102	11,013
13-Sep	0	10,034	-2	1,162,974	0	1,125	168	11,181
14-Sep	2	10,036	4	1,162,978	0	1,125	6	11,187
Total	10,036		1,162,978		1,125		11,187	

Table 4.–Historic dates of operation, expanded salmon passage, percent of each species passage calculated for the North River counting tower, and percent of hourly counts calculated, Norton Sound, 1972-74,1984-86, and 1996-2004.

Year	Operating Period	Chum Expanded	% Calculated	Pink Expanded	% Calculated	Chinook Expanded	% Calculated	Coho Expanded	% Calculated	% Hourly Counts Calculated
1972	July 7-July 28 [a]	2,332	[c]	54,934	[c]	561	[c]	[d]	[d]	[c]
1973	June 29-July 23 [a]	4,334	[c]	26,542	[c]	298	[c]	[d]	[d]	[c]
1974	June 25-July 17 [b]	826	[c]	143,789	[c]	196	[c]	[d]	[d]	[c]
1984	June 25-July 28	2,915	30.43%	458,387	31.97%	2,844	41.07%	[d]	[d]	11.30%
1985	June 27-Aug 31	4,567	14.41%	4,360	3.05%	1,426	16.06%	2,045	28.66%	17.40%
1986	June 25-July 18	3,738	[c]	236,487	[c]	1,613	[c]	[d]	[d]	14.00%
1996	June 16-July 25	9,789	18.64%	332,539	14.47%	1,197	15.96%	1,229	11.64%	20.10%
1997	June 16-Aug 21	6,904	25.09%	127,926	27.85%	4,185	29.75%	5,768	46.22%	14.10%
1998	June 15-Aug 12	1,526	23.33%	74,045	26.11%	2,100	18.10%	3,361	43.05%	24.90%
1999	June 30-Aug 31	5,600	48.68%	48,993	39.49%	2,263	55.10%	4,792	45.12%	34.00%
2000	June 17-Aug 12	4,971	23.52%	69,703	10.77%	1,046	18.93%	6,961	23.72%	28.70%
2001	July 5-Sept 15	6,515	29.59%	24,737	18.57%	1,337	33.58%	12,383	38.85%	42.40%
2002	June 19-Aug 29	6,143	3.47%	324,595	2.47%	1,505	1.66%	3,210	5.36%	4.09%
2003	June 15-Sept 13	9,859	11.96%	280,212	6.40%	1,452	15.70%	5,837	24.96%	16.10%
2004	June 15-Sept 14	10,036	3.60%	1,162,978	1.11%	1,125	1.87%	11,187	13.74%	8.91%

[a] Escapement based on 24-hour counts.

[b] Escapement based on 18-hour counts.

[c] Percent passage estimated unavailable due to lack of detailed data.

[d] Counting project did not monitor escapement during coho salmon run periods, resulting in a lack of coho salmon escapement data.

Table 5.–North River Tower Chinook salmon count expanded to Unalakleet Drainage Chinook salmon estimate.

Year	Operating Period	North River Tower Chinook Count	Estimated Unalakleet River Drainage Chinook Count
1984	June 25-July 28	2,844	7,110
1985	June 27-Aug 31	1,426	3,565
1986	June 25-July 18	1,613	4,033
1996	June 16-July 25	1,197	2,993
1997	June 16-Aug 21	4,185	10,463
1998	June 15-Aug 12	2,100	5,250
1999	June 30-Aug 31	2,263	5,658
2000	June 17-Aug 12	1,046	2,615
2001	July 5-Sept 15 [a]	1,337	[a] 3,343
2002	June 19-Aug 30	1,505	3,763
2003	June 15-Sept 13	1,452	3,630
2004	June 15-Sept 14	1,125	2,813

[a] Minimum count due to late start of project.

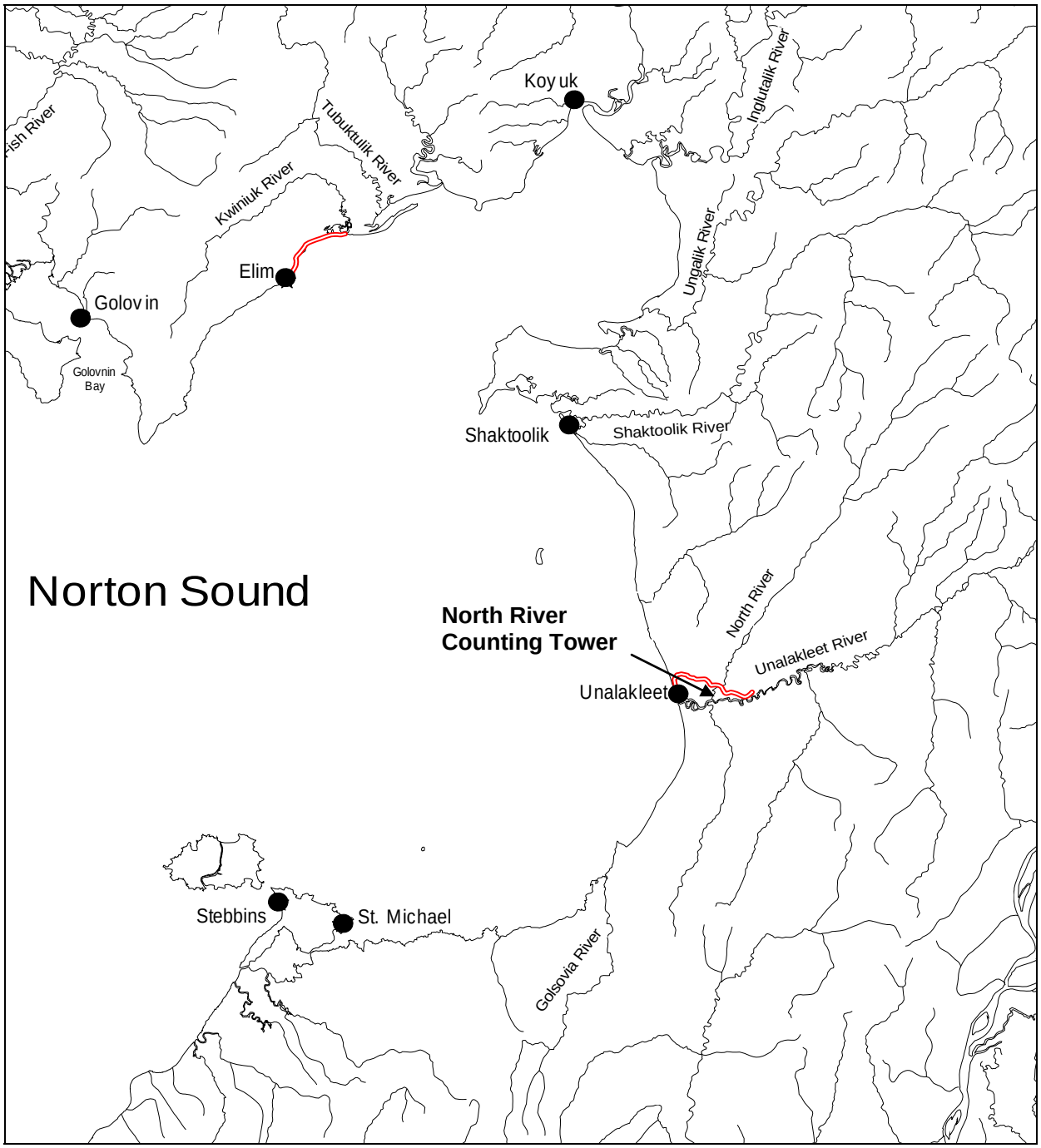

Figure 1.–Location of the North River counting tower project site, Norton Sound, 2002–2004.

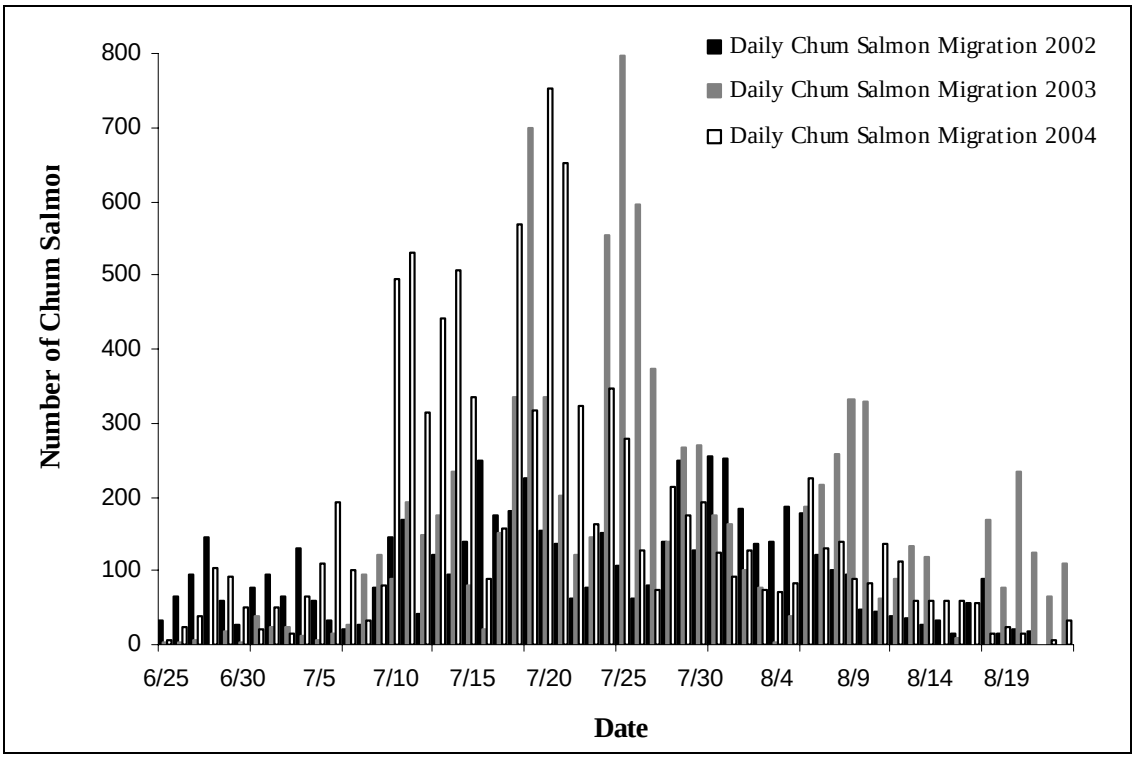

Figure 2.–Daily chum salmon migration past the North River counting tower, Norton Sound, 2002–2004.

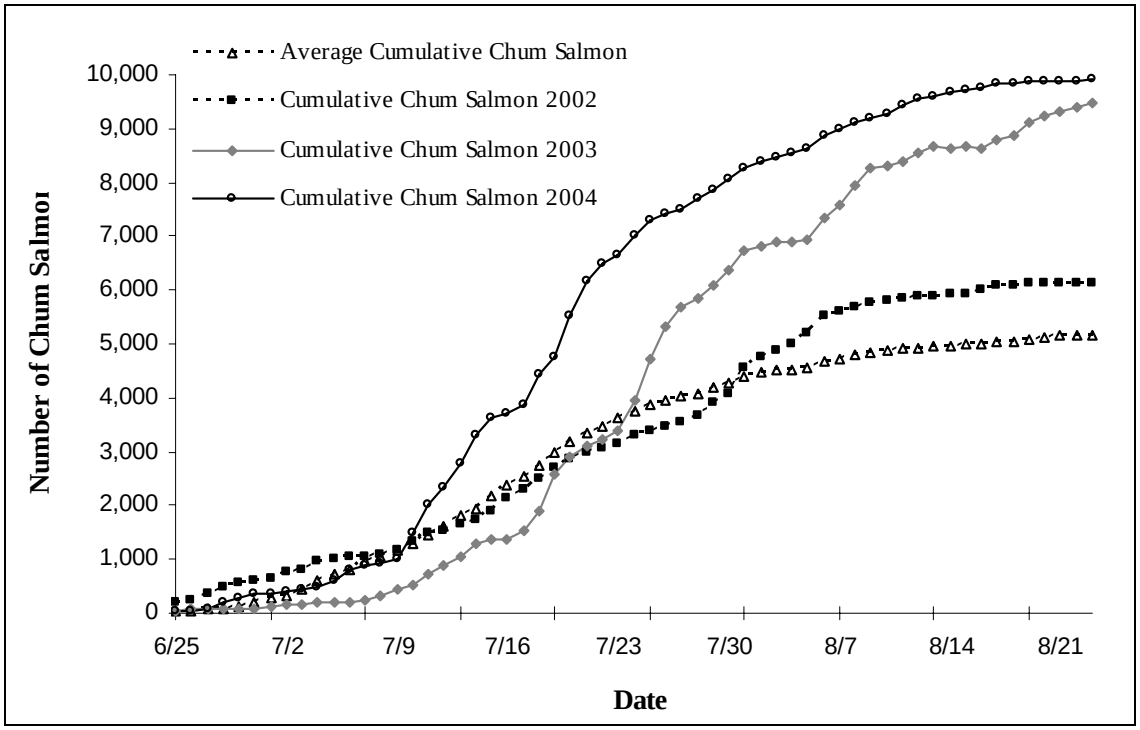

Figure 3.–The 2002, 2003, 2004, and average cumulative chum salmon migration past the North River counting tower, Norton Sound.

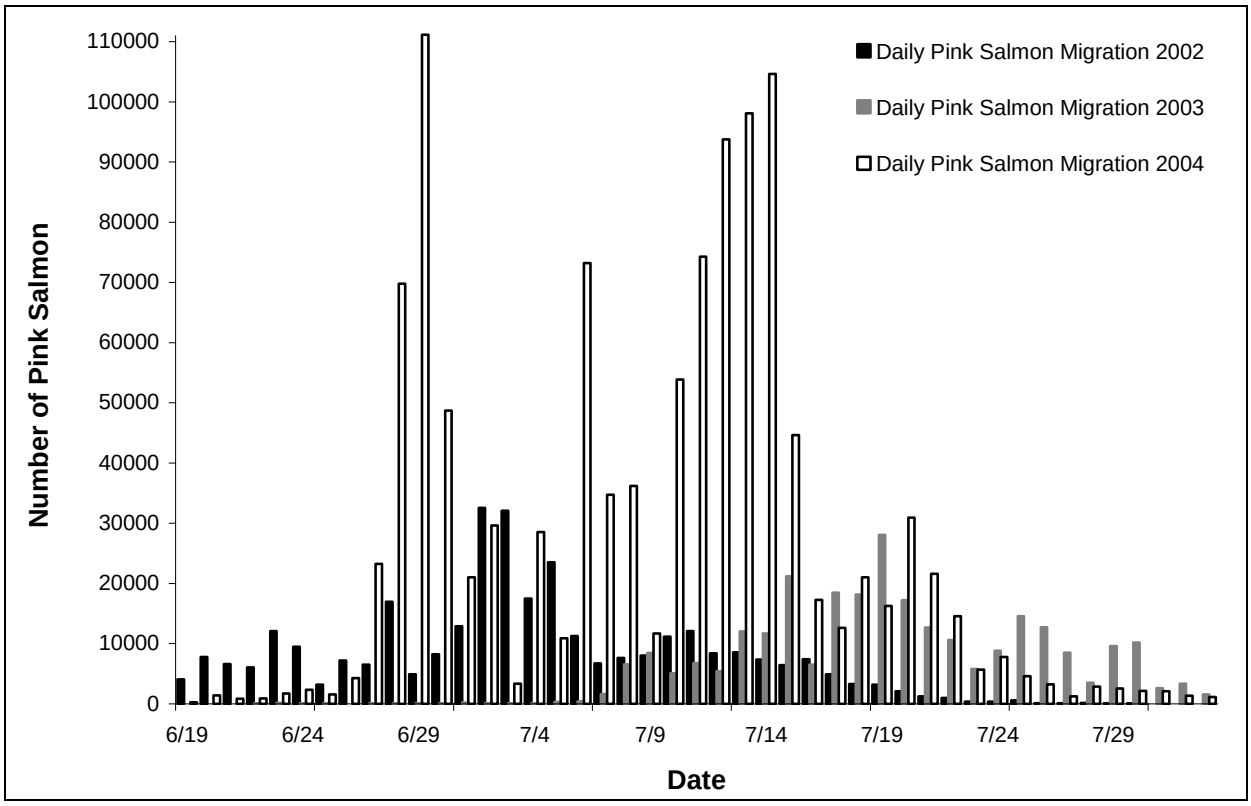

Figure 4.–Daily pink salmon migration past the North River counting tower, Norton Sound, 2002–2004.

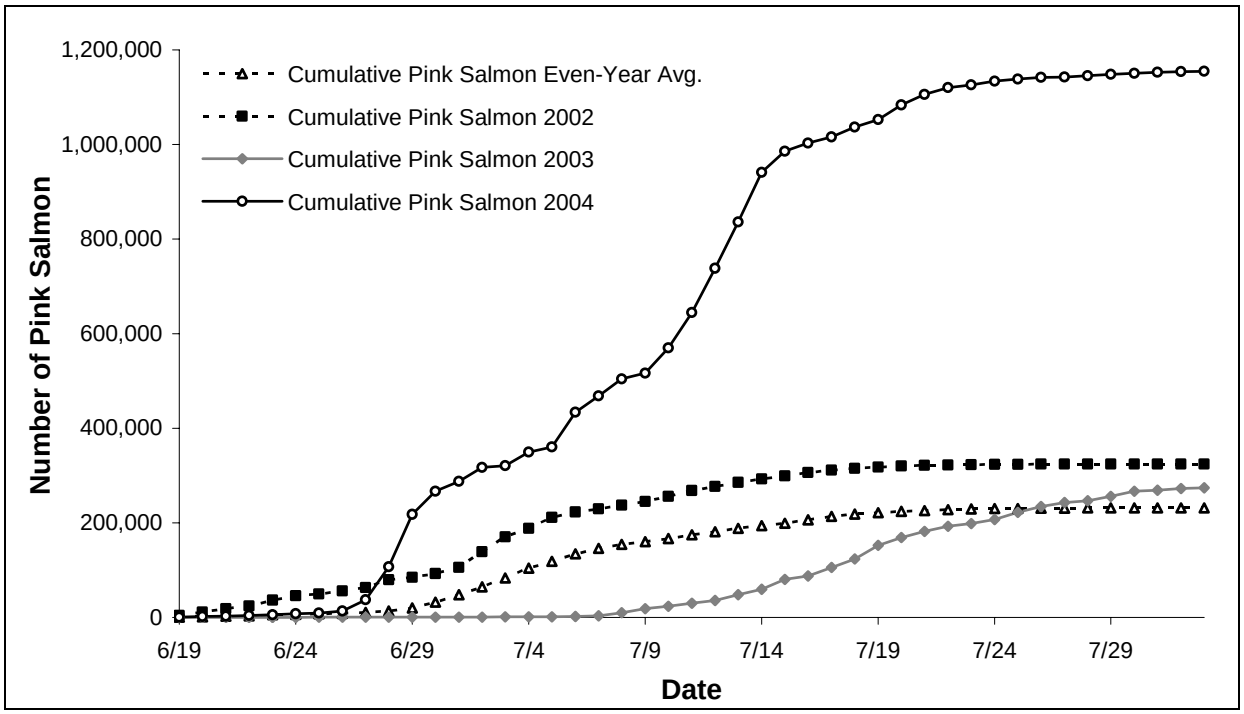

Figure 5.–The 2002, 2003, 2004 and even-year average cumulative pink salmon migration past the North River counting tower, Norton Sound.

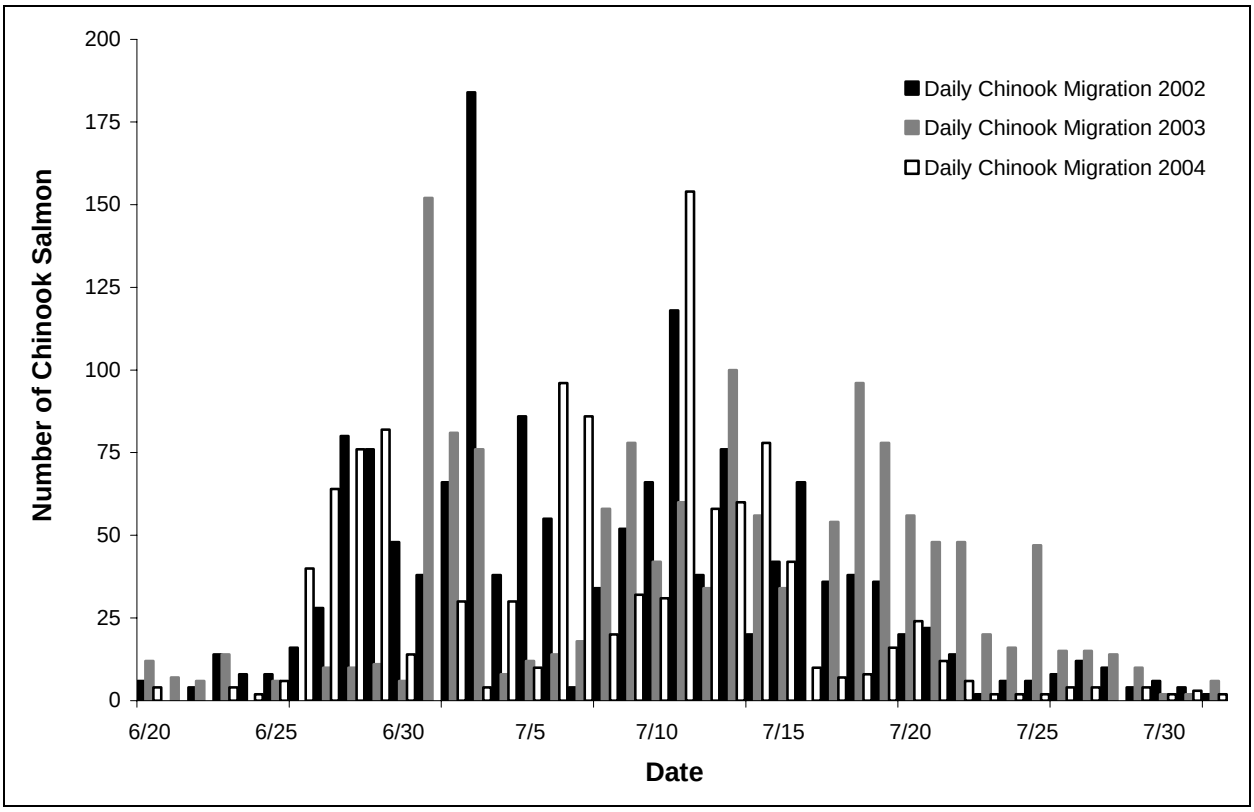

Figure 6.–Daily Chinook salmon migration past the North River counting tower, Norton Sound, 2002–2004.

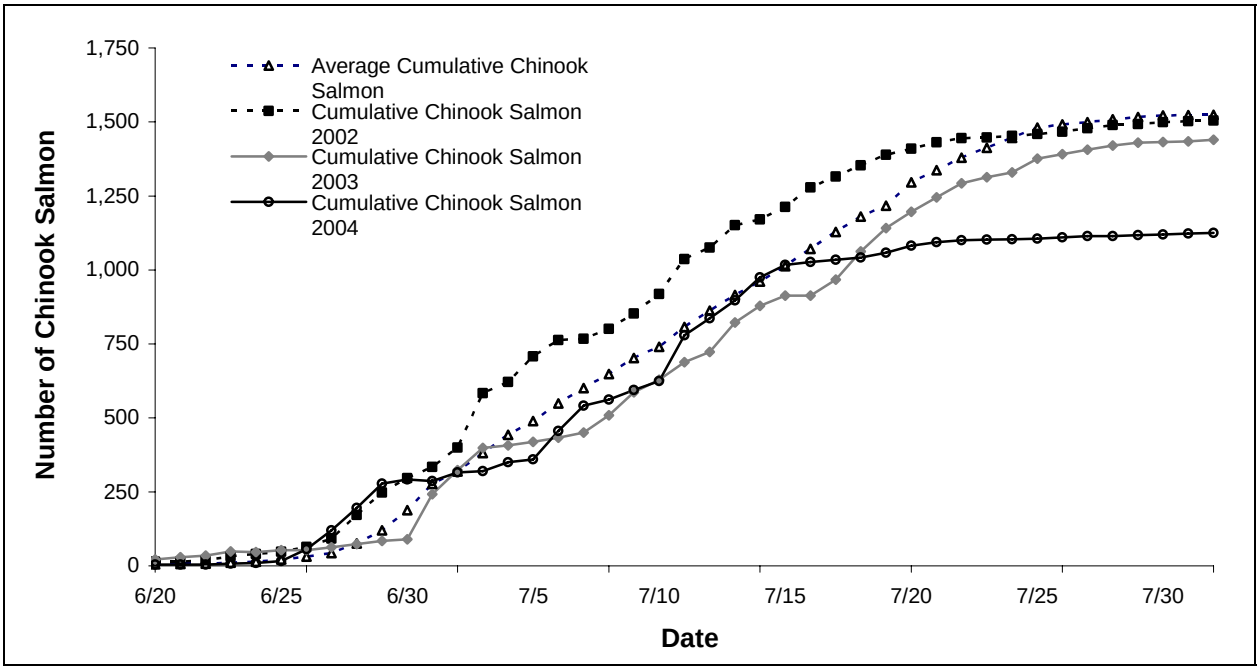

Figure 7.–The 2002, 2003, 2004 and average cumulative Chinook salmon migration past the North River counting tower, Norton Sound.

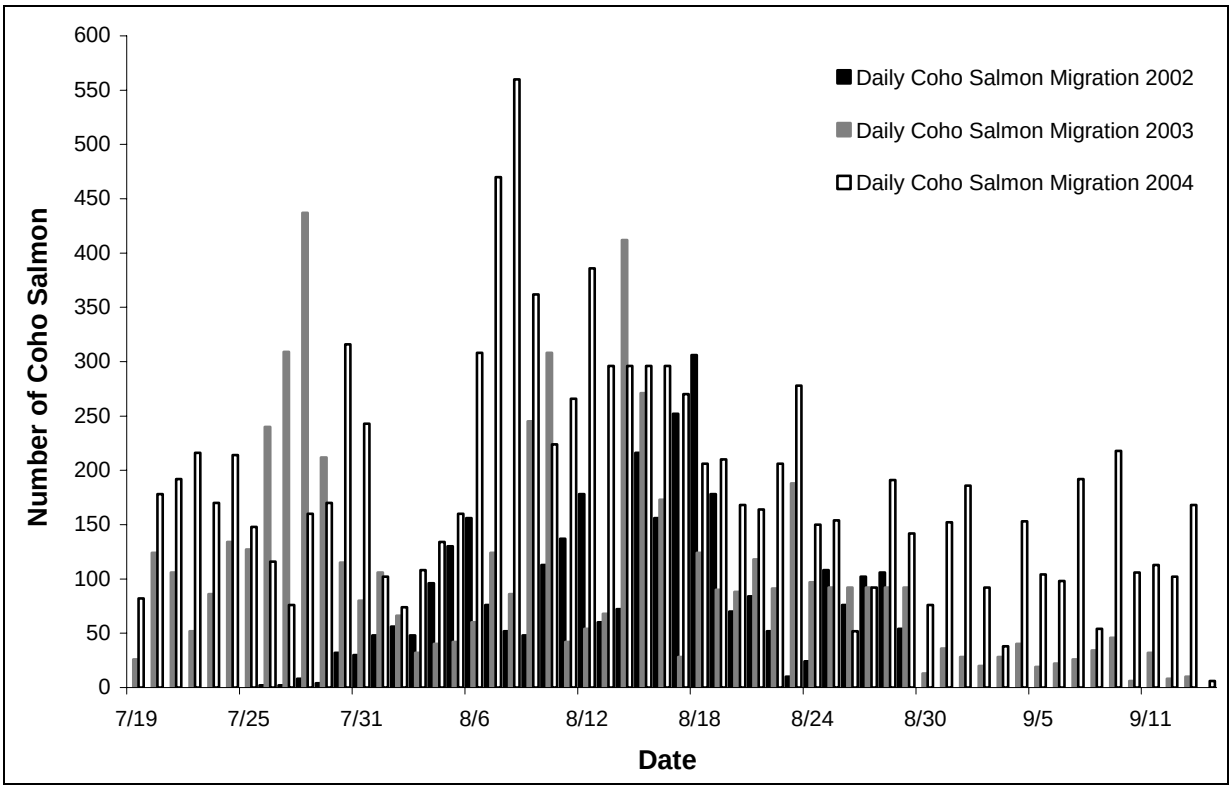

Figure 8.–Daily coho salmon migration past the North River counting tower, Norton Sound, 2002–2004.

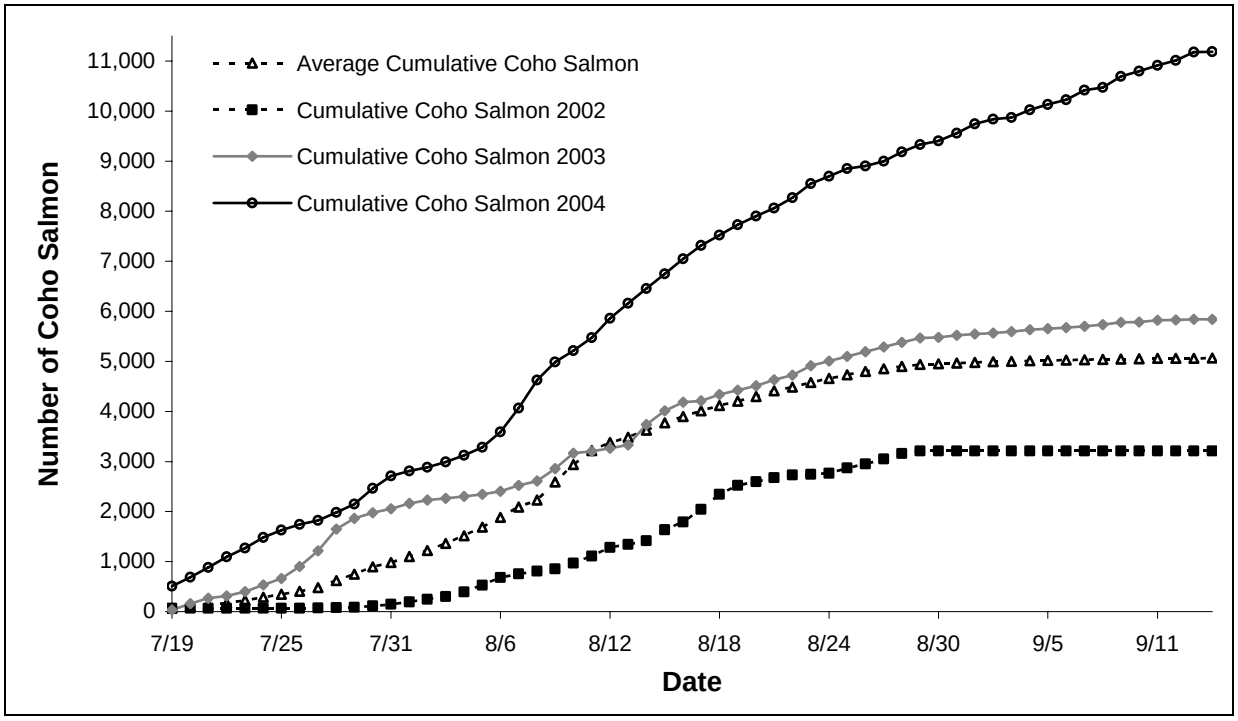

Figure 9.–The 2002, 2003, 2004 and average cumulative coho salmon migration past the North River counting tower, Norton Sound.

APPENDIX A

Appendix A1.–Expanded daily hourly chum salmon migration past the North River counting tower, Norton Sound, 2002.

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
6/19	Not expanded												0	0	0	0	0	0	Not expanded			0	0	0	0	0.0%
6/20	2	0	0								0	0	0	0	0	0	0	0	4	0	4	8	0	0	18	0.3%
6/21	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	4	0	0	0	0	0	0	8	0.1%
6/22	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	4	2	2	0	20	0.3%
6/23	8	0	2	2	0	0	2	0	0	0	0	4	0	2	0	0	0	6	0	0	10	2	6	10	54	0.9%
6/24	2	0	0	2	0	2	0	4	0	0	0	0	0	0	2	0	0	0	0	0	8	14	10	18	62	1.0%
6/25	2	2	0	0	2	0	0	4	0	0	0	0	0	2	2	0	0	0	0	8	0	2	0	10	34	0.6%
9/26	16	10	2	4	0	4	6	0	0	2	0	0	0	0	0	0	0	0	0	14	2	0	0	6	66	1.1%
6/27	0	6	0	2	4	8	0	0	0	0	0	0	0	0	0	4	0	0	0	2	6	18	14	30	94	1.5%
6/28	18	2	28	0	0	6	4	0	0	0	0	0	0	0	12	4	0	0	6	6	4	10	20	26	146	2.4%
6/29	4	2	0	0	2	0	0	2	0	2	0	0	2	0	0	12	6	0	10	0	4	4	2	6	58	0.9%
6/30	8	0	2	0	0	4	0	0	0	0	0	0	0	0	0	0	2	0	0	2	4	0	2	2	26	0.4%
7/1	6	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	10	40	18	2	78	1.3%
7/2	0	0	2	0	0	2	6	10	4	0	0	2	0	12	0	0	0	0	2	0	0	38	6	12	96	1.6%
7/3	12	2	0	0	4	0	6	16	4	2	2	4	0	0	0	0	0	0	8	0	0	0	2	4	66	1.1%
7/4	2	14	22	20	26	20	0	0	0	2	0	2	6	4	0	6	0	2	0	2	2	0	0	0	130	2.1%
7/5	0	0	4	2	0	2	6	2	0	0	2	4	4	0	6	2	0	2	2	4	10	6	0	0	58	0.9%
7/6	2	6	2	0	2	4	-2	0	0	0	2	2	2	1	3	1	0	1	2	0	2	0	2	0	32	0.5%
7/7	4	2	4	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	2	0	0	2	0	0	20	0.3%
7/8	0	2	2	2	0	4	0	0	0	0	2	0	0	4	2	2	0	6	0	0	0	2	0	0	28	0.5%
7/9	4	6	4	0	6	6	2	0	0	0	0	0	0	2	4	16	0	10	0	2	10	0	4	2	78	1.3%
7/10	10	4	0	2	2	6	0	0	2	0	0	0	0	2	0	2	6	16	12	16	10	18	24	12	144	2.3%
7/11	30	26	12	6	2	4	0	0	0	0	0	0	2	0	2	6	12	4	2	12	20	24	6	0	170	2.8%
7/12	4	8	4	0	2	0	0	0	0	0	0	0	0	0	0	2	0	4	2	0	4	8	0	4	42	0.7%
7/13	2	2	4	8	2	4	0	2	0	0	0	0	2	6	10	6	14	12	20	16	8	2	2	0	122	2.0%
7/14	2	16	8	4	2	4	0	0	0	4	4	0	0	6	2	2	4	0	6	12	4	4	8	4	96	1.6%
7/15	0	4	6	12	10	0	2	0	0	0	0	2	2	0	4	0	12	8	28	4	10	16	12	6	138	2.2%
7/16	6	24	30	42	14	2				4	4	0	4	2	2	4	10	12	6	10	4	24	26	18	248	4.0%
7/17	20	24	20	10	6	8				3	0	4	0	0	0	0	0	0	2	10	24	10	12	22	175	2.8%
7/18	0	18	40	28	16	12				2	0	20	4	0	0	4	0	0	2	8	2	10	12	4	182	3.0%
7/19	4	32	22	10	10	6	2	0	0	0	0	2	0	6	8	10	-4	2	16	40	16	14	12	16	224	3.6%
7/20	18	24	8	2	6	4				1	0	2	-2	6	2	0	10	6	0	0	10	28	22	6	153	2.5%
7/21	14	40	18	6	2	2				0	0	0	0	0	4	0	0	0	4	0	8	20	10	8	136	2.2%
7/22	16	6	12	2	0	10				0	0	0	0	4	2	0	6	2	0	0	0	0	0	2	62	1.0%

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Appendix A1.–Page 2 of 2.

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
7/23	10	8	12	4	14	2	0	0	0	0	0	0	2	0	2	0	4	0	10	2	0	6	0	0	76	1.2%
7/24	16	62	34	12	6	4	2	2	0	0	0	0	0	0	4	0	0	2	0	6	0	0	0	0	150	2.4%
7/25	8	26	12	2	6	4	0	0	0	0	0	0	0	2	4	2	0	6	0	4	0	8	12	10	106	1.7%
7/26	4	8	4	2	18	12	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	4	6	62	1.0%
7/27	8	8	2	1	9	6	1	0	0	0	0	0	0	0	0	6	6	2	2	0	6	16	6	2	81	1.3%
7/28	12	8	0	0	0	0	2	0	2	0	6	0	2	6	2	2	8	10	18	8	4	6	14	28	138	2.2%
7/29	84	46	36	14	-2	0	0	6	0	0	8	6	2	2	0	0	4	2	6	2	10	8	4	12	250	4.1%
7/30	6	14	24	12	0	6	0	0	0	0	4	0	0	2	0	10	2	0	2	0	4	4	18	20	128	2.1%
7/31	42	32	20	22	6	4	0	4	2	0	0	-2	4	6	0	0	40	4	2	6	6	28	6	22	254	4.1%
8/1	48	66	32	0	8	0	2	0	0	0	0	0	4	0	0	4	4	10	8	6	2	14	20	24	252	4.1%
8/2	36	52	12	4	0	0	4	0	2	0	2	0	0	4	0	10	4	0	0	0	8	6	0	40	184	3.0%
8/3	45	38	13	10	0	4	2	0	0	0	4	-4	0	0	0	0	0	4	2	2	0	0	4	12	136	2.2%
8/4	54	24	14	16	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	10	6	138	2.2%
8/5	34	12	30	26	2	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	12	14	50	188	3.1%
8/6	70	28	36	4	8	0	0	6	0	2	0	0	0	0	0	0	0	0	0	0	2	0	2	20	178	2.9%
8/7	10	46	20	6	2	14	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	122	2.0%
8/8	58	0	10	4	6	0	0	16	0	0	0	0	0	0	4	0	0	0	0	0	2	0	0	2	102	1.7%
8/9	24	34	14	6	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	2	0	94	1.5%
8/10	6	16	4	2	0	0	4	0	0	0	0	0	0	0	0	4	0	0	0	0	4	6	1	0	47	0.8%
8/11	5	13	6	1	1	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	43	0.7%
8/12	4	10	8	0	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	38	0.6%
8/13	8	2	6	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0.6%
8/14	4	2	4	6	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	2	0	0	0	26	0.4%
8/15	2	12	12	4	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	34	0.6%
8/16	2	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0.2%
8/17	20	26	10	4	0	0	0	0	0	0	-4	0	0	0	0	0	0	0	0	0	0	0	0	0	56	0.9%
8/18	26	44	16	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	1.5%
8/19	0	4	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	16	0.3%
8/20	0	2	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0.4%
8/21	4	6	0	-4	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	18	0.3%
8/22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
8/23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
8/24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Total	868	935	667	352	212	227	81	74	16	26	38	48	40	83	85	121	150	143	186	212	266	456	351	506	6,143	100%
% of Total	14.1	12.5	10.9	5.7	3.5	3.7	1.3	1.2	0.3	0.4	0.6	0.8	0.7	1.4	1.4	2.0	2.4	2.3	3.0	3.5	4.3	7.4	5.7	8.2	100	

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

Appendix A2.–Expanded daily hourly chum salmon migration past the North River counting tower, Norton Sound, 2003.

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
6/16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
6/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
6/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
6/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
6/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
6/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0.0
6/22	6	0	2	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2	2	16	0.2
6/23	6	2	0	4	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0.2
6/24	2	2	10	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0.2
6/25	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.0
6/26	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.0
6/27	0	0	-2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2	6	0.1
6/28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
6/29	0	14	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0.2
6/30	0	-4	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.0
7/1	4	16	2	2	0	0	0	0	0	0	0	0	0	0	4	6	0	0	2	2	2	0	0	0	40	0.4
7/2	2	8	1	2	0	0	0	0	0	0	0	1	0	0	2	5	0	1	1	1	1	0	0	0	25	0.3
7/3	0	8	1	2	0	0	0	0	0	0	0	1	0	0	2	5	0	1	1	1	1	0	0	0	23	0.2
7/4	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	4	0	2	0	0	0	2	0	0	12	0.1
7/5	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0.1
7/6	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	4	0	0	0	4	0	0	0	2	14	0.1
7/7	0	4	2	6	0	0	0	4	0	0	0	0	0	0	0	0	2	0	0	2	2	0	2	2	26	0.3
7/8	2	2	8	0	2	2	0	2	2	0	0	0	0	0	0	0	0	2	0	28	20	8	6	10	94	1.0
7/9	12	10	6	16	0	0	0	0	0	0	0	0	6	2	4	0	0	10	8	24	14	2	2	6	122	1.2
7/10	2	0	2	0	0	0	0	0	4	0	2	0	2	0	6	2	0	0	4	44	6	8	0	6	88	0.9
7/11	40	10	0	0	0	8	0	4	0	6	0	2	12	10	8	24	12	2	4	4	0	6	38	2	192	1.9
7/12	2	0	0	0	0	4	0	2	0	3	0	1	7	7	6	12	0	4	10	4	2	30	44	10	148	1.5
7/13	16	8	0	8	2	4	4	0	0	0	0	0	2	4	4	0	0	16	16	52	20	16	4	0	176	1.8
7/14	22	52	28	2	2	22	26	10	0	6	6	16	4	12	4	8	2	0	2	2	4	2	2	0	234	2.4

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Appendix A2.–Page 2 of 3.

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
7/15	6	-2	-4	-4	-4	2	-4	-4	4	0	8	20	22	12	8	4	6	2	4	2	0	0	0	2	80	0.8
7/16	0	4	4	2	0	6	2	2	0	2	2	0	-8	2	2	0	0	0	2	0	0	0	0	0	22	0.2
7/17	2	2	4	0	2	4	0	2	0	0	0	0	0	0	0	0	8	2	20	6	22	16	38	22	150	1.5
7/18	44	26	20	6	14	24	12	14	2	4	0	0	0	0	2	4	8	2	60	10	0	22	18	44	336	3.4
7/19	40	36	18	20	22	18	4	2	1	2	0	0	0	2	1	3	0	2	50	56	58	78	144	142	699	7.1
7/20	74	40	16	4	12	44	16	8	0	0	0	0	0	4	0	2	2	4	8	30	16	40	8	6	334	3.4
7/21	10	18	0	0	2	2	4	6	4	0	0	0	0	0	0	0	2	14	20	32	22	54	8	4	202	2.0
7/22	2	0	0	2	0	6	2	0	0	0	0	0	0	0	6	2	8	18	6	18	24	30	0	-2	122	1.2
7/23	4	24	0	2	0	4	12	0	0	-2	0	0	0	0	2	4	2	14	18	24	6	2	28	2	146	1.5
7/24	14	14	6	4	6	54	34	22	0	0	0	0	2	0	10	24	16	26	20	64	80	84	46	28	554	5.6
7/25	16	4	7	3	4	42	14	6	0	2	0	0	2	4	26	158	112	80	80	94	48	34	44	18	798	8.1
7/26	22	6	8	3	2	21	7	3	3	2	9	4	8	2	48	28	16	234	76	28	-4	28	28	15	597	6.1
7/27	12	4	4	3	2	21	7	3	3	2	9	1	5	1	24	15	8	117	41	17	3	28	28	15	373	3.8
7/28	12	4	4	3	2	21	7	3	3	2	9	-2	2	0	0	2	0	0	6	6	10	22	12	12	140	1.4
7/29	4	2	0	2	0	0	0	0	6	2	18	54	34	42	14	38	2	8	12	2	8	4	12	2	266	2.7
7/30	0	0	0	0	0	0	0	0	10	6	6	28	8	28	26	24	24	10	12	18	26	22	4	18	270	2.7
7/31	10	4	6	14	6	4	2	-4	0	0	0	2	-2	-2	0	0	14	10	12	10	32	34	16	6	174	1.8
8/1	6	8	10	6	8	4	8	2	2	-2	0	0	2	4	2	4	8	6	6	2	36	20	14	6	162	1.6
8/2	10	6	10	0	2	4	2	0	0	4	0	2	2	-2	0	-2	3	4	5	2	20	15	9	4	100	1.0
8/3	8	2	6	4	4	10	2	0	4	2	2	0	0	4	2	2	-2	2	4	2	4	10	4	2	78	0.8
8/4	-2	2	8	0	0	0	0	-2	-2	-2	0	2	0	0	4	-8	0	4	0	2	0	-2	-2	0	2	0.0
8/5	0	0	-4	0	0	0	0	-2	8	2	-2	2	-2	-2	0	10	6	4	2	0	6	4	0	6	38	0.4
8/6	16	4	12	24	14	4	2	4	0	2	2	4	8	2	14	2	2	4	8	2	8	22	20	8	188	1.9
8/7	16	14	10	4	16	12	6	8	0	0	0	0	0	2	0	14	2	12	6	40	32	12	8	2	216	2.2
8/8	0	2	2	4	-4	-2	2	2	2	4	0	6	8	8	12	26	16	12	18	14	28	36	38	24	258	2.6
8/9	0	4	0	2	0	0	0	2	1	6	0	4	9	10	11	19	14	50	26	40	22	46	50	16	332	3.4
8/10	-2	0	2	6	4	4	8	2	0	8	0	2	10	12	10	12	30	26	24	38	56	20	14	42	328	3.3
8/11	0	2	0	0	2	0	0	2	2	4	2	2	2	4	-4	4	0	2	6	2	6	14	2	8	62	0.6
8/12	28	16	0	4	0	0	2	4	0	2	4	6	2	-2	4	6	2	2	4	2	2	-2	4	0	90	0.9
8/13	6	0	8	4	-6	2	4	-4	2	2	4	2	4	0	6	4	2	26	14	6	12	8	22	4	132	1.3
8/14	2	4	10	0	4	-14	4	22	10	6	2	4	2	16	2	-4	12	12	2	20	-10	6	14	-6	120	1.2

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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
8/15	6	2	2	0	0	0	0	0	-8	-6	0	-20	-4	-14	-16	-2	11	9	3	12	-5	3	10	0	-17	-0.2
8/16	2	-1	-3	0	1	0	1	-3	-3	-6	-3	-12	2	-2	4	0	10	6	4	4	-5	3	10	0	9	0.1
8/17	-2	-4	-8	0	2	0	2	-6	2	-6	-6	-4	8	0	0	4	-10	-2	-12	10	0	0	6	6	-20	-0.2
8/18	10	0	2	-2	0	0	0	0	0	4	2	0	2	2	6	16	2	0	14	18	14	26	38	14	168	1.7
8/19	10	4	0	2	2	0	0	0	2	0	-2	2	0	-4	4	6	-6	8	2	6	14	-6	12	20	76	0.8
8/20	2	26	10	0	2	-6	0	2	0	0	0	2	8	4	2	22	6	10	0	2	12	100	20	10	234	2.4
8/21	20	12	4	14	4	0	0	14	2	2	0	4	-6	0	-14	-2	2	12	-2	8	0	26	0	24	124	1.3
8/22	2	12	10	-2	-16	-14	-2	8	0	2	0	4	2	8	4	-2	16	6	4	2	2	2	16	2	66	0.7
8/23	1	6	5	-1	-8	-7	-1	4	-2	2	0	4	4	2	10	8	14	0	14	16	20	6	6	6	109	1.1
8/24	0	0	0	0	0	0	0	0	-1	1	0	1	2	1	5	4	7	0	7	8	10	3	3	3	54	0.5
8/25	0	0	0	0	0	0	0	0	-1	1	0	1	2	1	5	4	7	0	7	8	10	3	3	3	54	0.5
8/26	0	0	0	0	0	0	0	0	-1	1	0	1	2	1	5	4	7	0	7	8	10	3	3	3	54	0.5
8/27	0	0	0	0	0	0	0	0	-1	1	0	1	2	1	5	4	7	0	7	8	10	3	3	3	54	0.5
8/28	0	0	0	0	0	0	0	0	-1	1	0	1	2	1	5	4	7	0	7	8	10	3	3	3	54	0.5
8/29	0	0	0	0	0	0	0	0	-1	1	0	1	2	1	5	4	7	0	7	8	10	3	3	3	54	0.5
8/30	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	-2	0.0
8/31	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	2	2	0	-2	2	0	0	4	12	0.1
9/1	0	0	2	0	0	0	0	0	4	2	6	0	0	2	8	0	0	2	0	0	0	0	0	6	32	0.3
9/2	0	0	2	0	0	0	0	-4	0	2	0	0	0	0	2	0	4	0	0	2	-2	4	4	2	16	0.2
9/3	0	0	0	0	0	0	0	0	-2	2	0	-4	0	-2	-2	-4	0	4	0	0	0	0	0	6	-2	0.0
9/4	0	0	0	0	2	0	0	0	0	0	0	-4	-2	0	0	0	0	0	2	0	2	8	0	10	18	0.2
9/5	0	0	0	-2	1	0	0	0	2	2	-6	0	0	0	-4	2	6	0	4	0	0	0	0	0	5	0.1
9/6	0	0	0	0	1	0	0	0	0	-2	0	0	2	0	0	-2	0	2	0	0	0	0	0	0	1	0.0
9/7	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	-2	0	0	2	0	4	0.0
9/8	0	-2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	-4	0	0	2	0	0	2	4	4	0.0
9/9	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	-4	2	2	2	0	0	6	0	6	18	0.2
9/10	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0.0
9/11	0	0	0	0	0	0	0	0	0	0	0	-2	2	0	0	0	0	0	2	0	0	0	4	0	6	0.1
9/12	0	0	0	0	0	0	0	0	0	4	2	2	0	0	0	0	0	0	4	0	0	0	0	-2	10	0.1
9/13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4	0	0	0	6	0.1
Total	529	439	265	181	119	314	191	142	62	85	78	146	187	192	306	533	438	808	705	883	765	977	882	632	9,859	100
% of Total	5.4	4.5	2.7	1.8	1.2	3.2	1.9	1.4	0.6	0.9	0.8	1.5	1.9	1.9	3.1	5.4	4.4	8.2	7.2	9.0	7.8	9.9	8.9	6.4	100	

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

Appendix A3.–Expanded daily chum salmon migration past the North River counting tower, Norton Sound, 2004.

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
15-Jun																					0	0	0	0	0	0.0%
16-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%
17-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%
18-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%
19-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4	0.0%
20-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%
21-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	0	0	0	6	0.1%
22-Jun	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0.0%
23-Jun	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	6	0.1%
24-Jun	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	2	0	8	0.1%
25-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	6	0.1%
26-Jun	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	8	6	2	24	0.2%
27-Jun	2	0	0	2	2	2	0	0	0	0	0	0	0	0	0	0	2	2	0	0	4	4	6	14	40	0.4%
28-Jun	16	14	6	12	4	0	0	0	0	0	0	0	0	0	4	2	0	0	12	4	2	2	2	24	104	1.0%
29-Jun	16	14	10	2	2	0	0	2	0	0	0	0	2	0	14	2	2	0	4	2	6	2	8	4	92	0.9%
30-Jun	26	8	0	0	0	0	0	0	0	0	0	0	0	0	2	8	0	2	0	2	0	2	0	0	50	0.5%
1-Jul	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	4	0	8	0	4	0	20	0.2%
2-Jul	4	6	2	0	0	2	-2	2	0	0	2	0	0	2	4	12	2	4	2	4	4	0	0	0	50	0.5%
3-Jul	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	6	2	0	4	16	0.2%
4-Jul	2	2	2	-2	2	-2	0	0	0	0	0	0	0	2	0	0	4	18	2	6	8	16	2	4	66	0.7%
5-Jul	0	8	0	0	0	0	2	0	0	0	0	0	0	-2	0	0	2	6	2	16	20	24	8	24	110	1.1%
6-Jul	12	10	8	6	6	8	2	2	0	6	0	4	0	2	26	40	12	6	8	2	4	8	8	12	192	1.9%
7-Jul	4	-2	0	0	2	0	0	4	2	0	0	0	0	4	2	4	30	22	16	6	4	2	0	0	100	1.0%
8-Jul	4	0	0	0	0	2	4	0	-4	0	-2	0	0	2	0	2	0	-4	4	6	0	4	10	4	32	0.3%
9-Jul	2	0	0	2	2	-2	0	0	-2	0	4	2	2	4	0	0	16	6	20	4	0	10	2	8	80	0.8%
10-Jul	12	18	6	6	10	6	4	4	2	2	2	5	1	6	5	33	2	14	12	42	72	48	68	116	496	4.9%
11-Jul	100	46	16	12	8	12	10	16	6	4	0	8	0	8	10	66	32	24	32	22	20	24	26	28	530	5.3%
12-Jul	38	36	10	4	2	6	4	10	2	0	0	0	0	4	2	14	10	10	10	26	26	22	56	22	314	3.1%
13-Jul	8	16	14	2	12	18	16	0	0	0	0	8	12	18	10	10	64	34	26	20	28	18	54	54	442	4.4%
14-Jul	46	44	8	6	16	8	18	6	4	2	2	20	10	10	8	10	10	28	58	44	14	66	40	30	508	5.1%

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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
15-Jul	24	12	10	0	10	8	10	4	6	-2	8	2	4	18	18	104	-12	2	14	46	34	6	8	0	334	3.3%
16-Jul	18	6	0	4	2	6	6	0	0	0	2	2	0	4	4	8	2	-2	10	-2	4	4	6	6	90	0.9%
17-Jul	2	6	4	0	0	34	20	6	4	0	1	1	5	6	7	6	2	8	0	4	0	12	12	16	156	1.6%
18-Jul	26	22	0	4	0	20	36	8	8	0	0	0	10	8	10	4	66	24	16	34	120	88	38	26	568	5.7%
19-Jul	16	10	6	14	6	26	28	10	2	0	2	6	4	14	6	8	10	12	14	10	16	24	36	36	316	3.1%
20-Jul	74	70	12	20	10	44	46	12	4	2	2	2	10	0	16	14	48	66	34	52	80	50	16	70	754	7.5%
21-Jul	78	42	16	6	10	22	16	18	4	2	0	0	2	8	4	6	46	78	100	88	44	16	24	22	652	6.5%
22-Jul	52	72	22	4	4	10	30	4	2	0	0	4	2	2	8	6	0	18	10	2	6	22	30	12	322	3.2%
23-Jul	32	26	2	0	0	6	18	10	8	0	-2	0	-4	-2	4	4	6	12	4	6	4	6	4	18	162	1.6%
24-Jul	46	40	12	0	4	8	10	10	0	0	0	0	2	4	12	10	8	26	16	16	52	32	20	20	348	3.5%
25-Jul	18	14	8	8	0	6	20	4	4	0	2	2	2	0	10	14	10	18	16	2	38	48	18	16	278	2.8%
26-Jul	16	0	4	6	-2	26	40	2	2	2	0	-4	0	0	0	2	-2	4	10	6	0	4	4	6	126	1.3%
27-Jul	2	0	8	4	0	4	10	8	0	4	0	-2	0	-4	6	2	2	2	8	0	2	4	6	8	74	0.7%
28-Jul	12	14	20	6	-4	8	22	2	-2	4	0	6	4	2	10	4	12	10	16	8	20	24	12	4	214	2.1%
29-Jul	16	10	8	2	6	16	8	8	2	2	2	0	2	8	14	8	8	8	6	10	2	10	8	12	176	1.8%
30-Jul	24	18	8	4	4	4	32	10	8	-2	0	0	2	6	2	4	6	2	6	10	8	8	16	12	192	1.9%
31-Jul	8	6	16	8	4	6	8	6	5	1	1	2	2	4	2	4	4	2	2	8	2	4	8	10	123	1.2%
1-Aug	6	14	4	2	2	-2	14	6	2	4	2	4	2	2	2	4	-2	2	6	4	4	4	2	4	92	0.9%
2-Aug	8	6	6	2	2	2	14	2	4	0	2	2	0	2	4	4	12	6	6	16	6	8	6	8	128	1.3%
3-Aug	4	2	2	0	8	8	10	8	0	-2	0	0	0	0	0	2	2	0	6	6	2	4	6	6	74	0.7%
4-Aug	2	4	8	-2	0	2	10	2	2	0	0	0	0	0	2	2	-2	8	-2	4	0	10	12	8	70	0.7%
5-Aug	8	8	4	10	2	0	4	8	0	0	-4	0	2	0	4	2	4	6	6	4	2	6	-6	12	82	0.8%
6-Aug	20	12	16	6	2	4	2	2	2	0	-2	-2	-2	-2	2	8	18	6	14	14	36	42	16	10	224	2.2%
7-Aug	18	22	8	12	12	6	12	26	2	0	-1	0	-2	-1	3	7	0	0	0	2	4	0	0	0	130	1.3%
8-Aug	20	20	6	10	10	2	10	6	2	0	0	2	-2	0	4	6	2	4	8	8	10	0	10	0	138	1.4%
9-Aug	12	22	4	2	4	4	10	14	-6	-4	2	-6	-2	-2	2	4	0	4	2	0	8	8	4	2	88	0.9%
10-Aug	2	8	6	-2	2	0	4	-2	0	4	2	0	4	6	-2	2	4	14	14	10	2	2	2	0	82	0.8%
11-Aug	4	14	6	0	0	0	4	4	0	2	4	-2	2	2	4	12	6	8	2	28	22	6	6	2	136	1.4%
12-Aug	10	14	2	8	8	8	10	6	0	-2	6	0	2	2	6	0	6	12	6	2	0	6	0	0	112	1.1%
13-Aug	5	7	1	4	4	3	5	4	-1	-1	1	0	3	1	4	0	4	8	3	1	0	3	0	0	59	0.6%
14-Aug	5	7	1	4	4	3	5	4	-1	-1	1	0	3	1	4	0	4	8	3	1	0	3	0	0	59	0.6%

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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
15-Aug	5	7	1	4	4	3	5	4	-1	-1	1	0	3	1	4	0	4	8	3	1	0	3	0	0	59	0.6%
16-Aug	5	7	1	4	4	3	5	4	-1	-1	1	0	3	1	4	0	4	8	3	1	0	3	0	0	59	0.6%
17-Aug	5	7	1	4	4	3	5	4	-1	-1	1	0	3	1	4	0	4	8	3	0	0	0	0	0	55	0.5%
18-Aug	0	0	0	0	0	-2	0	2	-2	0	-4	0	4	0	2	0	2	4	0	2	2	4	0	2	16	0.2%
19-Aug	0	0	0	0	0	2	0	0	-2	2	-2	2	2	4	6	0	4	2	2	2	4	-4	-2	2	24	0.2%
20-Aug	2	4	0	0	-2	0	-2	0	0	0	0	0	0	0	-2	2	-2	2	2	4	0	0	0	6	14	0.1%
21-Aug	0	2	0	-2	0	-4	0	0	-1	0	-1	0	0	-1	-2	2	4	2	2	-2	0	0	2	0	1	0.0%
22-Aug	2	-2	2	2	0	-2	-2	0	-2	0	-2	0	0	-2	-2	2	0	4	2	0	0	2	2	2	6	0.1%
23-Aug	2	0	4	2	-2	2	0	2	0	0	2	0	2	0	0	0	10	0	4	-2	-2	4	-2	6	32	0.3%
24-Aug	-2	-2	2	-2	0	2	0	-2	0	0	0	0	0	4	2	0	6	2	2	2	2	12	0	2	30	0.3%
25-Aug	2	-2	-2	2	-2	6	0	0	0	-2	0	2	0	0	0	2	0	2	0	4	-2	2	0	0	12	0.1%
26-Aug	-4	2	-2	2	-2	-2	2	0	-4	0	0	0	0	2	0	2	0	0	4	0	0	0	0	0	0	0.0%
27-Aug	-4	-2	-2	2	0	-2	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	-2	0.0%
28-Aug	0	0	2	0	0	-4	0	-2	0	1	0	-1	0	1	0	0	0	0	0	0	0	0	0	4	1	0.0%
29-Aug	2	0	-2	0	-2	2	-2	-2	0	2	0	-2	0	2	0	0	4	4	8	-6	-2	0	2	-6	2	0.0%
30-Aug	0	2	0	-2	2	-2	-2	-2	-2	0	0	0	0	0	0	2	0	0	-4	0	0	0	2	4	-2	0.0%
31-Aug	0	2	-4	0	-2	-2	0	2	0	4	2	0	0	-2	0	2	0	0	2	-2	-2	-2	0	4	2	0.0%
1-Sep	4	2	-2	0	0	4	4	2	0	0	0	0	2	6	-2	2	0	0	2	-2	-2	4	0	-6	18	0.2%
2-Sep	-2	-2	-2	2	4	0	2	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0.1%
3-Sep	2	-2	-2	2	0	-2	0	0	0	0	0	-2	0	0	-2	0	0	0	0	0	0	0	0	2	-4	0.0%
4-Sep	0	0	2	0	0	0	2	0	0	0	0	-1	0	0	-1	0	0	0	0	0	0	0	0	4	6	0.1%
5-Sep	-2	-2	2	0	0	0	4	0	0	0	0	0	0	0	0	0	2	0	0	0	0	-2	0	6	8	0.1%
6-Sep	0	0	0	0	2	0	0	0	0	0	-2	0	0	0	2	2	0	0	0	0	4	0	0	2	10	0.1%
7-Sep	0	6	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.0%
8-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	-2	0	2	2	0.0%
9-Sep	0	0	-2	0	0	0	-2	0	2	0	0	0	0	0	0	2	0	0	2	0	2	2	0	2	8	0.1%
10-Sep	0	0	2	0	4	0	2	-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.0%
11-Sep	2	0	0	0	-2	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	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	2	0	0	0	0	0	2	0.0%
Total	901	779	315	218	194	361	553	270	59	33	37	66	105	166	272	486	508	600	609	616	758	756	636	738	10,036	100%
	9.0%	7.8%	3.1%	2.2%	1.9%	3.6%	5.5%	2.7%	0.6%	0.3%	0.4%	0.7%	1.0%	1.7%	2.7%	4.8%	5.1%	6.0%	6.1%	6.1%	7.6%	7.5%	6.3%	7.4%	100%	

Note: Outlined areas indicate hours not counted.

Appendix A4.–Expanded daily hourly pink salmon migration past the North River counting tower, Norton Sound, 2002.

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
19-Jun	Not expanded												4	4	10	110	14	0	Not expanded			264	-36	3704	4,074	1.3%
20-Jun	518	1026	2								0	0	0	0	106	106	6	0	854	1860	312	2860	128	0	7,778	2.4%
21-Jun	1,374	680	50	10	18	44	0	4	0	0	0	0	0	0	52	6	1356	1148	128	54	868	752	20	30	6,594	2.0%
22-Jun	4	388	88	14	6	0	54	22	2	4	2	0	0	0	0	0	2	-26	0	3748	756	132	720	180	6,096	1.9%
23-Jun	868	38	26	10	0	8	4	0	0	4	8	4	2	88	4	6	-2	2162	0	594	1574	1374	3942	1356	12,070	3.7%
24-Jun	22	14	126	58	44	242	56	26	4	0	0	0	0	2	32	0	0	8	308	884	3150	2604	580	1322	9,482	2.9%
25-Jun	76	44	8	16	14	38	20	54	12	6	6	6	20	130	6	0	2	0	368	614	80	614	170	884	3,188	1.0%
26-Jun	2,022	74	190	58	46	156	16	8	6	28	2	0	0	0	-2	2	84	-4	26	1582	444	80	148	2218	7,184	2.2%
27-Jun	-10	68	18	38	104	90	24	10	0	0	0	0	0	4	0	90	540	116	0	126	292	1500	1264	2240	6,514	2.0%
28-Jun	1,052	50	324	20	80	198	30	8	44	28	16	12	2	20	2274	126	382	188	1652	1052	204	2740	4630	1816	16,948	5.2%
29-Jun	96	-20	-126	-92	-162	-346	-216	-118	142	0	0	12	20	8	0	150	1272	36	984	196	1018	112	276	1680	4,922	1.5%
30-Jun	610	108	116	2	-2	140	12	0	0	0	4	0	0	0	42	488	0	118	400	1580	316	2196	2	2130	8,262	2.5%
1-Jul	512	472	62	12	80	314	124	94	36	32	4	36	322	280	212	2	0	4	256	552	2320	4586	1800	786	12,898	4.0%
2-Jul	232	190	34	20	42	312	746	1062	338	76	60	64	272	2400	1596	60	780	606	588	150	152	15992	4946	1834	32,552	10.0%
3-Jul	5,166	150	32	20	64	360	1166	2826	514	388	142	208	60	216	54	312	60	600	3124	734	3520	4780	4884	2692	32,072	9.9%
4-Jul	492	1322	336	532	1092	2176	1464	108	94	94	76	78	118	332	304	464	228	220	470	894	1916	1040	3000	656	17,506	5.4%
5-Jul	464	216	50	46	54	442	1060	696	372	402	332	244	384	464	548	938	990	3084	1774	962	2494	2160	2630	2700	23,506	7.2%
6-Jul	774	108	76	18	20	62	-2	-14	16	313	311	226	321	312	368	580	750	1820	1175	696	1494	1102	352	412	11,290	3.5%
7-Jul	252	164	102	74	122	272	294	160	202	224	290	208	258	160	188	222	510	556	576	412	362	374	386	342	6,710	2.1%
8-Jul	158	214	136	144	162	396	268	150	84	76	140	110	140	290	320	526	522	540	408	502	682	724	540	408	7,640	2.4%
9-Jul	422	486	202	124	234	258	140	106	86	98	40	78	218	220	344	480	0	764	344	678	660	490	884	666	8,022	2.5%
10-Jul	464	308	156	62	138	378	176	142	66	80	42	58	128	104	108	196	460	900	712	1438	880	1704	1332	1120	11,152	3.4%
11-Jul	1,012	606	282	112	146	302	234	86	48	56	40	86	148	406	314	756	640	840	602	1034	1356	1540	780	670	12,096	3.7%
12-Jul	470	456	214	102	132	206	266	98	74	112	88	70	122	90	136	630	464	704	804	800	768	780	340	500	8,426	2.6%
13-Jul	636	678	306	204	232	446	334	196	100	60	114	160	84	370	454	426	464	502	720	568	510	540	440	0	8,544	2.6%
14-Jul	408	466	248	186	140	284	202	90	80	136	240	280	144	310	284	232	200	336	440	570	596	692	564	260	7,388	2.3%
15-Jul	110	536	330	448	160	200	168	52	110	0	212	220	140	96	136	98	280	312	650	272	702	640	404	184	6,460	2.0%
16-Jul	374	370	302	302	156	164				378	62	106	150	218	368	198	322	356	328	352	140	754	1266	740	7,406	2.3%
17-Jul	640	330	164	126	142	132				253	166	134	122	40	142	120	144	158	174	266	546	382	348	430	4,959	1.5%
18-Jul	144	202	154	152	78	188				526	64	112	80	72	90	118	66	208	114	138	192	184	202	248	3,332	1.0%
19-Jul	108	232	136	54	92	138	118	152	86	152	58	12	72	142	102	118	110	170	240	188	156	190	232	162	3,220	1.0%
20-Jul	166	174	28	30	22	32				333	14	14	32	48	38	68	204	150	30	60	152	188	222	108	2,113	0.7%
21-Jul	132	102	22	28	30	52				178	14	32	16	22	34	18	26	16	40	34	84	144	106	108	1,238	0.4%
22-Jul	94	28	54	20	26	58				142	12	22	46	32	26	44	82	46	40	66	38	50	34	26	986	0.3%
23-Jul	36	18	24	22	28	34	24	18	12	0	6	0	12	4	16	16	22	4	26	10	8	20	10	6	376	0.1%
24-Jul	62	82	40	28	22	8	18	14	0	6	14	6	4	6	14	8	10	4	6	6	12	4	4	10	388	0.1%
25-Jul	24	22	14	2	10	4	16	6	10	8	16	18	26	44	58	50	40	64	12	36	12	30	46	28	596	0.2%

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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
26-Jul	4	2	4	0	0	0	0	0	0	0	4	0	6	0	0	0	8	16	4	22	18	14	8	6	116	0.0%
27-Jul	7	7	3	0	0	0	0	0	0	4	0	0	0	2	0	4	10	8	12	4	12	22	16	10	121	0.0%
28-Jul	10	12	2	0	0	0	0	0	4	2	4	6	14	10	14	16	16	6	14	6	14	10	8	16	184	0.1%
29-Jul	22	4	4	0	2	0	0	0	0	0	2	4	8	0	6	0	4	2	4	4	0	2	4	12	84	0.0%
30-Jul	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	4	2	4	0	4	4	10	16	6	54	0.0%
31-Jul	4	0	0	0	2	0	0	0	0	0	2	2	0	0	2	0	2	0	8	0	0	0	0	0	22	0.0%
1-Aug	0	4	0	0	0	0	0	0	0	2	0	4	0	0	2	0	0	0	0	0	2	0	0	0	14	0.0%
2-Aug	0	0	0	0	0	0	0	0	4	2	0	0	0	4	2	0	0	0	0	0	0	0	0	0	12	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	0	0	0	0	0	0	0	0	0	0.0%
5-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Total	20,033	10,431	4,339	3,002	3,576	7,788	6,816	6,056	2,546	4,203	2,607	2,634	3,495	6,950	8,804	7,788	11,072	16,746	18,415	23,748	28,816	54,376	37,648	32,706	324,595	100%
	0	3.2%	1.3%	0.9%	1.1%	2.4%	2.1%	1.9%	0.8%	1.3%	0.8%	0.8%	1.1%	2.1%	2.7%	2.4%	3.4%	5.2%	5.7%	7.3%	8.9%	16.8%	11.6%	10.1%	100%	

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

Appendix A5.–Expanded daily hourly pink salmon migration past the North River counting tower, Norton Sound, 2003.

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
16-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%
17-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%
18-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%
19-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%
20-Jun	0	0	0	0	0	0	0	0	0	0	0	2	0	-2	0	0	0	0	0	0	0	0	0	0	0	0.0%
21-Jun	0	0	4	0	-2	0	0	0	0	0	2	0	0	0	-2	0	0	0	0	0	0	0	0	10	12	0.0%
22-Jun	0	2	0	0	0	6	0	0	0	0	0	2	0	6	2	10	0	0	0	0	0	0	0	20	48	0.0%
23-Jun	24	12	14	26	0	22	8	16	0	0	2	0	0	0	0	0	0	2	0	4	10	10	18	4	172	0.1%
24-Jun	32	22	6	14	22	-2	-2	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	2	0	110	0.0%
25-Jun	8	14	0	4	4	4	0	2	4	0	2	0	0	2	0	2	0	0	0	0	0	0	0	4	50	0.0%
26-Jun	2	4	2	10	-2	0	0	0	0	0	0	0	0	0	0	4	0	2	0	2	-2	2	-4	2	22	0.0%
27-Jun	16	2	2	0	0	20	2	2	0	0	0	0	0	0	6	0	4	0	0	0	0	0	20	26	100	0.0%
28-Jun	20	12	10	4	0	2	0	-2	0	0	0	0	0	0	0	0	2	1	1	0	4	8	6	10	78	0.0%
29-Jun	-4	28	22	34	10	-2	-2	4	0	0	0	0	0	0	0	0	0	2	2	0	5	4	3	5	111	0.0%
30-Jun	0	0	0	2	0	4	0	0	0	0	2	0	2	0	0	0	2	2	14	0	6	0	0	0	34	0.0%
1-Jul	6	8	4	4	0	0	0	0	0	2	0	4	6	8	6	14	34	40	30	12	8	2	0	2	190	0.1%
2-Jul	3	4	2	6	1	0	0	0	0	1	-1	1	3	4	6	7	18	22	15	6	6	1	2	4	111	0.0%
3-Jul	0	4	2	6	1	0	0	0	0	1	-1	1	3	4	6	7	18	22	15	6	6	0	2	0	103	0.0%
4-Jul	0	0	0	8	2	0	0	0	0	0	-2	-2	0	0	6	0	2	4	0	0	4	54	4	38	118	0.0%
5-Jul	66	36	33	7	10	7	4	2	-2	0	2	2	0	0	4	10	6	0	2	0	20	34	12	45	300	0.1%
6-Jul	40	72	66	6	18	14	8	4	10	8	2	8	4	4	4	8	0	0	0	14	50	28	38	52	458	0.2%
7-Jul	34	50	116	66	28	8	24	8	0	0	0	14	0	0	46	4	26	48	54	76	62	46	354	542	1,606	0.6%
8-Jul	366	294	82	60	116	74	38	26	0	2	0	0	0	0	0	8	12	80	-8	538	2624	936	262	1058	6,568	2.3%
9-Jul	440	176	48	98	14	12	0	6	8	16	22	12	722	346	962	220	240	128	370	584	996	508	884	1656	8,468	3.0%
10-Jul	662	168	14	10	0	0	0	0	26	16	14	12	166	76	54	32	40	50	100	682	174	212	-200	2770	5,078	1.8%
11-Jul	2278	562	74	30	28	402	200	48	14	2	6	14	22	32	18	42	110	60	336	194	68	210	1956	90	6,796	2.4%
12-Jul	112	82	48	64	18	58	30	20	15	8	3	10	21	31	21	25	38	66	24	18	646	2004	1296	784	5,442	1.9%
13-Jul	560	474	98	150	136	182	108	66	16	14	0	6	20	30	24	8	410	1050	1364	2300	1812	1080	1400	730	12,038	4.3%
14-Jul	700	1106	330	100	134	394	460	440	258	248	212	502	402	956	808	624	292	200	790	730	1120	390	400	88	11,684	4.2%
15-Jul	172	-42	-110	-106	-154	-232	0	22	28	22	130	224	190	292	5360	4226	2250	1950	1800	1790	1200	750	870	572	21,204	7.6%
16-Jul	-84	306	48	-10	130	666	314	570	144	24	48	80	60	68	168	478	278	194	540	240	272	248	996	740	6,518	2.3%
17-Jul	586	412	146	108	74	148	220	-16	-86	-182	-24	-16	-32	58	70	220	3542	1816	2024	1724	1766	2358	2106	1478	18,500	6.6%
18-Jul	1640	1762	668	456	538	1144	658	898	310	66	40	58	96	124	226	200	500	658	2158	936	32	1722	1148	2136	18,174	6.5%

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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
19-Jul	1960	1370	594	356	550	1446	736	202	229	87	48	51	92	185	173	180	348	366	1740	2262	1664	5180	4668	3580	28,067	10.0%
20-Jul	2016	906	200	124	134	902	760	454	148	108	56	44	88	246	120	160	280	488	560	2266	2180	2200	1800	1000	17,240	6.2%
21-Jul	1098	514	98	90	88	224	340	368	174	56	96	94	256	66	158	424	440	524	1212	1770	1334	2180	504	596	12,704	4.5%
22-Jul	62	-4	34	0	56	96	384	246	122	64	40	120	60	360	672	540	1202	1340	874	1154	1322	1098	464	318	10,624	3.8%
23-Jul	308	274	76	0	42	172	314	286	38	64	22	20	162	60	280	308	62	304	424	876	770	510	524	-82	5,814	2.1%
24-Jul	206	140	52	44	48	320	546	406	88	56	100	106	146	220	356	564	320	286	426	944	1150	1032	700	582	8,838	3.2%
25-Jul	492	208	52	43	102	480	490	270	172	88	54	60	110	136	682	1502	1476	1738	1226	1678	1026	826	1138	528	14,577	5.2%
26-Jul	348	122	52	43	70	262	265	145	223	279	425	300	250	740	1058	782	932	3184	910	616	76	588	701	389	12,760	4.6%
27-Jul	254	88	76	43	70	262	265	145	223	279	425	126	124	369	554	409	481	1622	506	335	171	588	701	389	8,505	3.0%
28-Jul	254	88	76	43	70	262	265	145	223	279	425	-48	-2	-2	50	36	30	60	102	54	266	350	264	250	3,540	1.3%
29-Jul	160	54	100	42	38	44	40	20	274	470	796	1330	1428	962	972	820	404	424	364	338	182	210	98	34	9,604	3.4%
30-Jul	4	22	-12	6	8	10	8	6	20	86	152	635	780	884	944	852	1092	1136	774	766	792	594	302	340	10,201	3.6%
31-Jul	230	28	14	30	18	26	16	-102	0	-16	-4	-60	-40	-28	-20	0	62	150	198	368	514	536	380	300	2,600	0.9%
1-Aug	34	42	20	44	46	32	122	38	104	84	114	58	98	78	114	90	204	302	276	334	298	422	224	156	3,334	1.2%
2-Aug	38	22	16	8	12	26	34	8	18	14	10	26	6	-10	-6	28	129	169	159	184	169	271	132	88	1,551	0.6%
3-Aug	36	22	12	8	26	32	18	8	24	50	56	48	30	32	72	56	54	36	42	34	40	120	40	20	916	0.3%
4-Aug	86	42	68	28	32	24	38	48	-68	-34	-34	2	8	4	16	62	42	28	34	20	62	18	16	16	558	0.2%
5-Aug	12	-10	2	-10	8	10	38	36	48	-18	30	48	34	30	84	108	10	8	4	2	28	20	30	100	652	0.2%
6-Aug	72	34	28	38	42	16	26	12	14	-10	-20	4	-8	38	-4	4	2	22	20	34	30	60	66	58	578	0.2%
7-Aug	54	42	26	12	8	28	18	22	4	2	6	2	6	16	16	30	50	32	22	52	64	42	62	14	630	0.2%
8-Aug	6	-6	4	10	-10	8	6	26	6	-4	24	10	24	14	8	42	34	24	36	42	52	56	48	36	496	0.2%
9-Aug	14	0	12	4	20	12	28	20	11	5	22	19	23	13	7	40	26	60	66	42	38	122	136	70	810	0.3%
10-Aug	8	6	20	10	28	16	12	14	16	14	20	28	22	12	6	38	32	40	8	40	46	32	24	124	616	0.2%
11-Aug	0	6	2	0	10	2	6	6	-8	6	6	4	0	-6	-4	18	12	12	14	4	2	2	0	8	102	0.0%
12-Aug	26	36	0	6	2	0	4	6	10	8	4	2	-4	-6	-2	6	4	2	6	4	0	2	4	0	120	0.0%
13-Aug	-2	4	0	-2	8	0	4	2	0	2	2	2	2	2	4	0	2	12	8	4	10	-4	10	0	70	0.0%
14-Aug	4	-4	0	8	6	0	4	10	0	4	0	2	4	2	0	8	24	-2	6	24	6	12	0	-10	108	0.0%
15-Aug	4	8	12	0	2	8	4	4	-2	4	0	2	0	-2	-6	7	13	0	7	18	4	8	1	-4	92	0.0%
16-Aug	1	4	6	-2	1	3	2	-3	-1	2	3	1	2	8	2	6	2	2	8	12	4	8	1	-4	68	0.0%
17-Aug	-2	0	0	-4	0	-2	0	-10	0	0	6	0	8	-2	4	4	0	-4	4	4	2	4	2	2	16	0.0%
18-Aug	2	4	4	-2	4	0	0	0	8	10	4	2	2	2	4	6	6	0	4	6	4	6	6	4	86	0.0%
19-Aug	0	0	0	0	0	0	0	0	0	6	0	2	2	4	2	0	0	-2	2	2	4	2	2	0	26	0.0%

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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
20-Aug	0	0	0	0	0	0	0	0	0	0	0	4	2	0	6	10	10	4	0	8	2	12	0	-2	56	0.0%
21-Aug	2	0	0	0	0	0	0	0	0	0	0	0	-2	-2	-2	8	0	0	4	0	0	0	4	4	16	0.0%
22-Aug	0	0	-2	-2	0	2	0	2	1	0	0	2	-2	6	0	0	2	-2	4	0	0	0	0	0	11	0.0%
23-Aug	0	1	-1	-1	0	1	0	1	2	0	0	4	0	4	6	4	2	0	0	0	0	4	0	0	27	0.0%
24-Aug	0	2	0	0	0	0	0	0	1	0	0	2	0	2	3	2	1	0	0	0	0	2	0	0	15	0.0%
25-Aug	0	1	0	0	0	-1	0	0	1	0	0	2	0	2	3	2	1	0	0	0	0	2	0	0	13	0.0%
26-Aug	0	1	0	0	0	-1	0	0	1	0	0	2	0	2	3	2	1	0	0	0	0	2	0	0	13	0.0%
27-Aug	0	1	0	0	0	-1	0	0	1	0	0	2	0	2	3	2	1	0	0	0	0	2	0	0	13	0.0%
28-Aug	0	1	0	0	0	-1	0	0	1	0	0	2	0	2	3	2	1	0	0	0	0	2	0	0	13	0.0%
29-Aug	0	1	0	0	0	-1	0	0	1	0	0	2	0	2	3	2	1	0	0	0	0	2	0	0	13	0.0%
30-Aug	0	1	0	0	0	-1	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	-1	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	5	0.0%
1-Sep	0	2	0	0	0	-2	0	0	4	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	6	0.0%
2-Sep	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	0	-4	0.0%
3-Sep	0	0	0	0	0	4	0	0	2	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	10	0.0%
4-Sep	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.0%
5-Sep	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.0%
6-Sep	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	5	0.0%
7-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	4	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	-4	0	0	0	0	0	0	0	0	0	0	-4	0.0%
10-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	-2	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%
Total	15,466	9,647	3,371	2,174	2,665	7,650	6,863	4,957	2,878	2,293	3,347	3,996	5,404	6,482	14,139	13,311	15,625	18,778	19,683	24,153	23,201	27,730	24,627	21,772	280,212	100%
	5.5%	3.4%	1.2%	0.8%	1.0%	2.7%	2.4%	1.8%	1.0%	0.8%	1.2%	1.4%	1.9%	2.3%	5.0%	4.8%	5.6%	6.7%	7.0%	8.6%	8.3%	9.9%	8.8%	7.8%	100%	

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

Appendix A6.–Expanded daily pink salmon migration past the North River counting tower, Norton Sound, 2004.

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
15-Jun																					0	8	8	-6	10	0.0%
16-Jun	142	32	64	6	0	-2	0	4	-2	2	0	0	0	2	0	0	0	2	0	0	14	16	80	6	366	0.0%
17-Jun	24	108	34	2	2	0	0	10	0	-2	0	2	2	2	-2	6	10	2	0	4	0	0	0	12	216	0.0%
18-Jun	36	30	10	4	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	4	0	0	84	0.0%
19-Jun	20	-2	36	4	4	-2	4	2	0	0	-1	0	3	0	0	0	2	8	0	8	30	16	40	78	250	0.0%
20-Jun	34	32	26	164	2	-2	2	2	0	0	-2	0	6	0	0	0	0	2	0	8	52	98	478	484	1386	0.1%
21-Jun	102	16	2	2	-2	0	2	0	10	8	2	2	8	2	8	8	0	74	34	486	14	60	2	2	842	0.1%
22-Jun	106	48	12	6	10	4	2	0	4	0	6	4	0	2	44	6	4	2	146	60	50	114	188	86	904	0.1%
23-Jun	318	14	6	4	6	0	0	4	2	6	6	0	10	16	-2	6	4	10	0	52	32	2	1202	14	1712	0.1%
24-Jun	204	92	156	12	12	20	8	6	0	2	0	6	4	2	0	40	954	0	108	8	52	0	620	6	2312	0.2%
25-Jun	14	508	52	12	0	6	0	-2	0	0	0	0	0	-2	0	0	2	0	2	0	2	236	208	558	1596	0.1%
26-Jun	348	196	100	70	40	24	10	16	13	7	6	9	21	17	16	14	0	8	20	202	222	1640	302	962	4263	0.4%
27-Jun	1438	1548	1568	1146	594	106	56	32	26	14	12	18	42	36	32	28	736	688	100	876	4780	2510	3000	3880	23266	2.0%
28-Jun	4260	3168	3094	3204	4118	3520	1112	378	102	16	20	144	64	340	780	4360	696	3694	10952	3340	4754	5288	5546	6850	69800	6.0%
29-Jun	5814	6628	6184	4622	4220	2310	156	380	266	252	712	1028	2940	2960	9820	8796	7938	5820	4788	4870	3664	11392	7812	7780	111152	9.6%
30-Jun	5046	6030	914	254	452	798	680	64	80	130	1380	650	684	4026	4514	2952	3548	2422	1974	10524	952	-76	270	446	48714	4.2%
1-Jul	800	594	82	32	94	152	430	414	140	102	82	1344	344	-58	-8	496	3144	3316	1898	1038	5598	244	494	256	21028	1.8%
2-Jul	614	352	134	14	38	26	30	1854	74	94	126	124	206	680	1080	10422	4580	3950	1086	1724	1270	332	576	246	29632	2.5%
3-Jul	-58	-302	-126	-24	-8	-128	-278	-184	-98	-186	-102	-28	36	-28	-4	-20	64	224	920	1464	1208	510	264	250	3366	0.3%
4-Jul	54	-100	-30	-34	2	-8	10	50	118	154	38	78	96	120	396	236	946	6124	1624	1478	12282	3974	600	380	28588	2.5%
5-Jul	122	34	-2	6	-18	6	84	50	18	28	14	28	208	46	52	58	124	228	376	938	3678	1588	1042	2188	10896	0.9%
6-Jul	1328	536	386	218	260	836	780	346	228	552	534	502	756	442	11128	33740	5494	2316	1532	796	1552	4566	2046	2366	73240	6.3%
7-Jul	236	130	84	52	72	86	58	194	320	226	234	194	276	2494	2004	1676	6850	5418	6622	3754	1312	938	710	776	34716	3.0%
8-Jul	230	218	-16	10	12	12	58	146	194	138	92	96	130	250	384	9806	3684	1876	3870	1676	1366	2750	6902	2308	36192	3.1%
9-Jul	706	26	50	40	14	108	202	142	94	52	134	304	370	490	346	366	770	478	1512	1514	1236	1078	828	840	11700	1.0%
10-Jul	872	1280	264	106	204	462	484	232	331	307	312	1059	882	1024	830	3244	510	806	798	2516	8248	5906	12892	10324	53893	4.6%
11-Jul	4130	2730	604	224	318	1056	4218	2140	568	562	490	1814	1394	1558	1314	6122	5006	4028	6296	9094	3590	4012	6856	6178	74302	6.4%
12-Jul	5028	2852	792	348	406	3642	3700	2736	1348	824	196	390	1430	1578	2246	4422	5634	4704	5422	9726	10190	7566	10770	7820	93770	8.1%
13-Jul	6108	3394	1486	320	536	2912	3380	1810	824	212	318	660	1838	1578	2518	2788	11268	8348	5904	5794	5922	4816	13096	12254	98084	8.4%
14-Jul	6806	2848	1924	260	762	2846	3782	1392	876	516	1226	5052	6158	4214	3494	3752	4296	5456	12340	10622	3706	9268	7566	5488	104650	9.0%
15-Jul	2224	1500	406	204	462	1174	1680	1726	658	268	482	772	1256	4404	5420	13834	790	406	1146	2170	1682	962	482	562	44670	3.8%
16-Jul	1854	730	110	62	98	1086	1166	672	238	136	218	302	380	426	1050	1442	742	502	2320	804	704	728	1124	406	17300	1.5%

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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
17-Jul	308	234	40	106	78	852	1054	798	243	188	190	285	463	362	884	1103	654	774	590	620	594	654	660	914	12648	1.1%
18-Jul	1078	298	88	48	78	414	1954	772	248	240	162	268	548	298	718	764	2598	982	602	1178	3366	2168	1354	796	21020	1.8%
19-Jul	560	360	110	88	84	916	1680	804	252	258	168	412	514	672	460	456	692	1886	856	686	658	936	1278	1484	16270	1.4%
20-Jul	1804	1034	206	92	214	1290	1870	878	274	54	92	260	674	1306	1532	1548	2370	3550	1900	1916	2430	2050	1006	2616	30966	2.7%
21-Jul	2102	564	138	110	100	858	1266	1186	354	106	72	20	166	254	694	496	1092	2204	2272	3768	1142	670	918	1080	21632	1.9%
22-Jul	868	1646	406	80	64	484	1636	850	302	82	38	18	434	528	564	826	214	916	596	186	256	990	1352	1254	14590	1.3%
23-Jul	848	444	46	14	18	152	624	260	390	36	20	24	2	76	224	362	348	340	404	172	204	116	182	382	5688	0.5%
24-Jul	706	450	30	16	22	200	568	286	2	20	-14	6	18	144	162	290	376	802	834	378	806	706	510	484	7802	0.7%
25-Jul	286	262	44	32	12	202	624	288	176	82	62	128	142	78	338	270	172	164	90	100	272	308	302	148	4582	0.4%
26-Jul	132	66	10	38	14	204	942	584	60	76	24	42	72	72	78	58	114	104	152	162	54	66	48	98	3270	0.3%
27-Jul	12	10	6	14	0	46	162	104	-10	-2	-14	42	72	52	-8	68	70	104	88	84	82	62	100	98	1242	0.1%
28-Jul	136	80	48	38	38	62	220	146	68	62	62	138	224	82	70	64	136	244	174	100	130	196	116	262	2896	0.2%
29-Jul	162	96	50	26	24	70	134	118	50	68	72	44	102	116	172	76	180	144	90	112	126	146	232	128	2538	0.2%
30-Jul	178	90	82	34	28	110	430	258	36	24	54	30	58	46	26	106	38	34	32	42	64	80	132	160	2172	0.2%
31-Jul	112	94	84	108	46	56	216	234	57	33	55	24	48	54	44	97	38	76	144	168	92	62	86	102	2130	0.2%
1-Aug	84	54	56	46	28	34	168	110	78	42	56	18	38	62	62	88	36	42	44	34	70	44	16	56	1366	0.1%
2-Aug	48	14	-12	52	18	24	84	76	44	22	24	26	18	18	24	38	44	62	58	54	10	138	114	136	1134	0.1%
3-Aug	56	72	42	24	30	46	86	148	34	36	-4	60	38	10	44	14	26	34	38	32	34	36	24	40	1000	0.1%
4-Aug	78	48	46	30	30	44	82	76	48	30	40	32	26	32	30	36	26	88	62	58	18	62	40	66	1128	0.1%
5-Aug	72	46	18	48	26	36	70	68	26	20	16	2	8	8	18	26	42	46	52	54	34	90	40	52	918	0.1%
6-Aug	52	40	44	28	12	42	22	34	24	26	14	8	16	8	4	24	78	46	68	76	92	86	88	78	1010	0.1%
7-Aug	64	30	58	12	42	20	52	48	29	29	26	19	24	14	16	33	24	100	72	70	106	142	80	84	1194	0.1%
8-Aug	46	44	46	24	36	20	38	46	34	32	38	30	32	20	28	42	46	20	36	30	20	38	24	24	794	0.1%
9-Aug	44	48	26	6	26	40	18	44	20	6	-10	2	12	14	20	22	50	42	22	52	18	24	22	58	626	0.1%
10-Aug	6	8	18	18	4	6	38	12	8	18	20	4	12	10	16	16	26	28	30	24	10	28	14	16	390	0.0%
11-Aug	22	22	2	12	10	0	-8	24	20	12	6	8	16	26	14	22	14	16	32	20	26	2	24	-12	330	0.0%
12-Aug	12	12	-10	6	8	6	2	4	4	6	10	10	8	12	14	12	16	20	-4	8	14	6	0	2	178	0.0%
13-Aug	6	6	-5	3	4	3	1	2	1	0	6	4	5	6	12	8	9	12	-2	4	8	4	0	1	98	0.0%
14-Aug	6	6	-5	3	4	3	1	2	1	0	6	4	5	6	12	8	9	12	-2	4	8	4	0	1	98	0.0%
15-Aug	6	6	-5	3	4	3	1	2	1	0	6	4	5	6	12	8	9	12	-2	4	8	4	0	1	98	0.0%
16-Aug	6	6	-5	3	4	3	1	2	1	0	6	4	5	6	12	8	9	12	-2	4	8	4	0	1	98	0.0%
17-Aug	6	6	-5	3	4	3	1	2	1	0	6	4	5	6	12	8	9	12	-2	0	2	2	0	0	85	0.0%
18-Aug	0	0	0	0	0	0	0	0	-2	-6	2	-2	2	0	10	4	2	4	0	-2	6	10	4	2	34	0.0%

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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
19-Aug	0	0	2	0	0	0	0	0	-4	4	2	-2	-2	-2	2	4	0	6	4	4	12	8	2	2	42	0.0%
20-Aug	2	0	0	2	0	2	2	0	-2	-2	-2	-4	0	0	-2	6	0	6	-6	-4	-2	4	-2	2	0	0.0%
21-Aug	4	2	0	0	0	2	0	-2	-1	-1	-1	-2	0	0	-1	3	2	2	0	4	0	0	0	0	11	0.0%
22-Aug	-2	-2	0	0	0	0	2	-8	4	0	0	-8	2	0	0	-2	4	2	2	0	2	-4	0	0	-8	0.0%
23-Aug	0	0	0	0	-2	0	0	0	0	0	0	0	2	0	0	2	0	-2	-4	0	0	0	0	4	0	0.0%
24-Aug	0	0	0	0	-4	0	0	0	0	2	-2	0	0	-2	0	0	4	-2	0	4	2	0	0	0	2	0.0%
25-Aug	0	-2	0	0	0	0	0	-2	0	0	0	0	-2	-2	-2	0	-4	0	0	2	0	0	0	-6	-18	0.0%
26-Aug	0	0	0	0	0	-2	4	2	-6	-2	0	-2	6	2	0	2	0	2	4	0	0	0	2	2	14	0.0%
27-Aug	0	0	2	2	2	0	0	2	4	0	0	0	0	-2	0	-2	4	0	2	2	2	-2	0	0	16	0.0%
28-Aug	0	4	0	2	0	0	0	0	3	0	1	-2	0	-1	0	-1	0	0	0	2	0	0	0	0	8	0.0%
29-Aug	0	2	-2	0	-2	-2	-4	0	2	0	2	-4	0	0	0	0	0	0	2	0	0	0	0	0	-6	0.0%
30-Aug	0	0	-2	0	0	0	0	0	0	0	2	0	0	-2	0	-2	0	0	-2	0	0	0	0	2	-4	0.0%
31-Aug	0	2	0	0	0	0	-6	-2	0	0	2	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0.0%
1-Sep	0	0	0	0	-2	0	0	0	2	0	4	0	-2	2	-2	0	0	0	0	0	0	0	0	-2	0	0.0%
2-Sep	4	0	0	-8	0	0	2	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	-4	0.0%
3-Sep	0	-2	0	-2	-2	-2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	-6	0.0%
4-Sep	-2	0	6	0	-10	2	0	0	0	0	0	1	0	-1	0	0	0	0	2	2	0	0	0	0	0	0.0%
5-Sep	-2	0	-2	0	2	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	-4	0.0%
6-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	4	0.0%
7-Sep	0	0	0	2	0	0	-4	0	0	0	0	0	2	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	2	0	0	0	0	0	0	2	0	0	0	0	0	4	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	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0.0%
14-Sep	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	8	-6	0	2	-2	0	0	0	4	0.0%
Total	58,870	41,470	20,107	12,513	13,802	27,295	35,849	22,874	9,308	6,021	7,854	16,515	23,362	31,015	53,773	115,609	77,381	73,852	81,122	85,764	88,946	80,488	94,772	84,416	1,162,978	100%
	5.1%	3.6%	1.7%	1.1%	1.2%	2.3%	3.1%	2.0%	0.8%	0.5%	0.7%	1.4%	2.0%	2.7%	4.6%	9.9%	6.7%	6.4%	7.0%	7.4%	7.6%	6.9%	8.1%	7.3%	100%	

Note: Outlined areas indicate hours not counted.

Appendix A7.–Expanded daily hourly Chinook salmon migration past the North River counting tower, Norton Sound, 2002.

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
19-Jun	Not expanded												0	0	0	2	2	0	Not expanded			2	0	2	8	0.5%
20-Jun	0	0	0								-2	0	0	0	4	0	0	0	2	0	2	0	0	0	6	0.4%
21-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%
22-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0.3%
23-Jun	2	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	6	14	0.9%
24-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	6	0	0	8	0.5%
25-Jun	0	4	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0.5%
26-Jun	6	2	4	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	1.1%
27-Jun	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	8	8	6	28	1.9%
28-Jun	6	0	2	0	0	8	0	0	0	0	0	2	2	0	4	2	0	2	2	2	2	4	14	28	80	5.3%
29-Jun	12	4	4	0	2	6	0	6	0	4	0	0	0	0	0	2	10	2	6	8	2	0	0	8	76	5.0%
30-Jun	4	4	2	0	0	0	0	0	0	0	0	0	0	0	2	0	12	0	0	4	2	4	4	10	48	3.2%
1-Jul	6	0	0	0	-2	0	2	0	2	2	0	0	0	0	0	0	0	0	4	2	10	8	0	4	38	2.5%
2-Jul	2	10	6	0	2	6	8	6	0	0	0	0	0	2	8	0	0	2	0	0	0	8	6	0	66	4.4%
3-Jul	4	4	16	4	6	4	20	26	4	6	-2	4	0	0	2	2	0	0	14	2	0	16	42	10	184	12.2%
4-Jul	0	2	4	4	4	4	0	0	0	0	2	-2	4	2	4	2	2	2	0	2	2	0	0	0	38	2.5%
5-Jul	0	0	0	2	0	0	0	-2	0	0	2	0	2	2	0	4	4	10	14	0	18	8	0	22	86	5.7%
6-Jul	0	2	0	0	0	0	0	0	0	0	1	1	1	1	0	2	3	5	7	2	16	6	4	4	55	3.7%
7-Jul	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	4	0.3%
8-Jul	0	2	4	2	0	2	0	0	2	0	0	0	0	0	0	0	6	2	0	2	2	6	4	0	34	2.3%
9-Jul	0	2	8	2	-4	4	0	0	0	0	4	0	0	2	6	10	0	4	-2	6	4	0	4	2	52	3.5%
10-Jul	4	4	6	2	8	8	2	0	0	0	0	0	0	2	0	0	4	10	4	2	2	4	4	0	66	4.4%
11-Jul	14	14	12	2	4	8	0	4	2	0	4	0	2	10	0	6	4	2	2	6	8	10	0	4	118	7.8%
12-Jul	2	6	4	4	0	4	0	2	0	0	0	4	2	0	0	0	4	2	2	0	0	0	0	2	38	2.5%
13-Jul	0	6	12	4	2	12	4	4	0	0	0	2	0	4	6	6	2	4	2	4	2	0	0	0	76	5.0%
14-Jul	0	2	0	0	0	2	0	0	0	0	2	0	0	2	2	2	2	2	0	2	2	0	0	0	20	1.3%
15-Jul	0	2	0	0	0	0	0	0	0	0	2	0	8	0	2	2	0	0	2	4	6	12	0	2	42	2.8%
16-Jul	2	6	6	2	6	0				0	0	0	6	4	2	0	0	0	10	8	2	4	4	4	66	4.4%
17-Jul	6	4	6	4	0	2				0	0	0	4	0	0	0	0	0	0	0	4	2	0	4	36	2.4%
18-Jul	0	8	2	2	2	6				0	0	0	0	2	2	2	0	2	0	0	0	4	6	0	38	2.5%
19-Jul	0	0	0	4	0	0	0	0	0	0	0	0	0	2	2	0	0	2	0	2	12	2	6	4	36	2.4%
20-Jul	4	0	0	0	0	0				0	0	0	2	0	2	0	2	2	0	2	2	2	2	0	20	1.3%
21-Jul	6	4	2	0	0	0				0	0	0	0	0	0	0	0	0	2	0	0	4	0	4	22	1.5%
22-Jul	2	0	4	0	0	0				0	0	0	0	0	0	2	0	2	2	0	0	0	0	2	14	0.9%
23-Jul	0	0	2	0	0	0	0	0	0	0	-2	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0.1%
24-Jul	-2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	6	0.4%
25-Jul	-2	0	0	0	0	0	0	0	2	2	0	0	2	0	0	2	0	0	0	0	0	0	0	0	6	0.4%
26-Jul	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	8	0.5%
27-Jul	0	0	0	0	0	2	0	2	0	4	0	0	0	0	2	-2	0	0	0	0	0	0	4	0	12	0.8%
28-Jul	0	0	0	0	0	4	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	10	0.7%
29-Jul	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	4	0.3%
30-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	2	0	0	0	0	0	6	0.4%
31-Jul	0	0	0	0	0	0	4	-2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	4	0.3%
1-Aug	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.1%
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	0	0	0	0	0	0	0	0	0	0.0%
5-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Total	78	100	108	38	34	86	40	50	14	20	11	15	39	35	54	50	61	61	75	62	104	124	112	134	1,505	100%
	5.2%	6.6%	7.2%	2.5%	2.3%	5.7%	2.7%	3.3%	0.9%	1.3%	0.7%	1.0%	2.6%	2.3%	3.6%	3.3%	4.1%	4.1%	5.0%	4.1%	6.9%	8.2%	7.4%	8.9%	100%	

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

Appendix A8.–Expanded daily hourly Chinook salmon migration past the North River counting tower, Norton Sound, 2003.

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
16-Jun	2	-2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0.1%
17-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%
18-Jun	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	4	0.3%
19-Jun	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.3%
20-Jun	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	12	0.8%
21-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	2	0	7	0.5%
22-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	4	0	6	0.4%
23-Jun	2	6	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	14	1.0%
24-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	-2	-0.1%
25-Jun	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%
26-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%
27-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	2	10	0.7%
28-Jun	2	4	0	2	0	0	-2	0	0	0	0	0	0	2	0	0	4	0	0	0	0	0	-2	0	10	0.7%
29-Jun	2	0	0	6	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	-1	0	11	0.8%
30-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4	0	0	0	6	0.4%
1-Jul	2	-2	2	0	0	0	0	0	0	0	0	10	0	34	28	24	16	20	8	4	2	0	2	2	152	10.5%
2-Jul	1	0	1	2	0	0	0	0	0	0	0	5	0	17	14	12	8	10	4	2	1	0	0	4	81	5.6%
3-Jul	0	0	1	2	0	0	0	0	0	0	0	5	0	17	14	12	8	10	4	2	1	0	0	0	76	5.2%
4-Jul	0	2	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	8	0.6%
5-Jul	0	1	2	2	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	1	12	0.8%
6-Jul	0	0	4	0	4	0	0	0	-2	0	0	0	0	0	2	2	2	0	0	0	2	0	0	0	14	1.0%
7-Jul	0	0	0	0	0	2	0	0	0	0	0	0	2	4	6	0	0	2	0	0	0	0	0	2	18	1.2%
8-Jul	6	0	2	0	2	0	0	0	2	0	0	0	0	0	0	0	2	4	0	10	12	8	4	6	58	4.0%
9-Jul	10	10	0	0	0	2	0	0	2	0	0	2	24	2	8	0	2	0	4	4	2	0	2	4	78	5.4%
10-Jul	0	0	0	0	0	0	0	0	0	0	2	0	4	2	4	0	2	2	6	10	0	2	0	8	42	2.9%
11-Jul	6	2	4	-2	0	6	2	4	-4	0	0	2	2	2	2	2	4	4	10	0	0	2	12	0	60	4.1%
12-Jul	0	2	0	-2	0	-4	2	4	-2	0	0	1	1	2	2	2	0	0	0	0	4	10	6	6	34	2.3%
13-Jul	8	10	0	6	2	4	2	0	0	0	0	0	0	2	2	2	4	12	6	20	16	4	0	0	100	6.9%
14-Jul	6	0	0	0	0	6	8	4	0	0	0	8	2	10	6	0	0	0	0	2	4	0	0	0	56	3.9%
15-Jul	0	0	0	0	-2	2	0	-4	0	-2	0	6	0	-2	22	2	6	-2	2	2	0	2	0	2	34	2.3%
16-Jul	-2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	2	0	0.0%
17-Jul	8	4	2	0	0	2	-2	0	0	0	0	0	0	2	0	0	4	4	4	6	2	10	4	4	54	3.7%
18-Jul	8	6	6	2	0	2	2	2	4	2	0	0	0	0	2	4	2	0	22	4	0	12	4	12	96	6.6%
19-Jul	14	6	0	2	0	6	2	4	3	1	1	1	1	1	1	3	2	2	4	0	0	6	10	8	78	5.4%
20-Jul	10	4	6	2	2	0	0	4	2	0	2	2	2	2	0	2	0	2	6	0	2	0	6	0	56	3.9%
21-Jul	2	4	2	0	2	4	0	0	2	0	4	2	0	0	2	0	2	4	4	2	6	4	0	2	48	3.3%

-continued-

Appendix A8.–Page 2 of 2.

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
22-Jul	0	2	0	0	2	0	4	0	0	0	0	0	2	0	10	4	2	0	8	2	8	0	0	4	48	3.3%
23-Jul	0	2	0	0	0	0	2	6	0	0	0	0	2	0	2	0	2	0	0	2	0	2	0	0	20	1.4%
24-Jul	0	0	2	4	4	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	16	1.1%
25-Jul	2	0	1	2	0	6	0	0	0	0	0	2	0	2	2	6	10	2	0	4	2	0	6	0	47	3.2%
26-Jul	2	0	0	2	0	3	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	3	1	15	1.0%
27-Jul	1	0	0	2	0	3	0	0	0	0	0	0	0	1	1	2	0	1	0	0	0	0	3	1	15	1.0%
28-Jul	1	0	0	2	0	3	0	0	0	0	0	0	0	0	2	4	0	0	0	0	0	0	0	2	14	1.0%
29-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	-2	0	2	0	4	0	0	0	0	10	0.7%
30-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	2	0	2	0	0	0	0	2	0.1%
31-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0.1%
1-Aug	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	2	0	0	6	0.4%
2-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	0	1	0	1	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	0	0	0	0	-2	0	0	0	-2	-0.1%
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	2	2	0	0	0	0	0	0	0	0	0	0	4	0.3%
7-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	0.3%
8-Aug	0	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	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	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	0	0	0	0.0%
11-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0.1%
12-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0.1%
13-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%
14-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%
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	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.1%
Total	97	67	35	38	16	51	20	36	7	1	11	46	44	112	132	83	90	102	94	91	72	67	67	73	1,452	100%
	6.7%	4.6%	2.4%	2.6%	1.1%	3.5%	1.4%	2.5%	0.5%	0.1%	0.8%	3.2%	3.0%	7.7%	9.1%	5.7%	6.2%	7.0%	6.5%	6.3%	5.0%	4.6%	4.6%	5.0%	100%	

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

Appendix A9.–Expanded daily Chinook salmon migration past the North River counting tower, Norton Sound, 2004.

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
15-Jun																					0	0	0	0	0	0.0%
16-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%
17-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%
18-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%
19-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%
20-Jun	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4	0.4%
21-Jun	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0.0%
22-Jun	0	0	0	-2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
23-Jun	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	4	0.4%
24-Jun	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.2%
25-Jun	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	6	0.5%
26-Jun	6	2	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	2	4	8	40	3.6%
27-Jun	12	6	10	0	2	2	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	6	6	12	64	5.7%
28-Jun	16	8	0	2	0	0	0	0	0	0	0	0	0	10	8	10	2	4	4	4	0	0	4	4	76	6.8%
29-Jun	14	8	2	0	6	0	4	0	0	4	0	0	4	2	2	0	8	4	2	4	4	0	4	10	82	7.3%
30-Jun	2	10	0	0	2	-4	0	-2	0	0	0	0	0	0	2	4	0	0	0	0	0	0	0	0	14	1.2%
1-Jul	2	0	0	-4	0	0	-6	0	0	0	-4	0	-2	0	0	2	0	4	2	0	0	0	0	0	-6	-0.5%
2-Jul	0	0	0	-2	2	0	0	2	0	0	0	0	0	0	2	8	2	2	8	0	4	0	2	0	30	2.7%
3-Jul	0	0	-4	0	2	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	2	0	0	0	4	0.4%
4-Jul	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	8	8	2	2	4	2	0	30	2.7%

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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
5-Jul	0	0	2	0	-4	0	-2	-2	0	4	0	0	0	0	0	2	0	2	0	0	2	4	0	2	10	0.9%
6-Jul	0	0	0	0	6	2	2	0	4	4	4	0	0	2	4	2	24	6	12	4	10	6	0	4	96	8.5%
7-Jul	0	2	0	0	2	0	0	10	8	2	0	2	4	16	0	6	6	6	4	4	2	6	4	2	86	7.6%
8-Jul	2	0	2	2	0	4	0	0	0	0	0	2	0	4	4	0	0	-4	0	4	0	0	0	0	20	1.8%
9-Jul	2	0	0	0	0	4	-2	-2	0	0	0	4	0	0	2	0	2	4	0	8	0	0	8	2	32	2.8%
10-Jul	2	0	2	0	0	0	2	2	0	1	1	5	0	4	3	3	0	2	2	0	0	0	0	2	31	2.8%
11-Jul	4	10	10	6	10	16	4	12	0	2	2	6	0	8	4	6	20	6	2	2	2	6	6	10	154	13.7%
12-Jul	12	2	2	2	0	4	0	4	2	0	0	0	2	2	0	0	2	6	0	0	10	0	4	4	58	5.2%
13-Jul	2	2	2	2	4	6	8	2	4	2	0	4	0	0	2	2	2	8	2	2	0	2	2	0	60	5.3%
14-Jul	8	10	2	4	0	2	4	10	8	0	4	6	0	6	0	0	0	0	4	2	0	0	2	6	78	6.9%
15-Jul	6	0	2	2	0	0	4	0	2	0	0	2	2	2	0	4	4	0	2	6	0	2	2	0	42	3.7%
16-Jul	2	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	2	0	2	0	0	0	0	0	10	0.9%
17-Jul	0	0	0	0	0	0	2	2	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	7	0.6%
18-Jul	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	8	0.7%
19-Jul	0	0	2	0	4	0	0	0	2	0	0	0	0	2	0	0	0	2	0	2	0	0	0	2	16	1.4%
20-Jul	0	6	2	0	0	2	0	0	0	0	0	0	0	2	0	2	2	4	0	2	2	0	0	0	24	2.1%
21-Jul	0	0	0	2	0	0	0	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	2	2	12	1.1%
22-Jul	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	6	0.5%
23-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0.2%
24-Jul	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0.2%
25-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0.2%
26-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	4	0.4%
27-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	4	0.4%
28-Jul	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	0.0%

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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
29-Jul	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.4%
30-Jul	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.2%
31-Jul	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0.3%
1-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0.2%
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	0	0	0	0	2	2	-2	0	2	0.2%
5-Aug	0	-2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-4	0	0	0	0	0	0	-4	-0.4%
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	0	0	0	0.0%
8-Aug	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.4%
9-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%
10-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%
11-Aug	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	-0.2%
12-Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
13-Aug																									0	0.0%
14-Aug																									0	0.0%
Total	94	66	44	16	40	40	22	46	37	27	7	35	10	71	35	57	86	62	54	48	56	44	60	68	1,125	100%
	8.4%	5.9%	3.9%	1.4%	3.6%	3.6%	2.0%	4.1%	3.3%	2.4%	0.6%	3.1%	0.9%	6.3%	3.1%	5.1%	7.6%	5.5%	4.8%	4.3%	5.0%	3.9%	5.3%	6.0%	100%	

Note: Outlined areas indicate hours not counted. Counted 0000-1400 August 15, 1200–1900 August 16, and all hours August 17–20, no fish observed.

Appendix A10.–Expanded daily hourly coho salmon migration past the North River counting tower, Norton Sound, 2002.

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
9-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	10	0	0	4	20	0.6%
10-Jul	2	2	0	2	0	2	2	0	0	0	0	0	0	0	0	0	0	0	6	6	0	0	0	0	22	0.7%
11-Jul	8	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	2	0	0	20	0.6%
12-Jul	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.1%
13-Jul	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.1%
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	0	0	0	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-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%
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%
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%
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%
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%
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%
23-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%
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0.1%
27-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0.1%
28-Jul	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	4	0	0	0	2	8	0.2%
29-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	4	0.1%
30-Jul	0	2	0	0	0	0	0	0	0	0	0	6	0	2	0	4	2	0	0	0	0	2	6	8	32	1.0%
31-Jul	8	0	2	2	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	4	2	2	2	4	30	0.9%
1-Aug	12	10	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2	2	2	4	0	10	48	1.5%
2-Aug	6	10	6	2	4	0	0	0	0	0	0	0	0	2	0	2	2	0	0	0	2	0		20	56	1.7%
3-Aug	15	9	4	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	2	4	6	0	0	0	48	1.5%
4-Aug	24	8	2	8	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	32	8	10	96	3.0%
5-Aug	12	2	14	12	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	8	72	130	4.0%
6-Aug	46	22	26	10	6	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	156	4.9%
7-Aug	6	28	14	6	0	6	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	2.4%
8-Aug	32	0	4	2	8	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	52	1.6%

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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
9-Aug	0	8	8	4	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	2	0	48	1.5%
10-Aug	20	48	10	0	2	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	12	14	1	0	113	3.5%
11-Aug	23	51	21	0	4	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	0	0	137	4.3%
12-Aug	26	54	32	0	6	12	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	178	5.5%
13-Aug	14	20	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	1.9%
14-Aug	0	8	26	34	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	2.2%
15-Aug	8	90	60	46	4	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	216	6.7%
16-Aug	14	54	86	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156	4.9%
17-Aug	74	132	34	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	252	7.9%
18-Aug	86	150	42	24	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	306	9.5%
19-Aug	12	62	56	32	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	178	5.5%
20-Aug	12	22	20	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	2.2%
21-Aug	12	16	38	2	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	84	2.6%
22-Aug	0	46	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	1.6%
23-Aug	0	20	-2	-8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0.3%
24-Aug	8	0	6	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0.7%
25-Aug	56	38	4	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	108	3.4%
26-Aug	34	10	22	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	76	2.4%
27-Aug	26	50	16	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	102	3.2%
28-Aug	32	44	10	12	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	106	3.3%
29-Aug	12	10	8	2	20	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54	1.7%
Total	640	1,034	599	249	94	45	42	6	0	2	0	8	0	4	6	8	4	4	10	30	64	90	31	240	3,210	100%
	19.9%	32.2%	18.7%	7.8%	2.9%	1.4%	1.3%	0.2%	0.0%	0.1%	0.0%	0.2%	0.0%	0.1%	0.2%	0.2%	0.1%	0.1%	0.3%	0.9%	2.0%	2.8%	1.0%	7.5%	100%	

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

Appendix A11.–Expanded daily hourly coho salmon migration past the North River counting tower, Norton Sound, 2003.

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
18-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	2	8	0.1%
19-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	2	6	8	4	26	0.4%
20-Jul	12	6	4	0	0	4	0	0	0	0	0	0	0	0	0	2	6	4	18	6	34	18	0	10	124	2.1%
21-Jul	22	26	10	4	4	6	12	2	0	0	0	0	0	0	0	0	0	2	6	8	0	4	0	0	106	1.8%
22-Jul	6	0	4	0	2	4	12	2	0	0	0	0	0	0	2	0	0	2	4	6	6	2	0	0	52	0.9%
23-Jul	6	26	12	0	0	4	4	0	0	0	2	0	0	0	0	0	0	6	4	10	4	2	6	0	86	1.5%
24-Jul	6	2	4	0	2	12	18	8	0	0	0	4	0	0	0	0	6	10	8	16	12	10	10	6	134	2.3%
25-Jul	0	10	2	1	14	18	4	2	0	0	0	0	2	2	24	10	6	12	14	0	0	0	6	0	127	2.2%
26-Jul	4	0	0	1	7	9	2	1	3	2	7	0	4	2	4	10	10	64	28	8	2	47	12	13	240	4.1%
27-Jul	7	2	2	1	7	9	2	1	3	2	7	2	2	9	4	8	7	33	22	52	55	47	12	13	309	5.3%
28-Jul	7	2	2	1	7	9	2	1	3	2	7	4	0	16	4	6	4	2	16	96	108	94	18	26	437	7.5%
29-Jul	10	4	4	2	0	0	0	0	6	4	14	22	20	16	12	28	20	6	0	8	10	14	12	0	212	3.6%
30-Jul	0	0	0	0	0	2	0	0	0	0	6	11	4	14	26	18	0	2	4	18	6	2	2	0	115	2.0%
31-Jul	6	0	4	2	0	0	0	0	0	-2	0	0	0	0	0	0	2	2	6	8	8	8	18	18	80	1.4%
1-Aug	4	2	2	0	0	0	0	0	0	0	0	0	0	0	2	0	6	6	8	4	18	22	18	14	106	1.8%
2-Aug	4	0	0	0	0	0	0	0	0	0	0	6	2	-2	6	-2	3	3	5	2	10	12	9	8	66	1.1%
3-Aug	2	0	2	0	0	8	0	0	0	2	4	0	2	0	2	2	0	0	2	0	2	2	0	2	32	0.5%
4-Aug	0	16	0	6	0	0	6	0	-2	2	0	0	0	0	4	0	0	0	4	0	4	0	0	0	40	0.7%
5-Aug	0	0	2	2	-4	0	0	0	6	2	0	0	2	8	4	18	0	0	0	0	0	0	0	2	42	0.7%
6-Aug	4	0	2	4	2	0	0	0	2	2	0	0	2	2	2	4	0	2	0	2	0	10	18	2	60	1.0%
7-Aug	4	2	4	0	2	2	0	4	0	0	0	0	0	2	0	4	2	10	22	22	16	4	14	10	124	2.1%
8-Aug	0	0	0	0	0	0	0	0	2	0	6	4	0	2	4	4	2	6	4	2	16	22	8	4	86	1.5%
9-Aug	2	4	0	2	0	2	2	0	2	1	5	4	3	3	4	3	14	42	16	10	10	62	38	16	245	4.2%
10-Aug	14	4	10	0	0	6	0	2	2	2	4	4	6	4	4	2	16	4	4	20	24	12	28	136	308	5.3%
11-Aug	2	0	0	0	0	0	0	4	0	0	0	2	0	0	2	6	6	8	6	0	0	6	0	0	42	0.7%
12-Aug	14	8	0	2	0	0	0	2	2	2	0	0	0	0	2	4	0	0	4	2	0	2	6	4	54	0.9%
13-Aug	2	8	8	2	4	0	2	-4	0	2	2	0	0	0	4	2	2	6	2	0	6	6	12	2	68	1.2%
14-Aug	2	14	12	14	0	4	4	20	2	2	4	2	4	0	0	16	38	24	16	64	46	48	54	22	412	7.1%
15-Aug	8	16	6	4	8	2	10	8	2	10	6	0	4	0	6	8	20	15	10	37	22	25	30	14	271	4.6%
16-Aug	7	9	3	7	4	1	4	4	-2	4	4	1	8	4	2	0	2	6	4	10	22	25	30	14	173	3.0%
17-Aug	6	2	0	10	0	0	-2	0	-6	-2	2	2	0	0	0	0	0	-4	6	2	-2	2	6	6	28	0.5%
18-Aug	0	0	0	0	0	0	0	0	0	-2	2	0	2	2	2	0	2	8	24	12	6	26	20	20	124	2.1%
19-Aug	0	0	0	-2	0	0	0	0	0	2	2	0	4	6	0	4	2	-2	6	14	20	6	18	10	90	1.5%
20-Aug	10	6	4	0	0	0	0	0	2	0	0	0	0	0	0	8	6	2	0	4	16	8	10	12	88	1.5%
21-Aug	6	0	0	4	0	0	0	0	0	0	0	0	2	0	2	20	8	12	14	8	0	12	10	20	118	2.0%
22-Aug	14	6	4	0	0	2	0	4	2	2	1	0	4	4	0	0	8	8	2	2	6	-14	16	20	91	1.6%
23-Aug	8	4	2	1	0	1	0	2	4	4	2	0	6	8	12	14	16	4	12	20	24	14	10	20	188	3.2%

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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
24-Aug	2	2	0	2	0	0	0	0	2	2	1	0	4	5	7	9	8	2	6	10	12	7	5	11	97	1.7%
25-Aug	1	0	0	1	1	0	-2	0	2	2	1	0	4	5	7	9	8	2	6	10	12	7	5	11	92	1.6%
26-Aug	1	0	0	1	1	0	-2	0	2	2	1	0	4	5	7	9	8	2	6	10	12	7	5	11	92	1.6%
27-Aug	1	0	0	1	1	0	-2	0	2	2	1	0	4	5	7	9	8	2	6	10	12	7	5	11	92	1.6%
28-Aug	1	0	0	1	1	0	-2	0	2	2	1	0	4	5	7	9	8	2	6	10	12	7	5	11	92	1.6%
29-Aug	1	0	0	1	1	0	-2	0	2	2	1	0	4	5	7	9	8	2	6	10	12	7	5	11	92	1.6%
30-Aug	1	0	0	1	1	0	-2	0	0	0	0	0	2	2	2	4	0	0	0	0	0	0	0	2	13	0.2%
31-Aug	0	-2	0	1	1	0	-2	0	-2	0	0	0	0	0	0	0	2	6	2	6	4	2	4	14	36	0.6%
1-Sep	0	0	2	0	2	0	-4	0	0	0	2	4	2	8	2	4	4	0	0	0	0	0	0	2	28	0.5%
2-Sep	4	0	6	-4	-2	4	0	-2	0	0	0	2	-6	2	4	4	2	4	0	2	2	0	0	-2	20	0.3%
3-Sep	0	0	2	0	2	0	-4	0	0	0	2	4	2	8	2	4	4	0	0	0	0	0	0	2	28	0.5%
4-Sep	4	0	6	2	4	0	0	-2	0	0	0	0	0	0	0	0	2	6	0	0	2	12	4	0	40	0.7%
5-Sep	2	-2	10	2	3	0	4	2	0	0	-2	0	0	0	-2	2	0	0	0	0	0	0	0	0	19	0.3%
6-Sep	1	-1	7	1	3	0	2	1	4	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	22	0.4%
7-Sep	0	0	4	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	-4	10	0	4	4	4	26	0.4%
8-Sep	4	2	6	0	0	0	0	4	0	0	0	0	4	0	2	2	0	0	0	0	2	0	0	8	34	0.6%
9-Sep	0	10	-4	2	2	0	2	0	0	0	0	2	0	0	0	0	0	0	16	4	0	2	6	4	46	0.8%
10-Sep	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	-4	0	0	0	0	0	2	0	6	0.1%
11-Sep	2	0	0	4	0	0	2	0	0	2	2	0	0	4	0	0	-2	0	2	4	-2	0	8	6	32	0.5%
12-Sep	0	2	0	0	0	0	0	0	0	-4	0	0	-2	0	2	0	2	0	-2	0	0	0	8	2	8	0.1%
13-Sep	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4	0	0	-2	0	4	2	10	0.2%
Total	230	190	148	84	82	109	70	66	47	53	97	82	109	158	194	277	274	339	359	561	591	628	529	560	5,837	100%
	3.9%	3.3%	2.5%	1.4%	1.4%	1.9%	1.2%	1.1%	0.8%	0.9%	1.7%	1.4%	1.9%	2.7%	3.3%	4.7%	4.7%	5.8%	6.2%	9.6%	10.1%	10.8%	9.1%	9.6%	100%	

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

Appendix A12.–Expanded daily coho salmon migration past the North River counting tower, Norton Sound, 2004.

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
9-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	0	2	0	0	8	0.1%
10-Jul	2	2	2	0	2	0	2	0	0	1	0	1	0	0	1	0	0	6	0	0	4	4	0	6	33	0.3%
11-Jul	2	2	0	0	0	0	0	0	0	2	0	2	0	0	2	0	0	0	0	2	0	0	2	0	14	0.1%
12-Jul	2	2	0	2	0	0	4	2	0	0	0	0	0	0	0	0	4	8	0	4	4	0	8	2	42	0.4%
13-Jul	2	4	2	0	2	2	2	4	0	0	0	0	0	0	2	2	4	0	8	-2	2	0	6	0	40	0.4%
14-Jul	4	2	4	0	4	2	0	0	0	0	0	0	2	0	0	0	2	2	10	2	0	6	2	0	42	0.4%
15-Jul	2	2	0	0	0	2	6	0	0	0	2	0	2	0	6	6	4	2	2	14	4	2	2	0	58	0.5%
16-Jul	6	4	0	0	0	2	4	8	2	2	0	2	2	0	6	4	2	2	6	0	2	2	0	0	56	0.5%
17-Jul	6	8	2	0	2	4	0	0	4	1	0	2	4	3	6	2	0	0	0	2	2	2	2	0	52	0.5%
18-Jul	6	2	2	0	0	2	8	2	6	0	0	2	6	6	6	0	4	4	4	4	6	6	4	2	82	0.7%
19-Jul	4	6	2	0	4	10	14	2	0	0	4	2	6	4	4	4	2	2	2	0	4	0	2	4	82	0.7%
20-Jul	18	18	4	10	6	20	4	0	4	2	0	2	2	2	2	6	8	8	6	18	6	14	8	10	178	1.6%
21-Jul	12	12	4	2	4	0	8	6	4	0	2	2	2	4	10	2	6	8	18	20	16	24	12	14	192	1.7%
22-Jul	10	62	14	0	2	6	16	8	6	4	-2	0	2	6	2	2	6	12	12	6	8	2	14	18	216	1.9%
23-Jul	8	6	0	0	2	6	26	6	26	8	2	2	0	0	10	8	4	14	12	8	8	6	4	4	170	1.5%
24-Jul	12	14	6	2	0	2	6	4	0	2	-2	2	0	2	4	2	28	12	24	20	16	24	22	12	214	1.9%
25-Jul	8	12	0	2	4	4	14	18	6	6	0	-6	0	6	12	18	8	0	8	4	6	12	4	2	148	1.3%
26-Jul	6	4	8	2	0	18	24	12	6	4	2	0	-2	6	4	0	6	2	4	4	4	0	2	0	116	1.0%
27-Jul	2	8	4	4	0	2	8	12	0	4	0	0	2	6	4	2	6	0	2	2	2	2	2	2	76	0.7%
28-Jul	0	2	6	10	-2	12	10	12	16	2	6	0	0	0	6	4	4	6	8	12	14	14	4	14	160	1.4%
29-Jul	6	2	12	6	2	4	12	14	2	4	0	6	6	16	20	8	4	8	4	0	4	10	10	10	170	1.5%
30-Jul	20	22	30	32	10	12	28	20	16	6	12	-2	6	10	8	4	2	14	10	12	10	6	12	16	316	2.8%
31-Jul	22	28	26	20	6	4	28	30	12	3	7	0	3	4	4	4	4	6	-2	2	8	12	6	6	243	2.2%
1-Aug	10	8	10	6	8	4	8	10	8	0	2	2	0	-2	0	4	2	0	2	4	4	2	6	4	102	0.9%
2-Aug	0	4	8	0	2	2	10	0	4	2	0	0	2	4	2	2	2	4	8	2	6	6	2	2	74	0.7%
3-Aug	8	8	4	2	4	2	26	4	2	6	2	0	2	4	4	0	0	2	10	6	4	4	4	0	108	1.0%
4-Aug	4	4	18	6	4	4	6	2	6	2	0	0	0	6	2	0	10	8	12	10	10	6	8	6	134	1.2%
5-Aug	10	2	28	12	2	2	4	0	6	2	2	4	0	0	4	4	6	8	10	6	6	26	6	10	160	1.4%
6-Aug	16	16	10	14	6	2	6	6	4	4	0	4	0	4	2	6	16	10	28	34	38	38	20	24	308	2.8%
7-Aug	54	82	66	22	32	10	20	56	3	7	2	6	1	2	2	5	4	6	6	16	12	22	10	24	470	4.2%
8-Aug	62	38	22	24	10	14	20	14	2	10	4	8	2	0	2	4	20	26	28	44	40	66	50	50	560	5.0%
9-Aug	34	62	10	20	4	-2	56	32	14	0	0	10	-2	6	-2	4	8	8	24	20	34	16	2	4	362	3.2%
10-Aug	12	10	6	2	8	8	10	-4	2	2	4	-4	0	2	10	18	8	44	22	30	8	12	12	2	224	2.0%

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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
11-Aug	20	30	12	10	8	4	4	18	8	2	0	-2	4	6	8	20	14	12	22	6	24	6	14	16	266	2.4%
12-Aug	42	46	22	12	16	4	24	18	4	2	4	2	-2	2	6	-2	14	34	28	30	34	28	4	14	386	3.5%
13-Aug	25	25	11	7	8	5	12	17	14	3	13	4	5	3	6	5	11	17	21	19	27	19	6	13	296	2.6%
14-Aug	25	25	11	7	8	5	12	17	14	3	13	4	5	3	6	5	11	17	21	19	27	19	6	13	296	2.6%
15-Aug	25	25	11	7	8	5	12	17	14	3	13	4	5	3	6	5	11	17	21	19	27	19	6	13	296	2.6%
16-Aug	25	25	11	7	8	5	12	17	14	3	13	4	5	3	6	5	11	17	21	19	27	19	6	13	296	2.6%
17-Aug	25	25	11	7	8	5	12	17	14	3	13	4	5	3	6	5	11	17	21	8	20	10	8	12	270	2.4%
18-Aug	8	4	0	2	0	6	0	16	24	4	22	6	12	4	6	12	8	0	14	12	2	18	18	8	206	1.8%
19-Aug	8	0	0	4	2	6	2	4	10	14	10	2	8	12	12	14	18	12	6	18	18	8	16	6	210	1.9%
20-Aug	16	10	0	4	0	2	0	14	-4	8	6	12	8	8	8	2	10	4	2	14	8	2	22	12	168	1.5%
21-Aug	14	6	0	-2	0	0	0	-6	-3	4	4	5	6	7	8	3	28	8	18	26	22	6	4	6	164	1.5%
22-Aug	20	4	-4	2	0	2	0	10	-2	0	2	-2	4	6	8	4	8	0	12	30	30	18	32	22	206	1.8%
23-Aug	8	0	4	4	2	0	2	6	-6	0	16	-2	6	0	16	8	8	26	30	14	0	44	20	72	278	2.5%
24-Aug	0	2	2	-2	2	4	2	0	2	0	2	8	2	0	-4	2	10	24	12	6	2	34	14	26	150	1.3%
25-Aug	50	2	4	2	-2	-2	-2	2	-2	0	0	0	-2	-2	2	8	18	40	18	4	4	0	-4	16	154	1.4%
26-Aug	12	4	2	2	-8	-4	2	-2	-6	4	-16	0	2	0	4	-4	4	2	24	2	6	0	0	22	52	0.5%
27-Aug	24	6	-6	-4	-6	-2	-2	0	0	2	0	2	4	2	0	8	0	2	0	2	0	0	14	46	92	0.8%
28-Aug	0	2	-12	0	0	-2	-2	-38	0	1	0	1	2	1	0	4	2	2	4	0	2	10	4	210	191	1.7%
29-Aug	32	2	4	0	-4	-4	2	2	0	0	0	0	0	0	0	0	14	6	36	14	20	8	0	10	142	1.3%
30-Aug	6	-6	-4	-4	-2	0	0	-4	6	0	6	2	0	0	2	0	4	2	6	6	2	0	-8	62	76	0.7%
31-Aug	80	0	2	-6	-4	0	2	2	14	0	0	0	0	2	0	4	0	2	14	0	4	4	4	28	152	1.4%
1-Sep	108	32	-4	-10	-6	-2	-4	0	0	2	0	2	0	8	0	6	10	6	0	0	2	2	4	30	186	1.7%
2-Sep	50	34	-4	2	0	-6	-2	-2	-2	2	0	0	0	0	0	2	0	2	0	0	0	0	0	16	92	0.8%
3-Sep	20	2	-12	-4	-6	-18	-2	-60	6	0	0	0	0	0	0	0	0	0	0	0	0	0	12	100	38	0.3%
4-Sep	76	10	-2	0	-2	-4	-4	0	3	1	0	0	0	2	-1	0	0	8	0	6	2	0	12	46	153	1.4%
5-Sep	38	16	6	4	-2	0	-2	-16	0	2	0	0	0	4	-2	0	0	0	0	6	2	0	0	48	104	0.9%
6-Sep	44	-4	10	0	-16	4	-4	2	0	0	2	0	0	0	0	0	0	2	0	0	4	4	6	44	98	0.9%
7-Sep	72	34	18	-6	10	-6	-4	0	0	4	0	0	0	0	0	0	0	0	2	0	0	0	2	66	192	1.7%
8-Sep	8	-6	-6	2	4	0	-4	-6	0	0	0	0	2	0	0	2	2	2	0	-2	0	0	2	54	54	0.5%
9-Sep	60	30	10	-6	0	-4	0	0	0	0	0	0	0	0	0	0	-4	0	16	0	20	0	16	80	218	1.9%
10-Sep	18	-12	32	0	4	-8	-4	-2	0	0	0	2	0	0	0	4	-6	0	0	4	0	0	22	52	106	0.9%
11-Sep	12	6	-6	32	6	4	0	0	0	0	1	0	0	0	0	2	0	0	12	0	4	2	22	16	113	1.0%
12-Sep	4	14	18	12	0	-2	-6	-6	0	0	2	-2	0	0	0	0	2	4	0	0	0	0	0	62	102	0.9%
13-Sep	24	24	6	4	-2	0	-4	-8	0	0	0	2	0	6	2	-2	8	2	0	6	0	0	24	76	168	1.5%
14-Sep	-10	6	-2	0	-2	0	2	0	0	0	0	0	2	0	-18	0	0	-2	-14	-6	6	0	46	-2	6	0.1%
Total	1,359	881	455	289	160	157	446	309	283	153	175	105	131	184	232	247	411	519	657	590	638	628	602	1,576	11,187	90%
	12.1%	7.9%	4.1%	2.6%	1.4%	1.4%	4.0%	2.8%	2.5%	1.4%	1.6%	0.9%	1.2%	1.6%	2.1%	2.2%	3.7%	4.6%	5.9%	5.3%	5.7%	5.6%	5.4%	14.1%	100%	

Note: Outlined areas indicate hours not counted.

Appendix A13.–Climatological and stream observations from the North River counting tower, Norton Sound, 2002.

Date	Time	Air Temp °F	Water Temp °F	% Cloud Cover	Water Depth (inches)	Water Visibility (Secchi)	Observer
1-Jul	08:00	59.0	58.0	100%	16.0	clear	NA
2-Jul	20:00	60.0	58.0	100%	16.5	clear	NA
3-Jul	08:00	50.0	57.0	50%	18.0	clear	NA
4-Jul	08:00	48.0	52.0	100%	19.0	clear	NA
5-Jul	08:00	34.0	52.0	100%	19.0	clear	NA
6-Jul	08:00	49.0	50.0	100%	19.0	clear	NA
7-Jul	08:00	50.0	50.0	100%	29.0	slightly turbid	NA
8-Jul	08:00	46.0	51.0	85%	25.0	slightly turbid	NA
9-Jul	08:00	46.0	52.0	75%	24.0	clear	NA
10-Jul	08:00	50.0	52.0	78%	24.0	clear	NA
11-Jul	08:00	48.0	52.0	68%	24.0	clear	NA
12-Jul	08:00	50.0	52.0	75%	23.0	clear	NA
13-Jul	08:00	60.0	57.0	0%	22.0	clear	NA
14-Jul	20:00	56.0	58.0	87%	21.0	clear	NA
15-Jul	08:00	62.0	58.0	75%	21.0	clear	NA
16-Jul	08:00	66.0	59.0	10%	20.0	clear	NA
17-Jul	08:00	63.0	60.0	80%	20.0	clear	NA
18-Jul	08:00	60.0	60.0	100%	20.0	clear	NA
19-Jul	08:00	NA	60.0	56%	20.0	clear	NA
20-Jul	08:00	46.0	60.0	69%	19.0	clear	NA
21-Jul	08:00	54.0	60.0	0%	19.0	clear	NA
22-Jul	08:00	56.0	60.0	100%	18.0	clear	NA
23-Jul	08:00	66.0	60.0	100%	16.5	clear	NA
24-Jul	08:00	60.0	59.0	99%	16.0	clear	NA
25-Jul	08:00	56.0	59.0	100%	17.0	clear	NA
26-Jul	08:00	48.0	59.0	100%	17.0	clear	NA
27-Jul	08:00	48.0	52.0	100%	20.0	clear	NA
28-Jul	08:00	56.0	57.0	100%	20.0	clear	NA
29-Jul	08:00	54.0	58.0	100%	23.0	clear	NA
30-Jul	08:00	48.0	60.0	100%	21.0	clear	NA
31-Jul	08:00	52.0	60.0	92%	20.0	clear	NA
1-Aug	08:00	62.0	60.0	0%	19.0	clear	NA
2-Aug	08:00	50.0	60.0	0%	18.5	clear	NA
3-Aug	08:00	52.0	60.0	0%	18.0	clear	NA
4-Aug	08:00	75.0	62.0	0%	17.0	clear	NA
5-Aug	08:00	46.0	58.0	0%	17.0	clear	NA
6-Aug	08:00	46.0	56.0	0%	17.0	clear	NA
7-Aug	08:00	36.0	54.0	0%	16.0	clear	NA
8-Aug	08:00	36.0	52.0	70%	16.0	clear	NA
9-Aug	08:00	50.0	54.0	100%	16.0	clear	NA
10-Aug	08:00	52.0	53.0	0%	17.0	clear	NA
11-Aug	08:00	36.0	52.0	0%	17.0	clear	NA
12-Aug	08:00	38.0	54.0	0%	17.0	clear	NA
13-Aug	08:00	30.0	50.0	50%	16.0	clear	NA
14-Aug	08:00	40.0	50.0	70%	16.0	clear	NA
15-Aug	08:00	42.0	52.0	100%	15.5	clear	NA
16-Aug	08:00	40.0	52.0	100%	16.0	clear	NA
17-Aug	08:00	50.0	52.0	100%	16.5	clear	NA
18-Aug	08:00	50.0	52.0	100%	18.0	clear	NA
19-Aug	08:00	44.0	50.0	98%	20.0	clear	NA
20-Aug	08:00	36.0	48.0	10%	20.0	clear	NA
21-Aug	08:00	38.0	48.0	10%	20.0	clear	NA
22-Aug	08:00	36.0	46.0	0%	20.0	clear	NA
23-Aug	08:00	33.0	46.0	0%	18.0	clear	NA
24-Aug	08:00	30.0	45.0	0%	17.0	clear	NA
25-Aug	08:00	40.0	46.0	98%	17.0	clear	NA
26-Aug	08:00	36.0	48.0	80%	16.0	clear	NA
27-Aug	08:00	36.0	48.0	85%	16.0	clear	NA
28-Aug	08:00	44.0	48.0	80%	16.0	clear	NA
29-Aug	08:00	40.0	48.0	75%	17.0	clear	NA

Note: NA = no observation made.

Appendix A14.–Climatological and stream observations from the North River counting tower, Norton Sound, 2003.

Date	Time	Air Temp °C	Water Temp °C	% Cloud Cover	Water Depth (inches)	Water Visibility (Secchi)	Observer
16-Jun	08:00	8.0	10.0	100%	14.0	clear	Jacob
17-Jun	08:00	12.0	10.0	30%	14.0	clear	jmk
18-Jun	20:00	22.0	11.0	90%	14.0	clear	Jacob
19-Jun	08:00	15.0	11.0	99%	14.5	clear	Jacob
20-Jun	20:00	23.0	10.0	85%	14.8	clear	CF
21-Jun	08:00	14.0	10.0	40%	14.0	clear	Jacob
22-Jun	20:00	NA	NA	NA	NA	NA	NA
23-Jun	08:00	14.0	14.0	100%	14.3	clear	jmk
24-Jun	20:00	12.0	12.0	100%	14.5	clear	jmk
25-Jun	08:00	12.0	10.0	75%	13.8	clear	jmk
26-Jun	2000	18.0	12.0	50%	12.5	clear	CF
27-Jun	08:00	10.0	10.0	2%	11.5	clear	jmk
28-Jun	20:00	12.0	14.0	60%	12.0	clear	jmk
29-Jun	08:00	50F	14.0	100%	11.0	clear	jmk
30-Jun	08:00	12.0	10.0	99%	12.5	clear	illegible
1-Jul	20:00	13.0	9.0	100%	29.0	turbid	CF
2-Jul	09:30	11.0	6.0	100%	41.5	turbid	jmk
3-Jul	08:00	NA	NA	NA	NA	NA	NA
4-Jul	20:00	14.0	9.0	25%	28.0	slightly turbid	Jacob
5-Jul	08:00	12.0	8.0	100%	25.5	clear	jmk
6-Jul	20:00	10.0	9.5	100%	21.0	clear	jmk
7-Jul	08:00	10.0	10.0	99%	20.0	clear	jmk
8-Jul	08:00	10.0	10.0	100%	19.0	clear	jmk
9-Jul	08:00	16.0	12.0	100%	17.0	clear	illegible
10-Jul	08:00	10.0	11.0	100%	16.5	clear	CF
11-Jul	08:00	10.0	10.0	99%	16.8	clear	CF
12-Jul	08:00	15.0	10.0	30%	15.0	clear	jmk
13-Jul	08:00	15.0	10.0	2%	14.3	clear	Jacob
14-Jul	08:00	12.0	12.0	100%	13.5	clear	CF
15-Jul	08:00	5.0	9.0	100%	15.5	clear	CF
16-Jul	08:00	5.0	9.0	70%	15.5	clear	CF
17-Jul	08:00	3.0	8.0	0%	14.0	clear	Jacob
18-Jul	08:00	12.0	10.0	90%	12.8	clear	CF
19-Jul	08:00	13.0	11.0	45%	12.0	clear	Jolene
20-Jul	08:00	12.0	11.0	70%	11.0	clear	jmk
21-Jul	20:00	12.0	11.0	100%	10.5	clear	jmk
22-Jul	08:00	12.0	9.0	100%	10.5	clear	illegible
23-Jul	08:00	14.0	10.0	100%	10.8	clear	illegible
24-Jul	08:00	14.0	10.0	100%	13.5	clear	illegible
25-Jul	08:00	16.0	10.0	85%	15.0	clear	Jacob
26-Jul	20:00	12.0	8.0	100%	25.8	turbid	Jacob
27-Jul	08:00	NA	NA	NA	NA	NA	NA
28-Jul	20:00	16.0	10.0	70%	28.8	turbid	Jolene
29-Jul	08:00	14.0	9.0	100%	27.0	turbid	illegible
30-Jul	08:00	8.0	8.0	100%	25.5	turbid	illegible
31-Jul	08:00	6.0	8.0	4%	25.0	turbid	Jacob

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Date	Time	Air Temp °C	Water Temp °C	% Cloud Cover	Water Depth (inches)	Water Visibility	Observer
1-Aug	08:00	16.0	8.0	5%	23.0	clear	Jacob
2-Aug	20:00	12.0	8.0	100%	21.5	clear	Jacob
3-Aug	08:00	10.0	9.0	100%	21.0	clear	illegible
4-Aug	08:00	11.0	9.0	100%	20.3	clear	CF
5-Aug	08:00	11.0	9.0	100%	19.0	clear	CF
6-Aug	08:00	10.0	8.0	0%	18.0	clear	Jacob
7-Aug	20:00	17.0	9.0	100%	17.3	clear	Jacob
8-Aug	08:00	11.0	10.0	90%	17.5	clear	CF
9-Aug	08:00	12.0	12.0	10%	16.5	clear	illegible
10-Aug	08:00	12.0	10.0	85%	15.5	clear	Jacob
11-Aug	08:00	12.0	12.0	100%	16.5	clear	illegible
12-Aug	08:00	10.0	10.0	100%	20.0	clear	illegible
13-Aug	08:00	11.0	9.0	100%	18.5	clear	illegible
14-Aug	08:00	13.0	10.0	100%	20.0	clear	illegible
15-Aug	08:00	9.0	9.0	100%	30.3	turbid	CF
16-Aug	08:00	10.5	8.0	100%	35.5	slightly turbid	illegible
17-Aug	08:00	3.0	6.0	65%	34.0	clear	illegible
18-Aug	08:00	0.0	6.0	0%	32.3	clear	illegible
19-Aug	08:00	6.0	6.0	75%	31.0	clear	illegible
20-Aug	08:00	8.0	6.0	85%	29.0	clear	illegible
21-Aug	08:00	13.0	8.0	85%	27.8	clear	illegible
22-Aug	08:00	3.0	8.0	80%	26.0	clear	CF
23-Aug	08:00	8.0	6.5	100%	26.0	clear	illegible
24-Aug	08:00	9.0	8.0	90%	41.0	turbid	illegible
25-Aug	08:00	10.0	8.0	100%	43.0	turbid	illegible
26-Aug	08:00	9.5	8.0	95%	53.0	turbid	illegible
27-Aug	08:00	10.0	7.5	95%	52.0	turbid	illegible
28-Aug	08:00	5.0	5.0	10%	48.0	turbid	CF
29-Aug	08:00	4.0	5.0	3%	43.8	slightly turbid	CF
30-Aug	08:00	9.0	7.5	100%	41.0	slightly turbid	GR
31-Aug	08:00	10.0	7.5	100%	38.8	clear	GR
1-Sep	20:00	12.0	7.0	100%	35.8	clear	CF
2-Sep	20:00	8.0	6.0	97%	35.0	clear	CF
3-Sep	20:00	9.0	6.0	100%	33.5	clear	CF
4-Sep	20:00	8.0	6.0	25%	33.0	clear	CF
5-Sep	08:00	3.0	5.0	90%	33.0	clear	CF
6-Sep	08:00	7.5	7.5	75%	31.0	clear	GR
7-Sep	20:00	11.0	8.0	25%	29.5	clear	HEN JR.
8-Sep	08:00	7.0	5.0	95%	30.0	clear	illegible
9-Sep	08:00	7.0	6.0	99%	28.8	clear	illegible
10-Sep	08:00	5.0	1.0	100%	27.5	clear	illegible
11-Sep	20:00	8.0	5.0	100%	28.0	clear	illegible
12-Sep	08:00	5.0	6.0	90%	27.0	clear	GR
13-Sep	20:00	7.0	4.5	99%	25.0	clear	GR

Note: NA = no observation made. Illegible = observer's name or initials unreadable.

Appendix A15.–Climatological and stream observations from the North River counting tower, Norton Sound, 2004.

Date	Time	Air Temp °C	Water Temp °C	% Cloud Cover	Water Depth (inches)	Water Visibility	Observer
16-Jun	09:00				14.00	clear	RS
17-Jun	09:00	19.0	10.0	75%	13.75	clear	RS
18-Jun	09:00	17.0	12.0	5%	15.25	clear	RS
19-Jun	07:00	12.0	9.0	0%	14.00	clear	RS
20-Jun	09:00	13.0	10.0	0%	12.00	clear	RS
21-Jun	09:00	15.0	11.0	80%	11.50	clear	RS
22-Jun	09:00	14.0	11.0	95%	11.00	clear	RS
23-Jun	09:00	14.0	10.0	97%	10.75	clear	RS
24-Jun	09:00	10.0	9.0	100%	11.25	clear	RS
25-Jun	09:00	12.0	10.0	90%	11.00	clear	CF
26-Jun	09:00	10.0	11.0	100%	9.75	clear	AO
27-Jun	09:00	11.0	11.0	100%	8.75	clear	AO
28-Jun	09:00	22.0	13.0	0%	7.75	clear	ZP
29-Jun	09:00	21.0	14.0	50%	6.50	clear	ZP
30-Jun	09:00	16.0	13.0	100%	6.00	clear	ZP
1-Jul	09:00	10.0	12.0	100%	5.50	clear	ZP
2-Jul	09:00	13.0	13.0	100%	5.25	clear	CF
3-Jul	09:00	15.0	13.0	100%	5.00	clear	CF
4-Jul	09:00	15.0	11.0	100%	4.50	clear	ZP
5-Jul	09:00	13.0	13.0	100%	3.75	clear	CF
6-Jul	09:00	14.0	13.0	95%	3.00	clear	CF
7-Jul	09:00	11.0	11.0	100%	2.50	clear	CF
8-Jul	09:00	12.0	10.0	100%	2.25	clear	CF
9-Jul	09:00	12.0	10.0	100%	2.45	clear	CF
10-Jul	09:00	14.0	11.0	100%	2.00	clear	AO
11-Jul	09:00	16.0	16.0	95%	1.25	clear	AO
12-Jul	09:00	12.0	12.0	25%	0.25	clear	ZP
13-Jul	09:00	28.0	14.0	15%	reset @10	clear	ZP
14-Jul	09:00	20.0	15.0	0%	9.75	clear	AO
15-Jul	09:00	21.0	15.0	98%	9.45	clear	AO
16-Jul	09:00	26.0	14.0	98%	10.25	clear	AO
17-Jul	09:00	24.0	14.0	80%	10.50	clear	AO
18-Jul	09:00	23.0	14.0	100%	10.00	clear	CF
19-Jul	09:00	18.0	13.0	60%	9.50	clear	CF
20-Jul	09:00	18.0	14.0	15%	8.75	clear	CF
21-Jul	09:00	13.0	15.0	100%	8.00	clear	CF
22-Jul	09:00	13.0	15.0	15%	7.50	clear	AO
23-Jul	09:00	15.0	15.0	99%	7.75	clear	CF
24-Jul	09:45	26.0	15.0	0%	7.25	clear	CF
25-Jul	09:00	13.0	15.0	50%	7.00	clear	AO
26-Jul	09:00	13.0	15.0	100%	6.75	clear	MT
27-Jul	09:00	13.0	16.0	100%	6.75	clear	MT
28-Jul	09:30	18.0	12.0	70%	7.50	clear	CF
29-Jul	09:00	15.0	15.0	90%	7.25	clear	AO
30-Jul	09:00	12.0	14.0	99%	7.50	clear	AO
31-Jul	09:00	16.0	16.0	100%	7.00	clear	MT

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Date	Time	Air Temp °C	Water Temp °C	% Cloud Cover	Water Depth (inches)	Water Visibility	Observer
1-Aug	09:00	14.0	15.0	100%	6.50	clear	ZP
2-Aug	09:00	13.0	13.0	100%	6.50	clear	ZP
3-Aug	09:00	11.0	12.0	100%	6.25	clear	MT
4-Aug	09:00	12.0	12.0	99%	6.75	clear	ZP
5-Aug	09:00	13.0	11.0	5%	6.25	clear	ZP
6-Aug	09:00	11.0	12.0	40%	6.00	clear	MT
7-Aug	09:00	13.0	14.0	100%	5.75	clear	MT
8-Aug	09:00	13.0	13.0	100%	5.75	clear	ZP
9-Aug	09:00	12.0	12.0	100%	13.50	poor	ZP
10-Aug	09:00	13.0	12.0	97%	11.50	fair	ZP
11-Aug	09:00	14.0	13.0	100%	9.75	clear	ZP
12-Aug	09:00	13.0	13.0	100%	14.25	clear	ZP
13-Aug	10:30	14.0	N/A	100%	46.00	dirty	AO
14-Aug							
15-Aug			Camp Closed--Dirty water to bank level (CF)				
16-Aug							
17-Aug	9:00	N/A	N/A	N/A	N/A	1/2 panel visible	CF
18-Aug	9:00	18.0	N/A	10%	N/A	1/3 panel visible	CF
19-Aug	9:00	18.0	N/A	35%	N/A	fair	CF
20-Aug	9:00	13.0	N/A	85%	reset @20	fair	MT
21-Aug	9:00	13.0	10.0	50%	18.00	fair	AO
22-Aug	9:00	15.0	10.0	100%	16.25	clear	ZP
23-Aug	9:00	12.0	10.0	30%	14.25	clear	MT
24-Aug	9:00	10.0	10.0	40%	12.75	clear	MT
25-Aug	9:30	11.0	10.0	75%	11.00	clear	CF
26-Aug	9:00	2.0	8.0	10%	9.50	clear	CF
27-Aug	9:00	12.0	7.0	85%	8.50	clear	AO
28-Aug	9:00	0.0	6.0	70%	7.75	clear	MT
29-Aug	9:00	8.0	7.0	100%	6.50	clear	MT
30-Aug	9:00	7.0	8.0	100%	6.25	clear	MT
31-Aug	9:00	9.0	9.0	100%	6.25	clear	MT
1-Sep	9:00	8.0	8.0	100%	5.00	clear	CF
2-Sep	9:00	8.0	8.0	50%	4.25	clear	CF
3-Sep	9:00	2.0	1.0	7%	3.00	clear	CF
4-Sep	9:00	4.0	6.0	100%	2.50	clear	MT
5-Sep	9:00	7.0	7.0	100%	3.25	clear	MT
6-Sep	9:00	4.0	7.0	80%	2.25	clear	ZP
7-Sep	9:00	3.0	6.0	5%	1.00	clear	CF
8-Sep	9:00	7.0	7.0	90%	reset @15	clear	ZP
9-Sep	9:00	6.0	7.0	5%	14.50	clear	ZP
10-Sep	9:00	7.0	6.0	99%	14.00	clear	AO
11-Sep	9:00	4.0	7.0	95%	13.50	clear	MT
12-Sep	9:00	2.0	6.0	60%	13.00	clear	MT
13-Sep	9:00	2.0	5.0	70%	13.00	clear	ZP
14-Sep	9:00	2.0	5.0	100%	13.50	clear	ZP

Note: NA = no observation made. Illegible = observer's name or initials unreadable.