

UPPER COOK INLET SALMON ESCAPEMENT STUDIES 1998

by

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ABSTRACT

Sockeye salmon *Oncorhynchus nerka* spawning escapements into four river systems of Upper Cook Inlet, Alaska, were estimated using side-scanning sonar equipment. Estimated sockeye salmon escapements were 767,558 into the Kenai River, 273,213 into the Kasilof River, 62,257 into the Crescent River, and 119,623 into the Yentna River. Indices of escapements of other salmon species into the Yentna River were also obtained by sonar: 155,193 pink *O. gorbuscha*, 10,212 chum *O. keta*, and 24,769 coho *O. kitsutch* salmon. Sockeye salmon in the Kenai River were primarily distributed within three age classes: 1.3 (40.7%); 1.2 (27.1%); and 2.3(13.9%). Kasilof River sockeye salmon were primarily age: 1.2 (39.7%); 1.3 (28.1%); and 2.2 (22.2%). Age-1.3 sockeye salmon were the most abundant (44.5 %) age class in the Crescent River, followed by age classes 2.3 (35.2%) and 2.2 (10.1%). Yentna River sockeye salmon were primarily age: 1.3 (62.7%), 1.2 (15.7 %), and 2.3 (10.5%). Length and sex ratio data were collected for sockeye salmon in each river. Sockeye salmon migration routes in all rivers were near shore. Hourly peak salmon counts were typically recorded during the late morning and afternoon in the Kenai River. The Kasilof River north bank hourly peak counts occurred in the early morning while hourly peak counts for the south bank occurred in the late morning and early afternoon. Peak hourly counts in the Crescent River were related to the *post meridiem* high tides. Peak hourly counts for the Yentna River began at 2400 h and then decreased until mid-afternoon, when counts increased.

KEY WORDS: Alaska, Cook Inlet, salmon, Kenai River, Kasilof River, Crescent River, Yentna River, Susitna River, age/sex/size, sonar, escapement enumeration

INTRODUCTION

Prior to 1968, sockeye salmon escapement estimates in Upper Cook Inlet (UCI), Alaska (Figure 1) were based on surveys of clear water spawning areas and provided no information about the distribution or number of sockeye salmon which spawned in glacially occluded waters (King and Davis 1989). Commercial and recreational fishery management efforts were further hampered by lack of daily and cumulative estimates of escapement. These constraints were significantly reduced by the development of hydroacoustic techniques to enumerate sockeye salmon in some glacial tributaries of UCI. Hydroacoustic enumeration of escapement began on the Kenai and Kasilof Rivers in 1968, was expanded to the Susitna River in 1978 and to the Crescent River in 1980. The Susitna River counting site was abandoned in 1985, and counting operations began on the Yentna River, a major tributary of the Susitna River, in 1986. Results of escapement enumeration studies were documented by Davis (1997), Davis and King (1993, 1994, 1995, and 1996), Davis et al. (1993), King (1990), King and Davis (1989, 1992), King and Tarbox (1984, 1986, 1987, 1988, 1989a, 1990 and 1991), King et al. (1989b, 1992), Namtvedt et al. (1979), Tarbox et al. (1981, 1983), and Waltemyer et al. (1980).

The program objectives of UCI escapement projects in 1998 were to estimate: (1) the daily and cumulative number of sockeye salmon entering the Kenai, Kasilof, Crescent, and Yentna Rivers; and (2) the age, length, and sex composition of those escapements. Indices of abundance were also obtained for Yentna River pink, chum and coho salmon.

METHODS

*Bendix Corporation*¹ side-scanning sonar counters described by King and Tarbox (1989a), Gaudet (1983) and Bendix Corp. (1980 and 1984) were used to enumerate salmon escapements. Pulse width was 100 ms and the frequency was 515 Khz. Two- and four-degree transducer elements were multiplexed in an alternating mode. The counting threshold was preset at approximately -38 db by the manufacturer. However, tests with a standard target of -41dB typically saturated the counters, indicating the counting threshold to be lower than -38dB. The pulse repetition rate was variable. Counters were operated without artificial substrates in the Kenai, Crescent and Yentna Rivers. A technical consultant tested the counters for proper operation prior to deployment, and reinspected counters when migrating fish densities neared maximum levels in each river system (A. Menin, Hydroacoustic Consulting, Sylmar, CA).

¹Use of a company's name does not constitute product endorsement.

Project operational dates were: 1 July through 9 August on the Kenai River; 15 June through 8 August on the Kasilof River; 27 June through 7 August on the Crescent River; and 7 July through 21 August on the Yentna River. Counting operations ceased when daily counts were < 1% of the cumulative count for 3 consecutive days, or when budgetary considerations mandated cessation of counting activities. Kenai and Kasilof River counting operation cessation criteria were not instituted until cessation of continuous commercial fishing. Yentna River counting operations continued past the historical termination date.

Raw hourly output data were edited to account for debris, bottom echoes, or other sources of non-fish counts. Hourly sonar counts by day were entered into a data-base program which calculated a daily average hourly count for inshore (1-6) and offshore (7-12) sonar sectors by

$$Ca = Cb/N, \quad (1)$$

where:

Ca = average count per sector per hour;

Cb = valid hourly counts for all inshore or offshore sectors; and

N = number of sector per hour units which contained only valid counts.

The average count was then substituted into any sector/hour block where counts were deleted through editing. Sonar counts collected from the north bank of the Crescent River received the same treatment but calculations were made manually and computer entry of data occurred post-season. The daily average hourly count for the south bank of the Crescent River was calculated for each sector by:

$$Cc = Cd/N, \quad (2)$$

where:

Cc = average count per sector per hour for the Crescent River south bank;

Cd = valid Crescent River south bank hourly counts per sector; and

N = number of hour units per sector which contained only valid counts.

All counts recorded on the south bank at Crescent River occurred in sectors one (98.3%) and two (1.7%) of the counting range. Printer skips (treated as false counts) regularly occurred in sectors one through six. Hourly averages for each sector were substituted where skips occurred or counts were deleted. Because of the spacial distribution of fish migrating adjacent to this bank, the method used for the treatment of false counts provided a more accurate estimate of daily escapement because it did not place a high hourly average count derived from sector one or two into sectors where very few targets were detected. Both banks were treated in this manner at Crescent River.

Temporal and spacial behavior of sockeye salmon was assessed by examining distribution of fish by sector, hourly passage rate, bank preference, and cumulative proportion of sonar counts by day.

The ensonified area for the counter operated on the north bank of the Crescent River was 4.6 m to 4.9 m and for the south bank 18.2 m to 24.4 m. The ensonified area for the north bank of the Kenai

River was 10.9 m to 18.3 m and 3.6 m to 5.9 m on the south bank. Ensonified areas at the Kasilof River ranged from 14.3 m to 17.7 m on the north bank and 12.1 m to 14.5 m on the south bank. In the Yentna River, ensonified areas for the north bank were 5.8 m to 7.3 m. On the south bank fish were counted between 5.8 m and 7.3 m. Reported ranges encompassed the period when 80% (10%-90%) of the run occurred and the maximum counting range employed was used for descriptive purposes. Transducer distance from shore varied among systems and is not reflected in the reported counting range.

Transducer orientation was accomplished by remotely controlled rotators except on the Kasilof River and the south bank of the Kenai River. Correct orientation of the acoustic axis was tested periodically by the use of an artificial target. A sealed plastic sphere was weighted and moved through the ensonified area at various distances from the transducer. Simultaneous detection of the target by the counter and visual recognition on an oscilloscope verified correct axis orientation. Transducers were moved nearer shore as water depth increased, except in the Kenai and Crescent Rivers where transducer repositioning was not necessary due to high flow regimes at the beginning of counting operations. Fish passage between (behind) the transducers and the bank was prevented by the use of weirs.

Counters were generally monitored throughout the 24-h period on the Kenai River and 0700-2400 h on the Kasilof River. At Crescent River counters were monitored throughout the day, but observations were concentrated during the late afternoon and evening hours when passage rates were at their daily peaks. Yentna Rivers counters were monitored 0600-2400 h. In addition to regularly scheduled monitoring, intensified monitoring was conducted during episodic fish passage. In all cases, visual counts from an oscilloscope were compared to the counts accumulated by the counter during a minimum 10-min period or for a minimum oscilloscope count of 100 fish. During periods of low density passage (<500 fish per hour), Kenai and Yentna River oscilloscope/counter observations were made at a minimum of 1 h per bank each day. When passage rates reached 500 fish per hour, minimum observation time increased to 2 h per bank per day. Kasilof and Crescent River counters were monitored for a minimum of 2 h per bank per day. If a relative error greater than 20% occurred between targets counted on the oscilloscope and targets recorded by the counter, counter adjustments were made to reduce the relative error. However, operators typically made adjustments to the counters to accommodate for less than 20% relative error. The basic counter adjustment consisted of changing the pulse repetition rate.

Information used to estimate species composition of sonar counts, and age, length, and sex composition of sockeye salmon escapements was obtained from salmon captured in fish wheels. Fish wheels were located on the north banks of the Kenai, Kasilof, and Crescent Rivers (1 at each site), and on both banks of the Yentna River. Fish wheels were operated 24 h per day at Crescent River, up to 24 h per day at Yentna River, and during daylight hours at the Kasilof River. The Kenai River fish wheel was typically operated during evening hours when the passage rate and proximity to shore of migrating sockeye salmon maximized capture rate. The fish wheel was generally stopped when operators estimated the minimum sample size required to provide age, sex and length data had been attained. Fish wheel catches at the Yentna River site were expanded for each 24 h period based on the hourly catch rate during the hours of operation by

$$F_d = (F_h/H) 24, \quad (3)$$

where:

F_d = expanded fish wheel catch for 24 hours;

F_h = fish wheel catch for hours operated; and

H = hours fish wheel operated.

Prior to 3 August all sonar counts in the Kenai River were treated as sockeye salmon. Kasilof River sonar counts were treated as sockeye salmon. In the Yentna River, daily fish wheel catches were grouped into sample sizes of at least 150 salmon to apportion sonar counts. The fish wheel at Crescent River was operated for 24 h, so actual (not adjusted to 24 h) fish wheel catches were used to apportion sonar counts there. Because of their size and number, Dolly Varden char were included in sonar count apportionment at Crescent River.

Factors influencing the accuracy of escapement estimates for pink, coho, chum, and chinook salmon in the Yentna River were discussed by Tarbox et al. (1981, 1983). Counts apportioned to these species in 1998 were considered to be index counts.

Sample sizes for estimating sockeye salmon age composition were based on methods for estimating multinomial proportions developed by Thompson (1987). Minimum sample sizes were calculated so that the estimated proportion of each major age class was within 5 % of the true proportion 90 % of the time. Previous years' age composition proportions were analyzed to determine adequate sample sizes for a variety of age class ratios. The largest sample size calculated in this manner was chosen as a minimum sample size for 1998. The minimum sample size was increased by 10% to account for unreadable scales, and this number was used as the total sample size required. Sockeye salmon scale samples were collected daily from the Kenai, Kasilof, Crescent, and Yentna Rivers. The number of salmon sampled for age composition per day was based on a percentage of the previous day's escapement count. These percentages were calculated by dividing the total season sample size by the anticipated total escapement.

Mid-eye to fork-of-tail length (mm) and sex were also recorded for all sockeye salmon sampled. Sex ratios and mean lengths were calculated by grouping all samples together regardless of type or timing of sampling. Age classes, which were $\geq 10\%$ of the total escapement in each river were included in the age and length composition tables.

RESULTS

Kenai River

An estimated 767,558 sockeye salmon migrated past the Kenai River sonar site (Table 1) from 1 July through 13 August. The desired in-river goal range for this drainage is 550,000-825,000 sockeye salmon. The biological escapement goal (number of spawners) is 330,000-600,000 sockeye salmon. Historical estimates of sockeye salmon spawning escapement (sonar count minus

sport harvest above the Soldotna Bridge) were made through 1996, but no estimate was made for 1998 (Table 2). A total of 67,727 sockeye salmon were passed at the Hidden Lake weir. The late-run Russian River sockeye salmon escapement totaled 128,073 fish (Table 3).

Eighty percent of the sockeye salmon escapement passed the sonar counters in 22 d (Table 4; mean = 20 d; range for 1979-98 = 6-39 d). The midpoint of the escapement was 28 July. Peak counts occurred on 2 August when 67,820 targets were detected (Table 5). Sockeye salmon migration along the north bank of the river accounted for 55.0% of the total escapement (Table 6). There were four distinct peaks in the daily numbers of fish passing the counters (Figure 2).

Most (83.8%) of the salmon migration adjacent to the north bank was within 7.5 m of the transducer. Salmon distribution adjacent to the south bank was more shore oriented (Figure 3), with 84.6% of the counts within 3.0 m of the transducer.

Salmon passage by the north bank counter was inconsistent over the 24-h period, with 0300-1800h at or below the 4.2% for a constant passage rate, except 1200-1300h which slightly exceeded 4.2%. Passage rates 2100-0200h exceeded the 4.2% for a constant passage rate. Fish passage during the hours when fish passage exceeded the 4.2% per hour rate accounted for 40.8% of the bank total (Figure 4,5). This pattern of fish passage was more pronounced on the south bank, where 70.0% of the fish migrated past the counter during the 1400-0100 h period.

Actual fish wheel catch was 7,755 sockeye salmon (Table 7), from which 700 scale samples, sex determinations, and lengths were obtained. The largest component (40.7%) of the sockeye salmon escapement was age-1.3 fish, followed by -1.2 (27.1%) and -2.3 fish (13.9%-Table 8). Mean length by sex was within historical bounds for age-1.3 fish. Male age-1.2 fish nearly equaled the smallest (1mm difference) to appear in the historical database, but females for this age class were within historical bounds. Age-2.3 lengths were within historical bounds but were on the low end of the range (Table 9). The male-to-female ratios fell within historical bounds. Female spawners of the major age classes constituted 49.5% of the total escapement.

Age-1.3 and -2.3 sockeye salmon were bound primarily for Quartz Creek, Tern Lake, the mainstem river, and the shorelines and outlets of Kenai and Skilak Lakes. Late-run sockeye salmon bound for Russian River (above the falls) were predominantly age-2.2 (37.3%), -2.1 (35.9%), and -2.3 (17.4%) fish (Athons 1998), while those bound for Hidden Lake were predominantly (82.6%) age 1.2 (Fandrei 1998a).

Kasilof River

A total of 273,213 sockeye salmon were counted at the Kasilof River sonar site from 15 June through 8 August (Table 10). The desired escapement range for this system is 150,000-250,000 sockeye salmon. Brood stock for artificial propagation at the Crooked Creek Hatchery (9,963 fish) were taken from Bear Creek (Fandrei 1998b, Table 11). The index area spawning escapement estimate for Bear Creek was 113,500 sockeye salmon (Table 12).

The midpoint of the sockeye salmon escapement occurred on 16 July, 3 d later than the mean for the previous 19 years (range 1-22 July; Table 13). Eighty percent of the escapement occurred in 36 d, 3 d greater than the historical mean (1979-97).

Sixty-four percent of the salmon counts occurred on the south bank (Table 6). Spacial distribution adjacent to the north bank was near shore (Figure 6), where 87.0% of the salmon migrated within 6.0 m of the transducer. Fish passage on the south bank was less shore oriented (83.3% of the salmon passed within 10.8 m of the transducer).

The average hourly passage rate on the north bank exceeded the average for a consistent passage rate (4.2%) between 0200-0800 h and 1300-1900 h (except 1500 h). Targets detected during these hours accounted for 59.4% of the total. Passage rates higher than the consistent passage rate adjacent to the south bank occurred between 0600-1500 h. Salmon counted during these hours accounted for 48.2% of the south bank total. Higher passage rates occurred during the early morning and morning hours (Figure 7). There was one major peak and several lesser peaks in daily passage of fish past the counting site (Figure 2).

A total of 1,937 sockeye salmon were captured in the Kasilof River fish wheel (Table 14), of which 857 were sampled for age, length, and sex characteristics. Age-1.2 (39.7%), -1.3 (28.1%), and -2.2 (22.2%) sockeye salmon were the predominant age classes (Table 15). Mean lengths for the major age classes fell within historical bounds, but age -1.3 and -2.2 mean lengths were near the small end of the range (Table 16). Male-to-female ratios were within historical bounds. Female spawners comprised 50.5% of the sockeye salmon sampled.

Crescent River

A total of 67,476 fish targets were counted at the Crescent River sonar site from 27 June through 7 August (Table 17). Sockeye salmon escapement was estimated to have been 62,257 fish or 92.3% of the total targets (Table 18). The desired sockeye salmon escapement goal for this system is 50,000 to 100,000 fish.

The midpoint of the sockeye salmon escapement occurred on 19 July, 2 d later than the date of the historical mean. Eighty percent of the escapement passed the site in 24 d, equal to the historical mean (Table 19). The peak in daily passage also occurred on 19 July. Run timing between banks was similar, but 70% of the fish migrated along the north bank (Table 6).

Spacial distribution of fish targets was strongly shore oriented, with 97.8% of the counts within 1.2 m of the transducer on the north bank and (Figure 8) and 100% of the south bank counts within 4.0 m of the transducer. Three peaks in daily passage were observed (Figure 2). A greater than expected (4.2% of the daily total) passage rate occurred adjacent to the north bank from 1200-2200 h (Figure 5), accounting for 75.6% of the bank total. On the south bank the highest hourly passage rates occurred between 1300-2300 h (Figure 9), accounting for 66.5% of the bank total.

The Crescent River fish wheel was operated 24 h per day and captured 2,059 sockeye salmon (Table 20), of which 577 were sampled for age, length, and sex data. Age-1.3 fish were the most abundant (44.5%), with other major components of the escapement represented by age-2.3 (35.2%), and -2.2 (10.1%; Table 21) fish. Mean lengths by sex for the major age classes were within historical bounds (Table 22). The ratios of male-to-female fish were within historical bounds. Females accounted for 54.9% of the total sockeye salmon escapement.

Crescent River hourly fish passage rates peaked during the afternoon and evening hours following high tides (Figure 10), but the association with *post meridiem* high tide was not as clearly evident as in previous years.

Yentna River

From 7 July through 21 August, 310,302 salmon were counted at the Yentna River sonar site, of which an estimated 119,632 were sockeye salmon (Table 23). The escapement goal range for the Yentna River is 100,000-150,000 sockeye salmon. Sonar counts apportioned to species other than sockeye salmon were: pink salmon, 155,193; coho salmon, 24,769; chum salmon, 10,212; and chinook salmon, 505 (Table 24). Estimates of coho and chinook salmon escapements for other tributaries of the Susitna River were also made (Table 25). No estimates for pink or chum salmon were available for the Susitna River above its confluence with the Yentna River.

The midpoint of the sockeye salmon escapement occurred on 30 July, 6 d later than the date of the historical mean. Eighty percent of the escapement passed the counters in 18 d (Table 26). Run timing was not appreciably different by bank. In a departure from the historical trend, 51.1% of the salmon migrated adjacent to the south bank (Table 6).

Salmon passage was shore oriented (Figure 11). Of the salmon counted from the north bank, 93.3% were within 7.8 m of the transducer. On the south bank, 92.1% of the salmon were counted within 5.4 m of the transducer.

Fish passage rates began to increase during afternoon hours and generally remained above the 4.2% required for a constant passage rate through the early morning hours (Figure 12). The seasonal hourly passage rate on the north bank met or exceeded the average for a constant hourly passage rate (4.2%) 1300-0400 h, except 1400 h and 1900 h (Figure 5). Counts accumulated during these hours accounted for 60.7% of the north bank total. On the south bank counts exceeded the 4.2% passage rate 1400 - 0200 h. Counts accumulated during these hours accounted for 62.1% of the bank total. There were two distinct peaks in the daily numbers of fish passing the counters (Figure 2).

A total of 27,203 sockeye salmon were captured in fish wheels at Yentna Station (Tables 27 and 28), of which 1,500 were sampled for age, sex, and length data. The major components of the escapement were ages 1.3 (62.7%), 1.2 (15.7%), and 2.3 (10.5%; Table 29). Age-1.2 males were the largest, and age-1.2 females were equal to the second largest to appear in the historical range. Age-1.3 males were equal to the second smallest in the historical range. Age 1.3 females and both

sexes of the 2.3 age class were the smallest recorded. Male-to-female ratios for all age classes fell within historical bounds (Table 30). Female spawners composed 52.1% of the total sockeye salmon escapement.

Eighty percent of the pink salmon escapement occurred in 16 d, with the midpoint occurring on 28 July (Table 31). Pink salmon run duration (80%) in the Yentna River has ranged 9 to 21 d. Migratory timing has been remarkably consistent, with the midpoint occurring between 25 and 30 July in 15 of the 17 years for which data are available.

DISCUSSION

The 1998 field season and sonar counting operations were similar to past years. Counting conditions on all rivers were thought to be within design and operational tolerances of the Bendix side-scanning sonar system because: 1) salmon passage was inshore and near the bottom during the peak of the run; 2) salmon densities were generally adequate for system adjustment; and, 3) one species, sockeye salmon, composed most of the run except in the Yentna River (36.9%).

Kenai River

Species apportionment of sonar counts was discontinued in 1995 because we perceived a potential problem in the apportionment process. A disproportionate number of non-sockeye salmon species appeared in the fish wheel catch. Additionally, we consider the numbers of fish of other species as insignificant during the time sockeye salmon are being counted under normal run timing circumstances. Salmon species other than sockeye salmon composed 1.0% of the fish wheel catch in 1995 and 4.0% in 1996 (a pink salmon year). In 1997 protracted run timing caused extended counting operations, and species apportionment began on 13 August, resulting in 1.3% of the total fish targets being apportioned to species other than sockeye salmon. In 1998 apportionment of fish wheel counts began on 3 August when fish wheel catch of sockeye salmon began to decline and pink salmon began to increase. Counts apportioned to species other than sockeye accounted for 1.97% of total targets. Counts of species other than sockeye salmon are of no value as index counts as extended run duration (coho salmon) and passage upstream outside the ensonified area (coho and chinook salmon) combine to limit the usefulness of these data.

Kasilof River

Run timing, counter limitations, and spawning locations relative to the sonar site made sonar escapement estimates for Kasilof River pink, coho, and chinook salmon impractical. Coho salmon entered the river primarily in August (G. Kyle, ADF&G, Soldotna, personal communication). The proportion of pink salmon was not known, but the average historical proportion of the pink salmon in the Kasilof River escapement is 1.9% (range 0.2-6.4%). Early- and late-run chinook salmon migrated past the sonar site during the time when sockeye were counted, but no counts were

apportioned to this species. We believe that the ratio of sockeye salmon to chinook salmon captured in the fish wheel has been biased toward chinook salmon during the latter portion of the run, resulting in total chinook estimates that exceed the actual spawners passing the counting site. The error associated with apportionment of chinook salmon counts to sockeye salmon is more acceptable than an inflated chinook salmon estimate.

Crescent River

Prior to 1993, fish were collected for species composition with drifted gill nets and a fish trap. The installation of a fish wheel at Crescent River provided a larger sample size and probably reduced the degree of size selectivity inherent to the gear types formerly used. Dolly Varden char had not appeared in the catch in previous years, but appeared in the fish wheel catch in 1993 (Davis and King 1994). We determined that the char captured at Crescent River were of adequate size to meet target detection thresholds of the counters and included them in the apportionment of daily sonar counts in 1993-98. We also concluded that these fish were migratory based on morphological characteristics and results of marking all Dolly Varden char captured in 1993-95. Of the Dolly Varden char marked in 1993-95, none were recaptured. The high proportion (18.6% or 548 fish) of char in the fish wheel catch in 1994 led us to believe that the sockeye salmon escapement may have historically been overestimated. The proportion of char in 1993 (0.5%) and 1995 (0.7%) may be more indicative of the degree of historical over apportionment to sockeye salmon than the high proportion observed in 1994 (Davis and King 1994, 1995). In 1996, 3,487 sonar counts were apportioned to Dolly Varden char and chinook salmon, or 9.9% of the total. In 1997, 3,092 sonar counts were apportioned to Dolly Varden char and chinook salmon, or 3.5% of the total counts. In 1998 only 0.82% of the fish wheel catch was Dolly Varden char.

We concluded from the hourly passage rate that daily migration timing is probably related to tide stage. However, we have not observed a diurnal bimodal entry pattern into Crescent River, so some other as yet unidentified variable(s) must also be influencing fish migration at this site. We have been unable to correlate fluctuations in water level or temperature to fish entry patterns into Crescent River.

Yentna River

King and Tarbox (1990) indicated sockeye and pink salmon exhibited differential migratory behavior in the Yentna River. They found that sockeye salmon were proportionally higher in the fish wheel catch 1200-2400 h and pink salmon were more frequently captured 0600-1200 h. This observation identified a potential source of error in the use of total daily adjusted fish wheel catches to apportion sonar counts. To overcome this potential bias, fish wheels catches used to apportion sonar counts were collected by operating the fish wheels in 4 time blocks of 6 h each over a 24 h period in 1993 and 1994. We determined that the degree of bias did not justify the additional expense of operating the fish wheels in this manner, and this method of fish wheel operation was discontinued in 1995. In 1997 a second fisheries research project was begun which required fishwheel operation 24 h/d, and fish sampling schedules reverted to the 1995 strategies.

Enumeration activities ceased on the Yentna River on 7 August. Migratory timing information could not be calculated for chum and coho salmon because migration continued past that date. The range for 1981-84=69.8%-92.0% (mean 78.7%) of the chum salmon escapement and 79.6%-89.9% (mean 84.8%) of the coho salmon escapement was recorded by 12 August (King and Tarbox 1986).

LITERATURE CITED

- Barrett, Bruce M. 1985. Adult salmon investigations, Susitna hydro aquatic studies, report no. 6. Alaska Department of Fish and Game, Anchorage.
- Bendix Corporation. 1980. Installation and operation manual for side scan salmon counter (1980 model). Bendix Corporation Oceanics Division Report SP-78-017, Sylmar, California.
- Bendix Corporation. 1984. Installation and operation manual - long range side scan herring counter with rock inhibitor. Bendix Corporation Oceanics Division, Sylmar, California.
- Cross, B.A., D.R. Bernard, and S.L. Marshall. 1983. Recruits-per-spawner ratios for sockeye salmon of Upper Cook Inlet, Alaska. Alaska Department of Fish and Game, Division of Commercial Fisheries Informational Leaflet 221, Juneau.
- Davis, R. Z. 1997. Upper Cook Inlet Salmon Escapement Studies, 1997. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report No. 2A98-31, Anchorage.
- Davis, R.Z., and B.E. King. 1996. Upper Cook Inlet Salmon Escapement Studies, 1995. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report No. 2A96-13, Anchorage.
- Davis, R.Z., and B.E. King. 1995. Upper Cook Inlet Salmon Escapement Studies, 1994. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report No. 2A95-441, Anchorage.
- Davis, R.Z., and B.E. King. 1994a. Upper Cook Inlet escapement studies, 1993. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report No. 2A94-27, Anchorage.
- Davis, R.Z., and B.E. King. 1994b. Supporting data for the 1993 Upper Cook Inlet adult salmon escapement studies. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report No. 2A93-41, Anchorage.
- Davis, R.Z., and B.E. King. 1993. Supporting data for the 1992 Upper Cook Inlet adult salmon escapement studies. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 2A93-09, Anchorage.

LITERATURE CITED, continued

- Davis, R.Z., King, B.E., and K.E. Tarbox. 1993. Upper Cook Inlet salmon escapement studies, 1992. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Fisheries Report 94-15, Juneau.
- Fandrei, G. 1998a. Hidden Lake sockeye salmon enhancement progress report 1998. Cook Inlet Aquaculture Association, Soldotna, Alaska.
- Fandrei, G. 1998b. Tustumena Lake sockeye salmon project progress report 1998. Cook Inlet Aquaculture Association, Soldotna, Alaska.
- Flagg, L.B. 1986. Central Cook Inlet FRED Division 1986 annual report. Alaska Department of Fish and Game, Division of Fisheries Rehabilitation, Enhancement and Development (unpublished manuscript), Anchorage.
- Gaudet, D.M. 1983. 1981 Bendix counter manual. Alaska Department of Fish and Game, Division of Commercial Fisheries (unpublished manuscript), Juneau.
- King, B.E., and R.Z. Davis. 1992. Supporting data for the 1991 Upper Cook Inlet adult salmon escapement studies. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 2A92-28. Anchorage.
- King, B.E. 1990. Upper Cook Inlet salmon escapement studies, 1990: Backup Data. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 2S-91-4. Anchorage.
- King, B.E., Brannian, L. and K.E. Tarbox. 1990. Kenai River sockeye salmon smolt studies, 1989. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 2S90-5. Anchorage.
- King, B.E., Brannian, L.K., and Tarbox, K.E. 1991. Kenai River sockeye salmon smolt studies, 1990-91. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 2S91-8, Anchorage.
- King, B.E., and R.Z. Davis. 1989. Summary of Upper Cook Inlet historic salmon spawning information. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 2S89-2, Anchorage.

LITERATURE CITED, continued

- King, B.E, Davis, R.Z. and K.E. Tarbox. 1992. Upper Cook Inlet salmon escapement studies, 1991. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Fisheries Report No. 92-2016, Juneau.
- King, B.E., and K.E. Tarbox. 1984. Upper Cook Inlet (*Oncorhynchus* spp.) escapement studies, 1983. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Data Report 122, Juneau.
- King, B.E., and K.E. Tarbox. 1986. Upper Cook Inlet (*Oncorhynchus* spp.) escapement studies, 1985. Alaska Department of Fish and Game, Division of Commercial Fisheries, Upper Cook Inlet Data Report 86-8, Anchorage.
- King, B.E., and K.E. Tarbox. 1987. Upper Cook Inlet (*Oncorhynchus* spp.) escapement studies, 1984. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Data Report 201, Juneau.
- King, B.E., and K.E. Tarbox. 1988. Upper Cook Inlet salmon escapement studies, 1986. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Fishery Report 88-04, Juneau.
- King, B.E., and K.E. Tarbox. 1989a. Upper Cook Inlet salmon escapement studies, 1987. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Fishery Report 89-11, Juneau.
- King, B.E., and K.E. Tarbox. 1989b. Upper Cook Inlet salmon escapement studies, 1988. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Fishery Report 89-19, Juneau.
- King, B.E, Davis, R.Z. and K.E. Tarbox. 1989b. Upper Cook Inlet salmon escapement studies, 1988. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Fisheries Report 89-19, Juneau.
- King, B.E., and K.E. Tarbox. 1990. Upper Cook Inlet salmon studies, 1990. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Fishery Report 91-21. Anchorage.
- King, B.E., and K.E. Tarbox. 1991. Upper Cook Inlet salmon escapement studies, 1989. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Fishery Report 91-20, Juneau.

LITERATURE CITED, continued

- Namtvedt, T. 1974. Cook Inlet forecast and optimum escapement studies. Alaska Department of Fish and Game, Division of Commercial Fisheries, Completion Report for periods July 1, 1971 to June 30, 1974, Project No. AFC-41, December 1974, Juneau.
- Namtvedt, T.B., N.V. Friese, and D.L. Waltemyer. 1979. Cook Inlet sockeye salmon studies. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Report for the period July 1, 1977 to June 30, 1978, Anchorage.
- Tarbox, K.E., B.E. King, and D.L. Waltemyer. 1981. Kenai, Kasilof, and Crescent River sonar investigations. Alaska Department of Fish and Game, Division of Commercial Fisheries, Legislative Report, Juneau.
- Tarbox, K.E., B.E. King, and D.L. Waltemyer. 1983. Cook Inlet sockeye salmon studies. Alaska Department of Fish and Game, Division of Commercial Fisheries, Completion report for period July 1, 1977 to June 30, 1982, Anchorage.
- Thompson, S.K. 1987. Sample sizes for estimating multinomial proportions. *The American Statistician* 41:42-46.
- Tobias, T.M., and K.E. Tarbox. 1999. Abundance, age, sex and size of chinook, sockeye, coho, and chum salmon returning to Upper Cook Inlet, Alaska, in 1998. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 2A99-19, Anchorage.
- Waltemyer, D.L., T.B. Namtvedt, and B.E. King. 1980. Cook Inlet sockeye salmon studies. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Report for the period July 1, 1978 to June 30, 1979, Anchorage.
- Waltemyer, D.L. 1992. Abundance, age, sex and length of chinook, sockeye, coho, and chum salmon returning to Upper Cook Inlet, Alaska in 1990. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Fisheries Report No. 92-2008, Juneau.
- Waltemyer, D.L. 1993. Abundance, age, sex and length of chinook, sockeye, coho, and chum salmon returning to Upper Cook Inlet, Alaska in 1993. Alaska Department of Fish and Game, Commercial Fisheries Research and Development Division, Regional Information Report No. 2A94-30, Anchorage.
- Waltemyer, D.L. 1994. Abundance, age, sex and length of chinook, sockeye, coho, and chum salmon returning to Upper Cook Inlet, Alaska in 1994. Alaska Department of Fish and Game, Commercial Fisheries Research and Development Division, Regional Information Report No. 2A95-37, Anchorage.

LITERATURE CITED, continued

Whitmore, C. and Sweet, D., 1999. Area management report for recreational fisheries of northern Cook Inlet 1998. Alaska Department of Fish and Game, Division of Sport Fish, Fishery Management Report 99-1, Anchorage.

Table 1. Estimated sockeye salmon escapement recorded by side-scanning sonar in the Kenai, Kasilof, Crescent and Susitna Rivers 1978-1998.

Year	System			
	Kenai R. ^a	Kasilof R. ^b	Crescent R.	Susitna R. ^c
1978	398,900	116,600	^d	94,400
1979	285,020	152,179	86,654	156,980
1980	464,038	187,154	90,863	190,866
1981	407,639	256,625	41,213	139,401 ^e 340,232
1982	619,831	180,239	58,957	215,856 ^f 265,332 113,847 ^e
1983	630,340	210,271	92,122	112,314 175,936 ^g 104,414 ^e
1984	344,571	231,685	118,345	194,480 ^f 279,446 ^g 149,375 ^e
1985	502,820	505,049	128,628	107,124 ^e 227,924 ^e
1986	501,157	275,963	20,385 ^h	92,076 ^e
1987	1,596,871	249,250	120,219	66,054 ^e
1988	1,021,469	204,000 ⁱ	57,716	52,330 ^e
1989	1,599,959	158,206	71,064	96,269 ^e
1990	659,520	144,136	52,238	140,290 ^e
1991	647,597	238,269	44,578	109,632 ^e
1992	994,798	184,178	58,229	66,074 ^e
1993	813,617	149,939	37,556	141,694 ^e
1994	> 1,003,446	205,117	30,355	128,032 ^e
1995	630,447	204,935	52,311	121,220 ^e
1996	797,847 244,000 ^v	249,944	28,729	90,660 ^e
1997	1,064,818	266,025	70,768	157,822 ^e
1998	767,558	273,213	62,257	119,623 ^e

^a Includes counts after 22 June (1978-87) and after 1 July (1988-98).

^b Includes counts or estimates prior to 15 June (1983-88) and post enumeration estimates (1981-86).

^c Sonar counts from Susitna Station unless otherwise indicated.

^d No counts conducted.

^e Sonar counts from Yentna Station only.

^f Sonar counts from Yentna Station and east bank of the Susitna River.

^g Counts from Yentna Station and mark-recapture estimate from Sunshine Station.

^h Counts through 16 July only.

ⁱ Combined counts from wiers on Bear and Glacier Flat Creeks and surveys of remaining spawning streams.

Table 2. Late-run Kenai River sockeye salmon escapement summary 1968-1998.

Year	Estimated Escapement at Sonar Site ^a	Estimated Russian River Sport Harvest ^b	Estimated Kenai River Mainstem Sport Harvest ^c	Estimated Total Harvest Above Sonar Site ^d	Sonar Count Less Sport Harvest
1968	88,000	5,820			
1969	53,000	1,150			
1970	73,000	600			
1971	300,000	10,730			
1972	318,000	16,050			
1973	367,000	8,930			
1974	161,000	8,500	8,030	16,530	144,470
1975	142,000	8,390	5,110	13,500	128,500
1976	380,000	13,700	13,140	26,840	353,160
1977	708,000	27,440	16,933	44,373	663,627
1978	398,900	24,530	24,542	49,072	349,828
1979	285,020	26,840	12,328	39,168	245,852
1980	464,038	33,500	18,592	52,092	411,946
1981	407,639	23,720	14,450	38,170	369,469
1982	619,831	10,320	38,400	48,720	571,111
1983	630,340	16,000	48,310	64,310	566,030
1984	344,571	21,970	11,160	33,130	311,441
1985	502,820	58,410	42,272	100,682	402,138
1986	501,157	30,810	51,221	82,031	419,126
1987	1,596,871	40,575	155,799	196,374	1,400,497
1988	1,021,469	19,536	103,124	122,660	898,809
1989	1,599,959	55,210	165,340	220,550	1,379,409
1990	659,520	56,175	87,580	143,755	515,765
1991	647,597	31,449	108,271	139,720	507,877
1992	994,798	26,101	161,957	188,058	806,740
1993	813,617	26,772	60,306	87,078	726,539
1994	1,003,446	26,375	93,616	119,991	883,455
1995	630,447	11,986	98,651	110,637	519,810
1996	797,847	20,142	140,270	160,412	637,435
1997	1,064,818	17,635	105,049	122,684	942,134
1998	767,558	74,299	150,644	224,943	358,798

^a Bendix Corp. multiple transducer sonar 1968-1977, side-scanning sonar 1978-1998.

^b Based on creel census data from Sport Fish Division, Soldotna.

^c Sport Fish Division Statewide Harvest Estimate, above the Soldotna Bridge (and sonar site) only

^d Combined Russian River and mainstem (above bridge) harvests.

^e Sonar count less sport harvest reduced by 77,060 fish harvested by dip net at Hidden Creek.

Table 3. Late-run sockeye salmon escapement counts in eight index areas, Kenai River drainage 1969-1998.

Year	Railroad Creek ^b	Johnson Creek ^b	Carter- Moose Creek ^b	Ptarmigan Creek ^b	Tern (Mud) Lake ^b	Quartz Creek ^c	Hidden Lake ^d	Russian River ^a		Total Index Area Escapement
								Above Weir	Below Weir	
1969	100	75	598	5	487	487	500	28,920	1,100	32,272
1970	99	118	348	7	561	200	323	28,200	220	30,076
1971	194	160	3,201	45	1,370	808	1,958	54,430	10,000	72,166
1972	700	150	3,400		1,200		4,956	79,000	6,000	95,406
1973	521	1,714	660	1,041	1,731	3,173	690	24,970	6,690	41,190
1974		46	939	558		255	1,150	24,650	2,210	29,808
1975	522	105	1,278	186	1,214	1,068	1,375	31,970	630	38,348
1976	1,032		5,558		1,548	3,372	4,860	31,950	3,470	51,790
1977	1,262	450	6,515	1,513	2,230	3,037	1,055	21,410	17,090	54,562
1978	1,749	780	1,933	3,529	1,126	10,627	4,647	32,760	18,330	75,481
1979		588	3,986	523	1,693	277	5,762	87,920	3,920	104,669
1980	1,259	253	4,879	5,752	2,575	7,982	27,448	83,980	3,220	137,348
1981	1,276	142	4,370	1,421	3,402	5,998	15,939	44,530	4,160	81,238
1982	2,518	498	4,752	7,525	4,300	70,540	8,648	30,790	45,000	174,571
1983	1,289	338	1,819	9,709		73,345	11,297	34,040	44,000	175,837
1984	2,090	939	5,927	18,000	2,728	37,659	27,792	92,660	3,000	190,795
1985	2,884	151	5,928	26,879			24,784	136,970	8,650	206,246
1986	600	245	1,659				17,530	40,420	6,022	66,476
1987	736	74	625	14,187		45,400	43,487	53,930	76,732	235,171
1988	1,990	1,243	1,607	31,696			50,907	42,480	28,840	158,763
1989	4,959	2,276	5,958	3,484			7,770	138,320	28,480	191,247
1990			2,306	3,230			77,959	83,336	11,760	178,591
1991			750 ^e	2,764 ^e	1,750 ^f		35,676	78,175	22,267	141,382
1992			1,106 ^e	3,147 ^e	970 ^f		32,912	63,478	4,980	106,593
1993							11,582	99,259	12,258	123,099
1994				1,204			6,086	122,277	15,211	144,778
1995						2,000 ^g	7,542	61,982	12,479	84,003
1996						4,181 ^g	55,526	34,691	31,601	121,818
1997						27,660 ^g	56,053	65,905	11,337	160,955
1998						11,128 ^g	67,727	113,480	14,593	206,928

^a 1969-75, ADF&G archives, Division of Sport Fish, Anchorage. 1976-98, Marsh, L., ADF&G, Division of Sport Fish, Soldotna.

^b United States Department of Agriculture, Forest Service, Seward, Alaska (1984-92, 1994).

^c FRED Division weir count (1982-83).

^d Weir count: 1971, 1973, 1976-89 (FRED Division); 1990-96 (Cook Inlet Aquaculture Association).

^e Carter-Moose Creek survey conducted on lower 1.0 mile of creek, Ptarmigan Creek survey conducted on lower 1.5 miles of creek (1991-1992, 1994).

^f Survey conducted on an unnamed stream at eastern end of Tern (Mud) Lake.

^g CFM&D ground survey, appx. 10 miles, Qtz. Cr. substation to Kenai Lk.

Table 4. Cumulative proportion by date of sockeye salmon counts recorded in the Kenai River 1979 - 1998.

Date	Cumulative Proportion ^a																			
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
22-Jun	0.001	0.002	0.001	0.002	0.001	0.003	0.001	0.000	0.001											
23-Jun	0.003	0.004	0.001	0.003	0.001	0.007	0.002	0.002	0.002											
24-Jun	0.006	0.005	0.002	0.004	0.002	0.010	0.003	0.003	0.002											
25-Jun	0.008	0.006	0.003	0.004	0.003	0.012	0.004	0.003	0.002											
26-Jun	0.010	0.008	0.004	0.005	0.004	0.013	0.005	0.004	0.003											
27-Jun	0.012	0.008	0.006	0.006	0.005	0.015	0.006	0.004	0.004											
28-Jun	0.013	0.009	0.007	0.007	0.006	0.017	0.007	0.006	0.005											
29-Jun	0.015	0.010	0.008	0.007	0.006	0.018	0.009	0.006	0.006											
30-Jun	0.017	0.011	0.009	0.008	0.007	0.021	0.010	0.007	0.007											
01-Jul	0.019	0.012	0.010	0.009	0.007	0.023	0.014	0.008	0.007	0.000	0.000	0.001	0.001	0.003	0.004		0.000	0.001	0.003	0.002
02-Jul	0.020	0.013	0.012	0.010	0.008	0.024	0.016	0.009	0.008	0.000	0.001	0.001	0.003	0.005	0.010	0.000	0.001	0.002	0.008	0.007
03-Jul	0.023	0.014	0.012	0.011	0.008	0.025	0.017	0.010	0.008	0.001	0.001	0.003	0.004	0.008	0.013	0.001	0.001	0.003	0.014	0.010
04-Jul	0.025	0.015	0.013	0.011	0.009	0.027	0.019	0.011	0.008	0.001	0.001	0.010	0.005	0.010	0.019	0.001	0.002	0.005	0.021	0.013
05-Jul	0.030	0.016	0.013	0.012	0.009	0.029	0.021	0.012	0.009	0.001	0.002	0.019	0.012	0.011	0.037	0.002	0.003	0.007	0.029	0.017
06-Jul	0.050	0.016	0.014	0.012	0.009	0.031	0.024	0.013	0.009	0.002	0.006	0.029	0.018	0.014	0.058	0.003	0.007	0.010	0.034	0.025
07-Jul	0.067	0.017	0.016	0.013	0.010	0.032	0.026	0.014	0.009	0.003	0.011	0.036	0.019	0.015	0.061	0.007	0.011	0.012	0.037	0.033
08-Jul	0.077	0.017	0.018	0.013	0.010	0.036	0.030	0.014	0.010	0.003	0.014	0.044	0.020	0.016	0.067	0.011	0.013	0.017	0.044	0.041
09-Jul	0.082	0.018	0.064	0.015	0.011	0.044	0.032	0.015	0.010	0.003	0.017	0.049	0.022	0.018	0.081	0.013	0.016	0.019	0.047	0.052
10-Jul	0.086	0.018	0.186	0.016	0.013	0.054	0.033	0.015	0.010	0.011	0.021	0.050	0.024	0.020	0.085	0.016	0.019	0.021	0.068	0.065
11-Jul	0.089	0.019	0.262	0.016	0.017	0.063	0.036	0.015	0.010	0.063	0.024	0.052	0.028	0.022	0.087	0.019	0.021	0.025	0.117	0.071
12-Jul	0.092	0.020	0.366	0.017	0.021	0.067	0.038	0.016	0.011	0.088	0.046	0.054	0.034	0.043	0.092	0.021	0.023	0.029	0.171	0.075
13-Jul	0.095	0.020	0.463	0.019	0.041	0.071	0.039	0.018	0.015	0.141	0.100	0.057	0.037	0.111	0.101	0.023	0.025	0.032	0.233	0.078
14-Jul	0.100	0.021	0.512	0.021	0.085	0.073	0.048	0.039	0.017	0.185	0.162	0.060	0.038	0.175	0.210	0.025	0.032	0.065	0.292	0.083
15-Jul	0.126	0.027	0.549	0.026	0.174	0.076	0.066	0.051	0.033	0.222	0.211	0.064	0.041	0.202	0.301	0.032	0.062	0.213	0.309	0.088
16-Jul	0.170	0.057	0.559	0.047	0.242	0.112	0.104	0.061	0.043	0.274	0.242	0.068	0.046	0.218	0.400	0.062	0.073	0.347	0.346	0.102
17-Jul	0.238	0.310	0.572	0.067	0.297	0.173	0.111	0.073	0.052	0.303	0.290	0.138	0.058	0.229	0.485	0.073	0.122	0.402	0.416	0.150
18-Jul	0.342	0.489	0.605	0.182	0.437	0.307	0.114	0.086	0.058	0.340	0.347	0.279	0.086	0.246	0.517	0.122	0.164	0.435	0.495	0.183
19-Jul	0.504	0.607	0.667	0.322	0.566	0.363	0.115	0.102	0.069	0.375	0.367	0.344	0.136	0.255	0.533	0.164	0.190	0.468	0.501	0.209
20-Jul	0.670	0.777	0.747	0.474	0.695	0.406	0.116	0.113	0.141	0.409	0.421	0.400	0.194	0.284	0.557	0.190	0.232	0.498	0.522	0.231
21-Jul	0.795	0.899	0.803	0.563	0.766	0.464	0.120	0.174	0.235	0.464	0.500	0.457	0.225	0.334	0.582	0.232	0.269	0.531	0.542	0.246
22-Jul	0.840	0.920	0.835	0.598	0.796	0.555	0.178	0.269	0.319	0.569	0.566	0.473	0.261	0.370	0.599	0.269	0.298	0.555	0.552	0.272
23-Jul	0.872	0.926	0.848	0.642	0.813	0.652	0.291	0.322	0.406	0.679	0.639	0.518	0.308	0.402	0.612	0.298	0.343	0.592	0.583	0.333
24-Jul	0.888	0.932	0.864	0.681	0.833	0.720	0.463	0.382	0.488	0.744	0.679	0.576	0.376	0.451	0.624	0.343	0.399	0.640	0.648	0.392
25-Jul	0.913	0.935	0.876	0.722	0.844	0.781	0.574	0.471	0.570	0.785	0.698	0.675	0.424	0.535	0.635	0.399	0.420	0.713	0.659	0.434
26-Jul	0.925	0.938	0.894	0.752	0.861	0.833	0.693	0.618	0.640	0.812	0.729	0.719	0.477	0.612	0.670	0.420	0.428	0.755	0.666	0.460
27-Jul	0.931	0.944	0.911	0.842	0.865	0.867	0.753	0.730	0.694	0.827	0.774	0.729	0.546	0.678	0.720	0.428	0.432	0.774	0.670	0.490
28-Jul	0.934	0.947	0.921	0.883	0.872	0.897	0.822	0.783	0.740	0.836	0.806	0.744	0.637	0.740	0.748	0.432	0.440	0.786	0.674	0.544
29-Jul	0.939	0.952	0.932	0.903	0.878	0.913	0.864	0.816	0.766	0.844	0.831	0.796	0.711	0.798	0.773	0.440	0.450	0.794	0.681	0.602

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Table 4. (p. 2 of 2)

Date	Cumulative Proportion ^a																			
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
30-Jul	0.945	0.955	0.940	0.918	0.882	0.921	0.897	0.862	0.790	0.847	0.846	0.846	0.772	0.830	0.795	0.450	0.469	0.801	0.688	0.644
31-Jul	0.950	0.957	0.948	0.931	0.891	0.928	0.911	0.897	0.831	0.850	0.856	0.867	0.838	0.843	0.814	0.469	0.525	0.825	0.694	0.694
01-Aug	0.953	0.960	0.955	0.940	0.906	0.933	0.919	1.000	0.871	0.854	0.875	0.879	0.885	0.854	0.827	0.525	0.620	0.854	0.698	0.766
02-Aug	0.955	0.962	0.964	0.946	0.916	0.937	0.922		0.899	0.859	0.888	0.896	0.912	0.864	0.845	0.620	0.673	0.877	0.701	0.855
03-Aug	0.958	0.964	1.000	0.951	0.920	0.943	0.925		0.917	0.863	0.899	0.932	0.927	0.871	0.858	0.673	0.696	0.898	0.705	0.871
04-Aug	0.961	0.966		0.955	0.934	0.948	0.929		0.930	0.873	0.908	0.963	0.934	0.877	0.866	0.696	0.713	0.916	0.708	0.882
05-Aug	0.965	0.968		1.000	0.964	0.956	0.931		0.943	0.894	0.916	0.978	0.939	0.888	0.879	0.713	0.728	0.928	0.712	0.894
06-Aug	0.968	0.970			0.977	0.960	0.935		0.953	0.914	0.930	0.991	0.946	0.903	0.908	0.728	0.740	0.938	0.724	0.914
07-Aug	0.971	0.972			0.983	0.963	0.938		0.962	0.933	0.949	1.000	0.953	0.915	0.927	0.740	0.748	0.953	0.737	0.929
08-Aug	0.973	0.974			0.989	0.969	0.943		0.967	0.944	0.960		0.967	0.930	0.938	0.748	0.757	0.967	0.758	0.943
09-Aug	0.977	0.975			0.993	1.000	0.947		0.972	0.953	0.966		0.979	0.942	0.959	0.757	0.771	0.982	0.774	0.953
10-Aug	0.981	0.978			0.996		0.953		0.979	1.000	0.974		0.988	0.955	0.970	0.771	0.791	0.991	0.784	0.962
11-Aug	0.987	0.982			0.999		0.960		0.985		0.985		0.995	0.969	0.979	0.791	0.814	1.000	0.805	0.974
12-Aug	0.993	0.985			1.000		1.000		0.988		0.990		1.000	0.981	0.989	0.814	0.835		0.821	0.986
13-Aug	0.995	0.992							0.991		0.994			1.000	1.000	0.835	0.857		0.841	1.000
14-Aug	0.996	0.993							0.998		0.998					0.857	0.874		0.856	
15-Aug	1.000	0.993							1.000		1.000					0.874	0.896		0.868	
16-Aug		0.995														0.896	0.914		0.877	
17-Aug		0.996														0.914	0.926		0.893	
18-Aug		0.997														0.926	0.942		0.906	
19-Aug		0.997														0.942	0.963		0.919	
21-Aug		0.997														0.963	0.977		0.932	
21-Aug		0.998														0.977	0.985		0.944	
22-Aug		0.998														0.985	0.992		0.956	
23-Aug		0.999														0.992	1.000		0.970	
24-Aug		0.999														1.000			0.985	
25-Aug		0.999																	1.000	
26-Aug		0.999																		
27-Aug		0.999																		
28-Aug		1.000																		
Midpoint	19-Jul	19-Jul	14-Jul	21-Jul	19-Jul	10-Jul	25-Jul	26-Jul	25-Jul	22-Jul	21-Jul	23-Jul	27-Jul	25-Jul	18-Jul	01-Aug	31-Jul	21-Jul	19-Jul	28-Jul
No. days for 80% ^b	12	6	18	12	18	14	16	12	14	25	23	18	15	25	26	31	31	21	39	22

^aProportion accrued on last day (1981, 1982, 1984-1986, 1988) represents that portion of the escapement estimated to have entered the river after termination of counting operations.

^bInclusive dates: date proportion of escapement reached 10% through date proportion of escapement reached 90%.

Table 5. Estimated salmon escapement into the Kenai River, 1 July through 13 August 1998.
 Species composition of daily sonar counts based on fish wheel catches.

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
01-Jul	1,774	1,774	0	0	0	0	0	0
02-Jul	3,218	4,992	0	0	0	0	0	0
03-Jul	2,682	7,674	0	0	0	0	0	0
04-Jul	2,534	10,208	0	0	0	0	0	0
05-Jul	3,060	13,268	0	0	0	0	0	0
06-Jul	5,862	19,130	0	0	0	0	0	0
07-Jul	6,211	25,341	0	0	0	0	0	0
08-Jul	6,010	31,351	0	0	0	0	0	0
09-Jul	8,522	39,873	0	0	0	0	0	0
10-Jul	10,043	49,916	0	0	0	0	0	0
11-Jul	4,486	54,402	0	0	0	0	0	0
12-Jul	2,860	57,262	0	0	0	0	0	0
13-Jul	2,957	60,219	0	0	0	0	0	0
14-Jul	3,218	63,437	0	0	0	0	0	0
15-Jul	4,486	67,923	0	0	0	0	0	0
16-Jul	10,526	78,449	0	0	0	0	0	0
17-Jul	36,451	114,900	0	0	0	0	0	0
18-Jul	25,763	140,663	0	0	0	0	0	0
19-Jul	19,585	160,248	0	0	0	0	0	0
20-Jul	17,387	177,635	0	0	0	0	0	0
21-Jul	11,534	189,169	0	0	0	0	0	0
22-Jul	19,659	208,828	0	0	0	0	0	0
23-Jul	46,831	255,659	0	0	0	0	0	0
24-Jul	45,226	300,885	0	0	0	0	0	0
25-Jul	31,950	332,835	0	0	0	0	0	0
26-Jul	20,069	352,904	0	0	0	0	0	0
27-Jul	22,954	375,858	0	0	0	0	0	0
28-Jul	41,313	417,171	0	0	0	0	0	0
29-Jul	44,618	461,789	0	0	0	0	0	0
30-Jul	32,295	494,084	0	0	0	0	0	0
31-Jul	38,698	532,782	0	0	0	0	0	0
01-Aug	55,400	588,182	0	0	0	0	0	0
02-Aug	67,820	656,002	0	0	0	0	0	0
03-Aug	12,762	668,764	711	711	210	210	79	79
04-Aug	8,463	677,227	613	1,324	423	633	102	181
05-Aug	8,612	685,839	624	1,948	430	1,063	104	285
06-Aug	15,442	701,281	1,119	3,067	772	1,835	186	471
07-Aug	11,783	713,064	1,536	4,603	392	2,227	122	593
08-Aug	10,597	723,661	959	5,562	402	2,629	0	593
09-Aug	7,481	731,142	530	6,092	149	2,778	40	633

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Table 5 (p. 2 of 2)

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
10-Aug	7,293	738,435	626	6,718	190	2,968	87	720
11-Aug	9,404	747,839	700	7,418	204	3,172	18	738
12-Aug	8,607	756,446	1,311	8,729	227	3,399	46	784
13-Aug	11,112	767,558	1,856	10,585	298	3,697	50	834

Table 6. Distribution of sockeye salmon escapement by bank recorded by side-scanning sonar in the Kenai, Kasilof, Crescent, and Yentna Rivers 1979-1998.

Year	Kenai River		Kasilof River		Crescent River		Yentna River	
	North Bank	South Bank	North Bank	South Bank	North Bank	South Bank	North Bank	South Bank
1979	72	28	53	47				
1980	61	39	52	48	49	51		
1981	72	28	69	31	57	43		
1982	39	61	73	27	54	46		
1983	42	58	51	49	39	61		
1984	65	35	56	44	71	28		
1985	54	46	70	30	70	30	9	91
1986	62	38	57	43	84	16	32	68
1987	48	52	55	45	64	36	10	90
1988	47	53	32	68	53	47	8	92
1989	57	43	39	61	52	48	12	88
1990	62	38	29	71	44	56	2	98
1991	73	27	39	61	33	67	8	92
1992	60	40	45	55	56	44	5	95
1993	49	51	28	72	41	56	14	86
1994	52	48	47	53	65	35	8	92
1995	52	48	38	62	68	32	11	89
1996	54	46	61	39	68	32	21	79
1997	56	44	41	59	79	21	11	89
1998	55	45	36	64	70	30	49	51

Table 7. Daily fish wheel catch by species for the north bank of the Kenai River, 2 July through 13 August 1998.^a

Date	Hours open	Sockeye		Pink		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
02-Jul	15.75	8	8	0	0	0	0	0	0
03-Jul	10.00	23	31	0	0	0	0	0	0
04-Jul	8.50	19	50	0	0	0	0	0	0
05-Jul	7.25	23	73	0	0	0	0	0	0
06-Jul	7.00	4	77	0	0	0	0	0	0
07-Jul	5.00	57	134	0	0	0	0	0	0
08-Jul	13.75	35	169	0	0	0	0	1	1
09-Jul	13.50	23	192	1	1	0	0	0	1
10-Jul	10.50	62	254	3	4	0	0	1	2
11-Jul	10.00	97	351	0	4	0	0	4	6
12-Jul	15.00	30	381	2	6	0	0	0	6
13-Jul	13.25	19	400	1	7	0	0	0	6
14-Jul	14.50	21	421	1	8	0	0	1	7
15-Jul	10.50	29	450	0	8	0	0	1	8
16-Jul	8.00	72	522	1	9	0	0	3	11
17-Jul	7.75	339	861	2	11	0	0	2	13
18-Jul	1.00	124	985	0	11	0	0	1	14
19-Jul	5.25	174	1,159	2	13	1	1	1	15
20-Jul	3.00	146	1,305	0	13	0	1	0	15
21-Jul	6.75	93	1,398	0	13	0	1	1	16
22-Jul	3.50	51	1,449	1	14	0	1	1	17
23-Jul	1.50	336	1,785	1	15	4	5	0	17
24-Jul	1.25	214	1,999	0	15	2	7	0	17
25-Jul	0.50	70	2,069	0	15	0	7	0	17
26-Jul	4.00	123	2,192	0	15	1	8	0	17
27-Jul	1.00	83	2,275	0	15	1	9	0	17
28-Jul	1.75	133	2,408	0	15	7	16	0	17
29-Jul	4.00	500	2,908	13	28	3	19	0	17
30-Jul	8.25	770	3,678	6	34	7	26	0	17
31-Jul	2.75	484	4,168	4	38	3	29	0	17
01-Aug	3.00	900	5,068	3	41	5	34	0	17
02-Aug	2.25	668	5,736	3	44	7	41	0	17
03-Aug	9.00	182	5,918	10	54	3	44	1	18
04-Aug	5.00	14	5,932	1	55	1	45	1	19
05-Aug	10.50	58	5,990	8	63	2	47	1	20
06-Aug	6.25	99	6,089	5	68	5	52	0	20
07-Aug	12.50	146	6,235	20	88	6	58	3	23
08-Aug	14.50	278	6,513	18	106	13	71	0	23
09-Aug	11.50	222	6,735	8	114	4	75	2	25
10-Aug	14.75	226	6,961	14	128	6	81	4	29
11-Aug	15.50	393	7,354	15	143	8	89	1	30
12-Aug	15.25	91	7,445	7	150	4	93	0	30
13-Aug	15.75	310	7,755	23	173	6	99	4	34

^a Fish wheel catch adjusted for 24 h: (daily catch*24 h) / hours open. Adjusted catch by species: 53,012 sockeye salmon; 484 pink salmon; 523 coho salmon; 101 chinook salmon; 478 Dolly Varden char; 141 rainbow trout and 19 white fish.

Table 8. Age composition of sockeye salmon collected in the Kenai River 1970-1998.

Year	Percentage Composition by Age Class ^{a,b,c}								Sample Size
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	Other	
1970	tr	10.0	17.0	tr	26.0	25.0	15.0	6.0	225
1971	0.0	8.0	39.0	1.0	3.0	38.0	11.0	0.0	168
1972	0.0	21.0	34.0	0.0	0.0	23.0	20.0	0.0	403
1973	0.0	5.0	68.0	1.0	1.0	8.0	16.0	0.0	632
1974	2.0	18.0	46.0	0.0	3.0	18.0	12.0	0.0	295
1975	2.0	10.0	36.0	2.0	4.0	31.0	14.0	1.0	162
1976	1.0	46.0	20.0	0.0	2.0	22.0	8.0	1.0	948
1977	0.0	6.0	76.0	1.0	tr	7.0	10.0	0.0	1,265
1978	0.0	2.5	86.7	0.0	0.0	4.9	5.4	tr	811
1979	tr	20.2	61.1	0.0	0.0	11.8	6.2	tr	601
1980	0.0	27.7	45.1	0.0	0.0	16.2	10.1	tr	715
1981	0.0	16.2	70.9	0.0	0.0	8.1	4.8	0.0	1,757
1982	0.1	5.8	87.5	tr	0.0	2.9	3.7	0.0	1,787
1983	0.4	8.2	79.1	0.2	0.5	2.2	8.9	0.4	1,765
1984	0.2	23.4	38.2	3.5	6.0	12.8	19.2	2.2	2,364
1985	0.1	15.9	56.4	0.3	0.1	14.7	11.4	1.1	2,201
1986	0.0	31.8	39.5	0.7	0.3	8.2	18.0	1.5	789
1987	0.0	12.8	78.4	0.1	0.0	3.2	5.2	0.3	745
1988	0.3	11.6	74.2	0.4	0.2	3.1	10.2	0.1	1,420
1989	0.1	9.1	75.3	1.0	0.5	4.1	9.7	0.2	2,275
1990	0.6	21.6	41.4	0.6	0.3	13.7	21.1	0.8	1,513
1991	0.2	48.2	31.6	0.1	0.5	5.7	11.4	2.7	2,504
1992	0.0	2.9	79.4	tr	tr	6.1	11.0	tr	1,338
1993	0.3	12.2	30.5	2.6	6.3	6.4	41.2	0.5	2,088
1994	0.3	6.6	61.1	0.8	0.8	17.8	12.1	0.5	1,341
1995	0.3	31.9	26.4	0.4	2.4	6.6	31.3	0.7	712
1996	0.0	10.8	75.4	0.3	0.7	6.1	5.4	1.1	684
1997	0.1	7.6	75.2	0.4	0.4	2.8	13.0	0.5	963
1998	0.3	27.1	40.7	1.3	6.6	9.6	13.9	0.5	700

^a Percentages weighted by total numbers in the escapement: 1978 (Bethe et al. 1980), 1978-1982, 1984-1998.

^b 1978-1997 from Waltemyer, ADF&G, Soldotna.

^c 1998 from Tobias, ADF&G, Soldotna.

Table 9. Length composition of the major age classes of sockeye salmon collected in the Kenai River 1980-1998. Length measured from mid-eye to fork-of-tail.^{a, b}

Year	Age Class	Male			Female			Ratio Male-Female	
		Ave Length (mm)	Stndrd Error	Sample Size	Ave Length (mm)	Stndrd Error	Sample Size		
1980	1.2	482	4	168	494	4	100	1.7:1	
1981		493	6	85	513	6	73	1.2:1	
1982		483	9	70	505	13	32	2.2:1	
1983		524	9	25	520	6	30	0.8:1	
1984		474	3	280	473	4	196	1.4:1	
1985		492	3	184	490	3	186	1.0:1	
1986		488	4	155	492	6	96	1.6:1	
1987		514	8	39	503	5	56	0.7:1	
1988		522	8	79	511	4	84	0.9:1	
1989		493	6	114	494	4	92	1.2:1	
1990		474	0	168	478	0	127	1.3:1	
1991		488	2	613	497	13	577	1.1:1	
1993		474	4	123	481	4	132	0.9:1	
1994		452	5	46	462	6	42	1.1:1	
1995		492	4	116	487	4	111	1.0:1	
1996		507	8	47	519	5	27	1.7:1	
1998		483	4	95	494	3	95	1.0:1	
1980		1.3	580	3	180	561	2	192	0.9:1
1981			590	2	290	569	1	430	0.7:1
1982	596		2	723	572	1	841	0.9:1	
1983	598		2	215	577	1	269	0.8:1	
1984	582		2	385	559	1	395	1.0:1	
1985	575		2	496	552	1	824	0.6:1	
1986	584		3	112	564	2	200	0.6:1	
1987	605		2	183	586	1	401	0.5:1	
1988	598		1	428	572	2	624	0.7:1	
1989	600		1	831	575	1	881	0.9:1	
1990	586		0	358	559	0	318	1.1:1	
1991	561		2	357	539	1	441	0.8:1	
1992	572		2	370	547	1	714	0.5:1	
1993	583		2	247	556	2	390	0.6:1	
1994	579		2	367	552	1	452	0.8:1	
1995	584		3	81	564	2	107	0.8:1	
1996	607		2	243	589	1	273	0.9:1	
1997	593		2	327	582	1	352	0.9:1	
1998	577		2	146	547	2	139	1.1:1	
1984	2.2	505	4	116	508	3	159	0.7:1	
1985		513	4	132	513	3	196	0.7:1	
1994		481	4	67	488	2	171	0.4:1	
1998		501	8	28	507	4	39	0.7:1	

-continued-

Table 9 (p. 2 of 2)

Year	Age Class	Male			Female			Ratio Male-Female
		Ave Length (mm)	Stndrd Error	Sample Size	Ave Length (mm)	Stndrd Error	Sample Size	
1980	2.3	589	3	67	579	3	80	0.8:1
1982		598	5	46	580	8	21	2.2:1
1983		595	4	25	582	4	36	0.7:1
1984		570	2	210	557	2	192	1.1:1
1985		570	3	106	555	2	129	0.8:1
1986		585	5	52	568	3	89	0.6:1
1988		596	3	53	577	3	92	0.6:1
1989		600	3	112	579	2	108	1.0:1
1990		589	0	177	568	0	132	1.3:1
1991		572	2	153	543	3	139	1.1:1
1992		569	4	46	546	2	88	0.5:1
1993		583	2	357	560	1	503	0.7:1
1994		578	4	73	551	3	89	0.8:1
1995		588	3	114	569	3	109	1.1:1
1997		600	4	52	576	4	73	0.7:1
1998		574	4	48	559	3	49	1.0:1

^a 1980-1997 from Waltemyer, ADF&G, Soldotna.

^b 1998 from Tobias, ADF&G, Soldotna.

Table 10. Estimated sockeye salmon escapement into the Kasilof River, 15 June through 8 August 1998.

Date	Daily	Cum	Date	Daily	Cum
15-Jun	296	296	13-Jul	3,650	127,139
16-Jun	432	728	14-Jul	2,492	129,631
17-Jun	775	1,503	15-Jul	5,828	135,459
18-Jun	2,905	4,408	16-Jul	7,252	142,711
19-Jun	3,489	7,897	17-Jul	13,973	156,684
20-Jun	1,882	9,779	18-Jul	8,165	164,849
21-Jun	3,413	13,192	19-Jul	10,574	175,423
22-Jun	4,560	17,752	20-Jul	7,931	183,354
23-Jun	4,667	22,419	21-Jul	4,460	187,814
24-Jun	3,238	25,657	22-Jul	6,871	194,685
25-Jun	3,589	29,246	23-Jul	7,422	202,107
26-Jun	4,565	33,811	24-Jul	9,095	211,202
27-Jun	7,776	41,587	25-Jul	7,123	218,325
28-Jun	7,752	49,339	26-Jul	5,671	223,996
29-Jun	8,700	58,039	27-Jul	5,252	229,248
30-Jun	3,238	61,277	28-Jul	8,528	237,776
1-Jul	7,528	68,805	29-Jul	6,137	243,913
2-Jul	6,551	75,356	30-Jul	5,615	249,528
3-Jul	3,749	79,105	31-Jul	6,677	256,205
4-Jul	2,043	81,148	1-Aug	6,029	262,234
5-Jul	6,683	87,831	2-Aug	2,369	264,603
6-Jul	8,482	96,313	3-Aug	1,448	266,051
7-Jul	3,369	99,682	4-Aug	1,596	267,647
8-Jul	5,539	105,221	5-Aug	2,165	269,812
9-Jul	7,165	112,386	6-Aug	1,300	271,112
10-Jul	7,302	119,688	7-Aug	1,248	272,360
11-Jul	2,059	121,747	8-Aug	853	273,213
12-Jul	1,742	123,489			

Table 11. Kasilof River sockeye salmon escapement estimates 1968-1998.

Year	Escapement Estimated by Sonar Count ^a	Fish used for Artificial Propagation of Tustumena Lake ^b	Sonar Count Less Egg Take ^c
1968	89,000		
1969	46,000		
1970	38,000		
1971			
1972	113,000		
1973	40,000		
1974	70,000	205	69,795
1975	48,000	3,365	44,635
1976	139,000	5,463	133,537
1977	155,300	1,794	153,506
1978	116,600	6,681	109,919
1979	152,179	3,024	149,155
1980	187,154	6,030	181,124
1980	256,625	9,700	246,925
1982	180,239	11,571	168,668
1983	210,271	9,903	200,368
1984	231,685	11,141	220,544
1985	505,049	11,280	493,769
1986	275,963	11,952	264,011
1987	249,246	9,865	239,381
1988	> 204,000 ^d 151,856	9,387	195,000
1989	158,206	7,367	150,839
1990	144,136	6,831	137,305
1991	238,269	8,850	229,419
1992	184,178	6,550	177,628
1993	149,939	9,098	140,841
1994	205,117	13,596 ^e	191,521
1995	204,935	12,416	192,519
1996	249,944	11,724 ^f	238,220
1997	266,025	8,289	257,736
1998	273,558	9,963	263,595

^a Multiple transducer sonar counts rounded to the nearest thousand (1968-1978) from Namtvedt et al. (1979).

^b From Cross et al. (1983): 1974-1980; FRED Div., Soldotna, Ak. files: 1981-1992; Fandrei, Cook Inlet Aquaculture Association: 1993-1998.

^c Considered estimate of natural spawners above sonar site.

^d Combined counts from weirs on Bear and Glacier Flat Creeks and surveys of spawning streams.

^e Includes 290 fish not used for artificial propagation of Tustumena Lake, Fandrei (1995).

^f Includes 550 fish not used for artificial propagation of Tustumena Lake, Fandrei (1996).

Table 12. Peak sockeye salmon escapement counts in seven index areas, Kasilof River drainage 1975-1998.

Year	Nikolai Creek ^a	Crystal Creek ^a	Clear Creek ^a	Glacier Flat Creek ^b	Seepage Creek ^a	Moose Creek ^a	Bear Creek ^b	Total Index Count ^c
1975	5,700	400	300	14,400	3,700	3,300	27,700	55,500
1976	12,000	800	300	7,100	800	14,000	51,800	86,800
1977	29,100	600	1,800	5,800	800	16,600	58,000	112,700
1978	34,200	200	200	4,700	1,100	15,900	43,400	99,700
1979	19,100	500	400	5,600	800	8,100	35,900	70,400
1980	10,000	1,000	2,100	15,500	1,800	15,600	125,000	171,000
1981	36,000	860	2,978	40,071	3,376	12,968	75,117	171,370
1982	16,800	1,785	4,183	17,348	1,638	13,400	51,350	106,504
1983	17,100	1,657	860	38,776	3,305	19,245	61,957	142,900
1984	8,270	141	2,619	76,217	6,250	13,999	54,328	161,824
1985 ^d	17,500	800	3,500	121,400	5,700	9,200	120,400	278,500
1986 ^d	11,900	1,400	2,700	60,600	2,000	21,200	102,900	202,700
1987	9,002	1,385	7,704	61,000	791	17,601	71,250	168,733
1988	10,841	593	5,809	40,015	1,387	17,727	127,532	203,904
1989	4,818	1,033	559	20,156	940	17,058	62,941	107,505
1990	7,474	879	220	14,355	1,217	18,800	46,300	89,245
1991	21,582	391	1,223	12,068	1,661	18,105	68,880	123,910
1992	10,145	1,105	1,979	9,144	349	15,235	44,100	82,057
1993							36,002	36,002
1994	63,723			13,347 ^e			39,100	116,170
1995							29,017	29,017
1996							58,692	58,692
1997							81,989	81,989
1998							113,500	113,500

^a Commercial Fisheries Division stream survey counts (1975-85); FRED Division stream survey counts (1982-92); U.S. Biological Service weir count (Nikolai Creek 1994).

^b FRED Division weir count, 1980-90, 1992. 1991 count is result of foot survey. 1993-98 counts are results of foot and aerial surveys and weir count, Cook Inlet Aquaculture Association, Gary Fandrei (personal communication).

^c Counts standardized to common unit for years when entire stream not surveyed.

^d Flagg (1986). Numbers rounded to nearest 100 fish.

^e U.S. Biological Service weir count (Glacier Flat Creek 1994). 1994 Glacier Flat Creek count includes 10,347 sockeye salmon passed through the weir and an estimated 3,000 sockeye salmon spawning downstream of the weir.

Table 13. Cumulative proportion by date of salmon counts recorded in the Kasilof River 1979-1998.

Date	Cumulative Proportion ^{a, b}																				
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
14-May			0.000																		
15-May			0.001																		
16-May			0.003																		
17-May			0.003																		
18-May			0.005																		
19-May			0.006																		
20-May			0.006																		
21-May			0.007																		
22-May			0.008																		
23-May	0.000		0.008																		
24-May	0.003		0.010																		
25-May	0.004		0.011																		
26-May	0.006		0.012																		
27-May	0.008		0.013																		
28-May	0.009		0.014																		
29-May	0.011		0.015																		
30-May	0.014		0.016																		
31-May	0.017		0.018																		
01-Jun	0.020		0.020																		
02-Jun	0.023		0.022																		
03-Jun	0.026		0.025																		
04-Jun	0.030		0.027																		
05-Jun	0.034		0.030																		
06-Jun	0.036		0.032																		
07-Jun	0.037		0.035																		
08-Jun	0.039		0.038																		
09-Jun	0.040		0.040			0.007															
10-Jun	0.041		0.043	0.001	0.045	0.008															
11-Jun	0.041		0.045	0.003	0.046	0.009															
12-Jun	0.042		0.047	0.005	0.048	0.011	0.002	0.037	0.044						0.011	0.000					
13-Jun	0.043		0.049	0.007	0.050	0.012	0.003	0.041	0.051						0.026	0.002					
14-Jun	0.044		0.051	0.008	0.051	0.013	0.003	0.045	0.062	0.009					0.043	0.004				0.003	
15-Jun	0.044		0.055	0.010	0.053	0.015	0.004	0.048	0.073	0.014	0.001	0.002	0.002	0.004	0.052	0.007	0.001	0.003	0.007	0.001	
16-Jun	0.045		0.059	0.011	0.056	0.018	0.004	0.053	0.091	0.018	0.002	0.004	0.009	0.014	0.064	0.010	0.002	0.007	0.013	0.003	
17-Jun	0.046		0.064	0.013	0.058	0.020	0.005	0.059	0.106	0.021	0.004	0.006	0.015	0.020	0.074	0.014	0.004	0.016	0.026	0.006	
18-Jun	0.048		0.075	0.015	0.060	0.022	0.005	0.062	0.120	0.025	0.006	0.008	0.019	0.031	0.090	0.017	0.006	0.023	0.039	0.016	
19-Jun	0.049		0.082	0.027	0.063	0.025	0.006	0.066	0.146	0.028	0.007	0.009	0.026	0.038	0.103	0.020	0.010	0.033	0.061	0.029	
20-Jun	0.051		0.099	0.035	0.065	0.031	0.007	0.068	0.171	0.032	0.011	0.010	0.033	0.050	0.118	0.025	0.016	0.047	0.098	0.036	
21-Jun	0.054		0.114	0.040	0.068	0.039	0.007	0.071	0.190	0.038	0.014	0.012	0.044	0.064	0.132	0.029	0.024	0.055	0.125	0.048	
22-Jun	0.060	0.003	0.133	0.043	0.070	0.048	0.008	0.073	0.198	0.046	0.016	0.014	0.056	0.082	0.143	0.034	0.032	0.079	0.141	0.065	

- Continued -

Table 13. (p. 2 of 3)

Date	Cumulative Proportion ^{a, b}																			
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
23-Jun	0.066	0.007	0.162	0.045	0.074	0.058	0.009	0.074	0.201	0.053	0.019	0.015	0.070	0.101	0.154	0.039	0.040	0.111	0.157	0.082
24-Jun	0.077	0.009	0.195	0.049	0.076	0.069	0.012	0.075	0.206	0.065	0.021	0.017	0.085	0.125	0.179	0.047	0.047	0.145	0.184	0.094
25-Jun	0.093	0.022	0.223	0.053	0.078	0.075	0.015	0.077	0.212	0.077	0.024	0.019	0.096	0.146	0.217	0.058	0.059	0.162	0.227	0.107
26-Jun	0.108	0.035	0.261	0.055	0.080	0.080	0.017	0.079	0.218	0.089	0.031	0.022	0.110	0.174	0.257	0.071	0.071	0.181	0.276	0.124
27-Jun	0.125	0.051	0.288	0.058	0.082	0.089	0.019	0.082	0.222	0.105	0.037	0.025	0.135	0.215	0.293	0.094	0.088	0.227	0.321	0.152
28-Jun	0.153	0.075	0.342	0.061	0.085	0.099	0.022	0.085	0.227	0.133	0.046	0.030	0.171	0.250	0.317	0.129	0.120	0.295	0.337	0.181
29-Jun	0.169	0.094	0.389	0.064	0.090	0.111	0.025	0.095	0.238	0.157	0.057	0.037	0.204	0.290	0.330	0.172	0.166	0.318	0.360	0.212
30-Jun	0.196	0.136	0.438	0.069	0.110	0.123	0.029	0.121	0.249	0.173	0.074	0.051	0.238	0.323	0.357	0.220	0.196	0.346	0.392	0.224
01-Jul	0.229	0.166	0.500	0.078	0.153	0.136	0.035	0.153	0.267	0.184	0.098	0.065	0.259	0.338	0.386	0.250	0.216	0.381	0.412	0.252
02-Jul	0.248	0.217	0.512	0.091	0.165	0.150	0.039	0.180	0.297	0.189	0.153	0.076	0.275	0.349	0.419	0.256	0.229	0.386	0.454	0.276
03-Jul	0.281	0.250	0.522	0.104	0.188	0.157	0.044	0.198	0.317	0.196	0.178	0.091	0.293	0.372	0.429	0.282	0.241	0.389	0.468	0.290
04-Jul	0.325	0.280	0.529	0.115	0.212	0.178	0.056	0.215	0.334	0.224	0.183	0.120	0.338	0.377	0.441	0.322	0.248	0.399	0.513	0.297
05-Jul	0.374	0.314	0.534	0.122	0.221	0.217	0.066	0.228	0.357	0.235	0.225	0.158	0.385	0.394	0.459	0.333	0.265	0.438	0.521	0.321
06-Jul	0.404	0.338	0.543	0.129	0.231	0.243	0.071	0.245	0.385	0.255	0.277	0.193	0.400	0.414	0.467	0.375	0.293	0.452	0.526	0.353
07-Jul	0.458	0.353	0.551	0.136	0.240	0.263	0.078	0.257	0.403	0.306	0.321	0.209	0.406	0.419	0.496	0.437	0.315	0.475	0.544	0.365
08-Jul	0.473	0.366	0.562	0.145	0.247	0.304	0.095	0.261	0.422	0.329	0.346	0.235	0.417	0.428	0.537	0.483	0.322	0.496	0.548	0.385
09-Jul	0.496	0.379	0.604	0.156	0.263	0.358	0.103	0.269	0.438	0.382	0.378	0.254	0.431	0.439	0.548	0.501	0.335	0.499	0.556	0.411
10-Jul	0.509	0.393	0.649	0.164	0.294	0.391	0.114	0.289	0.450	0.457	0.404	0.258	0.450	0.453	0.558	0.535	0.355	0.507	0.566	0.438
11-Jul	0.519	0.413	0.677	0.177	0.315	0.411	0.119	0.323	0.456	0.507	0.431	0.267	0.477	0.462	0.571	0.545	0.359	0.524	0.582	0.446
12-Jul	0.532	0.421	0.712	0.197	0.344	0.416	0.126	0.337	0.481	0.567	0.488	0.281	0.488	0.522	0.590	0.552	0.365	0.528	0.598	0.452
13-Jul	0.550	0.426	0.746	0.217	0.395	0.427	0.148	0.430	0.508	0.600	0.500	0.294	0.490	0.586	0.680	0.565	0.373	0.538	0.617	0.465
14-Jul	0.579	0.436	0.797	0.247	0.465	0.445	0.208	0.501	0.520	0.614	0.514	0.303	0.492	0.598	0.707	0.584	0.387	0.650	0.624	0.474
15-Jul	0.629	0.464	0.838	0.293	0.514	0.484	0.267	0.513	0.587	0.659	0.532	0.317	0.508	0.608	0.748	0.623	0.395	0.710	0.630	0.496
16-Jul	0.643	0.528	0.863	0.358	0.547	0.543	0.382	0.528	0.600	0.676	0.566	0.350	0.523	0.616	0.792	0.636	0.487	0.721	0.643	0.522
17-Jul	0.674	0.570	0.877	0.404	0.663	0.590	0.418	0.544	0.608	0.691	0.615	0.498	0.546	0.629	0.804	0.679	0.618	0.728	0.673	0.573
18-Jul	0.703	0.609	0.891	0.491	0.759	0.636	0.432	0.562	0.619	0.703	0.629	0.602	0.615	0.645	0.816	0.711	0.641	0.737	0.682	0.603
19-Jul	0.730	0.649	0.904	0.577	0.775	0.693	0.436	0.575	0.699	0.723	0.648	0.623	0.649	0.665	0.828	0.732	0.667	0.758	0.689	0.642
20-Jul	0.755	0.693	0.922	0.642	0.785	0.739	0.439	0.586	0.731	0.770	0.711	0.664	0.661	0.705	0.839	0.750	0.688	0.777	0.696	0.671
21-Jul	0.767	0.715	0.936	0.702	0.804	0.778	0.464	0.601	0.765	0.857	0.747	0.676	0.679	0.725	0.849	0.763	0.704	0.790	0.700	0.687
22-Jul	0.781	0.738	0.942	0.744	0.822	0.810	0.551	0.611	0.809	0.921	0.768	0.687	0.710	0.740	0.857	0.771	0.753	0.806	0.707	0.713
23-Jul	0.848	0.775	0.947	0.759	0.833	0.832	0.609	0.618	0.851	0.929	0.806	0.706	0.751	0.770	0.877	0.778	0.807	0.823	0.727	0.740
24-Jul	0.860	0.788	0.952	0.769	0.842	0.864	0.649	0.627	0.873	0.935	0.816	0.723	0.781	0.844	0.892	0.789	0.868	0.850	0.741	0.773
25-Jul	0.875	0.803	0.954	0.784	0.849	0.888	0.683	0.717	0.888	0.939	0.824	0.754	0.813	0.890	0.909	0.799	0.883	0.875	0.750	0.799
26-Jul	0.896	0.818	0.957	0.800	0.854	0.910	0.733	0.795	0.897	0.943	0.840	0.776	0.849	0.933	0.921	0.806	0.898	0.883	0.756	0.820
27-Jul	0.910	0.830	0.959	0.818	0.858	0.918	0.791	0.806	0.906	0.948	0.850	0.790	0.881	0.962	0.930	0.813	0.919	0.890	0.763	0.839
28-Jul	0.930	0.840	0.962	0.836	0.862	0.926	0.826	0.812	0.916	0.953	0.860	0.808	0.914	0.971	0.946	0.826	0.927	0.896	0.773	0.870
29-Jul	0.941	0.853	0.963	0.847	0.867	0.933	0.842	0.829	0.925	0.958	0.869	0.836	0.935	0.977	0.958	0.846	0.934	0.900	0.781	0.893
30-Jul	0.947	0.864	0.964	0.857	0.874	0.939	0.853	0.888	0.939	0.961	0.877	0.856	0.947	0.983	0.969	0.868	0.939	0.904	0.793	0.913
31-Jul	0.954	0.878	0.966	0.866	0.889	0.943	0.865	0.917	0.962	0.965	0.885	0.872	0.956	0.989	0.974	0.892	0.945	0.907	0.802	0.938
01-Aug	0.957	0.889	1.000	0.876	1.000	1.000	0.875	1.000	0.975	0.969	0.892	0.885	0.960	0.994	0.979	0.928	0.950	0.923	0.810	0.960

-Continued-

Table 13. (p. 3 of 3)

Date	Cumulative Proportion ^{a, b}																			
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
02-Aug	0.963	0.900		0.886			0.881		0.982	0.973	0.898	0.901	0.966	1.000	0.987	0.943	0.956	0.938	0.820	0.968
03-Aug	0.966	0.906		0.895			0.890		0.986	0.977	0.905	0.916	0.973		0.992	0.952	0.969	0.952	0.829	0.974
04-Aug	0.969	0.915		1.000			0.898		0.990	0.983	0.916	0.924	0.978		0.996	0.959	0.984	0.969	0.836	0.980
05-Aug	0.980	0.925					0.904		0.994	0.990	0.927	0.933	0.981		1.000	0.966	0.988	0.979	0.850	0.988
06-Aug	0.983	0.932					0.909		0.997	0.993	0.943	0.941	0.987			0.972	0.993	0.984	0.872	0.992
07-Aug	0.986	0.939					0.917		1.000	0.997	0.958	0.946	0.994			0.977	1.000	0.992	0.896	0.997
08-Aug	0.989	0.946					0.927			1.000	0.963	0.953	1.000			0.981		1.000	0.925	1.000
09-Aug	0.991	0.961					0.938				0.969	0.963				0.987			0.945	
10-Aug	0.994	0.968					0.945				0.976	0.972				0.994			0.962	
11-Aug	0.998	0.979					0.949				0.982	0.977				1.000			0.984	
12-Aug	1.000	0.988					1.000				0.986	0.984							1.000	
13-Aug		1.000									0.990	0.989								
14-Aug											0.996	0.995								
15-Aug											1.000	1.000								
Midpoint	10-Jul	16-Jul	01-Jul	19-Jul	15-Jul	16-Jul	22-Jul	14-Jul	13-Jul	11-Jul	13-Jul	18-Jul	15-Jul	12-Jul	08-Jul	09-Jul	14-Jul	10-Jul	04-Jul	16-Jul
No. days for 80% ^c	32	34	29	32	33	28	28	32	41	26	33	29	33	34	37	35	30	30	49	36

^a Proportion for first day (1983-1988) represents that portion of the escapement estimated to have passed the counting site prior to start of counting operations.

^b Proportion for last date (1981-1986) represents that portion of the escapement estimated to have entered the river after termination of counting operations.

^c Inclusive dates: date proportion of escapement reached 10% through date proportion of escapement reached 90%.

Table 14. Daily fish wheel catch by species for the north bank of the Kaslof River, 15 June through 9 August 1998.

Date	Hours open	Sockeye		Pink		Coho		Chinook ³	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
15-Jun	4.0	0	0	0	0	0	0	0	0
16-Jun	4.0	0	0	0	0	0	0	0	0
17-Jun	4.0	0	0	0	0	0	0	0	0
18-Jun	5.7	3	3	0	0	0	0	0	0
19-Jun	4.0	8	11	0	0	0	0	1	1
20-Jun	12.8	27	38	0	0	0	0	0	1
21-Jun	9.2	37	75	0	0	0	0	0	1
22-Jun	14.8	23	98	0	0	0	0	1	2
23-Jun	5.8	40	138	0	0	0	0	0	2
24-Jun	6.3	22	160	0	0	0	0	0	2
25-Jun	10.9	49	209	0	0	0	0	0	2
26-Jun	7.0	35	244	0	0	0	0	0	2
27-Jun	4.0	43	287	0	0	0	0	1	3
28-Jun	4.6	29	316	0	0	0	0	0	3
29-Jun	3.4	132	448	0	0	0	0	0	3
30-Jun	6.2	77	525	0	0	0	0	1	4
01-Jul	5.0	73	598	0	0	0	0	0	4
02-Jul	4.2	152	750	2	2	0	0	0	4
03-Jul	3.7	65	815	0	2	0	0	0	4
04-Jul	6.2	23	838	0	2	0	0	5	9
05-Jul	0.3	8	846	0	2	0	0	0	9
06-Jul	4.9	110	956	2	4	0	0	0	9
07-Jul	3.1	69	1,025	0	4	0	0	1	10
08-Jul	5.2	51	1,076	0	4	1	1	1	11
09-Jul	5.8	17	1,093	0	4	0	1	1	12
10-Jul	24.2	15	1,108	1	5	1	2	2	14
11-Jul	8.4	54	1,162	3	8	0	2	0	14
12-Jul	9.2	29	1,191	0	8	0	2	1	15
13-Jul	5.3	45	1,236	0	8	0	2	0	15
14-Jul	5.0	78	1,314	0	8	0	2	0	15
15-Jul	14.0	61	1,375	0	8	0	2	0	15
16-Jul	12.3	19	1,394	0	8	0	2	2	17
17-Jul	12.4	41	1,435	0	8	0	2	1	18
18-Jul	7.3	60	1,495	0	8	0	2	0	18
19-Jul	18.3	34	1,529	1	9	0	2	2	20
20-Jul	14.3	21	1,550	1	10	0	2	3	23
21-Jul	7.5	28	1,578	2	12	0	2	1	24
22-Jul	6.7	9	1,587	0	12	0	2	0	24
23-Jul	4.6	7	1,594	0	12	0	2	0	24
24-Jul	5.6	16	1,610	0	12	0	2	3	27
25-Jul	5.3	69	1,679	1	13	0	2	3	30
26-Jul	5.2	13	1,692	0	13	0	2	1	31
27-Jul	5.3	20	1,712	0	13	0	2	2	33
28-Jul	5.2	15	1,727	0	13	0	2	2	35
29-Jul	16.3	19	1,746	1	14	0	2	4	39
30-Jul	11.2	22	1,768	1	15	0	2	0	39
31-Jul	15.0	6	1,774	2	17	0	2	0	39
01-Aug	0.0	0	1,774	0	17	0	2	0	39
02-Aug	21.3	17	1,791	0	17	0	2	3	42
03-Aug	0.0	0	1,791	0	17	0	2	0	42
04-Aug	19.4	34	1,825	1	18	0	2	1	43
05-Aug	0.0	0	1,825	0	18	0	2	0	43
06-Aug	17.7	20	1,845	0	18	0	2	2	45
07-Aug	20.5	43	1,888	0	18	2	4	2	47
08-Aug	13.0	33	1,921	0	18	0	4	0	47
09-Aug	7.8	16	1,937	0	18	0	4	0	47

³ Other fish wheel captures included 5 Dolly Varden char.

Table 15. Age composition of sockeye salmon collected in the Kaslof River 1969-1998.

Year	Percentage Composition by Age Class ^{a, b, c}								Sample Size
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	Other	
1969	0.0	14.0	39.0	1.0	0.0	30.0	16.0	0.0	399
1970	tr	2.0	37.0	2.0	0.0	16.0	11.0	2.0	297
1971	0.0	6.0	69.0	0.0	0.0	8.0	16.0	1.0	153
1972	tr	42.0	36.0	1.0	tr	3.0	18.0	0.0	668
1973	0.0	20.0	57.0	0.0	0.0	19.0	4.0	0.0	374
1974	0.0	35.0	59.0	0.0	tr	4.0	2.0	0.0	254
1975	1.0	29.0	7.0	0.0	0.0	58.0	4.0	1.0	931
1976	tr	32.0	20.0	0.0	tr	35.0	12.0	1.0	755
1977	tr	30.0	30.0	0.0	1.0	28.0	11.0	0.0	1,209
1978	0.0	42.0	35.0	0.0	0.0	14.0	9.0	0.0	967
1979	0.0	52.2	37.2	0.0	tr	8.4	1.7	0.5	590
1980	0.0	58.7	27.8	0.0	0.0	8.0	4.5	1.0	988
1981	0.0	30.2	62.2	0.0	0.0	6.0	1.6	0.0	1,479
1982	1.0	34.0	49.5	0.0	0.1	10.7	4.7	0.0	1,518
1983	0.0	48.4	34.3	0.0	0.0	12.8	4.5	0.0	1,997
1984	0.0	50.5	24.8	tr	0.2	17.9	6.6	0.0	2,269
1985	0.2	57.3	21.8	0.1	0.1	17.8	2.6	0.1	3,063
1986	0.0	40.9	42.0	0.3	0.1	11.9	4.6	0.2	1,660
1987		43.4	27.4	0.0	0.1	22.4	6.4	0.3	1,248
1988	0.9	37.5	32.9	0.1	0.1	18.6	10.6	0.2	2,282
1989	0.2	44.0	46.3	0.2	0.0	5.2	4.2	0.0	1,216
1990	0.4	32.9	20.7	0.3	0.0	33.2	12.4	0.3	762
1991	0.0	31.5	33.4	0.1	0.1	29.0	5.8	0.1	2,106
1992	0.0	21.2	27.6	0.0	0.2	35.0	15.9	0.0	1,717
1993	0.4	16.3	29.8	0.0	0.4	28.0	25.2	0.0	571
1994	0.0	26.0	28.3	0.0	0.0	28.6	17.2	0.0	697
1995	0.2	44.0	15.5	0.0	0.0	25.0	15.3	0.0	587
1996	0.0	24.8	48.3	0.0	0.0	21.4	5.6	0.0	721
1997	0.0	21.1	54.8	0.0	0.0	13.5	10.7	0.0	758
1998	0.1	39.7	28.1	0.4	0.6	22.2	8.9	0.0	857

^a Percentages weighted by total numbers in the escapement: 1979-1998.

^b 1978-1997 from Waltemyer, ADF&G, Soldotna.

^c 1998 from Tobias, ADF&G, Soldotna.

Table 16. Length composition of the major age classes of sockeye salmon collected in the Kasilof River 1980-1998.
 Length measured from mid-eye to fork-of-tail.^{a, b}

Year	Age Class	Male			Female			Ratio Male-Female
		Ave Length ^a (mm)	Stndrd Error	Sample Size	Ave Length ^a (mm)	Stndrd Error	Sample Size	
1980	1.2	474	2	189	464	1	376	0.5:1
1981		503	2	241	492	3	146	1.7:1
1982		481	2	285	466	2	235	1.2:1
1983		493	2	113	491	3	78	1.4:1
1984		480	1	544	478	1	428	2.6:1
1985		474	1	723	472	1	897	0.8:1
1986		482	2	266	482	1	368	0.7:1
1987		472	2	282	470	2	257	1.1:1
1988		480	1	353	477	1	480	0.7:1
1989		481	2	245	480	2	290	0.8:1
1990		462	0	139	458	0	91	1.5:1
1991		467	2	326	461	2	305	1.1:1
1992		467	2	184	466	2	212	0.9:1
1993		479	4	40	479	3	53	0.8:1
1994		465	2	90	465	2	91	1.0:1
1995		491	2	117	483	2	141	0.8:1
1996		476	3	94	475	3	85	1.1:1
1997		456	4	80	452	3	80	1.0:1
1998		475	2	178	468	2	162	1.1:1
1980	1.3	531	7	35	516	2	115	0.3:1
1981		566	1	422	558	1	369	1.1:1
1982		549	1	377	542	1	428	0.9:1
1983		558	2	170	547	2	187	0.9:1
1984		539	1	304	533	1	383	0.8:1
1985		531	2	341	527	1	433	0.8:1
1986		550	2	342	543	1	405	0.8:1
1987		553	2	191	552	2	154	1.2:1
1988		550	1	311	543	1	382	0.8:1
1989		550	2	266	542	2	296	0.9:1
1990		518	0	81	523	0	106	0.8:1
1991		531	1	418	518	1	335	1.3:1
1992		536	2	195	527	2	197	1.0:1
1993		550	3	101	542	3	69	1.5:1
1994		538	3	98	530	3	99	1.1:1
1995		542	5	42	534	3	49	0.9:1
1996		566	2	213	556	2	135	1.6:1
1997		555	2	223	541	2	192	1.2:1
1998		527	3	110	525	2	131	0.8:1

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Table 16 (p. 2 of 2)

Year	Age Class	Male			Female			Ratio Male-Female	
		Ave Length ^a (mm)	Stndrd Error	Sample Size	Ave Length ^a (mm)	Stndrd Error	Sample Size		
1982	2.2	479	3	65	472	3	81	0.8:1	
1984		484	2	202	482	1	223	0.9:1	
1985		482	2	248	476	1	319	0.8:1	
1986		492	4	78	489	2	115	0.7:1	
1987		478	2	137	475	2	141	1.0:1	
1988		486	2	173	479	1	220	0.8:1	
1990		453	0	104	457	0	111	0.9:1	
1991		471	2	289	480	11	301	1.0:1	
1992		464	2	264	464	1	427	0.6:1	
1993		486	3	58	480	2	102	0.7:1	
1994		469	2	97	468	2	102	1.0:1	
1995		492	3	61	485	2	86	0.7:1	
1996		482	3	69	472	2	85	0.8:1	
1997		459	4	47	450	3	55	0.9:1	
1998		473	2	95	469	3	95	1.0:1	
1982		2.3	548	4	41	543	4	40	1.0:1
1984			533	3	102	526	3	80	1.3:1
1988			544	2	104	543	2	115	0.9:1
1990	514		0	63	529	0	61	1.0:1	
1991	516		4	61	514	3	64	1.0:1	
1992	534		3	112	532	2	122	0.9:1	
1993	542		3	66	533	3	78	0.8:1	
1994	545		4	49	529	3	71	0.7:1	
1995	546		4	42	536	3	48	0.9:1	
1997	546	6	39	526	5	42	0.9:1		

^a1980-1997 from Waltemyer, ADF&G, Soldotna.

^b1998 from Tobias, ADF&G, Soldotna.

Table 17. Estimated salmon escapement into the Crescent River 1979-1998.

Date	Sockeye	Pink	Chum	Coho	Other ^a	Total
1979	86,654	3,685	95		122	90,556
1980	90,863					90,863
1981	41,213	376			199	41,788
1982	58,957	111				59,068
1983	92,122	221				92,343
1984	118,345		4,880	538		123,763
1985	128,628	984	505	850		130,967
1986	20,385					20,385
1987	120,219	2,044	7,258	552	552	130,625
1988	57,716	85	3,362	245	549	61,957
1989	71,064	354	4,392		151	75,961
1990	52,238	219	7,677	73	21	60,228
1991	44,578	322	6,080	83		51,063
1992	58,241	738	6,892	303	171	66,345
1993	37,556	1,976	1,872		1,619	43,023
1994	30,355	657	2,939	73	7,771	41,795
1995	52,311	1,938	4,583	554	4,691	64,077
1996	28,729	250	2,821	52	3,487	35,339
1997	70,768	12,428	1,559		3,092	87,847
1998	62,257	1,376	2,439	261	1,143	67,476

^a 1993-98 counts represent combined chinook salmon and Dolly Varden char.

Table 18. Estimated salmon escapment into the Crescent River, 27 June through 7 August 1998. Species composition of daily sonar counts based on fish wheel catches.

Date	Sockeye		Pink		Chum		Coho		Other	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
27-Jun	579	579	0	0	0	0	0	0	4	4
28-Jun	414	993	0	0	0	0	0	0	2	6
29-Jun	370	1,363	0	0	0	0	0	0	2	8
30-Jun	553	1,916	0	0	0	0	0	0	3	11
1-Jul	220	2,136	0	0	0	0	0	0	1	12
2-Jul	241	2,377	0	0	0	0	0	0	2	14
3-Jul	127	2,504	0	0	0	0	0	0	0	14
4-Jul	157	2,661	0	0	0	0	0	0	1	15
5-Jul	78	2,739	0	0	0	0	0	0	0	15
6-Jul	55	2,794	0	0	0	0	0	0	0	15
7-Jul	685	3,479	0	0	0	0	0	0	4	19
8-Jul	1,742	5,221	0	0	0	0	0	0	11	30
9-Jul	3,634	8,855	0	0	22	22	0	0	22	52
10-Jul	3,366	12,221	0	0	21	43	0	0	20	72
11-Jul	2,530	14,751	70	70	0	43	0	0	119	191
12-Jul	2,193	16,944	60	130	0	43	0	0	103	294
13-Jul	1,333	18,277	35	165	0	43	0	0	64	358
14-Jul	1,617	19,894	43	208	0	43	0	0	77	435
15-Jul	1,754	21,648	63	271	0	43	0	0	31	466
16-Jul	2,588	24,236	92	363	0	43	0	0	46	512
17-Jul	2,810	27,046	99	462	0	43	0	0	50	562
18-Jul	3,279	30,325	54	516	0	43	0	0	18	580
19-Jul	3,651	33,976	59	575	0	43	0	0	20	600
20-Jul	2,781	36,757	46	621	0	43	0	0	15	615
21-Jul	995	37,752	6	627	20	63	0	0	59	674
22-Jul	993	38,745	6	633	20	83	0	0	59	733
23-Jul	3,583	42,328	0	633	48	131	0	0	25	758
24-Jul	2,115	44,443	0	633	29	160	0	0	14	772
25-Jul	763	45,206	28	661	46	206	11	11	34	806
26-Jul	1,003	46,209	38	699	59	265	15	26	45	851
27-Jul	1,679	47,888	62	761	100	365	24	50	75	926
28-Jul	987	48,875	37	798	58	423	15	65	43	969
29-Jul	2,094	50,969	77	875	125	548	31	96	93	1,062
30-Jul	2,121	53,090	87	962	209	757	0	96	0	1,062
31-Jul	2,311	55,401	94	1,056	229	986	0	96	0	1,062
1-Aug	1,794	57,195	73	1,129	177	1,163	0	96	0	1,062
2-Aug	942	58,137	45	1,174	238	1,401	31	127	15	1,077
3-Aug	926	59,063	45	1,219	233	1,634	30	157	15	1,092
4-Aug	828	59,891	40	1,259	208	1,842	28	185	13	1,105
5-Aug	909	60,800	46	1,305	229	2,071	29	214	15	1,120
6-Aug	852	61,652	41	1,346	215	2,286	27	241	14	1,134
7-Aug	605	62,257	30	1,376	153	2,439	20	261	9	1,143

Table 19. Cumulative proportion by date of sockeye salmon counts recorded in the Crescent River 1984 - 1998.

Date	Cumulative Proportion ^a														
	1984	1985	1986 ^b	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
15-Jun	0.000	0.000													
16-Jun	0.001	0.000													
17-Jun	0.002	0.000													
18-Jun	0.003	0.000													
19-Jun	0.003	0.000													
20-Jun	0.005	0.001													
21-Jun	0.008	0.001													
22-Jun	0.012	0.001											0.001		
23-Jun	0.017	0.001											0.006		
24-Jun	0.020	0.001											0.008	0.004	
25-Jun	0.024	0.001	0.000							0.010			0.011	0.014	
26-Jun	0.027	0.001	0.000				0.003	0.002		0.019			0.012	0.020	
27-Jun	0.036	0.002	0.000				0.007	0.004		0.022			0.013	0.029	0.009
28-Jun	0.041	0.002	0.001				0.013	0.006		0.031	0.001	0.000	0.015	0.037	0.016
29-Jun	0.049	0.005	0.005				0.021	0.010		0.034	0.002	0.000	0.018	0.049	0.022
30-Jun	0.069	0.007	0.008				0.025	0.013		0.038	0.008	0.002	0.036	0.058	0.031
01-Jul	0.081	0.008	0.017	0.012	0.008	0.008	0.034	0.017	0.045	0.056	0.012	0.002	0.060	0.067	0.034
02-Jul	0.100	0.012	0.031	0.016	0.038	0.020	0.055	0.031	0.072	0.061	0.015	0.003	0.074	0.091	0.038
03-Jul	0.118	0.016	0.054	0.020	0.149	0.043	0.065	0.033	0.096	0.077	0.017	0.006	0.087	0.153	0.040
04-Jul	0.140	0.057	0.077	0.023	0.223	0.096	0.077	0.040	0.115	0.183	0.028	0.010	0.105	0.188	0.043
05-Jul	0.156	0.138	0.084	0.027	0.269	0.129	0.098	0.061	0.138	0.239	0.035	0.012	0.129	0.214	0.044
06-Jul	0.170	0.188	0.084	0.058	0.338	0.181	0.128	0.063	0.153	0.246	0.044	0.022	0.148	0.239	0.045
07-Jul	0.184	0.196	0.110	0.084	0.404	0.231	0.141	0.064	0.159	0.258	0.061	0.029	0.161	0.267	0.056
08-Jul	0.225	0.226	0.126	0.112	0.488	0.293	0.155	0.079	0.173	0.273	0.086	0.052	0.174	0.300	0.084
09-Jul	0.268	0.251	0.134	0.160	0.554	0.334	0.184	0.090	0.192	0.297	0.092	0.082	0.181	0.348	0.142
10-Jul	0.322	0.274	0.144	0.193	0.581	0.369	0.207	0.092	0.212	0.314	0.103	0.106	0.189	0.429	0.196
11-Jul	0.360	0.293	0.154	0.243	0.598	0.412	0.264	0.100	0.243	0.353	0.132	0.132	0.197	0.500	0.237
12-Jul	0.387	0.319	0.165	0.269	0.625	0.463	0.286	0.131	0.292	0.386	0.170	0.169	0.202	0.550	0.272
13-Jul	0.409	0.364	0.184	0.305	0.655	0.502	0.299	0.143	0.335	0.423	0.214	0.204	0.262	0.581	0.294
14-Jul	0.425	0.388	0.197	0.333	0.688	0.502	0.321	0.188	0.379	0.501	0.251	0.250	0.391	0.606	0.320
15-Jul	0.454	0.415	0.204	0.370	0.692	0.518	0.345	0.245	0.424	0.580	0.276	0.281	0.471	0.625	0.348
16-Jul	0.499	0.445	0.213	0.386	0.697	0.611	0.393	0.292	0.463	0.642	0.295	0.317	0.513	0.654	0.389
17-Jul	0.548	0.480		0.406	0.717	0.674	0.472	0.355	0.512	0.685	0.368	0.364	0.551	0.691	0.434
18-Jul	0.599	0.506		0.448	0.748	0.691	0.540	0.425	0.539	0.723	0.395	0.400	0.595	0.719	0.487
19-Jul	0.639	0.525		0.513	0.771	0.710	0.574	0.461	0.573	0.752	0.425	0.417	0.653	0.734	0.546
20-Jul	0.684	0.546		0.548	0.781	0.750	0.610	0.497	0.610	0.772	0.453	0.440	0.692	0.747	0.590
21-Jul	0.721	0.573		0.593	0.808	0.776	0.653	0.524	0.653	0.797	0.460	0.494	0.729	0.759	0.606
22-Jul	0.743	0.596		0.671	0.828	0.804	0.705	0.582	0.701	0.821	0.487	0.598	0.746	0.774	0.622
23-Jul	0.783	0.632		0.773	0.853	0.829	0.742	0.649	0.772	0.845	0.542	0.660	0.757	0.793	0.680
24-Jul	0.802	0.665		0.819	0.885	0.855	0.762	0.688	0.831	0.865	0.581	0.692	0.775	0.814	0.714
25-Jul	0.813	0.698		0.856	0.917	0.884	0.801	0.718	0.877	0.883	0.602	0.725	0.812	0.833	0.726
26-Jul	0.824	0.729		0.877	0.941	0.907	0.839	0.753	0.898	0.908	0.624	0.756	0.864	0.847	0.742
27-Jul	0.838	0.756		0.893	0.959	0.930	0.864	0.801	0.912	0.925	0.665	0.778	0.893	0.865	0.769
28-Jul	0.852	0.775		0.905	0.965	0.958	0.880	0.836	0.928	0.942	0.696	0.803	0.910	0.885	0.785
29-Jul	0.870	0.794		0.915	0.976	0.968	0.896	0.866	0.948	0.953	0.727	0.834	0.924	0.901	0.819
30-Jul	0.882	0.821		0.920	0.989	0.978	0.933	0.885	0.960	0.969	0.766	0.883	0.948	0.926	0.853
31-Jul	0.893	1.000		0.938	1.000	0.994	0.956	0.916	0.974	0.981	0.827	0.897	0.965	0.944	0.890

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Table 19. (p. 2 of 2)

Date	Cumulative Proportion ^a														
	1984	1985	1986 ^b	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
01-Aug	1.000			0.960		1.000	0.973	0.966	0.987	0.990	0.875	0.907	0.985	0.959	0.919
02-Aug				0.975			0.986	0.978	1.000	1.000	0.914	0.915	1.000	0.972	0.934
03-Aug				0.985			0.993	0.984			0.928	0.939		0.983	0.949
04-Aug				0.994			1.000	0.987			0.949	0.964		0.991	0.962
05-Aug				0.996				0.992			0.975	0.980		1.000	0.977
06-Aug				1.000				0.996			0.983	0.987			0.990
07-Aug								1.000			0.989	0.993			1.000
08-Aug											1.000	1.000			
Midpoint	17-Jul	18-Jul		19-Jul	09-Jul	15-Jul	18-Jul	21-Jul	17-Jul	14-Jul	23-Jul	22-Jul	16-Jun	11-Jul	19-Jul
No. days for 80% ^c	31+	26+		21	23	22	25	21	23	23	24	23	22	27	24

^a Proportion accrued on last day (1984-1986, 1988) represents that portion of the escapement estimated to have entered the river after termination of counting operations.

^b Enumeration activities terminated on 16 July 1986. Estimated proportions from King and Tarbox (1988).

^c Inclusive dates: date proportion of escapement reached 10% through date proportion of escapement reached 90%.

Table 20. Daily fish wheel catch by species for the Crescent River, 27 June through 7 August 1998.

Date	Hours open	Sockeye		Pink		Chum		Coho		Chinook		Dolly Varden	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
27-Jun	24.0	4	4	0	0	0	0	0	0	0	0	0	0
28-Jun	24.0	7	11	0	0	0	0	0	0	0	0	0	0
29-Jun	24.0	15	26	0	0	0	0	0	0	0	0	0	0
30-Jun	24.0	15	41	0	0	0	0	0	0	0	0	0	0
01-Jul	24.0	5	46	0	0	0	0	0	0	0	0	0	0
02-Jul	24.0	14	60	0	0	0	0	0	0	0	0	0	0
03-Jul	24.0	1	61	0	0	0	0	0	0	0	0	0	0
04-Jul	24.0	3	64	0	0	0	0	0	0	0	0	0	0
05-Jul	24.0	3	67	0	0	0	0	0	0	0	0	0	0
06-Jul	24.0	10	77	0	0	0	0	0	0	0	0	0	0
07-Jul	24.0	25	102	0	0	0	0	0	0	0	0	0	0
08-Jul	24.0	62	164	0	0	0	0	0	0	1	1	0	0
09-Jul	24.0	564	728	0	0	4	4	0	0	4	5	0	0
10-Jul	24.0	102	830	0	0	0	4	0	0	0	5	0	0
11-Jul	24.0	44	874	0	0	0	4	0	0	2	7	0	0
12-Jul	24.0	28	902	0	0	0	4	0	0	0	7	0	0
13-Jul	24.0	35	937	2	2	0	4	0	0	0	7	0	0
14-Jul	24.0	41	978	2	4	0	4	0	0	4	11	1	1
15-Jul	24.0	52	1,030	2	6	0	4	0	0	2	13	0	1
16-Jul	24.0	60	1,090	2	8	0	4	0	0	1	14	0	1
17-Jul	24.0	57	1,147	2	10	0	4	0	0	0	14	0	1
18-Jul	24.0	84	1,231	2	12	0	4	0	0	0	14	0	1
19-Jul	24.0	56	1,287	0	12	0	4	0	0	0	14	1	2
20-Jul	24.0	43	1,330	1	13	0	4	0	0	0	14	0	2
21-Jul	24.0	83	1,414	1	14	1	5	0	0	1	15	3	5
22-Jul	24.0	68	1,482	0	14	2	7	0	0	1	16	4	9
23-Jul	24.0	96	1,578	0	14	1	8	0	0	0	16	1	10
24-Jul	24.0	51	1,629	0	14	1	9	0	0	0	16	0	10
25-Jul	24.0	35	1,664	0	14	2	11	0	0	0	16	1	11
26-Jul	24.0	25	1,689	0	14	0	11	0	0	0	16	1	12
27-Jul	24.0	23	1,712	2	16	3	14	1	1	0	16	2	14
28-Jul	24.0	21	1,733	1	17	1	15	1	2	0	16	1	15
29-Jul	24.0	31	1,764	2	19	2	17	0	2	0	16	1	16
30-Jul	24.0	41	1,805	4	23	4	21	0	2	0	16	0	16
31-Jul	24.0	66	1,871	1	24	8	29	0	2	0	16	0	16
01-Aug	24.0	65	1,936	2	26	5	34	0	2	0	16	0	16
02-Aug	24.0	43	1,979	2	28	3	37	1	3	0	16	1	17
03-Aug	24.0	22	2,001	2	30	3	40	0	3	0	16	0	17
04-Aug	24.0	19	2,020	0	30	2	42	0	3	0	16	0	17
05-Aug	24.0	13	2,033	1	31	8	50	1	4	0	16	1	18
06-Aug	24.0	14	2,047	0	31	7	57	1	5	0	16	0	18
07-Aug	24.0	12	2,059	1	32	8	65	1	6	0	16	0	18

Table 21. Age composition of sockeye salmon collected in the Crescent River 1979-1998.

Year	Percentage Composition by Age Class ^{a, b, c}								Sample Size
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	Other	
1979	tr	27.8	70.1	0.0	0.0	tr	tr	tr	643
1980	0.0	6.5	86.9	0.0	0.0	2.9	1.6	2.1	511
1981	0.0	8.2	32.1	0.0	0.0	9.6	49.9	tr	1,117
1982	0.0	12.9	79.2	0.1	0.0	0.8	7.0	0.0	711
1983	0.0	10.9	42.2	0.2	0.7	27.4	18.6	0.0	731
1984	0.0	3.5	16.9	0.0	0.0	20.0	59.4	tr	780
1985	0.2	4.7	31.3	0.0	0.3	20.5	43.0	0.0	594
1986	0.0	6.5	15.8	0.0	0.0	13.0	64.0	0.7	139
1987	0.0	2.6	47.7	0.0	0.0	4.2	45.0	0.5	191
1988	0.0	10.4	44.9	0.5	0.1	17.8	26.1	0.1	741
1989	0.0	2.6	84.2	0.6	0.0	0.6	15.0	0.1	728
1990	0.0	3.7	48.5	0.4	0.1	3.5	43.2	0.5	591
1991	0.0	14.9	50.4	0.3	0.0	16.8	16.5	1.1	357
1992	0.0	2.6	21.7	0.0	0.0	12.4	61.9	1.6	194
1993	0.2	8.8	37.2	0.0	0.9	5.8	46.9	0.2	465
1994	0.2	6.6	49.6	0.4	0.4	12.3	30.5	0.2	547
1995	0.4	9.2	18.4	0.6	0.2	9.4	61.7	0.2	543
1996	0.0	15.2	25.4	0.0	0.0	22.9	35.0	0.5	394
1997	0.0	10.6	56.0	0.0	0.2	6.6	26.6	0.0	640
1998	0.0	9.9	44.5	0.4	0.0	10.1	35.2	0.0	577

^a Percentages weighted by total numbers in the escapement: 1979-1981, 1986-1998.

^b 1979-1997 from Waltemyer, ADF&G, Soldotna.

^c 1998 from Tobias, ADF&G, Soldotna.

Table 22. Length composition of the major age classes of sockeye salmon collected in the Crescent River 1980-1998. Length measured from mid-eye to fork-of-tail.^{a, b}

Year	Male				Female			Ratio Male-Female
	Age Class	Ave Length ^a (mm)	Stndrd Error	Sample Size	Ave Length ^a (mm)	Stndrd Error	Sample Size	
1997	0.3	569	4	51	544	5	31	1.7:1
1980	1.2	472	6	47	471	7	31	1.5:1
1981		522	9	59	491	9	33	1.8:1
1982		467	6	47	487	7	25	1.9:1
1991		517	6	36	490	8	17	2.1:1
1996		477	6	41	510	7	19	2.2:1
1997		511	3	81	495	3	82	1.0:1
1980	1.3	568	2	167	549	2	223	0.7:1
1981		576	3	121	555	3	172	0.7:1
1982		586	1	303	556	1	259	1.2:1
1983		570	2	111	542	2	169	0.7:1
1984		574	5	60	552	2	72	0.8:1
1985		565	4	75	551	2	111	0.7:1
1987		601	3	54	573	3	37	1.5:1
1988		581	2	195	550	2	138	1.4:1
1989		593	1	320	561	2	271	1.2:1
1990		592	3	184	571	0	120	1.5:1
1991		560	3	105	543	3	75	1.4:1
1992		555	9	24	535	5	18	1.3:1
1993		578	3	81	559	2	92	0.9:1
1994		563	2	124	547	2	147	0.8:1
1995		581	4	40	555	2	60	0.7:1
1996		607	5	50	586	4	50	1.0:1
1997		574	2	142	547	2	119	1.2:1
1998		583	2	114	556	2	143	0.8:1
1981		2.2	487	6	40	519	5	57
1983	494		4	93	488	3	89	1.0:1
1984	499		4	81	507	4	75	1.1:1
1985	496		5	75	490	4	47	1.6:1
1988	487		5	72	496	4	60	1.2:1
1991	515		5	42	498	6	18	2.3:1
1992	486		12	10	492	5	14	0.7:1
1994	466		4	54	481	6	13	4.2:1
1996	497		5	65	525	5	29	2.2:1
1998	497		7	27	515	3	31	0.9:1

-continued-

Table 22 (p. 2 of 2)

Year	Age Class	Male			Female			Ratio Male-Female
		Ave Length ^a (mm)	Stndrd Error	Sample Size	Ave Length ^a (mm)	Stndrd Error	Sample Size	
1980	2.3	584	2	158	554	2	237	0.7:1
1983		569	4	43	550	2	80	0.5:1
1984		581	2	261	553	2	202	1.3:1
1985		568	4	94	551	2	161	0.6:1
1986		573	5	44	556	3	45	1.0:1
1987		595	4	49	573	3	37	1.3:1
1988		585	3	110	556	2	83	1.3:1
1989		594	3	72	568	3	37	1.9:1
1990		601	0	165	571	0	72	2.3:1
1991		558	4	36	537	4	23	1.6:1
1992		572	4	58	547	3	62	0.9:1
1993		585	2	104	558	2	114	0.9:1
1994		570	2	86	549	3	81	1.1:1
1995		581	2	154	553	2	181	0.9:1
1996		604	4	222	577	3	72	3.1:1
1997		590	3	84	569	2	86	1.0:1
1998		584	3	85	563	2	118	0.7:1

^a 1980-1997 from Waltemyer, ADF&G, Soldotna.

^b 1998 from Tobias, ADF&G, Soldotna.

Table 23. Estimated salmon escapement into the Yentna River, 7 July through 21 August 1998. Species composition of daily sonar counts based on fish wheel catches.

Date	Sockeye		Pink		Chum		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7-Jul	353	353	16	16	11	11	3	3	20	20
8-Jul	354	707	15	31	12	23	1	4	20	40
9-Jul	438	1,145	18	49	15	38	3	7	25	65
10-Jul	892	2,037	33	82	28	66	6	13	45	110
11-Jul	1,515	3,552	29	111	23	89	13	26	0	110
12-Jul	1,631	5,183	68	179	41	130	126	152	33	143
13-Jul	881	6,064	66	245	32	162	53	205	18	161
14-Jul	616	6,680	104	349	58	220	93	298	4	165
15-Jul	402	7,082	167	516	54	274	110	408	13	178
16-Jul	589	7,671	379	895	127	401	163	571	2	180
17-Jul	915	8,586	375	1,270	113	514	183	754	8	188
18-Jul	2,639	11,225	1,494	2,764	217	731	715	1,469	31	219
19-Jul	7,843	19,068	5,526	8,290	349	1,080	1,044	2,513	47	266
20-Jul	9,536	28,604	8,019	16,309	395	1,475	1,243	3,756	45	311
21-Jul	7,788	36,392	6,964	23,273	239	1,714	1,202	4,958	52	363
22-Jul	2,739	39,131	4,629	27,902	178	1,892	814	5,772	23	386
23-Jul	1,377	40,508	3,413	31,315	130	2,022	628	6,400	19	405
24-Jul	2,166	42,674	6,523	37,838	271	2,293	960	7,360	10	415
25-Jul	2,554	45,228	8,388	46,226	338	2,631	782	8,142	3	418
26-Jul	3,053	48,281	9,590	55,816	254	2,885	462	8,604	9	427
27-Jul	2,738	51,019	11,663	67,479	202	3,087	449	9,053	0	427
28-Jul	3,305	54,324	11,487	78,966	241	3,328	903	9,956	14	441
29-Jul	4,619	58,943	14,206	93,172	314	3,642	1,252	11,208	0	441
30-Jul	8,011	66,954	10,957	104,129	446	4,088	2,241	13,449	0	441
31-Jul	7,442	74,396	10,654	114,783	492	4,580	2,086	15,535	0	441
1-Aug	7,419	81,815	8,783	123,566	483	5,063	1,839	17,374	9	450
2-Aug	9,307	91,122	8,403	131,969	890	5,953	1,812	19,186	0	450
3-Aug	8,159	99,281	7,331	139,300	631	6,584	1,044	20,230	3	453
4-Aug	5,530	104,811	4,352	143,652	344	6,928	312	20,542	0	453
5-Aug	3,690	108,501	3,001	146,653	377	7,305	461	21,003	8	461
6-Aug	2,369	110,870	1,738	148,391	326	7,631	264	21,267	0	461
7-Aug	1,286	112,156	1,543	149,934	310	7,941	201	21,468	6	467
8-Aug	1,181	113,337	1,487	151,421	318	8,259	493	21,961	8	475
9-Aug	608	113,945	878	152,299	338	8,597	618	22,579	5	480
10-Aug	811	114,756	1,083	153,382	387	8,984	585	23,164	0	480
11-Aug	805	115,561	484	153,866	176	9,160	559	23,723	0	480
12-Aug	852	116,413	387	154,253	178	9,338	236	23,959	3	483
13-Aug	701	117,114	376	154,629	215	9,553	247	24,206	6	489
14-Aug	554	117,668	180	154,809	191	9,744	244	24,450	3	492

(continued)

Table 23. (p.2 of 2)

Date	Sockeye		Pink		Chum		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
15-Aug	324	117,992	112	154,921	99	9,843	100	24,550	0	492
16-Aug	233	118,225	82	155,003	84	9,927	74	24,624	0	492
17-Aug	311	118,536	35	155,038	65	9,992	47	24,671	3	495
18-Aug	242	118,778	30	155,068	50	10,042	37	24,708	4	499
19-Aug	317	119,095	53	155,121	62	10,104	21	24,729	2	501
20-Aug	231	119,326	37	155,158	46	10,150	17	24,746	1	502
21-Aug	297	119,623	35	155,193	62	10,212	23	24,769	3	505

Table 24. Estimated salmon escapement into the Yentna River 1981-1998.

Date	Sockeye	Pink	Chum	Coho	Chinook	Total
1981	139,401	36,054	19,765	17,017	9	212,246
1982	113,847	447,167	27,830	34,089		622,933
1983	104,414	60,661	10,802	8,867		184,744
1984	149,375	369,299	26,508	18,172		563,354
1985	107,124	120,990	12,092	9,181	404	249,791
1986	92,076	673,901	56,656	23,457	1,112	847,202
1987	66,054	84,099	17,859	6,279	407	174,698
1988	52,330	137,027	49,074	12,173	444	251,048
1989	96,269	173,698	63,379	25,695	393	359,434
1990	140,290	244,569	33,566	21,346	607	440,378
1991	109,632	75,377	21,655	57,275	204	264,143
1992	66,083	239,378	30,062	29,073	107	364,703
1993	141,694	227,171	28,021	37,752	363	435,001
1994	128,032	79,178	18,971	25,173	226	251,580
1995	121,220	103,990	31,473	74,406	346	331,435
1996	90,660	98,236	21,056	35,420	345	245,717
1997	157,822	28,960	12,671	13,670	297	213,420
1998	119,623	155,193	10,212	24,769	505	310,302

Table 25. Salmon escapement observations in selected Susitna River tributaries 1998.

	Number of Fish Observed or Estimated				
	Sockeye	Pink	Chum	Coho	Chinook
Chelatna Lake ^a	27,284	99	0	766	62
Deception Creek ^b					1,273
Rabideux Creek ^b				56	
Birch Creek ^b				356	
Question Creek ^b				519	
Answer Creek ^b				45	
Goose Creek ^b					415
Little Willow Creek ^b					1,782
Montana Creek ^b					2,936
Prairie Creek ^b					4,465
Sheep Creek ^b					1,160
Willow Creek ^b					3,500
Alexander Creek ^b					2,807
Deshka River ^b	107	541,946	264	6,773	15,409
Peters Creek ^b					4,367
Lake Creek ^b					5,056
Cache Creek ^b					1,771
Talachulitna River ^b					2,759

^a Fandrei, G., Cook Inlet Aquaculture Association, personal communication.

^b Whitmore, C. and Sweet, D., 1998.

Table 26. Cumulative proportion by date of sockeye salmon counts recorded in the Yentna River 1981-1998.

Date	Cumulative Proportion ^a																	
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
27-Jun		0.000																
28-Jun		0.000																
29-Jun	0.001	0.000				0.001												
30-Jun	0.004	0.000	0.000			0.002												
01-Jul	0.008	0.001	0.001	0.001	0.000	0.002	0.000											
02-Jul	0.013	0.001	0.001	0.001	0.001	0.003	0.001											
03-Jul	0.016	0.001	0.002	0.002	0.001	0.003	0.001											
04-Jul	0.017	0.002	0.003	0.003	0.001	0.004	0.002											
05-Jul	0.018	0.002	0.003	0.004	0.001	0.005	0.002											
06-Jul	0.020	0.002	0.004	0.004	0.002	0.005	0.003										0.002	
07-Jul	0.021	0.002	0.004	0.005	0.003	0.006	0.003	0.004	0.003	0.002	0.000	0.002	0.001	0.002	0.001	0.001	0.004	0.003
08-Jul	0.023	0.002	0.004	0.005	0.003	0.006	0.004	0.008	0.006	0.005	0.001	0.003	0.002	0.004	0.001	0.003	0.006	0.006
09-Jul	0.026	0.002	0.005	0.006	0.004	0.007	0.004	0.012	0.009	0.008	0.001	0.005	0.004	0.008	0.002	0.005	0.009	0.010
10-Jul	0.056	0.002	0.005	0.007	0.005	0.008	0.005	0.016	0.012	0.010	0.002	0.007	0.005	0.010	0.003	0.007	0.011	0.017
11-Jul	0.092	0.003	0.006	0.009	0.006	0.009	0.005	0.019	0.014	0.013	0.002	0.008	0.006	0.013	0.004	0.007	0.013	0.030
12-Jul	0.155	0.003	0.008	0.011	0.007	0.010	0.005	0.022	0.015	0.014	0.002	0.010	0.007	0.016	0.005	0.009	0.016	0.043
13-Jul	0.230	0.003	0.011	0.012	0.008	0.011	0.006	0.025	0.016	0.016	0.003	0.012	0.008	0.020	0.006	0.011	0.030	0.051
14-Jul	0.344	0.003	0.034	0.015	0.009	0.011	0.007	0.029	0.019	0.017	0.003	0.016	0.009	0.022	0.006	0.013	0.087	0.056
15-Jul	0.454	0.004	0.059	0.017	0.010	0.014	0.008	0.034	0.023	0.019	0.004	0.022	0.014	0.024	0.007	0.022	0.149	0.059
16-Jul	0.521	0.005	0.096	0.023	0.010	0.022	0.010	0.039	0.026	0.020	0.005	0.035	0.134	0.026	0.007	0.131	0.197	0.064
17-Jul	0.563	0.016	0.131	0.142	0.011	0.027	0.014	0.043	0.051	0.022	0.005	0.062	0.284	0.029	0.012	0.348	0.229	0.072
18-Jul	0.599	0.043	0.179	0.232	0.012	0.036	0.020	0.046	0.103	0.025	0.009	0.086	0.360	0.056	0.022	0.519	0.254	0.094
19-Jul	0.638	0.155	0.351	0.345	0.013	0.041	0.027	0.090	0.161	0.105	0.028	0.120	0.382	0.115	0.068	0.614	0.280	0.159
20-Jul	0.681	0.329	0.567	0.458	0.014	0.042	0.034	0.197	0.202	0.217	0.100	0.148	0.420	0.167	0.160	0.671	0.316	0.239
21-Jul	0.732	0.527	0.693	0.554	0.014	0.043	0.047	0.269	0.234	0.284	0.193	0.184	0.464	0.250	0.251	0.702	0.367	0.304
22-Jul	0.801	0.627	0.722	0.626	0.016	0.052	0.059	0.303	0.280	0.327	0.302	0.229	0.513	0.297	0.335	0.745	0.434	0.327
23-Jul	0.846	0.665	0.758	0.681	0.019	0.162	0.107	0.375	0.359	0.383	0.378	0.296	0.574	0.333	0.378	0.784	0.492	0.338
24-Jul	0.882	0.711	0.786	0.755	0.145	0.193	0.218	0.484	0.453	0.452	0.425	0.373	0.647	0.397	0.426	0.822	0.544	0.357
25-Jul	0.905	0.734	0.824	0.785	0.359	0.253	0.331	0.630	0.532	0.505	0.451	0.447	0.709	0.426	0.496	0.856	0.606	0.378
26-Jul	0.925	0.780	0.867	0.808	0.507	0.371	0.442	0.771	0.646	0.573	0.505	0.519	0.763	0.517	0.580	0.880	0.668	0.403
27-Jul	0.940	0.811	0.894	0.836	0.636	0.491	0.528	0.821	0.749	0.667	0.575	0.606	0.810	0.557	0.678	0.899	0.697	0.426
28-Jul	0.950	0.831	0.905	0.855	0.782	0.606	0.587	0.858	0.799	0.734	0.637	0.674	0.831	0.599	0.743	0.913	0.722	0.454

- Continued -

Table 26. (p. 2 of 3)

Cumulative Proportion^a

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Date	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
29-Jul	0.958	0.847	0.913	0.866	0.903	0.752	0.625	0.886	0.854	0.769	0.674	0.734	0.857	0.662	0.796	0.928	0.743	0.493
30-Jul	0.969	0.859	0.921	0.874	0.942	0.831	0.655	0.916	0.864	0.796	0.720	0.794	0.893	0.712	0.832	0.941	0.767	0.560
31-Jul	0.976	0.890	0.925	0.885	0.960	0.861	0.686	0.937	0.868	0.825	0.754	0.825	0.927	0.750	0.852	0.943	0.795	0.622
01-Aug	0.980	0.933	0.929	0.893	0.970	0.882	0.709	0.946	0.873	0.859	0.779	0.858	0.938	0.788	0.875	0.948	0.826	0.684
02-Aug	0.986	0.948	0.937	0.901	0.978	0.908	0.750	0.960	0.879	0.907	0.806	0.881	0.950	0.830	0.897	0.954	0.852	0.762
03-Aug	0.988	0.955	0.941	0.909	0.983	0.917	0.789	0.969	0.889	0.947	0.850	0.896	0.967	0.862	0.915	0.965	0.870	0.830
04-Aug	0.990	0.962	0.945	0.920	0.987	0.924	0.825	0.975	0.907	0.962	0.891	0.910	0.985	0.889	0.928	0.981	0.893	0.876
05-Aug	0.991	0.965	0.949	0.926	0.990	0.935	0.857	0.981	0.923	0.971	0.930	0.915	0.992	0.919	0.944	0.991	0.911	0.907
06-Aug	0.992	0.967	0.953	0.934	0.994	0.940	0.875	0.984	0.936	0.978	0.942	0.922	0.996	0.942	0.975	0.996	0.923	0.927
07-Aug	0.992	0.970	0.955	0.939	0.997	1.000	0.889	0.989	0.944	0.985	0.959	0.929	1.000	0.962	0.990	1.000	0.931	0.938
08-Aug	0.992	0.972	0.958	0.944	1.000		0.900	0.992	0.949	0.990	0.975	0.941		0.974	0.992		0.945	0.947
09-Aug	0.993	0.975	0.959	0.949			0.932	0.994	0.954	0.994	0.986	0.966		0.984	0.996		0.961	0.953
10-Aug	0.994	0.977	0.959	0.954			0.962	0.996	0.958	0.995	0.994	0.984		0.992	1.000		0.982	0.959
11-Aug	0.995	0.979	0.962	0.958			0.986	1.000	0.962	0.998	0.999	1.000		0.996			0.992	0.966
12-Aug	0.996	0.981	0.968	0.962			0.996		0.966	1.000	1.000			1.000			1.000	0.973
13-Aug	0.997	0.982	0.974	0.965			1.000		0.975									0.979
14-Aug	0.997	0.984	0.977	0.968					0.985									0.984
15-Aug	0.998	0.985	0.979	0.970					0.992									0.986
16-Aug	0.998	0.986	0.982	0.973					0.995									0.988
17-Aug	0.998	0.987	0.985	0.975					0.997									0.991
18-Aug	0.998	0.988	0.987	0.977					0.998									0.993
19-Aug	0.998	0.989	0.988	0.979					0.999									0.996
20-Aug	0.999	0.990	0.990	0.980					1.000									0.998
21-Aug	0.999	0.990	0.991	0.981														1.000
22-Aug	0.999	0.990	0.992	0.984														
23-Aug	0.999	0.991	0.993	0.987														
24-Aug	1.000	0.992	0.994	0.989														
25-Aug		0.993	0.994	0.992														
26-Aug		0.994	0.995	0.994														
27-Aug		0.994	0.996	0.996														
28-Aug		0.995	0.997	0.996														
29-Aug		0.996	0.998	0.998														

Table 26. (p. 3 of 3)

Date	Cumulative Proportion ^a																	
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
30-Aug		0.997	0.998	0.999														
31-Aug		0.997	0.999	0.999														
01-Sep		0.998	0.999	1.000														
02-Sep		0.999	0.999															
03-Sep		0.999	0.999															
04-Sep		1.000	1.000															
Midpoint	16-Jul	21-Jul	20-Jul	21-Jul	26-Jul	28-Jul	27-Jul	25-Jul	25-Jul	25-Jul	26-Jul	26-Jul	22-Jul	26-Jul	26-Jul	18-Jul	24-Jul	30-Jul
No. days for 80% ^b	14	14	12	17	6	11+	17	11	18	15	17	17	16	19	15	13	22	18

^a Proportion accrued on last day (1986) represents that portion of the escapement estimated after enumeration operations.

^b Inclusive dates: date proportion of escapement reached 10% through date proportion of escapement reached 90%.

Table 27. Daily adjusted fish wheel catch by species for the north bank of the Yentna River, 7 July through 21 August 1998.

Date	Hours open ^a	Sockeye		Pink		Chum		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
07-Jul	24.0	38	38	3	3	0	0	0	0	4	4
08-Jul	24.0	24	62	1	4	0	0	0	0	2	6
09-Jul	22.0	22	84	2	6	2	2	0	0	5	11
10-Jul	23.9	114	198	3	9	5	7	1	1	1	12
11-Jul	23.5	135	333	2	11	3	10	1	2	0	12
12-Jul	23.4	96	429	3	14	1	11	6	8	3	15
13-Jul	25.5	97	526	12	26	5	16	5	13	3	18
14-Jul	23.8	104	630	22	48	12	28	16	29	1	19
15-Jul	23.5	100	730	47	95	13	41	24	53	5	24
16-Jul	23.5	91	821	81	176	22	63	25	78	0	24
17-Jul	24.3	110	931	97	273	25	88	36	114	4	28
18-Jul	24.0	163	1,094	176	449	19	107	66	180	0	28
19-Jul	23.9	571	1,665	441	890	30	137	84	264	3	31
20-Jul	24.2	588	2,253	515	1,405	23	160	87	351	1	32
21-Jul	23.8	351	2,604	385	1,790	18	178	57	408	3	35
22-Jul	23.6	170	2,774	318	2,108	16	194	51	459	1	36
23-Jul	23.9	147	2,921	463	2,571	22	216	50	509	2	38
24-Jul	24.6	240	3,161	853	3,424	30	246	90	599	2	40
25-Jul	21.7	447	3,608	1,429	4,853	42	288	86	685	0	40
26-Jul	24.0	487	4,095	1,503	6,356	34	322	36	721	3	43
27-Jul	24.4	552	4,647	2,133	8,489	33	355	61	782	0	43
28-Jul	22.8	405	5,052	1,471	9,960	22	377	58	840	2	45
29-Jul	25.3	416	5,468	1,071	11,031	22	399	73	913	0	45
30-Jul	24.8	882	6,350	822	11,853	38	437	137	1,050	0	45
31-Jul	22.4	771	7,121	714	12,567	41	478	107	1,157	0	45
01-Aug	22.4	780	7,901	798	13,365	36	514	101	1,258	0	45
02-Aug	21.7	851	8,752	691	14,056	55	569	93	1,351	0	45
03-Aug	23.4	888	9,640	850	14,906	48	617	69	1,420	0	45
04-Aug	24.4	703	10,343	554	15,460	55	672	22	1,442	0	45
05-Aug	24.8	404	10,747	432	15,892	50	722	28	1,470	1	46
06-Aug	23.5	259	11,006	257	16,149	35	757	11	1,481	0	46
07-Aug	24.0	147	11,153	231	16,380	38	795	13	1,494	1	47
08-Aug	24.1	140	11,293	242	16,622	38	833	25	1,519	1	48
09-Aug	24.0	90	11,383	187	16,809	51	884	29	1,548	1	49
10-Aug	24.0	128	11,511	173	16,982	54	938	35	1,583	0	49
11-Aug	23.9	119	11,630	82	17,064	31	969	43	1,626	0	49
12-Aug	23.1	106	11,736	59	17,123	25	994	17	1,643	0	49
13-Aug	24.0	93	11,829	54	17,177	17	1,011	28	1,671	1	50
14-Aug	25.4	99	11,928	38	17,215	30	1,041	28	1,699	0	50
15-Aug	22.9	74	12,002	39	17,254	15	1,056	19	1,718	0	50
16-Aug	22.9	49	12,051	19	17,273	17	1,073	12	1,730	0	50
17-Aug	25.4	38	12,089	5	17,278	7	1,080	9	1,739	1	51
18-Aug	24.0	71	12,160	10	17,288	16	1,096	8	1,747	2	53
19-Aug	23.3	32	12,192	5	17,293	4	1,100	1	1,748	0	53
20-Aug	22.9	40	12,232	9	17,302	9	1,109	0	1,748	1	54
21-Aug	25.1	27	12,259	4	17,306	6	1,115	4	1,752	0	54

^a Fish wheel catch adjusted for 24 h: (daily catch * 24 h) / hours open. Actual catch by species: 12,067 sockeye salmon; 17,057 pink salmon; 1,102 chum salmon; 1,712 coho salmon; 54 chinook salmon; 104 whitefish; 5 long-nosed sucker; 1 burbot.

FN: 98YEIFWR.XLS

Table 28. Daily adjusted fish wheel catch by species for the south bank of the Yentna River, 7 July through 21 August 1998.

Date	Hours open ^a	Sockeye		Pink		Chum		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
07-Jul	24.0	26	26	1	1	0	0	0	0	4	4
08-Jul	24.0	28	54	0	1	0	0	0	0	3	7
09-Jul	23.0	42	96	1	2	1	1	0	0	0	7
10-Jul	23.0	94	190	3	5	4	5	2	2	0	7
11-Jul	23.0	195	385	5	10	1	6	2	4	0	7
12-Jul	22.8	223	608	4	15	5	12	20	24	3	10
13-Jul	25.0	167	775	12	27	7	18	11	35	1	11
14-Jul	23.2	123	898	11	38	7	25	18	52	0	11
15-Jul	24.9	96	994	34	72	14	39	30	82	1	12
16-Jul	23.1	165	1,159	73	145	32	71	46	128	1	13
17-Jul	24.3	179	1,338	45	190	16	87	28	156	0	13
18-Jul	24.5	262	1,600	110	300	19	106	61	216	4	17
19-Jul	23.6	614	2,214	405	705	24	130	76	293	4	21
20-Jul	23.9	631	2,844	518	1,223	27	157	76	369	4	25
21-Jul	23.7	542	3,386	419	1,643	10	167	81	450	3	28
22-Jul	23.7	409	3,796	639	2,282	18	185	121	570	2	30
23-Jul	24.0	300	4,096	656	2,938	21	206	152	722	4	34
24-Jul	24.6	382	4,477	1,049	3,986	48	254	182	904	1	35
25-Jul	24.4	449	4,926	1,521	5,507	79	333	195	1,099	1	36
26-Jul	23.2	586	5,513	1,869	7,376	56	389	129	1,228	0	36
27-Jul	23.5	611	6,123	2,944	10,320	57	446	146	1,374	0	36
28-Jul	24.5	495	6,618	1,656	11,977	44	490	190	1,564	2	38
29-Jul	23.0	426	7,044	1,752	13,729	42	532	200	1,765	0	38
30-Jul	26.5	552	7,597	1,272	15,001	46	578	302	2,066	0	38
31-Jul	22.5	513	8,110	1,364	16,365	50	628	320	2,386	0	38
01-Aug	22.5	545	8,655	820	17,186	55	684	263	2,650	2	40
02-Aug	22.1	812	9,467	876	18,062	126	810	292	2,942	0	40
03-Aug	23.5	1,230	10,696	1,038	19,099	121	931	214	3,156	1	41
04-Aug	24.3	717	11,413	563	19,662	27	958	68	3,224	0	41
05-Aug	23.8	534	11,947	342	20,004	47	1,005	87	3,311	1	42
06-Aug	24.6	488	12,435	291	20,295	68	1,074	72	3,383	0	42
07-Aug	23.2	373	12,809	327	20,621	84	1,158	80	3,463	1	43
08-Aug	24.0	277	13,085	268	20,889	74	1,231	157	3,620	2	45
09-Aug	24.2	120	13,205	133	21,022	65	1,297	166	3,786	1	46
10-Aug	24.1	93	13,298	121	21,143	51	1,348	120	3,906	0	46
11-Aug	24.4	166	13,464	90	21,234	31	1,379	149	4,055	0	46
12-Aug	23.5	166	13,629	62	21,296	31	1,410	62	4,118	1	47
13-Aug	23.0	142	13,771	71	21,367	58	1,468	56	4,174	1	48
14-Aug	25.3	115	13,886	31	21,398	44	1,512	65	4,239	1	49
15-Aug	23.0	100	13,986	21	21,419	35	1,547	36	4,275	0	49
16-Aug	23.4	82	14,068	20	21,440	36	1,583	31	4,306	0	49
17-Aug	25.0	93	14,161	11	21,450	22	1,605	12	4,318	0	49
18-Aug	23.7	96	14,258	7	21,457	17	1,623	15	4,333	0	49
19-Aug	23.6	94	14,351	14	21,472	20	1,643	10	4,344	0	49
20-Aug	23.3	99	14,450	12	21,484	20	1,662	10	4,354	0	49
21-Aug	25.2	105	14,555	5	21,489	24	1,686	11	4,365	1	50

^a Fish wheel catch adjusted for 24 h: (daily catch * 24 h) / hours open. Actual catch by species: 14,394 sockeye salmon; 21,258 pink salmon; 1,667 chum salmon; 4,326 coho salmon; 50 chinook salmon; 59 whitefish; 5 long-nosed sucker.

Table 29. Age composition of sockeye salmon collected in the Yentna River 1986-1998.

Year	Percentage Composition by Age Class ^{a, b, c}											Sample Size
	0.2	0.3	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.2	
1986	0.0	2.1	1.9	22.7	56.5	0.2	0.6	5.9	10.0	0.1		492
1987	1.3	2.4	0.9	23.3	50.6	1.0	0.0	8.6	11.7	0.0		1,089
1988	2.7	2.4	0.4	33.5	41.9	0.2	1.7	6.5	10.4	0.1		1,727
1989	0.2	0.2	1.3	27.2	63.5	0.4	0.2	3.0	4.0	0.0		1,362
1990	0.8	2.4	0.3	29.9	47.6	0.7	0.1	9.8	8.2	0.1		1,710
1991	2.0	10.1	0.1	25.2	44.1	0.1	0.1	7.0	11.1	0.1		1,509
1992	1.6	0.6	1.0	31.1	29.6	0.1	0.4	16.9	18.3	0.1	0.4	1,451
1993	1.0	4.6	0.1	32.1	35.5	0.0	0.4	11.7	14.5	0.1	0.0	1,390
1994	1.3	3.9	0.6	23.2	43.2	0.2	0.0	9.7	17.6	0.0	0.0	637
1995	2.2	5.1	0.8	19.7	51.3	0.4	0.2	8.5	11.6	0.0	0.2	507
1996	3.2	3.2	0.4	25.5	43.8	0.0	0.4	9.4	14.0	0.0	0.0	466
1997	1.1	10.5	0.1	32.4	43.7	0.1	0.1	4.7	7.2	0.0	0.0	534
1998	0.7	5.7	0.3	15.7	62.7	0.3	0.0	4.0	10.5	0.0	0.0	1,500

^a Percentages weighted by total numbers in the escapement: 1979-1981, 1986-1998.

^b 1986-1997 from Waltemyer, ADF&G, Soldotna.

^c 1998 from Tobias, ADF&G, Soldotna.

Table 30. Length composition of the major age classes of sockeye salmon collected in the Yentna River 1986-1998. Length measured from mid-eye to fork-of-tail.^a

Year	Age Class	Male			Female			Ratio Male-Female
		Ave Length ^a (mm)	Stndrd Error	Sample Size	Ave Length ^a (mm)	Stndrd Error	Sample Size	
1991	0.3	572	5	59	550	2	100	0.6:1
1997		598	5	41	559	4	38	1.1:1
1986	1.2	455	3	104	472	5	52	2.0:1
1987		484	3	158	477	2	156	1.0:1
1988		461	2	408	486	3	170	2.4:1
1989		463	4	246	485	4	122	2.0:1
1990		446	0	305	446	0	238	1.3:1
1991		460	3	253	484	2	130	2.0:1
1992		443	2	360	469	3	115	3.1:1
1993		465	2	279	494	2	167	1.7:1
1994		468	3	107	484	5	41	2.6:1
1995		460	4	58	472	6	42	1.4:1
1996		463	5	78	469	7	41	1.9:0
1997		479	4	110	479	3	133	0.8:1
1998		485	4	104	486	2	132	0.8:1
1986		1.3	579	3	172	563	2	216
1987	591		2	246	565	2	222	1.1:1
1988	580		2	365	552	1	359	1.0:1
1989	575		3	390	553	1	474	0.8:1
1990	573		0	400	552	0	526	0.7:1
1991	562		2	301	542	1	356	0.9:1
1992	546		4	188	543	2	242	0.8:1
1993	561		2	288	549	1	266	0.9:1
1994	596		3	133	561	2	142	0.9:1
1995	568		3	124	545	2	136	0.9:1
1996	589		3	107	568	2	97	1.1:1
1997	585		2	155	555	2	173	0.9:1
1998	562		1	453	538	1	487	0.9:1
1992	2.2		451	3	181	471	6	53
1993		476	4	93	487	3	69	1.3:1

-continued-

Table 30 (p. 2 of 2)

Year	Age Class	Male			Female			Ratio Male-Female
		Ave Length ^a (mm)	Stndrd Error	Sample Size	Ave Length ^a (mm)	Stndrd Error	Sample Size	
1986	2.3	588	5	25	555	4	44	0.6:1
1987		583	4	62	566	3	52	1.2:1
1988		585	4	92	554	3	87	1.1:1
1990		574	0	73	542	0	96	0.8:1
1991		561	4	78	536	3	86	0.9:1
1992		564	3	123	538	4	126	1.0:1
1993		562	3	74	544	2	128	0.6:1
1994		600	5	56	561	2	56	1.0:1
1995		578	4	25	544	3	34	0.7:1
1996		585	5	31	558	4	34	0.9:1
1998		558	3	82	534	4	76	1.1:1

^a 1986-1997 from Waltemyer, ADF&G, Soldotna.

^b 1998 from Tobias, ADF&G, Soldotna.

Table 31. Cumulative proportion by date of pink salmon counts recorded in the Yentna River 1981-1998.

Date	Cumulative Proportion																	
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
27-Jun		0.000																
28-Jun		0.000																
29-Jun	0.000	0.000				0.000	0.000											
30-Jun	0.002	0.000	0.000			0.000	0.000											
01-Jul	0.003	0.000	0.001	0.000	0.001	0.000	0.000											
02-Jul	0.005	0.000	0.001	0.000	0.002	0.000	0.004											
03-Jul	0.007	0.000	0.001	0.000	0.003	0.000	0.008											
04-Jul	0.008	0.000	0.002	0.000	0.003	0.000	0.011											
05-Jul	0.008	0.000	0.003	0.000	0.005	0.001	0.015											
06-Jul	0.011	0.000	0.003	0.000	0.007	0.001	0.018											0.004
07-Jul	0.015	0.000	0.003	0.000	0.011	0.001	0.022	0.000	0.003	0.000	0.002	0.000	0.001	0.000	0.002	0.000	0.008	0.000
08-Jul	0.021	0.000	0.003	0.000	0.012	0.001	0.025	0.000	0.008	0.000	0.005	0.000	0.002	0.001	0.003	0.000	0.012	0.000
09-Jul	0.025	0.000	0.004	0.000	0.015	0.001	0.029	0.000	0.013	0.000	0.006	0.001	0.004	0.002	0.005	0.000	0.017	0.000
10-Jul	0.037	0.000	0.004	0.000	0.018	0.001	0.031	0.000	0.018	0.000	0.007	0.001	0.005	0.002	0.008	0.000	0.023	0.001
11-Jul	0.039	0.000	0.005	0.001	0.021	0.001	0.035	0.000	0.026	0.000	0.009	0.001	0.006	0.003	0.010	0.000	0.028	0.001
12-Jul	0.039	0.000	0.006	0.001	0.025	0.001	0.041	0.000	0.034	0.000	0.010	0.001	0.007	0.004	0.013	0.000	0.033	0.001
13-Jul	0.042	0.000	0.009	0.001	0.030	0.001	0.047	0.000	0.043	0.001	0.012	0.001	0.008	0.006	0.015	0.000	0.037	0.002
14-Jul	0.050	0.000	0.030	0.001	0.033	0.002	0.051	0.000	0.052	0.001	0.014	0.002	0.009	0.007	0.018	0.000	0.048	0.002
15-Jul	0.057	0.000	0.039	0.001	0.038	0.003	0.056	0.001	0.058	0.001	0.016	0.002	0.014	0.008	0.021	0.000	0.058	0.003
16-Jul	0.061	0.000	0.056	0.001	0.042	0.007	0.065	0.001	0.060	0.001	0.018	0.003	0.134	0.011	0.025	0.002	0.070	0.006
17-Jul	0.062	0.001	0.098	0.003	0.046	0.011	0.075	0.001	0.071	0.002	0.019	0.005	0.284	0.018	0.044	0.006	0.079	0.008
18-Jul	0.072	0.002	0.171	0.008	0.050	0.014	0.088	0.001	0.105	0.002	0.027	0.009	0.360	0.049	0.075	0.009	0.092	0.018
19-Jul	0.082	0.010	0.288	0.023	0.053	0.015	0.099	0.002	0.158	0.014	0.063	0.017	0.382	0.095	0.120	0.015	0.113	0.053
20-Jul	0.105	0.021	0.400	0.067	0.056	0.016	0.110	0.005	0.196	0.030	0.092	0.028	0.420	0.139	0.159	0.023	0.125	0.105
21-Jul	0.132	0.040	0.511	0.126	0.060	0.017	0.135	0.013	0.224	0.050	0.120	0.050	0.464	0.210	0.206	0.035	0.141	0.150
22-Jul	0.158	0.056	0.565	0.190	0.064	0.021	0.156	0.019	0.255	0.084	0.151	0.078	0.513	0.293	0.248	0.061	0.186	0.180
23-Jul	0.236	0.078	0.638	0.277	0.078	0.059	0.180	0.032	0.287	0.132	0.180	0.126	0.574	0.354	0.301	0.111	0.220	0.202
24-Jul	0.311	0.126	0.704	0.365	0.135	0.125	0.222	0.061	0.349	0.190	0.216	0.212	0.647	0.467	0.377	0.174	0.257	0.244
25-Jul	0.398	0.162	0.743	0.420	0.226	0.222	0.307	0.129	0.420	0.263	0.257	0.322	0.709	0.548	0.460	0.256	0.301	0.298
26-Jul	0.464	0.192	0.791	0.466	0.329	0.369	0.407	0.231	0.493	0.342	0.308	0.459	0.763	0.628	0.533	0.319	0.348	0.360
27-Jul	0.512	0.237	0.820	0.510	0.475	0.535	0.537	0.338	0.570	0.433	0.361	0.561	0.810	0.693	0.596	0.404	0.391	0.435
28-Jul	0.580	0.330	0.843	0.578	0.636	0.695	0.624	0.459	0.638	0.514	0.441	0.668	0.831	0.741	0.671	0.514	0.433	0.509
29-Jul	0.639	0.447	0.855	0.669	0.763	0.830	0.668	0.589	0.691	0.580	0.499	0.751	0.857	0.796	0.732	0.631	0.523	0.600
30-Jul	0.705	0.562	0.864	0.728	0.833	0.894	0.701	0.662	0.730	0.640	0.567	0.815	0.893	0.854	0.781	0.727	0.603	0.671
31-Jul	0.752	0.654	0.871	0.784	0.877	0.924	0.729	0.722	0.748	0.722	0.640	0.862	0.927	0.906	0.812	0.737	0.654	0.740
01-Aug	0.795	0.735	0.879	0.837	0.903	0.957	0.741	0.768	0.759	0.815	0.677	0.899	0.938	0.937	0.847	0.757	0.702	0.796
02-Aug	0.819	0.824	0.903	0.873	0.926	0.979	0.767	0.826	0.770	0.884	0.703	0.924	0.950	0.958	0.886	0.792	0.738	0.850
03-Aug	0.834	0.896	0.908	0.903	0.942	0.991	0.799	0.878	0.781	0.927	0.751	0.941	0.967	0.970	0.921	0.856	0.788	0.898
04-Aug	0.849	0.934	0.912	0.925	0.956	0.996	0.838	0.909	0.812	0.947	0.804	0.954	0.985	0.978	0.955	0.923	0.836	0.926

-Continued-

Table 31. (p. 2 of 2)

Date	Cumulative Proportion																	
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
05-Aug	0.865	0.953	0.918	0.943	0.966	0.999	0.870	0.931	0.850	0.964	0.870	0.961	0.992	0.985	0.970	0.968	0.877	0.945
06-Aug	0.883	0.962	0.924	0.956	0.978	1.000	0.887	0.951	0.883	0.976	0.911	0.967	0.996	0.991	0.979	0.987	0.904	0.956
07-Aug	0.897	0.969	0.931	0.962	0.991		0.895	0.969	0.912	0.984	0.951	0.971	1.000	0.995	0.986	1.000	0.925	0.966
08-Aug	0.905	0.978	0.936	0.969	1.000		0.901	0.982	0.924	0.990	0.971	0.979		0.997	0.990		0.937	0.976
09-Aug	0.913	0.984	0.937	0.975			0.921	0.990	0.938	0.994	0.985	0.990		0.998	0.995		0.951	0.981
10-Aug	0.918	0.989	0.938	0.982			0.950	0.995	0.943	0.997	0.995	0.997		1.000	1.000		0.974	0.988
11-Aug	0.924	0.991	0.943	0.986			0.975	1.000	0.948	0.998	0.999	1.000					0.997	0.991
12-Aug	0.929	0.994	0.951	0.988			0.989		0.952	1.000	1.000						1.000	0.994
13-Aug	0.930	0.996	0.958	0.991			0.996		0.963									0.996
14-Aug	0.931	0.997	0.966	0.992			1.000		0.974									0.998
15-Aug	0.935	0.998	0.971	0.994					0.989									0.998
16-Aug	0.942	0.998	0.978	0.994					0.994									0.999
17-Aug	0.949	0.999	0.984	0.995					0.997									0.999
18-Aug	0.958	0.999	0.988	0.996					0.998									0.999
19-Aug	0.967	0.999	0.990	0.997					0.999									1.000
20-Aug	0.979	0.999	0.992	0.997					1.000									
21-Aug	0.984	0.999	0.993	0.997														
22-Aug	0.989	1.000	0.993	0.998														
23-Aug	0.992		0.994	0.998														
24-Aug	0.995		0.995	0.998														
25-Aug	0.997		0.996	0.999														
26-Aug	0.999		0.996	0.999														
27-Aug	1.000		0.997	0.999														
28-Aug	1.000		0.998	0.999														
29-Aug			0.998	0.999														
30-Aug			0.999	1.000														
31-Aug			0.999															
01-Sep			0.999															
02-Sep			0.999															
03-Sep			1.000															
Midpoint	27-Jul	30-Jul	21-Jul	27-Jul	28-Jul	27-Jul	27-Jul	29-Jul	27-Jul	28-Jul	30-Jul	27-Jul	22-Jul	25-Jul	26-Jul	28-Jul	29-Jul	28-Jul
No. days for 80% ^a	20	12	16	14	9	8+	20	11	21	12	17	11	16	12	16	13	19	16

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^a Inclusive dates: date proportion of escapement reached 10% through date proportion of escapement reached 90%.

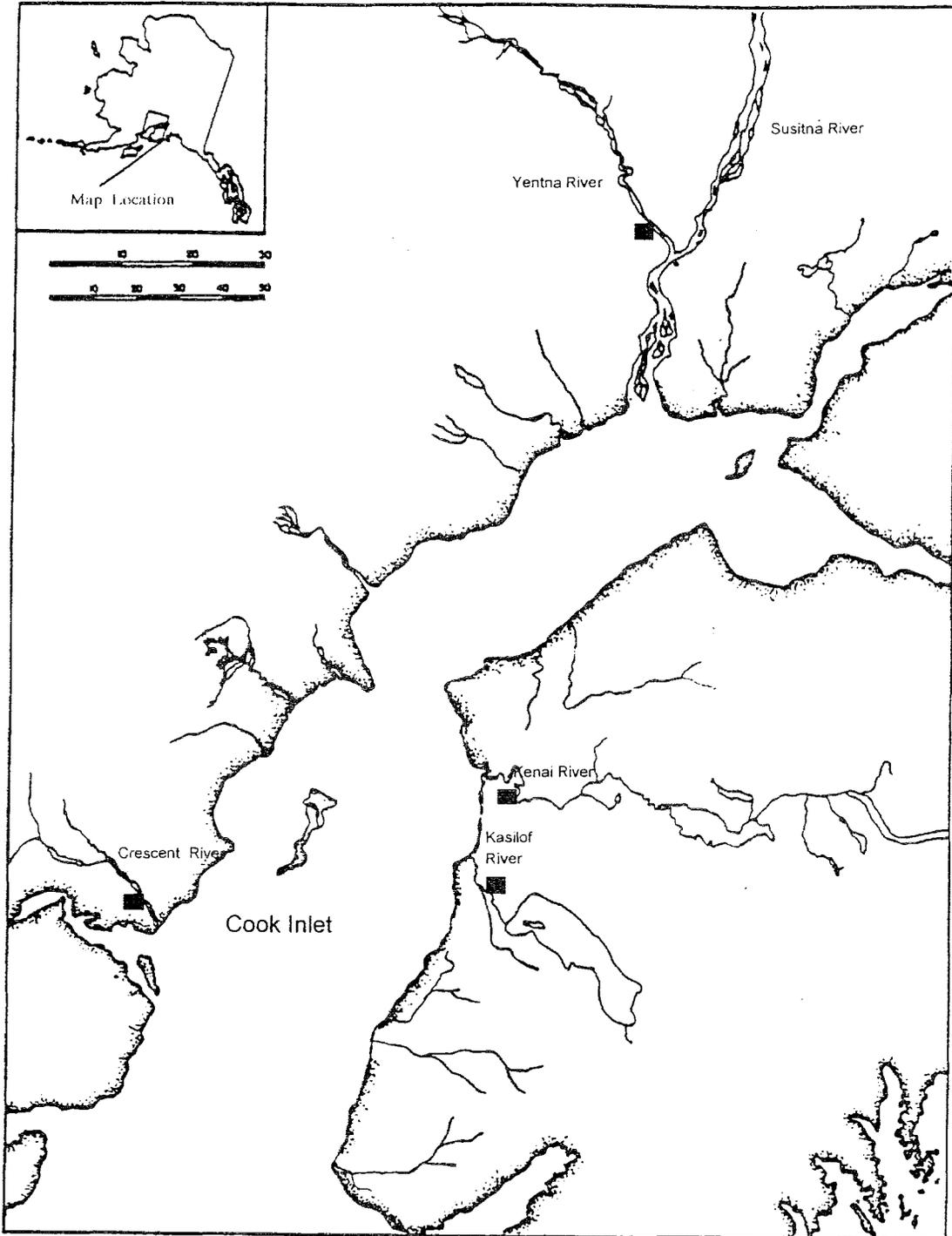


Figure 1. Upper Cook Inlet, Alaska, and sites where salmon escapement was monitored with side-scanning sonar.

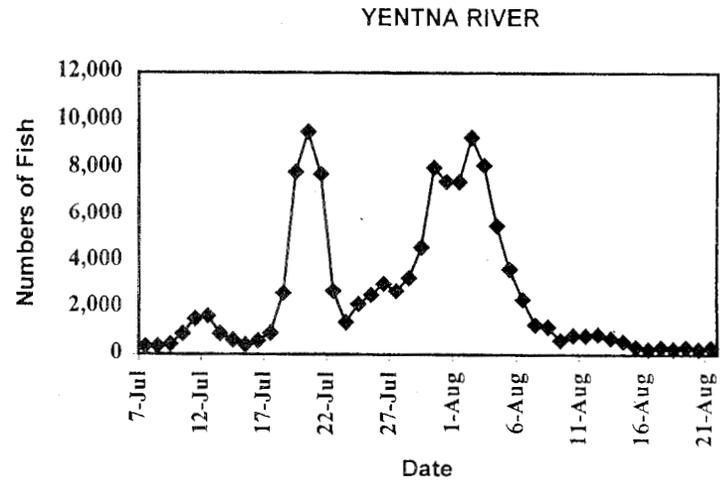
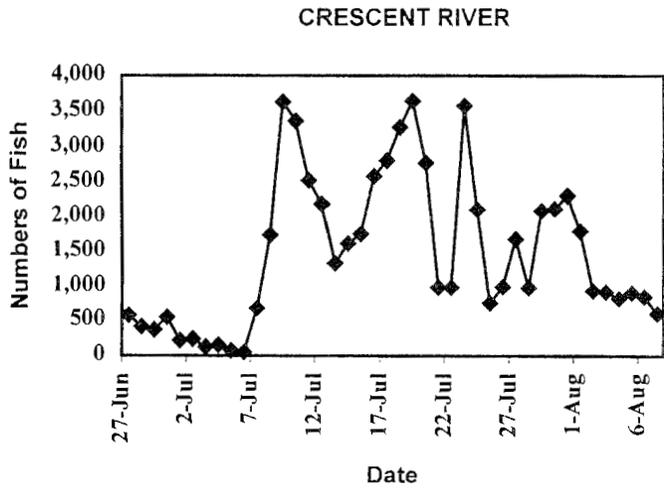
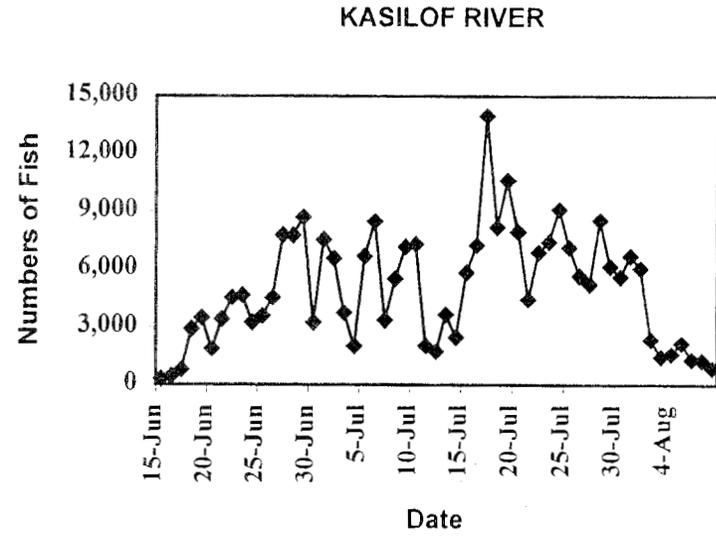
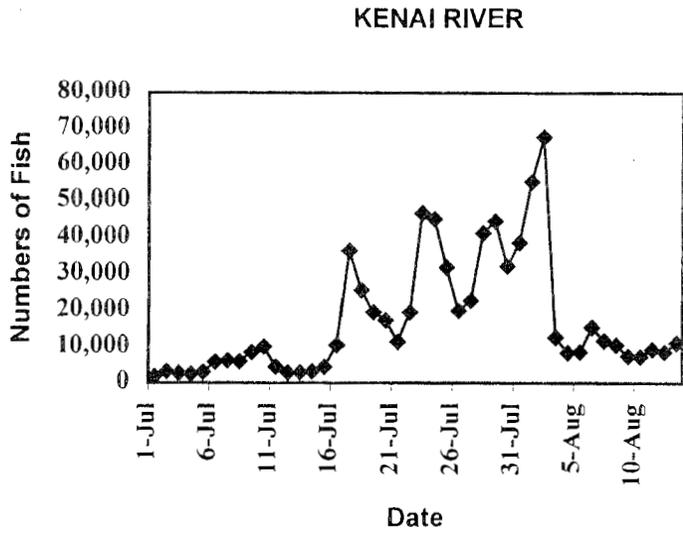
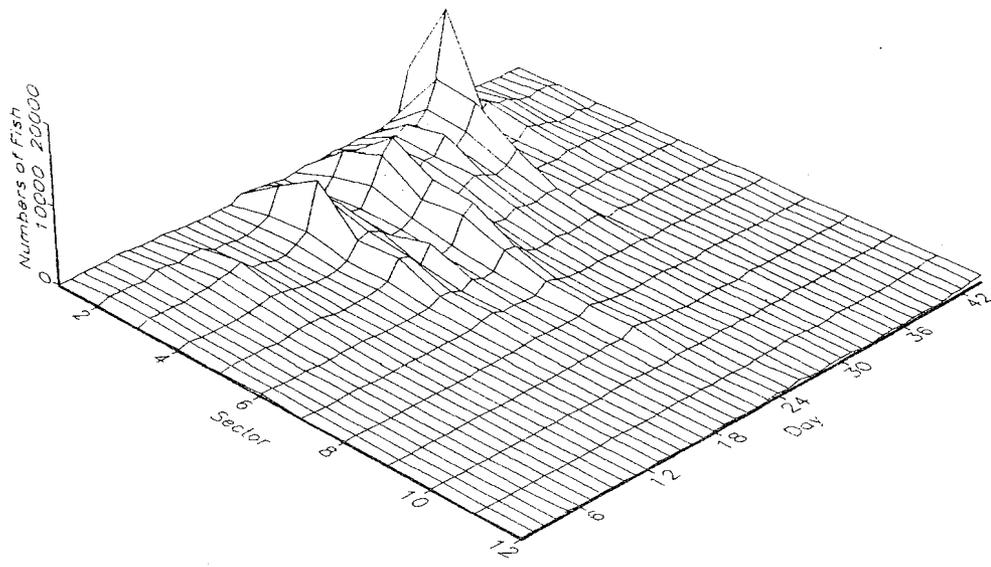


Figure 2. Daily escapement of sockeye salmon into the Kenai, Kasilof, Crescent and Yentna Rivers 1998.

North Bank



South Bank

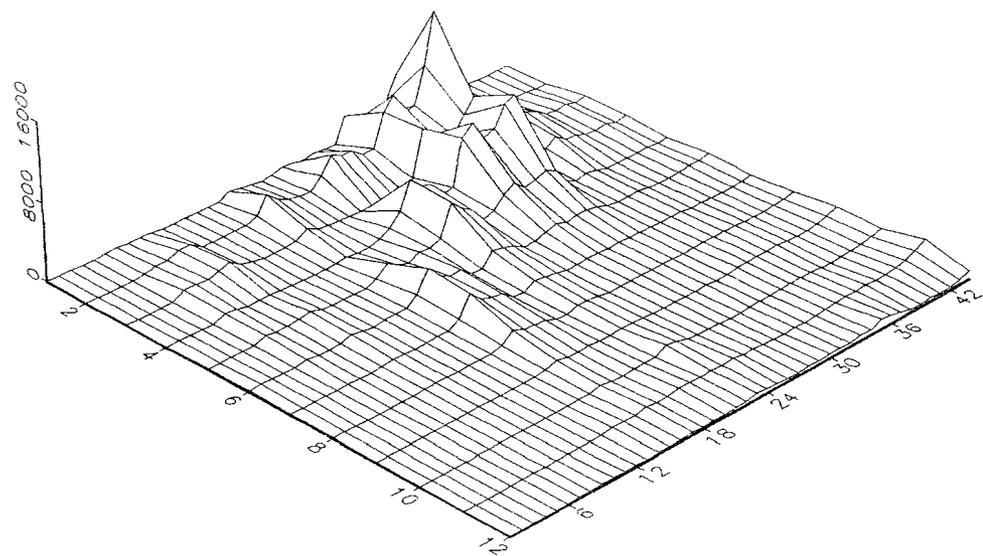
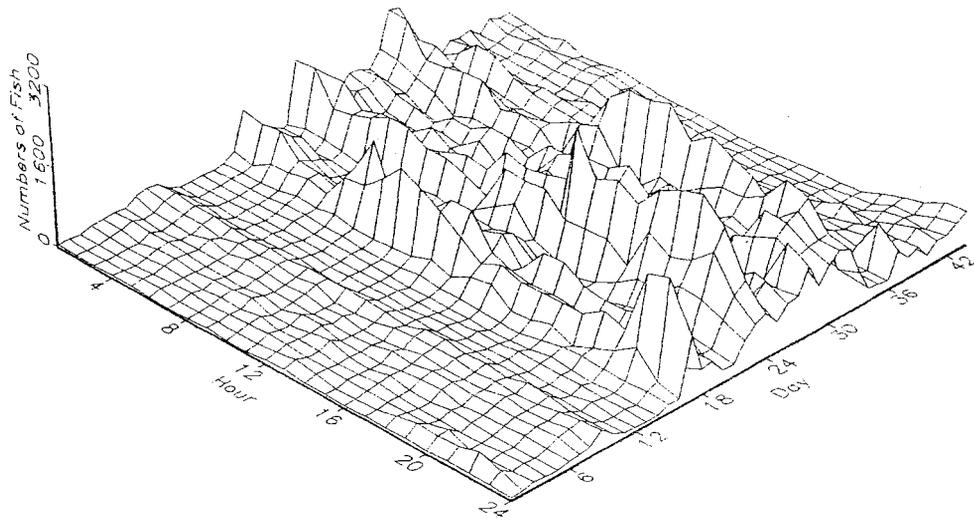


Figure 3. Distribution of salmon sonar counts by sector in the Kenai River 1998.

North Bank



South Bank

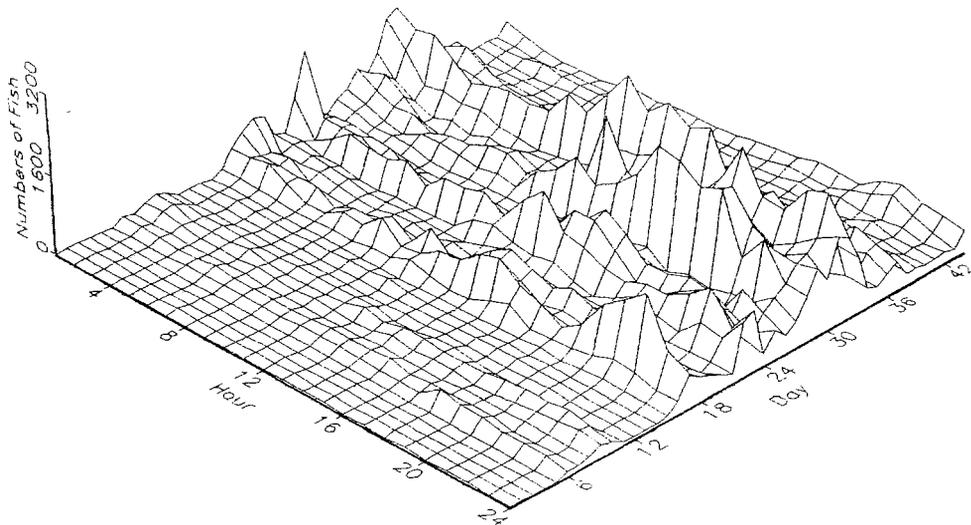
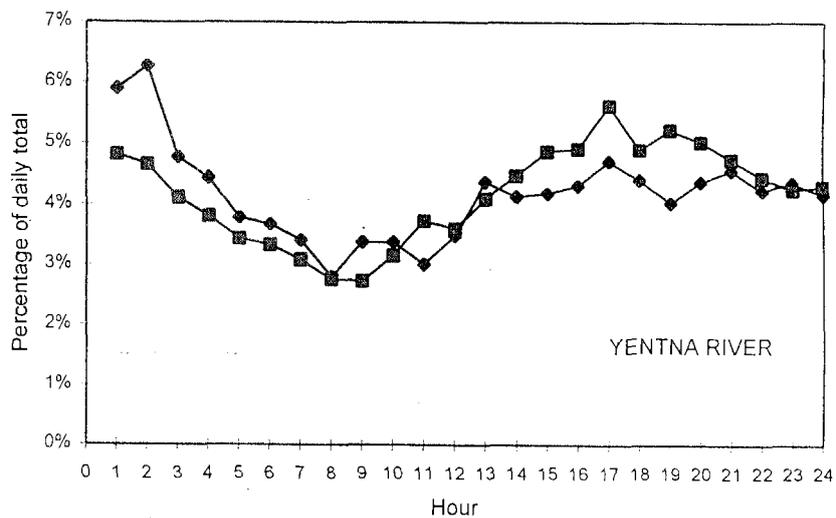
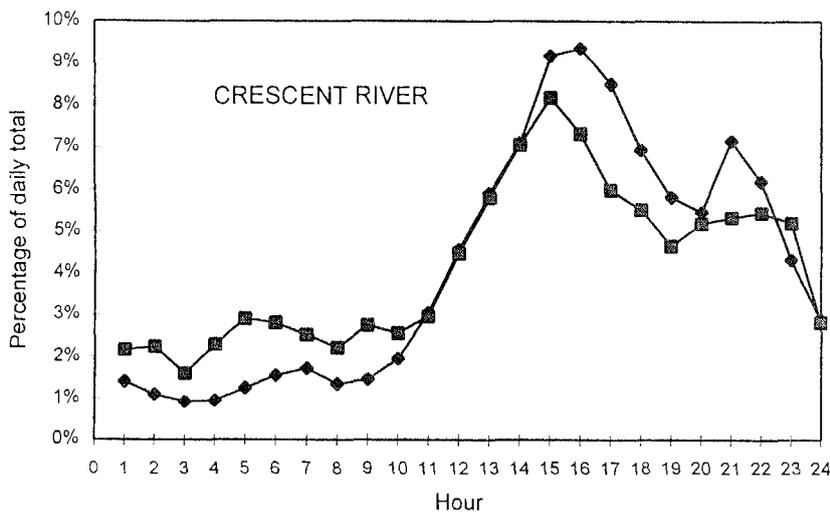
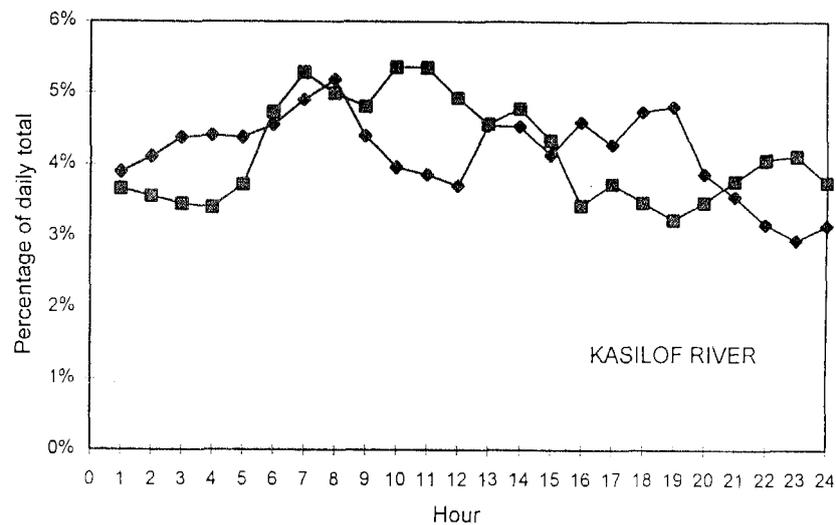
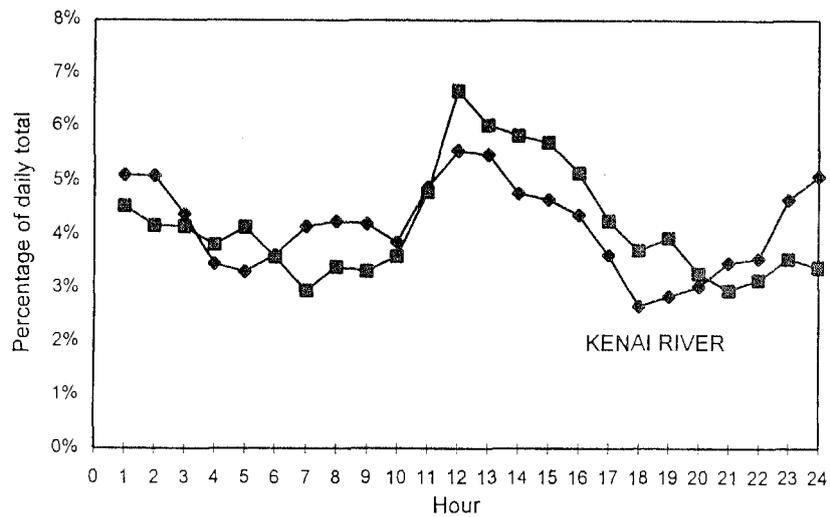


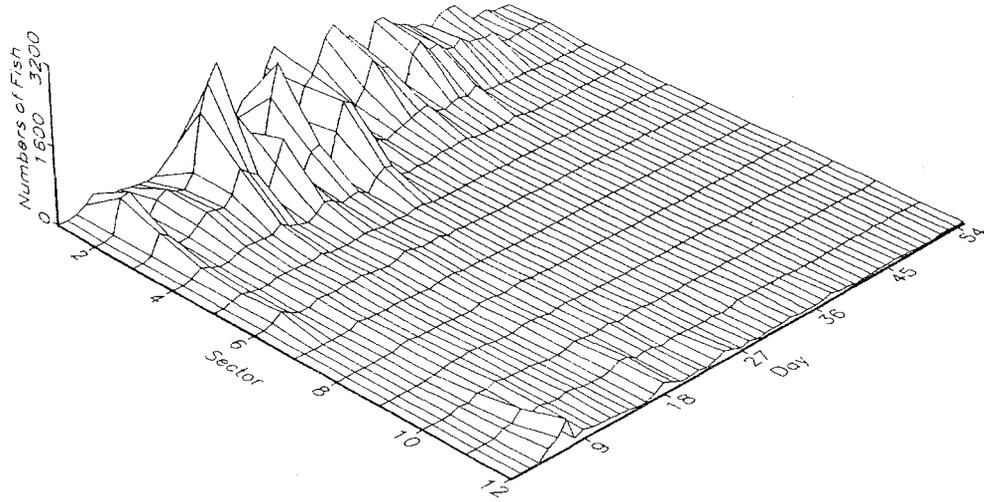
Figure 4. Hourly distribution of salmon migrating past the Kenai River sonar counters 1998. 63



△ North bank □ South bank

Figure 5. Mean hourly passage rates of salmon migrating past the Kenai, Kasilof, Crescent and Yentna River sonar counters 1998.

North Bank



South Bank

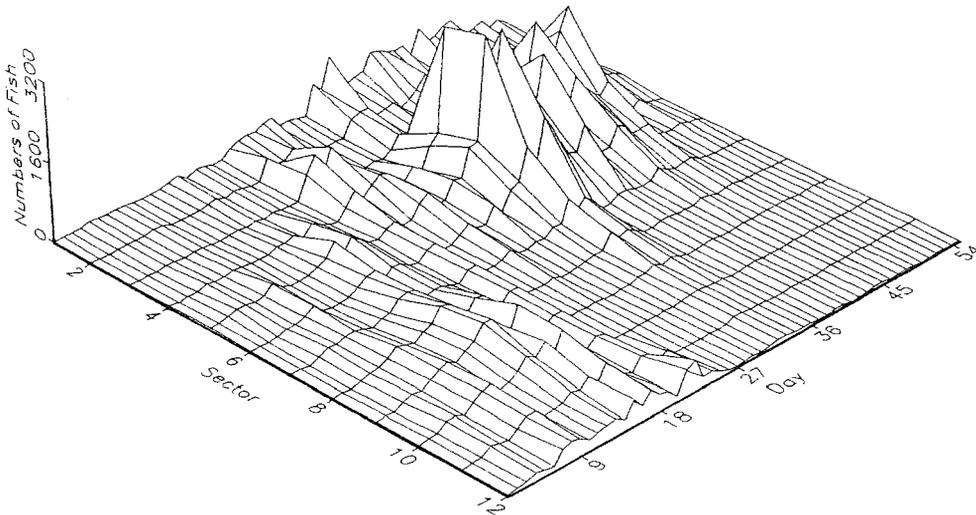
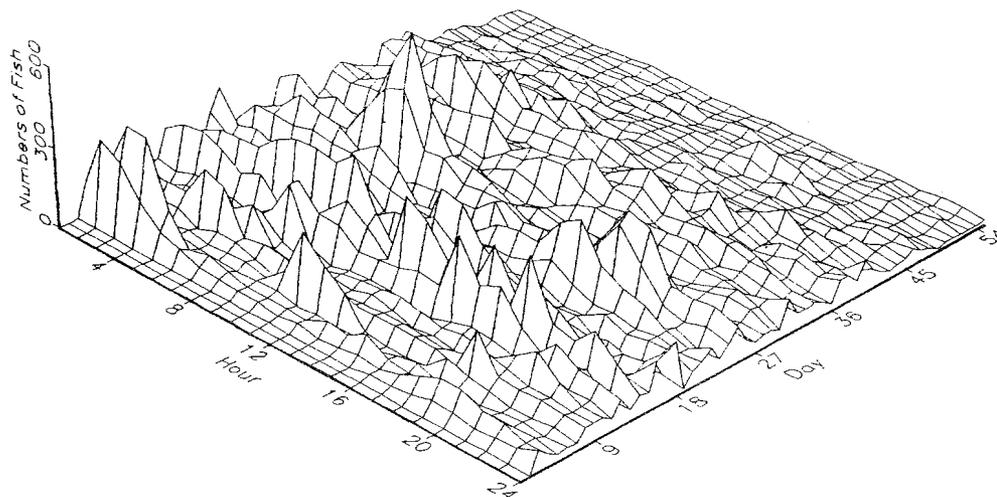


Figure 6. Distribution of salmon sonar counts by sector in the Kasilof River 1998.

North Bank



South Bank

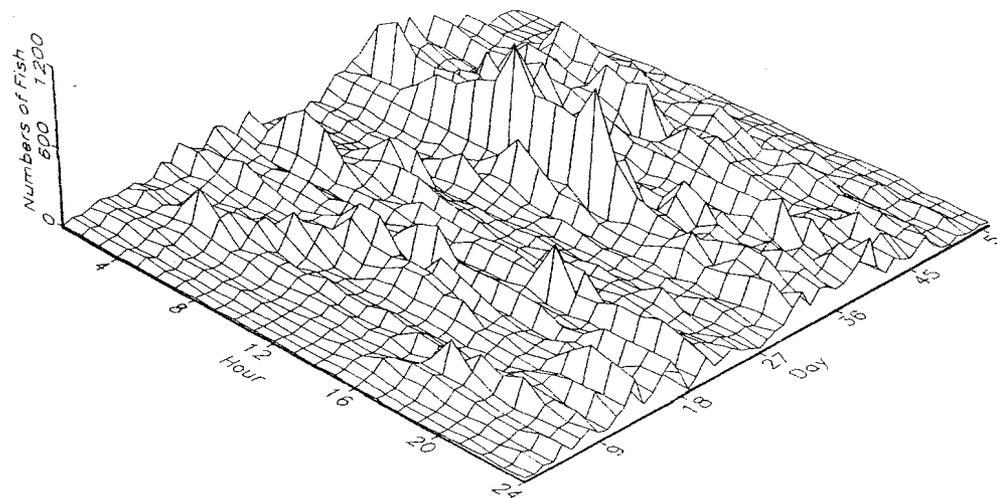
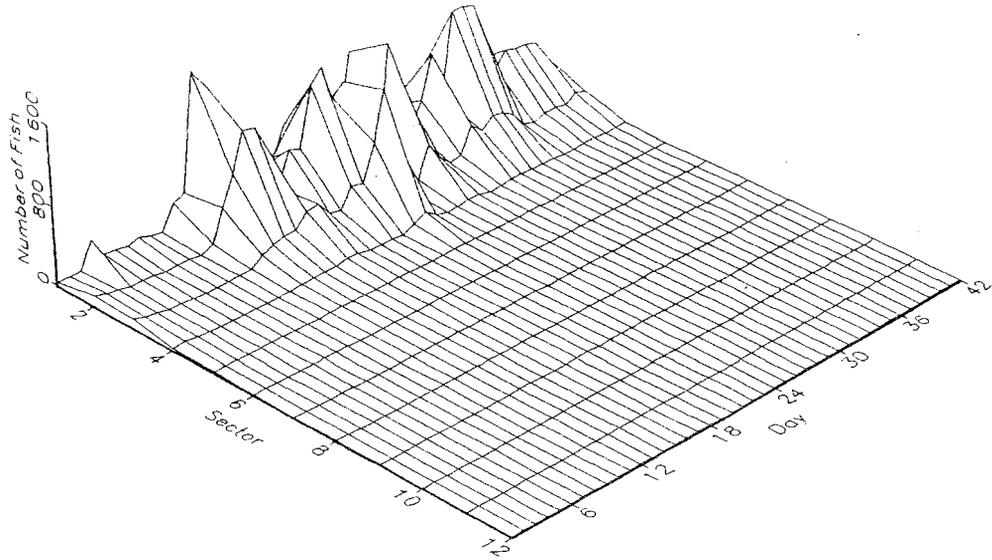


Figure 7. Hourly distribution of salmon migrating past the Kasilof River sonar counters 1998.

North Bank



South Bank

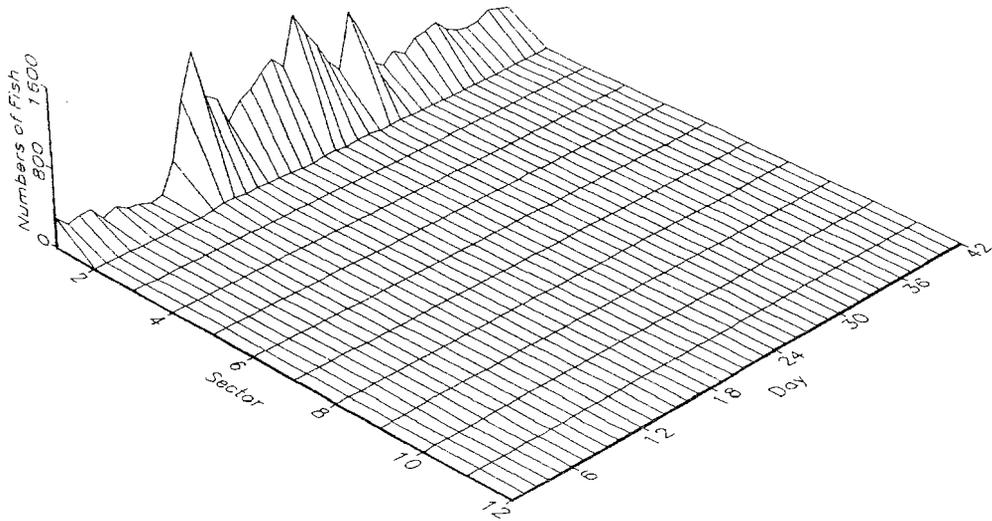
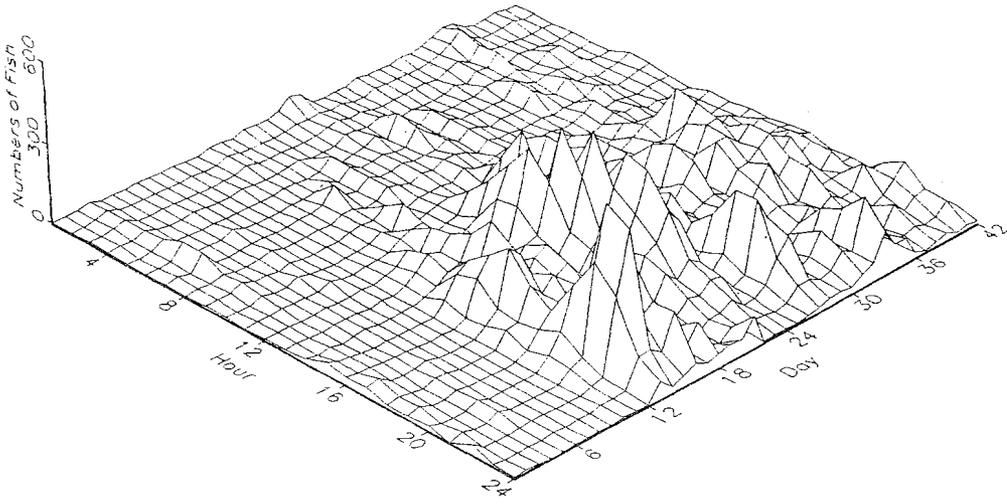


Figure 8. Distribution of salmon sonar counts by sector in the Crescent River 1998.

North Bank



South Bank

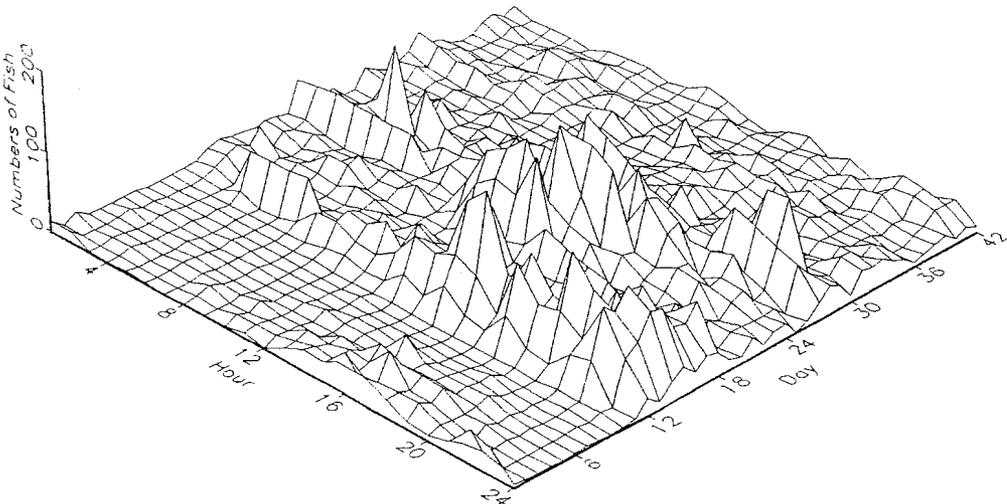


Figure 9. Hourly distribution of salmon migrating past the Crescent River sonar counters 1998.

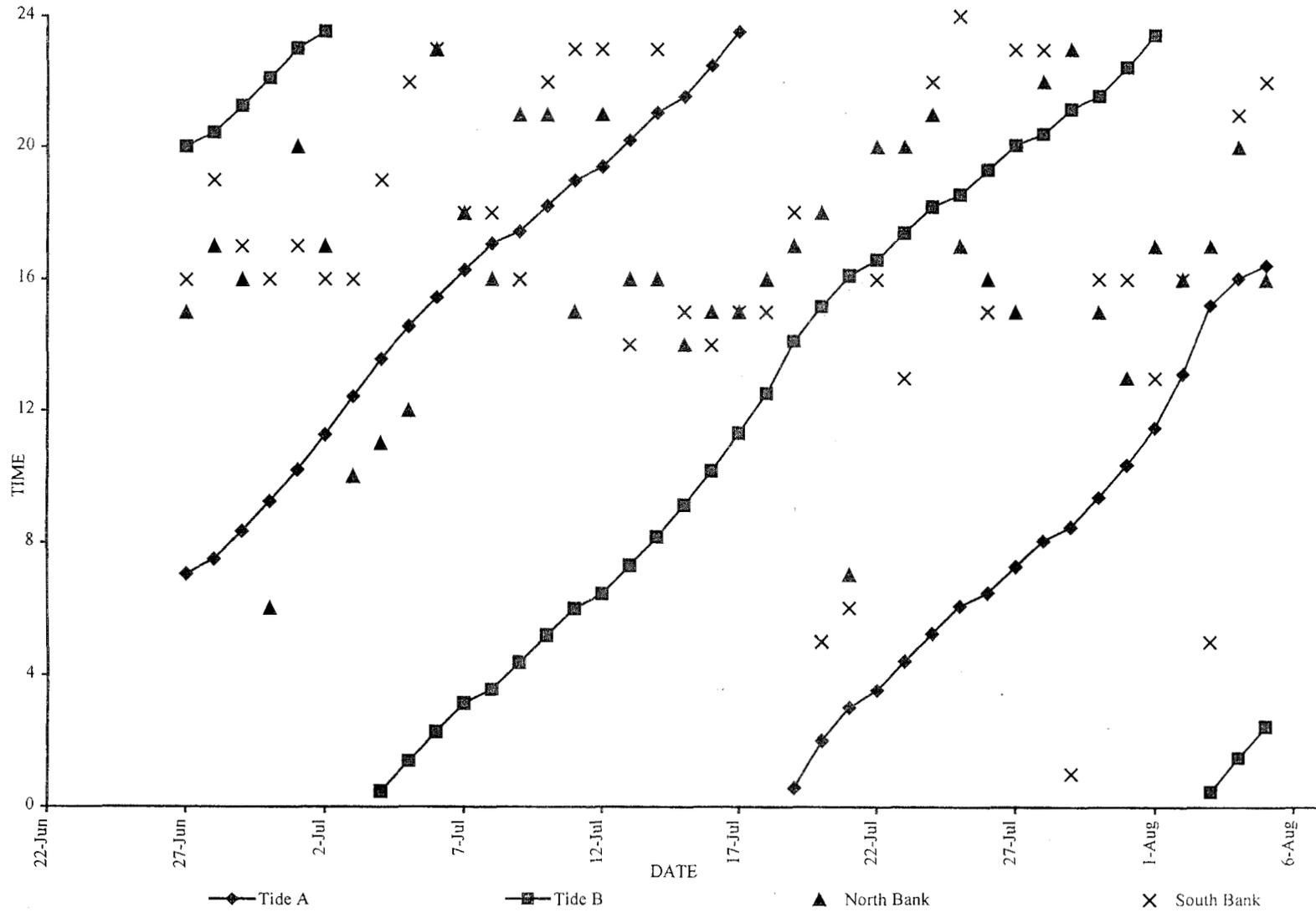
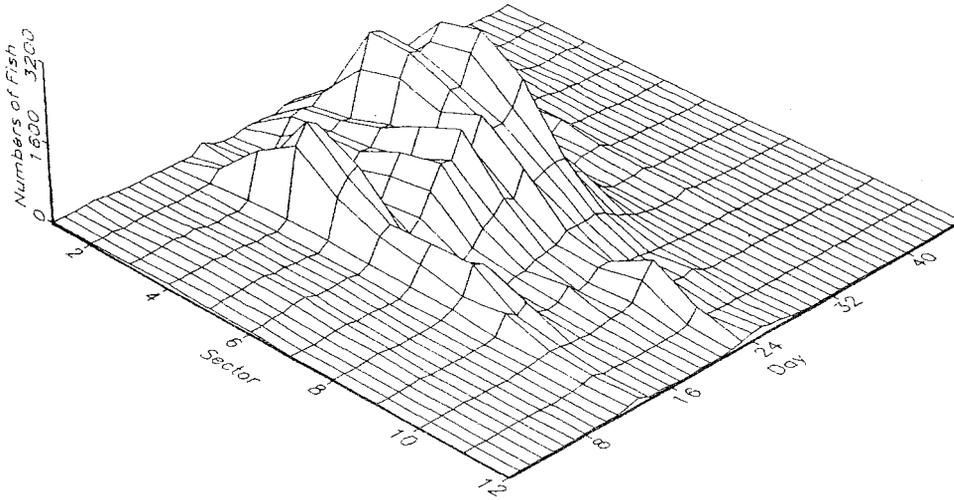


Figure 10. Time of peak daily sonar count and daily high tides at Crescent River 1998.

North Bank



South Bank

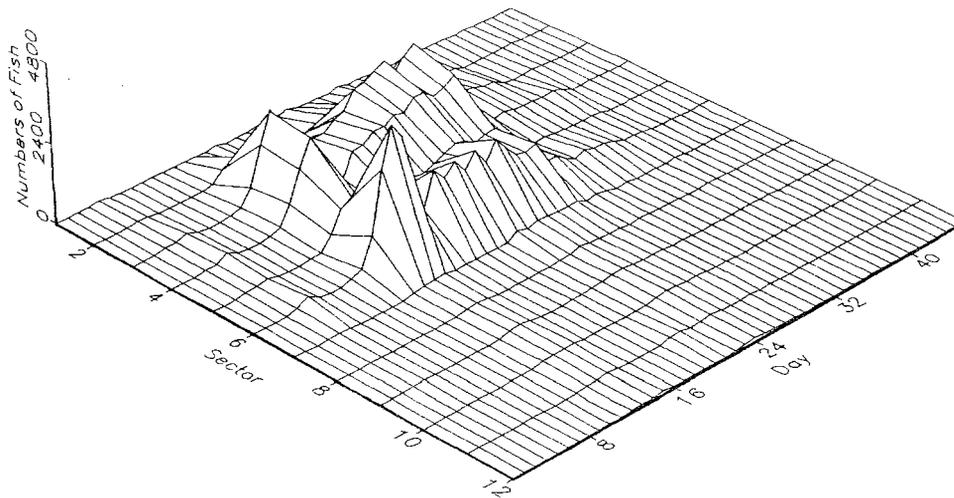
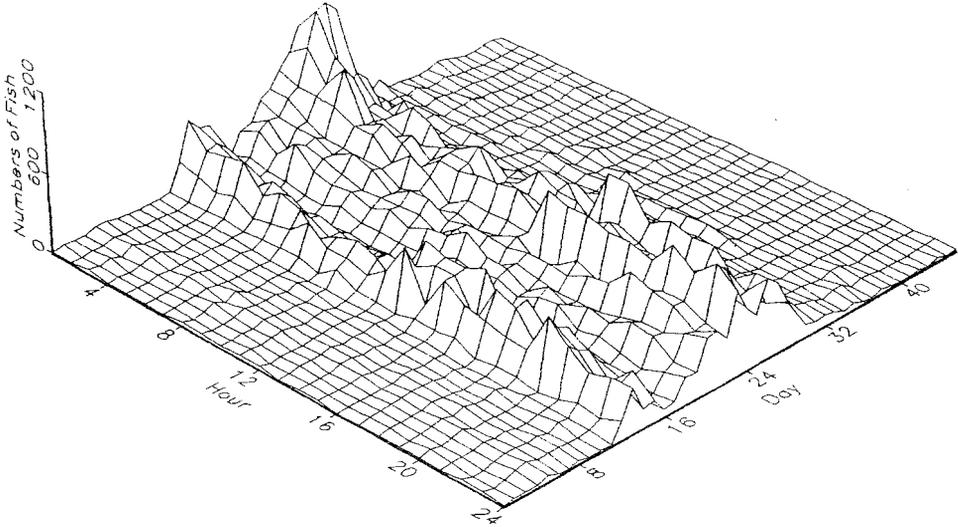


Figure 11. Distribution of salmon sonar counts by sector in the Yentna River 1998.

North Bank



South Bank

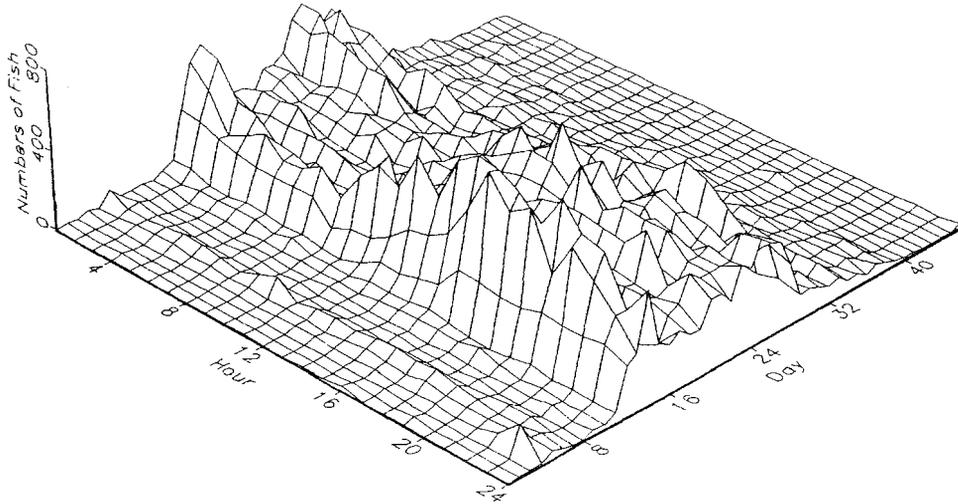


Figure 12. Hourly distribution of salmon migrating past the Yentna River sonar counters 1998.

Appendix A.1. Estimated salmon escapement adjacent to the north bank of the Kenai River, 1 July through 13 August 1998. Species composition of daily sonar counts based on fish wheel catches.

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
1-Jul	1,262	1,262	0	0	0	0	0	0
2-Jul	2,614	3,876	0	0	0	0	0	0
3-Jul	2,172	6,048	0	0	0	0	0	0
4-Jul	2,136	8,184	0	0	0	0	0	0
5-Jul	2,758	10,942	0	0	0	0	0	0
6-Jul	3,248	14,190	0	0	0	0	0	0
7-Jul	3,435	17,625	0	0	0	0	0	0
8-Jul	4,007	21,632	0	0	0	0	0	0
9-Jul	5,192	26,824	0	0	0	0	0	0
10-Jul	5,604	32,428	0	0	0	0	0	0
11-Jul	2,354	34,782	0	0	0	0	0	0
12-Jul	1,544	36,326	0	0	0	0	0	0
13-Jul	1,517	37,843	0	0	0	0	0	0
14-Jul	1,337	39,180	0	0	0	0	0	0
15-Jul	2,861	42,041	0	0	0	0	0	0
16-Jul	5,896	47,937	0	0	0	0	0	0
17-Jul	21,292	69,229	0	0	0	0	0	0
18-Jul	17,086	86,315	0	0	0	0	0	0
19-Jul	13,104	99,419	0	0	0	0	0	0
20-Jul	10,392	109,811	0	0	0	0	0	0
21-Jul	6,512	116,323	0	0	0	0	0	0
22-Jul	11,840	128,163	0	0	0	0	0	0
23-Jul	28,140	156,303	0	0	0	0	0	0
24-Jul	30,541	186,844	0	0	0	0	0	0
25-Jul	19,280	206,124	0	0	0	0	0	0
26-Jul	13,392	219,516	0	0	0	0	0	0
27-Jul	14,708	234,224	0	0	0	0	0	0
28-Jul	16,507	250,731	0	0	0	0	0	0
29-Jul	18,760	269,491	0	0	0	0	0	0
30-Jul	14,854	284,345	0	0	0	0	0	0
31-Jul	19,183	303,528	0	0	0	0	0	0
1-Aug	26,965	330,493	0	0	0	0	0	0
2-Aug	30,712	361,205	0	0	0	0	0	0
3-Aug	6,127	367,332	341	341	101	101	38	38
4-Aug	4,445	371,777	322	663	222	323	54	92
5-Aug	3,582	375,359	260	923	179	502	43	135
6-Aug	8,201	383,560	594	1,517	410	912	99	234

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Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7-Aug	5,677	389,237	770	2,287	243	1,155	122	356
8-Aug	6,149	395,386	401	2,688	294	1,449	0	356
9-Aug	4,610	399,996	170	2,858	79	1,528	40	396
10-Aug	4,586	404,582	286	3,144	124	1,652	87	483
11-Aug	5,467	410,049	206	3,350	108	1,760	18	501
12-Aug	4,699	414,748	352	3,702	114	1,874	46	547
13-Aug	5,096	419,844	381	4,083	124	1,998	50	597

^aSpecies apportionment began on 13 August.

Appendix A.2. Estimated salmon escapement adjacent to the south bank of the Kenai River, 1 July through 13 August 1998. Species composition of daily sonar counts based on fish wheel catches.

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
1-Jul	512	512	0	0	0	0	0	0
2-Jul	604	1,116	0	0	0	0	0	0
3-Jul	510	1,626	0	0	0	0	0	0
4-Jul	398	2,024	0	0	0	0	0	0
5-Jul	302	2,326	0	0	0	0	0	0
6-Jul	2,614	4,940	0	0	0	0	0	0
7-Jul	2,776	7,716	0	0	0	0	0	0
8-Jul	2,003	9,719	0	0	0	0	0	0
9-Jul	3,330	13,049	0	0	0	0	0	0
10-Jul	4,439	17,488	0	0	0	0	0	0
11-Jul	2,132	19,620	0	0	0	0	0	0
12-Jul	1,316	20,936	0	0	0	0	0	0
13-Jul	1,440	22,376	0	0	0	0	0	0
14-Jul	1,881	24,257	0	0	0	0	0	0
15-Jul	1,625	25,882	0	0	0	0	0	0
16-Jul	4,630	30,512	0	0	0	0	0	0
17-Jul	15,159	45,671	0	0	0	0	0	0
18-Jul	8,677	54,348	0	0	0	0	0	0
19-Jul	6,481	60,829	0	0	0	0	0	0
20-Jul	6,995	67,824	0	0	0	0	0	0
21-Jul	5,022	72,846	0	0	0	0	0	0
22-Jul	7,819	80,665	0	0	0	0	0	0
23-Jul	18,691	99,356	0	0	0	0	0	0
24-Jul	14,685	114,041	0	0	0	0	0	0
25-Jul	12,670	126,711	0	0	0	0	0	0
26-Jul	6,677	133,388	0	0	0	0	0	0
27-Jul	8,246	141,634	0	0	0	0	0	0
28-Jul	24,806	166,440	0	0	0	0	0	0
29-Jul	25,858	192,298	0	0	0	0	0	0
30-Jul	17,441	209,739	0	0	0	0	0	0
31-Jul	19,515	229,254	0	0	0	0	0	0
1-Aug	28,435	257,689	0	0	0	0	0	0
2-Aug	37,108	294,797	0	0	0	0	0	0
3-Aug	6,635	301,432	370	370	109	109	41	41
4-Aug	4,018	305,450	291	661	201	310	48	89
5-Aug	5,030	310,480	364	1,025	251	561	61	150
6-Aug	7,241	317,721	525	1,550	362	923	87	237

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Appendix A.2. (p2 of2)

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7-Aug	6,106	323,827	766	2,316	149	1,072	0	237
8-Aug	4,448	328,275	558	2,874	108	1,180	0	237
9-Aug	2,871	331,146	360	3,234	70	1,250	0	237
10-Aug	2,707	333,853	340	3,574	66	1,316	0	237
11-Aug	3,937	337,790	494	4,068	96	1,412	0	237
12-Aug	3,908	341,698	959	5,027	113	1,525	0	237
13-Aug	6,016	347,714	1,475	6,502	174	1,699	0	237

^aSpecies apportionment began on 13 August.

Appendix A.3. Kenai River north bank sonar counts by hour, 1 July through 13 August 1998.

Counts by Hour																									Daily	Cum
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total	Total
1-Jul	56	41	36	61	36	31	15	20	65	26	26	71	96	37	50	53	65	57	71	63	83	67	82	54	1,262	1,262
2-Jul	41	31	29	29	73	85	38	48	46	67	59	107	164	108	39	59	58	163	247	228	234	368	233	60	2,614	3,876
3-Jul	33	26	31	28	56	73	97	67	90	113	143	148	100	104	88	95	91	114	112	227	58	71	89	118	2,172	6,048
4-Jul	105	67	53	70	112	84	43	113	76	138	90	132	110	71	84	128	85	64	72	49	58	112	124	96	2,136	8,184
5-Jul	127	112	60	139	153	95	135	142	199	40	73	148	210	98	75	155	94	83	143	112	94	93	94	84	2,758	10,942
6-Jul	153	201	170	173	132	92	86	62	116	53	181	170	81	82	69	145	185	206	97	145	151	192	168	138	3,248	14,190
7-Jul	132	113	88	99	107	93	103	137	83	91	56	74	63	91	203	154	231	237	205	213	213	251	254	144	3,435	17,625
8-Jul	269	137	121	97	216	125	228	148	110	142	71	120	65	60	131	220	172	177	187	286	212	243	302	168	4,007	21,632
9-Jul	332	273	201	192	115	236	180	207	154	216	65	57	88	216	248	249	263	193	239	209	223	299	351	386	5,192	26,824
10-Jul	309	334	273	258	228	204	229	186	227	234	234	201	188	143	277	298	234	262	177	300	260	173	183	192	5,604	32,428
11-Jul	125	159	156	78	84	69	81	102	36	11	53	102	102	140	117	151	148	125	130	72	98	49	77	89	2,354	34,782
12-Jul	43	27	40	22	73	102	93	62	26	60	44	74	31	79	120	80	98	90	59	33	36	124	58	70	1,544	36,326
13-Jul	55	37	23	61	46	53	44	35	37	31	47	55	40	35	55	99	82	129	108	104	120	79	83	59	1,517	37,843
14-Jul	77	50	46	47	82	122	63	82	69	42	35	15	33	15	15	14	29	45	130	85	55	63	47	76	1,337	39,180
15-Jul	67	86	83	82	150	146	98	121	71	60	97	166	92	96	69	53	60	114	196	244	201	168	181	160	2,861	42,041
16-Jul	100	103	83	128	233	167	257	173	150	184	221	359	217	415	489	160	191	303	100	283	442	725	268	145	5,896	47,937
17-Jul	250	155	371	400	470	367	889	939	1,252	1,688	1,471	1,207	889	585	759	625	618	614	633	888	753	2,045	2,166	1,258	21,292	69,229
18-Jul	1,014	901	959	541	480	371	997	1,734	622	857	913	1,342	1,330	696	528	458	470	426	339	422	466	417	307	496	17,086	86,315
19-Jul	643	732	738	437	267	190	237	290	358	172	192	244	824	962	461	979	996	727	654	672	807	469	519	534	13,104	99,419
20-Jul	296	610	616	367	189	89	432	90	721	460	332	778	739	844	488	588	174	348	347	355	277	681	338	233	10,392	109,811
21-Jul	189	228	211	228	152	187	93	178	253	165	295	230	422	592	270	270	241	191	326	396	467	380	312	236	6,512	116,323
22-Jul	277	395	364	325	215	227	313	326	381	270	498	772	1,028	498	295	158	251	468	750	719	1,013	956	767	574	11,840	128,163
23-Jul	1,524	1,542	898	969	1,100	1,292	1,278	1,046	1,050	882	680	1,426	1,377	1,407	986	1,013	1,010	694	1,571	1,283	1,413	1,778	1,140	781	28,140	156,303
24-Jul	653	1,314	1,351	958	1,074	1,100	765	898	412	350	221	348	503	339	2,749	1,900	2,091	1,812	2,276	2,470	2,601	2,167	1,325	864	30,541	186,844
25-Jul	594	725	690	585	374	482	562	762	888	804	1,360	1,235	1,278	1,397	1,055	507	415	425	620	951	1,373	767	850	581	19,280	206,124
26-Jul	390	395	379	394	329	443	277	265	434	370	483	648	665	395	558	824	868	735	788	672	749	431	1,062	838	13,392	219,516
27-Jul	476	672	329	282	394	677	448	364	349	324	689	954	744	592	301	542	475	1,067	1,019	747	631	938	814	880	14,708	234,224
28-Jul	725	631	322	256	206	467	381	690	368	214	650	1,191	1,373	1,053	835	670	975	674	257	423	505	689	1,617	1,335	16,507	250,731
29-Jul	709	769	581	502	364	660	642	849	840	619	1,073	1,056	1,140	613	785	519	420	456	456	1,032	1,205	1,399	1,222	849	18,760	269,491
30-Jul	618	534	483	258	181	220	179	365	407	194	185	618	356	791	398	448	422	657	969	893	1,622	1,583	1,312	1,161	14,854	284,345
31-Jul	942	901	721	580	306	455	419	421	433	246	610	780	798	1,038	631	1,058	595	717	1,003	821	1,333	1,703	1,340	1,332	19,183	303,528
1-Aug	1,651	1,619	979	1,016	1,122	1,138	713	823	722	339	1,169	1,339	638	486	884	797	1,049	1,279	1,262	1,479	2,014	1,856	1,346	1,245	26,965	330,493
2-Aug	1,588	1,157	1,175	916	857	773	563	628	725	939	1,084	1,830	2,153	2,135	2,277	1,709	1,985	1,749	1,581	1,125	1,204	1,357	528	674	30,712	361,205
3-Aug	716	488	385	288	244	136	170	114	190	204	141	199	203	254	120	263	199	334	223	354	405	414	314	249	6,607	367,812
4-Aug	246	308	372	347	166	227	155	109	74	100	97	151	171	109	210	80	131	211	313	289	362	366	232	217	5,043	372,855
5-Aug	113	159	227	265	177	121	95	44	49	84	73	82	134	134	169	157	450	168	168	560	168	168	168	168	4,064	376,919
6-Aug	219	421	816	744	464	349	267	245	182	390	113	146	179	284	258	334	292	473	358	312	451	346	1,009	652	9,304	386,223
7-Aug	424	506	485	287	244	356	318	273	255	282	191	125	109	134	140	158	207	151	61	377	375	449	502	403	6,812	393,035
8-Aug	372	284	224	137	85	106	182	354	221	195	381	222	261	320	299	268	251	291	240	276	376	519	470	510	6,844	399,879
9-Aug	439	222	211	182	170	121	148	123	123	180	165	130	147	189	125	126	177	166	297	471	231	228	309	219	4,899	404,778

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-Continued-

Appendix A.3. (p.2 of 2)

Counts by Hour

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total	Cum Total
10-Aug	233	257	210	262	215	238	291	142	137	185	166	116	190	135	108	144	149	139	126	191	198	353	482	416	5,083	409,861
11-Aug	481	333	401	374	285	311	378	270	212	240	229	147	73	125	69	69	98	136	77	98	300	370	328	395	5,799	415,660
12-Aug	387	378	330	213	277	312	334	211	178	148	136	107	69	77	75	47	26	50	104	122	296	317	471	546	5,211	420,871
13-Aug	409	352	254	393	210	234	294	215	167	147	140	89	46	38	31	51	70	66	71	234	358	457	651	674	5,651	426,522
Total	18,602	18,785	16,575	14,070	12,513	13,426	13,610	14,473	13,558	12,556	15,232	19,511	19,519	18,009	17,958	16,887	16,898	17,868	19,162	20,893	24,883	26,680	24,495	20,359	426,522	

Appendix A.4. Kenai River south bank sonar counts by hour, 1 July through 13 August 1998.

Counts by Hour

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total	Cum Total
1-Jul	3	2	1	0	7	23	11	5	11	23	14	19	32	31	34	26	24	19	48	27	44	55	24	29	512	512
2-Jul	18	20	13	17	25	24	48	25	18	17	27	18	44	24	20	16	29	41	35	34	20	27	23	21	604	1,116
3-Jul	28	30	37	10	17	14	19	11	15	17	17	29	9	22	26	23	26	32	31	23	21	20	22	11	510	1,626
4-Jul	18	10	15	13	5	19	25	15	5	11	12	10	5	24	37	10	25	26	13	15	18	20	31	16	398	2,024
5-Jul	17	14	11	7	10	10	2	19	8	1	21	9	14	17	11	11	16	17	18	26	12	15	5	11	302	2,326
6-Jul	14	20	15	13	71	66	68	72	67	70	108	108	108	85	71	73	69	327	272	254	190	199	177	97	2,614	4,940
7-Jul	129	129	101	71	92	149	104	98	95	84	114	156	151	138	190	98	146	119	144	150	73	65	91	89	2,776	7,716
8-Jul	68	73	77	44	50	74	80	27	45	32	35	71	63	102	84	85	75	117	134	133	150	131	110	143	2,003	9,719
9-Jul	200	217	134	71	71	48	108	79	30	94	77	53	72	210	119	165	152	87	101	182	222	252	322	264	3,330	13,049
10-Jul	268	265	114	99	79	154	64	58	39	63	99	230	148	249	239	191	190	205	269	314	284	365	267	186	4,439	17,488
11-Jul	173	144	106	117	96	70	73	111	79	90	114	134	45	39	134	163	85	66	57	49	33	32	61	61	2,132	19,620
12-Jul	50	31	48	31	48	26	39	31	33	38	23	58	81	53	90	80	63	79	93	98	65	61	55	42	1,316	20,936
13-Jul	47	47	40	26	16	21	30	18	36	38	26	46	51	80	96	123	121	130	109	91	77	58	59	54	1,440	22,376
14-Jul	67	77	107	78	63	38	67	58	95	88	154	77	59	84	86	67	113	82	109	81	82	65	43	41	1,881	24,257
15-Jul	33	71	47	29	31	26	51	38	26	38	28	46	61	69	82	78	89	126	65	125	145	119	107	95	1,625	25,882
16-Jul	149	146	123	99	46	61	88	67	142	146	314	182	102	133	314	457	156	179	210	271	416	362	219	248	4,630	30,512
17-Jul	466	485	553	329	116	120	353	285	632	258	328	572	594	926	1,060	711	539	297	560	1,179	1,463	1,793	895	645	15,159	45,671
18-Jul	689	414	389	365	353	133	326	288	544	270	735	351	371	520	461	371	221	153	267	159	320	214	275	488	8,677	54,348
19-Jul	884	375	475	156	103	64	82	185	199	155	184	182	188	590	374	87	188	129	138	317	353	382	299	392	6,481	60,829
20-Jul	813	248	218	258	164	98	69	172	207	106	227	138	454	683	482	309	527	350	303	281	382	110	115	281	6,995	67,824
21-Jul	353	344	297	255	208	100	118	160	125	106	107	244	383	269	189	140	246	218	233	169	178	194	206	180	5,022	72,846
22-Jul	251	296	159	161	77	41	117	98	106	140	454	560	411	349	409	233	132	321	537	371	262	668	569	1,097	7,819	80,665
23-Jul	887	177	423	726	632	615	762	439	808	799	917	631	1,150	1,531	900	803	585	518	689	677	915	1,239	658	1,210	18,691	99,356
24-Jul	1,759	548	546	571	350	376	392	316	309	503	503	426	546	659	1,247	1,222	830	402	367	620	871	742	349	231	14,685	114,041
25-Jul	337	475	518	449	439	152	302	306	229	407	224	152	307	803	927	1,346	1,060	658	647	800	731	490	317	594	12,670	126,711
26-Jul	234	282	157	203	156	106	65	115	230	140	105	192	90	232	173	665	586	459	183	237	223	861	610	373	6,677	133,388
27-Jul	437	384	238	280	269	127	120	156	164	168	187	228	338	448	348	484	569	264	417	354	460	479	790	537	8,246	141,634
28-Jul	557	447	281	193	396	413	366	287	371	275	797	1,035	1,489	1,105	1,326	1,744	2,487	2,397	2,067	2,217	1,051	1,631	960	914	24,806	166,440
29-Jul	887	625	482	519	305	442	468	651	686	466	563	1,085	1,059	2,380	1,481	1,327	1,717	1,668	1,405	2,166	1,594	1,297	1,237	1,348	25,858	192,298
30-Jul	714	863	587	231	138	167	255	548	631	437	375	395	844	949	1,080	1,017	1,044	959	714	1,134	915	1,088	1,332	1,024	17,441	209,739
31-Jul	1,042	631	387	222	361	253	399	354	470	498	439	429	676	987	813	957	654	1,490	1,726	1,251	974	1,219	1,530	1,753	19,515	229,254
1-Aug	1,633	1,178	617	679	604	673	514	483	414	479	546	690	1,234	1,289	1,506	1,456	1,078	1,615	2,440	1,639	1,577	2,169	2,306	1,616	28,435	257,689
2-Aug	1,784	1,509	1,574	1,255	936	1,061	1,153	1,084	1,132	1,656	1,472	2,031	2,594	2,060	2,423	2,118	2,303	1,335	1,279	1,648	1,270	1,144	1,176	1,111	37,108	294,797
3-Aug	607	507	323	203	121	176	165	239	326	338	192	187	259	209	329	295	306	262	358	243	373	294	452	391	7,155	301,952
4-Aug	311	228	236	102	94	113	126	74	100	130	101	97	109	113	93	223	240	250	324	330	286	236	336	306	4,558	306,510
5-Aug	302	243	207	66	124	94	95	129	194	108	226	246	177	70	100	142	269	299	277	296	404	516	677	445	5,706	312,216
6-Aug	512	342	293	193	83	164	207	331	190	242	157	140	209	206	342	187	285	339	388	646	509	901	752	597	8,215	320,431
7-Aug	468	656	384	213	166	140	80	88	68	90	119	151	122	98	173	255	448	447	559	441	701	504	413	237	7,021	327,452
8-Aug	461	379	88	93	73	58	108	131	153	176	213	124	97	124	130	251	356	289	260	406	287	279	332	246	5,114	332,566
9-Aug	106	63	81	91	60	18	43	83	111	116	110	102	90	91	110	128	164	256	294	265	249	273	196	201	3,301	335,867

-Continued-

Appendix A.4. (p.2 of 2)

Counts by Hour

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total	Cum Total
10-Aug	150	114	71	38	56	101	114	79	49	64	76	65	99	94	117	155	178	140	135	184	365	235	233	201	3,113	338,980
11-Aug	186	151	161	243	147	161	156	156	103	116	111	100	150	140	147	171	264	241	340	249	275	318	203	238	4,527	343,507
12-Aug	155	142	77	66	92	93	82	144	97	86	93	126	130	158	206	293	246	218	381	502	683	462	310	175	5,017	348,524
13-Aug	396	268	153	81	78	66	135	206	160	224	204	201	237	297	339	356	467	438	386	646	791	605	537	451	7,722	356,246
Total	18,663	13,670	10,964	8,966	7,428	6,948	8,049	8,319	9,552	9,403	10,948	12,126	15,452	18,740	18,918	19,112	19,368	18,064	19,382	21,300	20,314	22,189	19,681	18,690	356,246	

Appendix A.5. Kenai River north bank sonar counts by hour, 1 July through 13 August 1998. Counts expressed as percentage of daily total.

Date	Counts by Hour																								Daily Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jul	4.4	3.2	2.9	4.8	2.9	2.5	1.2	1.6	5.2	2.1	2.1	5.6	7.6	2.9	4.0	4.2	5.2	4.5	5.6	5.0	6.6	5.3	6.5	4.3	100.0
2-Jul	1.6	1.2	1.1	1.1	2.8	3.3	1.5	1.8	1.8	2.6	2.3	4.1	6.3	4.1	1.5	2.3	2.2	6.2	9.4	8.7	9.0	14.1	8.9	2.3	100.0
3-Jul	1.5	1.2	1.4	1.3	2.6	3.4	4.5	3.1	4.1	5.2	6.6	6.8	4.6	4.8	4.1	4.4	4.2	5.2	5.2	10.5	2.7	3.3	4.1	5.4	100.0
4-Jul	4.9	3.1	2.5	3.3	5.2	3.9	2.0	5.3	3.6	6.5	4.2	6.2	5.1	3.3	3.9	6.0	4.0	3.0	3.4	2.3	2.7	5.2	5.8	4.5	100.0
5-Jul	4.6	4.1	2.2	5.0	5.5	3.4	4.9	5.1	7.2	1.5	2.6	5.4	7.6	3.6	2.7	5.6	3.4	3.0	5.2	4.1	3.4	3.4	3.4	3.0	100.0
6-Jul	4.7	6.2	5.2	5.3	4.1	2.8	2.6	1.9	3.6	1.6	5.6	5.2	2.5	2.1	4.5	5.7	6.3	3.0	4.5	4.6	5.9	5.2	4.2	4.2	100.0
7-Jul	3.8	3.3	2.6	2.9	3.1	2.7	3.0	4.0	2.4	2.6	1.6	2.2	1.8	2.6	5.9	4.5	6.7	6.9	6.0	6.2	6.2	7.3	7.4	4.2	100.0
8-Jul	6.7	3.4	3.0	2.4	5.4	3.1	5.7	3.7	2.7	3.5	1.8	3.0	1.6	1.5	3.3	5.5	4.3	4.4	4.7	7.1	5.3	6.1	7.5	4.2	100.0
9-Jul	6.4	5.3	3.9	3.7	2.2	4.5	3.5	4.0	3.0	4.2	1.3	1.1	1.7	4.2	4.8	4.8	5.1	3.7	4.6	4.0	4.3	5.8	6.8	7.4	100.0
10-Jul	5.5	6.0	4.9	4.6	4.1	3.6	4.1	3.3	4.1	4.2	4.2	3.6	3.4	2.6	4.9	5.3	4.2	4.7	3.2	5.4	4.6	3.1	3.3	3.4	100.0
11-Jul	5.3	6.8	6.6	3.3	3.6	2.9	3.4	4.3	1.5	0.5	2.3	4.3	4.3	5.9	5.0	6.4	6.3	5.3	5.5	3.1	4.2	2.1	3.3	3.8	100.0
12-Jul	2.8	1.7	2.6	1.4	4.7	6.6	6.0	4.0	1.7	3.9	2.8	4.8	2.0	5.1	7.8	5.2	6.3	5.8	3.8	2.1	2.3	8.0	3.8	4.5	100.0
13-Jul	3.6	2.4	1.5	4.0	3.0	3.5	2.9	2.3	2.4	2.0	3.1	3.6	2.6	2.3	3.6	6.5	5.4	8.5	7.1	6.9	7.9	5.2	5.5	3.9	100.0
14-Jul	5.8	3.7	3.4	3.5	6.1	9.1	4.7	6.1	5.2	3.1	2.6	1.1	2.5	1.1	1.1	1.0	2.2	3.4	9.7	6.4	4.1	4.7	3.5	5.7	100.0
15-Jul	2.3	3.0	2.9	2.9	5.2	5.1	3.4	4.2	2.5	2.1	3.4	5.8	3.2	3.4	2.4	1.9	2.1	4.0	6.9	8.5	7.0	5.9	6.3	5.6	100.0
16-Jul	1.7	1.7	1.4	2.2	4.0	2.8	4.4	2.9	2.5	3.1	3.7	6.1	3.7	7.0	8.3	2.7	3.2	5.1	1.7	4.8	7.5	12.3	4.5	2.5	100.0
17-Jul	1.2	0.7	1.7	1.9	2.2	1.7	4.2	4.4	5.9	7.9	6.9	5.7	4.2	2.7	3.6	2.9	2.9	2.9	3.0	4.2	3.5	9.6	10.2	5.9	100.0
18-Jul	5.9	5.3	5.6	3.2	2.8	2.2	5.8	10.1	3.6	5.0	5.3	7.9	7.8	4.1	3.1	2.7	2.8	2.5	2.0	2.5	2.7	2.4	1.8	2.9	100.0
19-Jul	4.9	5.6	5.6	3.3	2.0	1.4	1.8	2.2	2.7	1.3	1.5	1.9	6.3	7.3	3.5	7.5	7.6	5.5	5.0	5.1	6.2	3.6	4.0	4.1	100.0
20-Jul	2.8	5.9	5.9	3.5	1.8	0.9	4.2	0.9	6.9	4.4	3.2	7.5	7.1	8.1	4.7	5.7	1.7	3.3	3.3	3.4	2.7	6.6	3.3	2.2	100.0
21-Jul	2.9	3.5	3.2	3.5	2.3	2.9	1.4	2.7	3.9	2.5	4.5	3.5	6.5	9.1	4.1	4.1	3.7	2.9	5.0	6.1	7.2	5.8	4.8	3.6	100.0
22-Jul	2.3	3.3	3.1	2.7	1.8	1.9	2.6	2.8	3.2	2.3	4.2	6.5	8.7	4.2	2.5	1.3	2.1	4.0	6.3	6.1	8.6	8.1	6.5	4.8	100.0
23-Jul	5.4	5.5	3.2	3.4	3.9	4.6	4.5	3.7	3.7	3.1	2.4	5.1	4.9	5.0	3.5	3.6	3.6	2.5	5.6	4.6	5.0	6.3	4.1	2.8	100.0
24-Jul	2.1	4.3	4.4	3.1	3.5	3.6	2.5	2.9	1.3	1.1	0.7	1.1	1.6	1.1	9.0	6.2	6.8	5.9	7.5	8.1	8.5	7.1	4.3	2.8	100.0
25-Jul	3.1	3.8	3.6	3.0	1.9	2.5	2.9	4.0	4.6	4.2	7.1	6.4	6.6	7.2	5.5	2.6	2.2	2.2	3.2	4.9	7.1	4.0	4.4	3.0	100.0
26-Jul	2.9	2.9	2.8	2.9	2.5	3.3	2.1	2.0	3.2	2.8	3.6	4.8	5.0	2.9	4.2	6.2	6.5	5.5	5.9	5.0	5.6	3.2	7.9	6.3	100.0
27-Jul	3.2	4.6	2.2	1.9	2.7	4.6	3.0	2.5	2.4	2.2	4.7	6.5	5.1	4.0	2.0	3.7	3.2	7.3	6.9	5.1	4.3	6.4	5.5	6.0	100.0
28-Jul	4.4	3.8	2.0	1.6	1.2	2.8	2.3	4.2	2.2	1.3	3.9	7.2	8.3	6.4	5.1	4.1	5.9	4.1	1.6	2.6	3.1	4.2	9.8	8.1	100.0
29-Jul	3.8	4.1	3.1	2.7	1.9	3.5	3.4	4.5	4.5	3.3	5.7	5.6	6.1	3.3	4.2	2.8	2.2	2.4	2.4	5.5	6.4	7.5	6.5	4.5	100.0
30-Jul	4.2	3.6	3.3	1.7	1.2	1.5	1.2	2.5	2.7	1.3	1.2	4.2	2.4	5.3	2.7	3.0	2.8	4.4	6.5	6.0	10.9	10.7	8.8	7.8	100.0
31-Jul	4.9	4.7	3.8	3.0	1.6	2.4	2.2	2.2	2.3	1.3	3.2	4.1	4.2	5.4	3.3	5.5	3.1	3.7	5.2	4.3	6.9	8.9	7.0	6.9	100.0
1-Aug	6.1	6.0	3.6	3.8	4.2	4.2	2.6	3.1	2.7	1.3	4.3	5.0	2.4	1.8	3.3	3.0	3.9	4.7	4.7	5.5	7.5	6.9	5.0	4.6	100.0
2-Aug	5.2	3.8	3.8	3.0	2.8	2.5	1.8	2.0	2.4	3.1	3.5	6.0	7.0	7.0	7.4	5.6	6.5	5.7	5.1	3.7	3.9	4.4	1.7	2.2	100.0
3-Aug	10.8	7.4	5.8	4.4	3.7	2.1	2.6	1.7	2.9	3.1	2.1	3.0	3.1	3.8	1.8	4.0	3.0	5.1	3.4	5.4	6.1	6.3	4.8	3.8	100.0
4-Aug	4.9	6.1	7.4	6.9	3.3	4.5	3.1	2.2	1.5	2.0	1.9	3.0	3.4	2.2	4.2	1.6	2.6	4.2	6.2	5.7	7.2	7.3	4.6	4.3	100.0
5-Aug	2.8	3.9	5.6	6.5	4.4	3.0	2.3	1.1	1.2	2.1	1.8	2.0	3.3	3.2	3.3	4.2	3.9	11.1	4.1	4.1	13.8	4.1	4.1	4.1	100.0
6-Aug	2.4	4.5	8.8	8.0	5.0	3.8	2.9	2.6	2.0	4.2	1.2	1.6	1.9	3.1	2.8	3.6	3.1	5.1	3.8	3.4	4.8	3.7	10.8	7.0	100.0
7-Aug	6.2	7.4	7.1	4.2	3.6	5.2	4.7	4.0	3.7	4.1	2.8	1.8	1.6	2.0	2.1	2.3	3.0	2.2	0.9	5.5	5.5	6.6	7.4	5.9	100.0
8-Aug	5.4	4.1	3.3	2.0	1.2	1.5	2.7	5.2	3.2	2.8	5.6	3.2	3.8	4.7	4.4	3.9	3.7	4.3	3.5	4.0	5.5	7.6	6.9	7.5	100.0
9-Aug	9.0	4.5	4.3	3.7	3.5	2.5	3.0	2.5	2.5	3.7	3.4	2.7	3.0	3.9	2.6	2.6	3.6	3.4	6.1	9.6	4.7	4.7	6.3	4.5	100.0

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Appendix A.5. (p.2 of 2)

Counts by Hour																									
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total
10-Aug	4.6	5.1	4.1	5.2	4.2	4.7	5.7	2.8	2.7	3.6	3.3	2.3	3.7	2.7	2.1	2.8	2.9	2.7	2.5	3.8	3.9	6.9	9.5	8.2	100.0
11-Aug	8.3	5.7	6.9	6.4	4.9	5.4	6.5	4.7	3.7	4.1	3.9	2.5	1.3	2.2	1.2	1.2	1.7	2.3	1.3	1.7	5.2	6.4	5.7	6.8	100.0
12-Aug	7.4	7.3	6.3	4.1	5.3	6.0	6.4	4.0	3.4	2.8	2.6	2.1	1.3	1.5	1.4	0.9	0.5	1.0	2.0	2.3	5.7	6.1	9.0	10.5	100.0
13-Aug	7.2	6.2	4.5	7.0	3.7	4.1	5.2	3.8	3.0	2.6	2.5	1.6	0.8	0.7	0.5	0.9	1.2	1.2	1.3	4.1	6.3	8.1	11.5	11.9	100.0
Total	4.4	4.4	3.9	3.3	2.9	3.1	3.2	3.4	3.2	2.9	3.6	4.6	4.6	4.2	4.2	4.0	4.0	4.2	4.5	4.9	5.8	6.3	5.7	4.8	100.0

Appendix A.6. Kenai River south bank sonar counts by hour, 1 July through 13 August 1998. Counts expressed as percentage of daily total.

Date	Counts by Hour																								Daily Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jul	0.6	0.4	0.2	0.0	1.4	4.5	2.1	1.0	2.1	4.5	2.7	3.7	6.3	6.1	6.6	5.1	4.7	3.7	9.4	5.3	8.6	10.7	4.7	5.7	100.0
2-Jul	3.0	3.3	2.2	2.8	4.1	4.0	7.9	4.1	3.0	2.8	4.5	3.0	7.3	4.0	3.3	2.6	4.8	6.8	5.8	5.6	3.3	4.5	3.8	3.5	100.0
3-Jul	5.5	5.9	7.3	2.0	3.3	2.7	3.7	2.2	2.9	3.3	3.3	5.7	1.8	4.3	5.1	4.5	5.1	6.3	6.1	4.5	4.1	3.9	4.3	2.2	100.0
4-Jul	4.5	2.5	3.8	3.3	1.3	4.8	6.3	3.8	1.3	2.8	3.0	2.5	1.3	6.0	9.3	2.5	6.3	6.5	3.3	3.8	4.5	5.0	7.8	4.0	100.0
5-Jul	5.6	4.6	3.6	2.3	3.3	3.3	0.7	6.3	2.6	0.3	7.0	3.0	4.6	5.6	3.6	3.6	5.3	5.6	6.0	8.6	4.0	5.0	1.7	3.6	100.0
6-Jul	0.5	0.8	0.6	0.5	2.7	2.5	2.6	2.8	2.6	2.7	4.1	4.1	4.1	3.3	2.7	2.8	2.6	12.5	10.4	9.7	7.3	7.6	6.8	3.7	100.0
7-Jul	4.6	4.6	3.6	2.6	3.3	5.4	3.7	3.5	3.4	3.0	4.1	5.6	5.4	5.0	6.8	3.5	5.3	4.3	5.2	5.4	2.6	2.3	3.3	3.2	100.0
8-Jul	3.4	3.6	3.8	2.2	2.5	3.7	4.0	1.3	2.2	1.6	1.7	3.5	3.1	5.1	4.2	4.2	3.7	5.8	6.7	6.6	7.5	6.5	5.5	7.1	100.0
9-Jul	6.0	6.5	4.0	2.1	2.1	1.4	3.2	2.4	0.9	2.8	2.3	1.6	2.2	6.3	3.6	5.0	4.6	2.6	3.0	5.5	6.7	7.6	9.7	7.9	100.0
10-Jul	6.0	6.0	2.6	2.2	1.8	3.5	1.4	1.3	0.9	1.4	2.2	5.2	3.3	5.6	5.4	4.3	4.3	4.6	6.1	7.1	6.4	8.2	6.0	4.2	100.0
11-Jul	8.1	6.8	5.0	5.5	4.5	3.3	3.4	5.2	3.7	4.2	5.3	6.3	2.1	1.8	6.3	7.6	4.0	3.1	2.7	2.3	1.5	1.5	2.9	2.9	100.0
12-Jul	3.8	2.4	3.6	2.4	3.6	2.0	3.0	2.4	2.5	2.9	1.7	4.4	6.2	4.0	6.8	6.1	4.8	6.0	7.1	7.4	4.9	4.6	4.2	3.2	100.0
13-Jul	3.3	3.3	2.8	1.8	1.1	1.5	2.1	1.3	2.5	2.6	1.8	3.2	3.5	5.6	6.7	8.5	8.4	9.0	7.6	6.3	5.3	4.0	4.1	3.8	100.0
14-Jul	3.6	4.1	5.7	4.1	3.3	2.0	3.6	3.1	5.1	4.7	8.2	4.1	3.1	4.5	4.6	3.6	6.0	4.4	5.8	4.3	4.4	3.5	2.3	2.2	100.0
15-Jul	2.0	4.4	2.9	1.8	1.9	1.6	3.1	2.3	1.6	2.3	1.7	2.8	3.8	4.2	5.0	4.8	5.5	7.8	4.0	7.7	8.9	7.3	6.6	5.8	100.0
16-Jul	3.2	3.2	2.7	2.1	1.0	1.3	1.9	1.4	3.1	3.2	6.8	3.9	2.2	2.9	6.8	9.9	3.4	3.9	4.5	5.9	9.0	7.8	4.7	5.4	100.0
17-Jul	3.1	3.2	3.6	2.2	0.8	0.8	2.3	1.9	4.2	1.7	2.2	3.8	3.9	6.1	7.0	4.7	3.6	2.0	3.7	7.8	9.7	11.8	5.9	4.3	100.0
18-Jul	7.9	4.8	4.5	4.2	4.1	1.5	3.8	3.3	6.3	3.1	8.5	4.0	4.3	6.0	5.3	4.3	2.5	1.8	3.1	1.8	3.7	2.5	3.2	5.6	100.0
19-Jul	13.6	5.8	7.3	2.4	1.6	1.0	1.3	2.9	3.1	2.4	2.8	2.8	2.9	9.1	5.8	1.3	2.9	2.0	2.1	4.9	5.4	5.9	4.6	6.0	100.0
20-Jul	11.6	3.5	3.1	3.7	2.3	1.4	1.0	2.5	3.0	1.5	3.2	2.0	6.5	9.8	6.9	4.4	7.5	5.0	4.3	4.0	5.5	1.6	1.6	4.0	100.0
21-Jul	7.0	6.8	5.9	5.1	4.1	2.0	2.3	3.2	2.5	2.1	2.1	4.9	7.6	5.4	3.8	2.8	4.9	4.3	4.6	3.4	3.5	3.9	4.1	3.6	100.0
22-Jul	3.2	3.8	2.0	2.1	1.0	0.5	1.5	1.3	1.4	1.8	5.8	7.2	5.3	4.5	5.2	3.0	1.7	4.1	6.9	4.7	3.4	8.5	7.3	14.0	100.0
23-Jul	4.7	0.9	2.3	3.9	3.4	3.3	4.1	2.3	4.3	4.3	4.9	3.4	6.2	8.2	4.8	4.3	3.1	2.8	3.7	3.6	4.9	6.6	3.5	6.5	100.0
24-Jul	12.0	3.7	3.7	3.9	2.4	2.6	2.7	2.2	2.1	3.4	3.4	2.9	3.7	4.5	8.5	8.3	5.7	2.7	2.5	4.2	5.9	5.1	2.4	1.6	100.0
25-Jul	2.7	3.7	4.1	3.5	3.5	1.2	2.4	2.4	1.8	3.2	1.8	1.2	2.4	6.3	7.3	10.6	8.4	5.2	5.1	6.3	5.8	3.9	2.5	4.7	100.0
26-Jul	3.5	4.2	2.4	3.0	2.3	1.6	1.0	1.7	3.4	2.1	1.6	2.9	1.3	3.5	2.6	10.0	8.8	6.9	2.7	3.5	3.3	12.9	9.1	5.6	100.0
27-Jul	5.3	4.7	2.9	3.4	3.3	1.5	1.5	1.9	2.0	2.0	2.3	2.8	4.1	5.4	4.2	5.9	6.9	3.2	5.1	4.3	5.6	5.8	9.6	6.5	100.0
28-Jul	2.2	1.8	1.1	0.8	1.6	1.7	1.5	1.2	1.5	1.1	3.2	4.2	6.0	4.5	5.3	7.0	10.0	9.7	8.3	8.9	4.2	6.6	3.9	3.7	100.0
29-Jul	3.4	2.4	1.9	2.0	1.2	1.7	1.8	2.5	2.7	1.8	2.2	4.2	4.1	9.2	5.7	5.1	6.6	6.5	5.4	8.4	6.2	5.0	4.8	5.2	100.0
30-Jul	4.1	4.9	3.4	1.3	0.8	1.0	1.5	3.1	3.6	2.5	2.2	2.3	4.8	5.4	6.2	5.8	6.0	5.5	4.1	6.5	5.2	6.2	7.6	5.9	100.0
31-Jul	5.3	3.2	2.0	1.1	1.8	1.3	2.0	1.8	2.4	2.6	2.2	2.2	3.5	5.1	4.2	4.9	3.4	7.6	8.8	6.4	5.0	6.2	7.8	9.0	100.0
1-Aug	5.7	4.1	2.2	2.4	2.1	2.4	1.8	1.7	1.5	1.7	1.9	2.4	4.3	4.5	5.3	5.1	3.8	5.7	8.6	5.8	5.5	7.6	8.1	5.7	100.0
2-Aug	4.8	4.1	4.2	3.4	2.5	2.9	3.1	2.9	3.1	4.5	4.0	5.5	7.0	5.6	6.5	5.7	6.2	3.6	3.4	4.4	3.4	3.1	3.2	3.0	100.0
3-Aug	8.5	7.1	4.5	2.8	1.7	2.5	2.3	3.3	4.6	4.7	2.7	2.6	3.6	2.9	4.6	4.1	4.3	3.7	5.0	3.4	5.2	4.1	6.3	5.5	100.0
4-Aug	6.8	5.0	5.2	2.2	2.1	2.5	2.8	1.6	2.2	2.9	2.2	2.1	2.4	2.5	2.0	4.9	5.3	5.5	7.1	7.2	6.3	5.2	7.4	6.7	100.0
5-Aug	5.3	4.3	3.6	1.2	2.2	1.6	1.7	2.3	3.4	1.9	4.0	4.3	3.1	1.2	1.8	2.5	4.7	5.2	4.9	5.2	7.1	9.0	11.9	7.8	100.0
6-Aug	6.2	4.2	3.6	2.3	1.0	2.0	2.5	4.0	2.3	2.9	1.9	1.7	2.5	2.5	4.2	2.3	3.5	4.1	4.7	7.9	6.2	11.0	9.2	7.3	100.0
7-Aug	6.7	9.3	5.5	3.0	2.4	2.0	1.1	1.3	1.0	1.3	1.7	2.2	1.7	1.4	2.5	3.6	6.4	6.4	8.0	6.3	10.0	7.2	5.9	3.4	100.0
8-Aug	9.0	7.4	1.7	1.8	1.4	1.1	2.1	2.6	3.0	3.4	4.2	2.4	1.9	2.4	2.5	4.9	7.0	5.7	5.1	7.9	5.6	5.5	6.5	4.8	100.0
9-Aug	3.2	1.9	2.5	2.8	1.8	0.5	1.3	2.5	3.4	3.5	3.3	3.1	2.7	2.8	3.3	3.9	5.0	7.8	8.9	8.0	7.5	8.3	5.9	6.1	100.0

-Continued-

Appendix A.6. (p.2 of 2)

Counts by Hour

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total
10-Aug	4.8	3.7	2.3	1.2	1.8	3.2	3.7	2.5	1.6	2.1	2.4	2.1	3.2	3.0	3.8	5.0	5.7	4.5	4.3	5.9	11.7	7.5	7.5	6.5	100.0
11-Aug	4.1	3.3	3.6	5.4	3.2	3.6	3.4	3.4	2.3	2.6	2.5	2.2	3.3	3.1	3.2	3.8	5.8	5.3	7.5	5.5	6.1	7.0	4.5	5.3	100.0
12-Aug	3.1	2.8	1.5	1.3	1.8	1.9	1.6	2.9	1.9	1.7	1.9	2.5	2.6	3.1	4.1	5.8	4.9	4.3	7.6	10.0	13.6	9.2	6.2	3.5	100.0
13-Aug	5.1	3.5	2.0	1.0	1.0	0.9	1.7	2.7	2.1	2.9	2.6	2.6	3.1	3.8	4.4	4.6	6.0	5.7	5.0	8.4	10.2	7.8	7.0	5.8	100.0
Total	5.2	3.8	3.1	2.5	2.1	2.0	2.3	2.3	2.7	2.6	3.1	3.4	4.3	5.3	5.3	5.4	5.4	5.1	5.4	6.0	5.7	6.2	5.5	5.2	100.0

Appendix A.7. Kenai River north bank sonar counts by sector, 1 July through 13 August 1998.

Counts by Sector														
Date	1	2	3	4	5	6	7	8	9	10	11	12	Daily Total	Cum Total
1-Jul	78	120	55	129	63	224	17	63	125	149	107	132	1,262	1,262
2-Jul	99	621	644	358	215	217	60	31	39	104	108	118	2,614	3,876
3-Jul	256	559	588	253	114	96	29	38	20	55	95	69	2,172	6,048
4-Jul	245	604	520	303	109	74	35	19	16	32	70	109	2,136	8,184
5-Jul	279	467	463	300	271	200	155	95	94	65	80	289	2,758	10,942
6-Jul	537	1,239	810	345	39	32	40	30	14	25	70	67	3,248	14,190
7-Jul	351	1,086	927	509	175	72	50	43	29	44	52	97	3,435	17,625
8-Jul	210	765	1,395	763	417	158	32	43	50	35	55	84	4,007	21,632
9-Jul	215	1,196	1,501	1,138	522	222	83	85	73	40	36	81	5,192	26,824
10-Jul	320	1,192	2,113	945	470	283	47	44	48	50	37	55	5,604	32,428
11-Jul	131	361	823	620	213	95	27	16	23	14	10	21	2,354	34,782
12-Jul	40	358	716	257	96	15	9	18	16	11	5	3	1,544	36,326
13-Jul	26	105	238	154	167	55	144	132	134	103	157	102	1,517	37,843
14-Jul	22	143	277	159	191	51	94	95	91	64	76	74	1,337	39,180
15-Jul	178	613	906	275	498	102	75	95	44	20	16	39	2,861	42,041
16-Jul	190	1,390	1,930	821	782	230	209	146	127	22	16	33	5,896	47,937
17-Jul	909	4,485	7,783	2,709	3,133	994	527	272	190	141	82	67	21,292	69,229
18-Jul	857	2,669	4,694	3,211	2,509	869	921	461	268	239	177	211	17,086	86,315
19-Jul	559	3,491	3,655	2,522	1,029	272	384	320	167	298	149	258	13,104	99,419
20-Jul	445	1,525	1,811	1,312	2,889	1,082	459	230	238	121	95	185	10,392	109,811
21-Jul	148	871	1,417	1,428	919	418	284	271	207	131	271	147	6,512	116,323
22-Jul	372	2,516	3,804	2,246	1,325	617	279	283	159	66	85	88	11,840	128,163
23-Jul	659	5,060	7,030	4,022	4,457	2,638	1,429	1,015	1,050	321	196	263	28,140	156,303
24-Jul	452	4,433	8,657	5,832	5,520	2,413	960	669	775	310	189	331	30,541	186,844
25-Jul	679	3,133	5,754	3,786	2,773	1,273	523	362	427	268	121	181	19,280	206,124
26-Jul	681	3,247	3,105	2,093	1,607	660	372	298	301	220	242	566	13,392	219,516
27-Jul	569	3,514	3,817	2,976	1,343	722	303	249	324	362	288	241	14,708	234,224
28-Jul	860	3,764	3,669	3,747	2,149	1,043	459	238	51	174	153	200	16,507	250,731
29-Jul	763	4,582	5,720	3,171	1,649	700	391	455	95	417	392	425	18,760	269,491
30-Jul	742	3,901	3,555	2,502	1,541	830	320	409	144	218	368	324	14,854	284,345
31-Jul	1,124	5,377	4,870	3,101	2,015	1,110	403	258	201	200	210	314	19,183	303,528
1-Aug	1,697	8,613	7,934	4,441	1,920	1,070	551	225	83	206	90	135	26,965	330,493
2-Aug	6,826	17,058	5,365	808	191	60	54	18	56	113	66	97	30,712	361,205
3-Aug	299	1,083	1,022	785	642	514	366	324	455	420	416	281	6,607	367,812
4-Aug	166	760	639	700	504	369	432	393	192	224	305	359	5,043	372,855
5-Aug	162	754	432	587	486	329	263	274	160	225	207	185	4,064	376,919
6-Aug	664	2,539	1,720	1,086	813	518	385	430	201	279	316	353	9,304	386,223
7-Aug	478	1,766	1,160	817	550	411	272	358	185	255	233	327	6,812	393,035
8-Aug	499	1,596	1,014	961	678	513	270	177	231	360	289	256	6,844	399,879
9-Aug	299	816	402	677	513	292	304	148	252	443	430	323	4,899	404,778
10-Aug	353	539	321	612	481	286	341	326	395	386	540	503	5,083	409,861
11-Aug	217	779	759	629	504	401	441	302	394	370	463	540	5,799	415,660
12-Aug	226	811	235	428	377	265	420	206	381	482	664	716	5,211	420,871
13-Aug	157	375	284	440	329	423	503	363	634	574	723	846	5,651	426,522
Total	25,039	100,876	104,534	64,958	47,188	23,218	13,722	10,327	9,159	8,656	8,750	10,095	426,522	

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Appendix A.8. Kenai River south bank sonar counts by sector, 1 July through 13 August 1998.

Date	Counts by Sector												Daily Total	Cum Total
	1	2	3	4	5	6	7	8	9	10	11	12		
1-Jul	79	27	12	33	36	108	79	35	44	24	9	26	512	512
2-Jul	38	38	21	29	59	168	106	61	29	17	18	20	604	1,116
3-Jul	87	15	27	19	48	131	94	33	25	15	4	12	510	1,626
4-Jul	59	21	21	20	42	103	75	21	17	7	2	10	398	2,024
5-Jul	34	12	16	17	32	58	60	39	15	9	4	6	302	2,326
6-Jul	126	147	717	516	505	321	96	50	43	25	28	40	2,614	4,940
7-Jul	285	416	751	386	319	203	123	73	57	31	57	75	2,776	7,716
8-Jul	81	491	697	90	285	151	97	46	22	13	11	19	2,003	9,719
9-Jul	189	1,006	991	155	403	212	129	63	31	23	52	76	3,330	13,049
10-Jul	151	1,000	1,380	127	649	519	272	124	68	26	39	84	4,439	17,488
11-Jul	27	273	591	48	253	370	251	139	70	28	32	50	2,132	19,620
12-Jul	20	164	294	27	158	227	189	81	42	19	42	53	1,316	20,936
13-Jul	24	194	83	11	210	318	240	129	56	33	80	62	1,440	22,376
14-Jul	58	321	85	15	191	360	299	172	61	53	194	72	1,881	24,257
15-Jul	34	279	77	16	194	348	232	137	39	53	154	62	1,625	25,882
16-Jul	86	711	221	36	625	1,177	904	436	136	84	146	68	4,630	30,512
17-Jul	724	2,443	1,016	154	1,638	3,288	2,959	1,401	519	304	478	235	15,159	45,671
18-Jul	476	1,437	383	44	951	1,968	1,806	862	294	116	271	69	8,677	54,348
19-Jul	401	878	224	37	643	1,374	1,421	748	245	91	263	156	6,481	60,829
20-Jul	166	644	171	342	1,154	1,473	1,182	653	336	193	488	193	6,995	67,824
21-Jul	270	566	46	904	987	539	280	234	204	170	528	294	5,022	72,846
22-Jul	556	1,723	57	2,188	1,499	441	184	134	159	192	461	225	7,819	80,665
23-Jul	516	3,304	147	4,851	4,548	1,837	803	501	377	825	495	487	18,691	99,356
24-Jul	271	2,733	126	3,794	3,534	1,513	641	419	274	635	408	337	14,685	114,041
25-Jul	501	2,644	139	3,305	2,783	1,183	498	284	220	323	541	249	12,670	126,711
26-Jul	267	1,807	88	1,734	1,267	477	174	122	92	106	323	220	6,677	133,388
27-Jul	266	1,896	902	1,961	1,544	542	216	149	119	130	296	225	8,246	141,634
28-Jul	2,783	5,195	5,453	6,473	2,757	900	287	153	142	97	220	346	24,806	166,440
29-Jul	1,835	6,393	4,283	7,527	3,455	1,218	350	184	146	76	149	242	25,858	192,298
30-Jul	806	3,874	3,008	5,514	2,395	844	222	137	74	63	130	374	17,441	209,739
31-Jul	1,020	4,372	3,182	5,944	2,669	1,014	345	175	167	112	198	317	19,515	229,254
1-Aug	2,406	8,122	4,787	7,935	3,171	1,016	292	145	88	80	111	282	28,435	257,689
2-Aug	4,605	13,181	6,211	8,384	2,571	774	230	153	133	127	254	485	37,108	294,797
3-Aug	185	1,000	821	1,970	1,032	431	232	211	265	222	375	411	7,155	301,952
4-Aug	69	368	321	711	453	283	178	232	274	296	419	954	4,558	306,510
5-Aug	161	262	720	1,229	698	334	203	234	300	253	558	754	5,706	312,216
6-Aug	460	489	2,384	1,981	539	348	206	267	292	253	484	512	8,215	320,431
7-Aug	974	748	2,117	1,110	152	169	67	320	393	193	577	201	7,021	327,452
8-Aug	480	472	1,580	1,033	171	149	69	177	225	119	487	152	5,114	332,566
9-Aug	106	129	792	655	105	152	78	129	167	170	516	302	3,301	335,867
10-Aug	53	109	631	524	116	193	82	123	233	213	661	175	3,113	338,980
11-Aug	81	186	807	772	175	332	138	221	365	326	837	287	4,527	343,507
12-Aug	68	78	442	407	119	328	219	337	685	593	1,263	478	5,017	348,524
13-Aug	58	102	671	613	175	505	333	574	1,069	924	1,925	773	7,722	356,246
Total	21,942	70,270	47,493	73,641	45,310	28,399	16,941	10,918	8,612	7,662	14,588	10,470	356,246	

FN: 98RZ5C.XLS

Appendix A.9. Kenai River north bank sonar counts by sector, 1 July through 13 August 1998. Counts expressed as percentage of daily total.

Date	Counts by Sector												Daily Total
	1	2	3	4	5	6	7	8	9	10	11	12	
1-Jul	6.2	9.5	4.4	10.2	5.0	17.7	1.3	5.0	9.9	11.8	8.5	10.5	100.0
2-Jul	3.8	23.8	24.6	13.7	8.2	8.3	2.3	1.2	1.5	4.0	4.1	4.5	100.0
3-Jul	11.8	25.7	27.1	11.6	5.2	4.4	1.3	1.7	0.9	2.5	4.4	3.2	100.0
4-Jul	11.5	28.3	24.3	14.2	5.1	3.5	1.6	0.9	0.7	1.5	3.3	5.1	100.0
5-Jul	10.1	16.9	16.8	10.9	9.8	7.3	5.6	3.4	3.4	2.4	2.9	10.5	100.0
6-Jul	16.5	38.1	24.9	10.6	1.2	1.0	1.2	0.9	0.4	0.8	2.2	2.1	100.0
7-Jul	10.2	31.6	27.0	14.8	5.1	2.1	1.5	1.3	0.8	1.3	1.5	2.8	100.0
8-Jul	5.2	19.1	34.8	19.0	10.4	3.9	0.8	1.1	1.2	0.9	1.4	2.1	100.0
9-Jul	4.1	23.0	28.9	21.9	10.1	4.3	1.6	1.6	1.4	0.8	0.7	1.6	100.0
10-Jul	5.7	21.3	37.7	16.9	8.4	5.0	0.8	0.8	0.9	0.9	0.7	1.0	100.0
11-Jul	5.6	15.3	35.0	26.3	9.0	4.0	1.1	0.7	1.0	0.6	0.4	0.9	100.0
12-Jul	2.6	23.2	46.4	16.6	6.2	1.0	0.6	1.2	1.0	0.7	0.3	0.2	100.0
13-Jul	1.7	6.9	15.7	10.2	11.0	3.6	9.5	8.7	8.8	6.8	10.3	6.7	100.0
14-Jul	1.6	10.7	20.7	11.9	14.3	3.8	7.0	7.1	6.8	4.8	5.7	5.5	100.0
15-Jul	6.2	21.4	31.7	9.6	17.4	3.6	2.6	3.3	1.5	0.7	0.6	1.4	100.0
16-Jul	3.2	23.6	32.7	13.9	13.3	3.9	3.5	2.5	2.2	0.4	0.3	0.6	100.0
17-Jul	4.3	21.1	36.6	12.7	14.7	4.7	2.5	1.3	0.9	0.7	0.4	0.3	100.0
18-Jul	5.0	15.6	27.5	18.8	14.7	5.1	5.4	2.7	1.6	1.4	1.0	1.2	100.0
19-Jul	4.3	26.6	27.9	19.2	7.9	2.1	2.9	2.4	1.3	2.3	1.1	2.0	100.0
20-Jul	4.3	14.7	17.4	12.6	27.8	10.4	4.4	2.2	2.3	1.2	0.9	1.8	100.0
21-Jul	2.3	13.4	21.8	21.9	14.1	6.4	4.4	4.2	3.2	2.0	4.2	2.3	100.0
22-Jul	3.1	21.3	32.1	19.0	11.2	5.2	2.4	2.4	1.3	0.6	0.7	0.7	100.0
23-Jul	2.3	18.0	25.0	14.3	15.8	9.4	5.1	3.6	3.7	1.1	0.7	0.9	100.0
24-Jul	1.5	14.5	28.3	19.1	18.1	7.9	3.1	2.2	2.5	1.0	0.6	1.1	100.0
25-Jul	3.5	16.3	29.8	19.6	14.4	6.6	2.7	1.9	2.2	1.4	0.6	0.9	100.0
26-Jul	5.1	24.2	23.2	15.6	12.0	4.9	2.8	2.2	2.2	1.6	1.8	4.2	100.0
27-Jul	3.9	23.9	26.0	20.2	9.1	4.9	2.1	1.7	2.2	2.5	2.0	1.6	100.0
28-Jul	5.2	22.8	22.2	22.7	13.0	6.3	2.8	1.4	0.3	1.1	0.9	1.2	100.0
29-Jul	4.1	24.4	30.5	16.9	8.8	3.7	2.1	2.4	0.5	2.2	2.1	2.3	100.0
30-Jul	5.0	26.3	23.9	16.8	10.4	5.6	2.2	2.8	1.0	1.5	2.5	2.2	100.0
31-Jul	5.9	28.0	25.4	16.2	10.5	5.8	2.1	1.3	1.0	1.0	1.1	1.6	100.0
1-Aug	6.3	31.9	29.4	16.5	7.1	4.0	2.0	0.8	0.3	0.8	0.3	0.5	100.0
2-Aug	22.2	55.5	17.5	2.6	0.6	0.2	0.2	0.1	0.2	0.4	0.2	0.3	100.0
3-Aug	4.5	16.4	15.5	11.9	9.7	7.8	5.5	4.9	6.9	6.4	6.3	4.3	100.0
4-Aug	3.3	15.1	12.7	13.9	10.0	7.3	8.6	7.8	3.8	4.4	6.0	7.1	100.0
5-Aug	4.0	18.6	10.6	14.4	12.0	8.1	6.5	6.7	3.9	5.5	5.1	4.6	100.0
6-Aug	7.1	27.3	18.5	11.7	8.7	5.6	4.1	4.6	2.2	3.0	3.4	3.8	100.0
7-Aug	7.0	25.9	17.0	12.0	8.1	6.0	4.0	5.3	2.7	3.7	3.4	4.8	100.0
8-Aug	7.3	23.3	14.8	14.0	9.9	7.5	3.9	2.6	3.4	5.3	4.2	3.7	100.0
9-Aug	6.1	16.7	8.2	13.8	10.5	6.0	6.2	3.0	5.1	9.0	8.8	6.6	100.0
10-Aug	6.9	10.6	6.3	12.0	9.5	5.6	6.7	6.4	7.8	7.6	10.6	9.9	100.0
11-Aug	3.7	13.4	13.1	10.8	8.7	6.9	7.6	5.2	6.8	6.4	8.0	9.3	100.0
12-Aug	4.3	15.6	4.5	8.2	7.2	5.1	8.1	4.0	7.3	9.2	12.7	13.7	100.0
13-Aug	2.8	6.6	5.0	7.8	5.8	7.5	8.9	6.4	11.2	10.2	12.8	15.0	100.0
Total	5.9	23.7	24.5	15.2	11.1	5.4	3.2	2.4	2.1	2.0	2.1	2.4	100.0

Appendix A.10. Kenai River south bank sonar counts by sector, 1 July through 13 August 1998. Counts expressed as percentage of daily total.

Date	Counts by Sector												Daily Total
	1	2	3	4	5	6	7	8	9	10	11	12	
1-Jul	15.4	5.3	2.3	6.4	7.0	21.1	15.4	6.8	8.6	4.7	1.8	5.1	100.0
2-Jul	6.3	6.3	3.5	4.8	9.8	27.8	17.5	10.1	4.8	2.8	3.0	3.3	100.0
3-Jul	17.1	2.9	5.3	3.7	9.4	25.7	18.4	6.5	4.9	2.9	0.8	2.4	100.0
4-Jul	14.8	5.3	5.3	5.0	10.6	25.9	18.8	5.3	4.3	1.8	0.5	2.5	100.0
5-Jul	11.3	4.0	5.3	5.6	10.6	19.2	19.9	12.9	5.0	3.0	1.3	2.0	100.0
6-Jul	4.8	5.6	27.4	19.7	19.3	12.3	3.7	1.9	1.6	1.0	1.1	1.5	100.0
7-Jul	10.3	15.0	27.1	13.9	11.5	7.3	4.4	2.6	2.1	1.1	2.1	2.7	100.0
8-Jul	4.0	24.5	34.8	4.5	14.2	7.5	4.8	2.3	1.1	0.6	0.5	0.9	100.0
9-Jul	5.7	30.2	29.8	4.7	12.1	6.4	3.9	1.9	0.9	0.7	1.6	2.3	100.0
10-Jul	3.4	22.5	31.1	2.9	14.6	11.7	6.1	2.8	1.5	0.6	0.9	1.9	100.0
11-Jul	1.3	12.8	27.7	2.3	11.9	17.4	11.8	6.5	3.3	1.3	1.5	2.3	100.0
12-Jul	1.5	12.5	22.3	2.1	12.0	17.2	14.4	6.2	3.2	1.4	3.2	4.0	100.0
13-Jul	1.7	13.5	5.8	0.8	14.6	22.1	16.7	9.0	3.9	2.3	5.6	4.3	100.0
14-Jul	3.1	17.1	4.5	0.8	10.2	19.1	15.9	9.1	3.2	2.8	10.3	3.8	100.0
15-Jul	2.1	17.2	4.7	1.0	11.9	21.4	14.3	8.4	2.4	3.3	9.5	3.8	100.0
16-Jul	1.9	15.4	4.8	0.8	13.5	25.4	19.5	9.4	2.9	1.8	3.2	1.5	100.0
17-Jul	4.8	16.1	6.7	1.0	10.8	21.7	19.5	9.2	3.4	2.0	3.2	1.6	100.0
18-Jul	5.5	16.6	4.4	0.5	11.0	22.7	20.8	9.9	3.4	1.3	3.1	0.8	100.0
19-Jul	6.2	13.5	3.5	0.6	9.9	21.2	21.9	11.5	3.8	1.4	4.1	2.4	100.0
20-Jul	2.4	9.2	2.4	4.9	16.5	21.1	16.9	9.3	4.8	2.8	7.0	2.8	100.0
21-Jul	5.4	11.3	0.9	18.0	19.7	10.7	5.6	4.7	4.1	3.4	10.5	5.9	100.0
22-Jul	7.1	22.0	0.7	28.0	19.2	5.6	2.4	1.7	2.0	2.5	5.9	2.9	100.0
23-Jul	2.8	17.7	0.8	26.0	24.3	9.8	4.3	2.7	2.0	4.4	2.6	2.6	100.0
24-Jul	1.8	18.6	0.9	25.8	24.1	10.3	4.4	2.9	1.9	4.3	2.8	2.3	100.0
25-Jul	4.0	20.9	1.1	26.1	22.0	9.3	3.9	2.2	1.7	2.5	4.3	2.0	100.0
26-Jul	4.0	27.1	1.3	26.0	19.0	7.1	2.6	1.8	1.4	1.6	4.8	3.3	100.0
27-Jul	3.2	23.0	10.9	23.8	18.7	6.6	2.6	1.8	1.4	1.6	3.6	2.7	100.0
28-Jul	11.2	20.9	22.0	26.1	11.1	3.6	1.2	0.6	0.6	0.4	0.9	1.4	100.0
29-Jul	7.1	24.7	16.6	29.1	13.4	4.7	1.4	0.7	0.6	0.3	0.6	0.9	100.0
30-Jul	4.6	22.2	17.2	31.6	13.7	4.8	1.3	0.8	0.4	0.4	0.7	2.1	100.0
31-Jul	5.2	22.4	16.3	30.5	13.7	5.2	1.8	0.9	0.9	0.6	1.0	1.6	100.0
1-Aug	8.5	28.6	16.8	27.9	11.2	3.6	1.0	0.5	0.3	0.3	0.4	1.0	100.0
2-Aug	12.4	35.5	16.7	22.6	6.9	2.1	0.6	0.4	0.4	0.3	0.7	1.3	100.0
3-Aug	2.6	14.0	11.5	27.5	14.4	6.0	3.2	2.9	3.7	3.1	5.2	5.7	100.0
4-Aug	1.5	8.1	7.0	15.6	9.9	6.2	3.9	5.1	6.0	6.5	9.2	20.9	100.0
5-Aug	2.8	4.6	12.6	21.5	12.2	5.9	3.6	4.1	5.3	4.4	9.8	13.2	100.0
6-Aug	5.6	6.0	29.0	24.1	6.6	4.2	2.5	3.3	3.6	3.1	5.9	6.2	100.0
7-Aug	13.9	10.7	30.2	15.8	2.2	2.4	1.0	4.6	5.6	2.7	8.2	2.9	100.0
8-Aug	9.4	9.2	30.9	20.2	3.3	2.9	1.3	3.5	4.4	2.3	9.5	3.0	100.0
9-Aug	3.2	3.9	24.0	19.8	3.2	4.6	2.4	3.9	5.1	5.1	15.6	9.1	100.0
10-Aug	1.7	3.5	20.3	16.8	3.7	6.2	2.6	4.0	7.5	6.8	21.2	5.6	100.0
11-Aug	1.8	4.1	17.8	17.1	3.9	7.3	3.0	4.9	8.1	7.2	18.5	6.3	100.0
12-Aug	1.4	1.6	8.8	8.1	2.4	6.5	4.4	6.7	13.7	11.8	25.2	9.5	100.0
13-Aug	0.8	1.3	8.7	7.9	2.3	6.5	4.3	7.4	13.8	12.0	24.9	10.0	100.0
Total	6.2	19.7	13.3	20.7	12.7	8.0	4.8	3.1	2.4	2.2	4.1	2.9	100.0

Appendix A.11. Estimated salmon escapement adjacent to the north bank of the Kasilof River, 15 June through 8 August 1998.

Date	Daily	Cum	Date	Daily	Cum
15-Jun	296	296	13-Jul	3,650	127,139
16-Jun	432	728	14-Jul	2,492	129,631
17-Jun	775	1,503	15-Jul	5,828	135,459
18-Jun	2,905	4,408	16-Jul	7,252	142,711
19-Jun	3,489	7,897	17-Jul	13,973	156,684
20-Jun	1,882	9,779	18-Jul	8,165	164,849
21-Jun	3,413	13,192	19-Jul	10,574	175,423
22-Jun	4,560	17,752	20-Jul	7,931	183,354
23-Jun	4,667	22,419	21-Jul	4,460	187,814
24-Jun	3,238	25,657	22-Jul	6,871	194,685
25-Jun	3,589	29,246	23-Jul	7,422	202,107
26-Jun	4,565	33,811	24-Jul	9,095	211,202
27-Jun	7,776	41,587	25-Jul	7,123	218,325
28-Jun	7,752	49,339	26-Jul	5,671	223,996
29-Jun	8,700	58,039	27-Jul	5,252	229,248
30-Jun	3,238	61,277	28-Jul	8,528	237,776
1-Jul	7,528	68,805	29-Jul	6,137	243,913
2-Jul	6,551	75,356	30-Jul	5,615	249,528
3-Jul	3,749	79,105	31-Jul	6,677	256,205
4-Jul	2,043	81,148	1-Aug	6,029	262,234
5-Jul	6,683	87,831	2-Aug	2,369	264,603
6-Jul	8,482	96,313	3-Aug	1,448	266,051
7-Jul	3,369	99,682	4-Aug	1,596	267,647
8-Jul	5,539	105,221	5-Aug	2,165	269,812
9-Jul	7,165	112,386	6-Aug	1,300	271,112
10-Jul	7,302	119,688	7-Aug	1,248	272,360
11-Jul	2,059	121,747	8-Aug	853	273,213
12-Jul	1,742	123,489			

FN: 98KA1C.XLS

Appendix A.12. Estimated salmon escapement adjacent to the south bank of the Kasilof River, 15 June through 8 August 1998.

Date	Daily	Cum	Date	Daily	Cum
15-Jun	14	14	13-Jul	1,483	60,550
16-Jun	17	31	14-Jul	924	61,474
17-Jun	337	368	15-Jul	1,648	63,122
18-Jun	1,792	2,160	16-Jul	2,475	65,597
19-Jun	1,978	4,138	17-Jul	3,207	68,804
20-Jun	727	4,865	18-Jul	2,383	71,187
21-Jun	1,386	6,251	19-Jul	2,632	73,819
22-Jun	1,507	7,758	20-Jul	1,662	75,481
23-Jun	2,031	9,789	21-Jul	1,214	76,695
24-Jun	1,610	11,399	22-Jul	2,455	79,150
25-Jun	1,485	12,884	23-Jul	2,589	81,739
26-Jun	1,973	14,857	24-Jul	2,093	83,832
27-Jun	3,806	18,663	25-Jul	2,144	85,976
28-Jun	3,868	22,531	26-Jul	1,657	87,633
29-Jun	4,010	26,541	27-Jul	1,391	89,024
30-Jun	1,026	27,567	28-Jul	1,515	90,539
1-Jul	2,884	30,451	29-Jul	1,203	91,742
2-Jul	3,412	33,863	30-Jul	1,385	93,127
3-Jul	1,933	35,796	31-Jul	1,339	94,466
4-Jul	1,072	36,868	1-Aug	1,079	95,545
5-Jul	2,930	39,798	2-Aug	513	96,058
6-Jul	4,102	43,900	3-Aug	369	96,427
7-Jul	1,383	45,283	4-Aug	426	96,853
8-Jul	2,767	48,050	5-Aug	502	97,355
9-Jul	4,570	52,620	6-Aug	338	97,693
10-Jul	4,744	57,364	7-Aug	333	98,026
11-Jul	1,017	58,381	8-Aug	322	98,348
12-Jul	686	59,067			

FN: 98KA2C.XLS

Appendix A.13. Kasilo River north bank sonar counts by hour, 15 June through 8 August 1998.

Counts by Hour																										
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total	Cum Total
15-Jun	0	1	1	0	1	0	0	0	0	1	0	0	0	3	4	1	0	0	0	0	1	0	1	0	14	14
16-Jun	0	0	4	1	1	0	0	1	0	0	0	0	0	0	0	2	0	0	1	2	0	3	2	0	17	31
17-Jun	0	4	2	1	0	0	0	0	0	3	4	0	0	0	0	16	15	27	47	42	26	36	40	74	337	368
18-Jun	120	323	270	162	90	63	32	27	23	20	12	24	7	13	31	17	39	77	109	108	73	68	40	44	1,792	2,160
19-Jun	100	231	395	389	153	42	61	41	19	18	21	18	55	45	87	36	27	27	47	23	40	37	42	24	1,978	4,138
20-Jun	32	42	48	68	45	28	26	24	28	31	14	23	18	20	10	29	46	19	37	13	30	38	26	32	727	4,865
21-Jun	50	31	37	34	47	29	38	45	23	85	270	183	121	23	8	10	20	88	61	50	30	32	44	27	1,386	6,251
22-Jun	32	64	70	76	32	60	59	35	11	14	16	66	66	66	66	66	66	41	217	85	79	83	70	67	1,507	7,758
23-Jun	70	119	121	121	243	210	58	75	64	57	35	41	49	59	56	53	47	68	113	98	73	74	62	65	2,031	9,789
24-Jun	30	72	56	66	60	116	168	41	30	24	46	43	69	51	24	38	25	26	77	127	185	108	64	64	1,610	11,399
25-Jun	72	41	76	67	42	78	119	51	25	22	46	62	69	81	66	49	66	49	32	102	95	65	69	41	1,485	12,884
26-Jun	86	73	101	81	83	65	120	251	54	21	41	46	46	33	27	53	75	67	52	92	176	123	113	94	1,973	14,857
27-Jun	191	236	250	217	162	199	107	249	163	155	96	106	116	144	128	354	209	246	136	77	86	102	38	39	3,806	18,663
28-Jun	78	172	129	81	117	66	31	47	160	234	174	94	365	307	204	153	141	155	383	173	152	228	149	75	3,868	22,531
29-Jun	135	185	223	228	232	298	334	339	319	385	210	95	75	64	102	69	116	106	152	75	75	42	86	65	4,010	26,541
30-Jun	22	40	43	34	21	24	9	4	17	36	51	30	6	31	35	75	73	66	32	51	51	32	79	164	1,026	27,567
1-Jul	84	56	99	83	142	104	83	59	74	127	178	190	237	174	79	251	107	161	130	64	30	89	104	179	2,884	30,451
2-Jul	170	107	95	120	164	119	138	184	208	128	120	140	326	305	190	135	101	120	69	59	80	47	87	200	3,412	33,863
3-Jul	248	142	164	123	98	62	40	40	48	31	60	80	49	154	170	115	69	68	78	27	21	17	21	8	1,933	35,796
4-Jul	7	18	22	17	22	35	14	15	19	11	17	36	25	58	66	86	91	52	61	102	70	86	89	53	1,072	36,868
5-Jul	99	191	191	180	202	188	187	148	122	107	94	69	78	105	100	126	166	114	81	90	72	86	63	71	2,930	39,798
6-Jul	84	165	207	282	251	235	182	236	181	89	97	69	105	165	184	178	291	334	209	160	140	88	63	107	4,102	43,900
7-Jul	88	67	74	54	79	70	58	44	45	47	33	41	29	45	30	47	56	115	96	56	41	80	41	47	1,383	45,283
8-Jul	66	67	66	51	48	121	89	69	96	108	114	114	179	79	94	117	150	213	326	214	111	83	107	85	2,767	48,050
9-Jul	91	102	126	147	141	259	365	398	209	215	152	165	164	125	136	118	128	235	361	331	158	149	164	131	4,570	52,620
10-Jul	184	227	171	208	174	271	453	600	347	209	203	182	135	98	113	114	127	150	246	192	123	71	81	65	4,744	57,364
11-Jul	52	40	49	32	50	29	47	101	41	40	23	18	42	69	33	27	46	35	37	38	45	36	51	36	1,017	58,381
12-Jul	16	13	22	16	13	18	20	20	45	20	35	22	45	30	40	15	31	24	36	15	56	31	55	48	686	59,067
13-Jul	38	58	59	37	54	28	31	68	127	120	30	46	73	54	73	75	77	65	32	50	68	89	87	44	1,483	60,550
14-Jul	37	12	14	13	11	15	8	14	30	63	49	33	57	39	43	50	47	38	30	45	69	100	77	30	924	61,474

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Counts by Hour																										
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total	Cum Total
15-Jul	58	26	23	21	33	23	20	28	33	80	111	87	52	90	118	112	117	93	90	77	78	65	86	127	1,648	63,122
16-Jul	113	100	118	117	87	71	84	81	63	121	134	181	189	131	106	123	119	120	130	65	58	37	67	60	2,475	65,597
17-Jul	131	99	137	193	154	166	168	183	204	118	164	175	191	233	160	150	101	85	94	55	76	60	54	56	3,207	68,804
18-Jul	111	107	43	46	52	61	66	89	69	70	116	107	132	143	159	181	116	130	144	121	98	95	67	60	2,383	71,187
19-Jul	90	124	161	106	93	110	91	85	76	88	97	63	119	147	197	238	176	124	111	119	100	42	30	45	2,632	73,819
20-Jul	33	74	116	125	99	51	65	56	62	48	69	64	72	80	66	78	111	117	67	58	59	40	28	24	1,662	75,481
21-Jul	24	21	31	13	17	34	21	23	49	31	28	29	43	74	42	96	71	130	69	48	66	94	66	94	1,214	76,695
22-Jul	127	96	96	181	228	141	83	61	73	81	84	45	80	72	104	107	132	180	78	49	99	98	65	95	2,455	79,150
23-Jul	131	162	151	167	187	223	168	111	128	107	134	93	70	95	89	72	52	112	83	48	28	53	68	57	2,589	81,739
24-Jul	107	90	85	109	114	108	211	97	59	44	114	131	105	71	60	41	55	68	110	62	59	33	42	118	2,093	83,832
25-Jul	133	133	141	155	90	63	134	138	75	47	77	102	77	69	77	78	65	66	87	137	73	39	21	67	2,144	85,976
26-Jul	103	74	60	62	62	52	65	99	135	71	42	94	83	73	109	79	47	46	50	54	77	54	25	41	1,657	87,633
27-Jul	62	59	75	51	70	81	88	87	81	41	27	68	78	81	48	46	46	53	65	47	38	43	31	25	1,391	89,024
28-Jul	47	64	52	68	78	86	90	72	79	62	57	76	82	85	63	56	49	59	46	50	57	59	45	33	1,515	90,539
29-Jul	50	63	70	56	47	70	64	37	50	46	74	73	67	62	35	45	31	37	37	46	33	19	52	39	1,203	91,742
30-Jul	63	54	59	38	86	76	103	63	65	57	62	68	70	47	60	33	43	78	28	42	31	53	47	59	1,385	93,127
31-Jul	49	35	37	64	73	86	61	75	30	40	48	63	69	56	68	82	53	55	54	60	31	54	61	35	1,339	94,466
1-Aug	48	46	66	49	76	59	74	30	37	50	46	56	62	70	67	138	118	90	39	36	15	27	30	25	1,354	95,820
2-Aug	32	28	24	31	50	34	40	39	29	18	23	31	38	22	40	27	16	24	15	30	10	21	14	8	644	96,464
3-Aug	13	8	2	7	12	10	21	21	22	41	39	18	31	25	25	24	17	18	23	21	19	20	9	17	463	96,927
4-Aug	9	8	12	20	20	29	27	36	13	21	9	6	23	25	30	33	39	21	28	27	42	22	18	17	535	97,462
5-Aug	21	8	16	9	14	27	23	31	31	28	44	19	34	46	27	24	41	36	23	33	33	18	31	13	630	98,092
6-Aug	12	9	12	9	20	22	19	16	21	19	10	16	21	20	26	18	15	19	15	33	25	24	10	13	424	98,516
7-Aug	12	7	11	14	9	15	24	33	28	12	14	11	17	24	18	23	32	27	13	27	11	12	11	13	418	98,934
8-Aug	5	12	5	9	6	14	17	27	21	17	12	19	9	22	18	21	15	16	23	23	17	29	29	18	404	99,338
Total	3,866	4,406	4,788	4,709	4,555	4,544	4,704	4,844	4,061	3,779	3,876	3,731	4,420	4,303	4,011	4,400	4,129	4,590	4,810	3,929	3,489	3,234	3,022	3,138	99,338	

Appendix A.14. Kasilof River south bank sonar counts by hour, 15 June through 8 August 1998.

Counts by Hour																										
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total	Cum Total
15-Jun	12	12	12	12	12	12	12	12	12	12	12	12	10	0	6	1	12	0	6	17	22	23	12	29	282	282
16-Jun	39	41	31	34	45	25	27	10	6	12	4	11	11	10	19	19	3	5	10	7	20	4	8	14	415	697
17-Jun	27	23	31	7	10	4	8	5	12	5	9	2	7	12	45	42	11	8	15	17	10	24	61	43	438	1,135
18-Jun	50	81	88	44	66	45	42	30	50	31	15	20	20	52	44	114	56	69	38	27	46	27	29	29	1,113	2,248
19-Jun	81	90	88	87	43	23	18	15	10	11	20	38	44	45	35	84	124	114	92	94	61	55	117	122	1,511	3,759
20-Jun	61	57	69	71	92	37	23	15	8	7	26	29	39	23	39	39	88	82	90	71	47	45	49	48	1,155	4,914
21-Jun	49	40	76	97	127	97	77	82	27	41	65	73	72	54	83	43	87	311	155	71	55	75	82	88	2,027	6,941
22-Jun	68	129	96	166	369	223	58	98	98	89	63	44	33	37	67	162	148	100	245	171	240	139	87	123	3,053	9,994
23-Jun	81	100	49	50	214	239	124	93	92	79	126	88	88	125	95	112	89	59	119	145	144	131	129	65	2,636	12,630
24-Jun	37	75	42	45	40	196	202	53	23	58	55	53	52	69	60	51	59	16	28	133	122	71	44	44	1,628	14,258
25-Jun	55	75	70	54	50	103	208	148	54	33	59	47	68	62	69	57	28	65	49	95	153	196	198	108	2,104	16,362
26-Jun	142	87	85	54	88	67	120	294	134	34	17	106	132	109	124	112	106	87	89	72	126	121	143	143	2,592	18,954
27-Jun	104	78	112	84	61	83	80	183	234	130	95	153	234	246	190	226	93	125	72	114	256	379	342	296	3,970	22,924
28-Jun	232	234	143	98	112	93	94	160	173	341	211	203	245	232	176	108	102	112	102	110	153	202	157	91	3,884	26,808
29-Jun	163	222	219	272	203	152	125	175	246	413	397	179	132	317	255	190	127	89	107	174	129	132	142	130	4,690	31,498
30-Jun	72	89	46	43	39	45	53	40	66	63	177	98	70	100	124	72	88	62	57	139	133	111	207	218	2,212	33,710
1-Jul	132	90	95	109	113	121	105	103	122	173	205	350	410	213	218	224	224	209	127	161	282	281	289	288	4,644	38,354
2-Jul	230	121	113	123	167	178	120	172	168	155	220	143	166	114	104	88	59	63	75	85	90	107	105	173	3,139	41,493
3-Jul	202	176	125	88	61	84	89	86	41	61	58	38	99	86	98	59	85	68	45	74	28	29	22	14	1,816	43,309
4-Jul	13	31	37	36	30	42	28	19	26	34	29	42	31	52	49	90	38	31	62	52	31	51	54	63	971	44,280
5-Jul	141	80	127	135	122	66	93	95	93	68	100	73	156	156	156	156	445	153	172	236	232	283	238	177	3,753	48,033
6-Jul	219	145	340	447	383	197	87	55	100	195	160	147	154	187	169	113	286	293	118	90	67	197	155	76	4,380	52,413
7-Jul	80	73	67	74	102	150	140	67	62	44	59	64	87	59	47	37	59	59	103	56	152	118	130	97	1,986	54,399
8-Jul	70	104	72	67	103	150	223	242	243	176	148	131	78	87	77	70	72	81	119	98	60	79	92	130	2,772	57,171
9-Jul	71	73	53	64	117	216	365	136	151	117	117	80	65	63	108	98	76	102	106	108	76	45	106	82	2,595	59,766
10-Jul	54	57	46	57	52	179	326	306	80	68	104	79	85	107	90	85	125	90	94	195	96	55	65	63	2,558	62,324
11-Jul	45	36	37	38	25	33	56	73	26	36	42	39	66	77	48	32	35	54	30	46	32	52	55	29	1,042	63,366
12-Jul	20	17	10	14	15	13	24	37	59	69	55	38	71	30	26	47	28	31	44	59	120	100	71	58	1,056	64,422
13-Jul	81	68	72	50	71	68	70	147	263	138	93	81	71	132	97	68	87	58	82	65	86	93	40	86	2,167	66,589
14-Jul	40	57	54	39	46	36	56	54	77	147	143	74	53	40	45	30	53	78	39	85	48	79	101	94	1,568	68,157

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Counts by Hour

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total	Cum Total
15-Jul	117	76	109	86	77	70	125	90	148	258	458	328	192	195	113	101	99	171	232	172	208	264	301	190	4,180	72,337
16-Jul	198	198	198	198	198	198	198	198	198	198	198	198	219	108	102	161	162	196	327	151	282	238	186	269	4,777	77,114
17-Jul	192	234	254	263	377	528	525	625	693	1,020	720	732	708	995	513	328	264	234	236	299	339	335	214	138	10,766	87,880
18-Jul	243	192	143	87	118	237	377	278	266	353	245	292	270	290	504	231	231	168	249	171	126	209	267	235	5,782	93,662
19-Jul	269	570	660	463	443	479	459	372	305	267	388	408	193	255	185	133	354	189	285	223	235	328	271	208	7,942	101,604
20-Jul	153	159	193	370	289	331	400	372	325	237	272	258	309	237	245	226	432	344	139	148	277	236	163	154	6,269	107,873
21-Jul	131	121	102	101	101	148	139	139	136	122	88	107	120	128	176	124	137	161	91	79	165	273	194	163	3,246	111,119
22-Jul	162	137	165	205	336	368	241	101	203	239	192	135	124	122	162	157	170	211	109	129	107	132	281	228	4,416	115,535
23-Jul	121	128	116	157	180	518	335	136	151	254	398	200	215	156	193	187	148	145	210	103	53	119	317	293	4,833	120,368
24-Jul	224	228	170	136	267	342	624	407	231	288	425	366	294	294	294	294	294	294	294	392	126	91	222	405	7,002	127,370
25-Jul	376	245	188	140	159	232	430	517	249	121	153	282	191	184	186	114	89	135	87	224	283	112	128	154	4,979	132,349
26-Jul	228	187	160	145	120	150	158	357	348	279	174	213	237	174	139	144	80	85	102	102	156	133	70	73	4,014	136,363
27-Jul	128	141	117	97	118	139	167	168	336	337	285	101	200	195	152	90	70	87	70	190	214	140	165	154	3,861	140,224
28-Jul	300	307	257	230	261	430	406	354	309	548	482	531	196	356	294	231	209	169	139	181	172	313	229	109	7,013	147,237
29-Jul	112	149	122	115	160	195	347	223	305	285	347	356	239	230	330	204	179	139	133	147	203	153	180	81	4,934	152,171
30-Jul	129	138	109	105	131	183	229	177	184	228	273	248	238	262	250	197	152	199	138	135	150	127	130	118	4,230	156,401
31-Jul	131	125	99	155	167	351	271	303	234	296	254	289	284	358	257	159	175	284	223	189	201	196	157	180	5,338	161,739
1-Aug	189	191	163	172	240	483	450	382	356	385	282	270	343	388	303	208	273	241	228	145	138	147	157	79	6,213	167,952
2-Aug	94	98	91	71	105	116	200	185	135	119	85	108	60	96	109	94	78	74	103	99	102	36	44	28	2,330	170,282
3-Aug	33	35	46	24	35	46	108	106	72	59	60	75	57	53	48	67	54	106	74	46	50	43	42	16	1,355	171,637
4-Aug	22	29	43	22	30	41	88	67	75	78	71	86	64	83	100	63	56	59	109	116	54	25	38	49	1,468	173,105
5-Aug	54	19	43	30	43	60	128	179	110	101	116	111	105	108	114	89	132	73	98	102	65	99	84	25	2,088	175,193
6-Aug	56	22	32	48	17	22	60	70	54	53	55	50	61	88	68	74	52	67	64	58	36	42	35	24	1,208	176,401
7-Aug	44	27	31	25	17	22	52	26	86	80	41	71	56	58	65	63	43	76	61	59	45	38	30	33	1,149	177,550
8-Aug	6	21	10	9	5	11	23	44	23	43	38	37	39	44	33	25	33	44	44	48	19	29	16	22	666	178,216
Total	6,383	6,338	6,126	6,013	6,972	8,677	9,593	8,881	8,288	9,088	8,984	8,387	7,863	8,353	7,698	6,393	6,859	6,625	6,335	6,575	6,923	7,162	7,251	6,449	178,216	

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Appendix A.15. Kasilof River north bank sonar counts by hour, 15 June through 8 August 1998. Counts expressed as percentage of daily total.

Date	Counts by Hour																								Daily Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
15-Jun	0.0	7.1	7.1	0.0	7.1	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	21.4	28.6	7.1	0.0	0.0	0.0	0.0	7.1	0.0	7.1	0.0	100.0
16-Jun	0.0	0.0	23.5	5.9	5.9	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8	0.0	0.0	5.9	11.8	0.0	17.6	11.8	0.0	100.0
17-Jun	0.0	1.2	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.9	1.2	0.0	0.0	0.0	0.0	4.7	4.5	8.0	13.9	12.5	7.7	10.7	11.9	22.0	100.0
18-Jun	6.7	18.0	15.1	9.0	5.0	3.5	1.8	1.5	1.3	1.1	0.7	1.3	0.4	0.7	1.7	0.9	2.2	4.3	6.1	6.0	4.1	3.8	2.2	2.5	100.0
19-Jun	5.1	11.7	20.0	19.7	7.7	2.1	3.1	2.1	1.0	0.9	1.1	0.9	2.8	2.3	4.4	1.8	1.4	1.4	2.4	1.2	2.0	1.9	2.1	1.2	100.0
20-Jun	4.4	5.8	6.6	9.4	6.2	3.9	3.6	3.3	3.9	4.3	1.9	3.2	2.5	2.8	1.4	4.0	6.3	2.6	5.1	1.8	4.1	5.2	3.6	4.4	100.0
21-Jun	3.6	2.2	2.7	2.5	3.4	2.1	2.7	3.2	1.7	6.1	19.5	13.2	8.7	1.7	0.6	0.7	1.4	6.3	4.4	3.6	2.2	2.3	3.2	1.9	100.0
22-Jun	2.1	4.2	4.6	5.0	2.1	4.0	3.9	2.3	0.7	0.9	1.1	4.4	4.4	4.4	4.4	4.4	4.4	2.7	14.4	5.6	5.2	5.5	4.6	4.4	100.0
23-Jun	3.4	5.9	6.0	6.0	12.0	10.3	2.9	3.7	3.2	2.8	1.7	2.0	2.4	2.9	2.8	2.6	2.3	3.3	5.6	4.8	3.6	3.6	3.1	3.2	100.0
24-Jun	1.9	4.5	3.5	4.1	3.7	7.2	10.4	2.5	1.9	1.5	2.9	2.7	4.3	3.2	1.5	2.4	1.6	1.6	4.8	7.9	11.5	6.7	4.0	4.0	100.0
25-Jun	4.8	2.8	5.1	4.5	2.8	5.3	8.0	3.4	1.7	1.5	3.1	4.2	4.6	5.5	4.4	3.3	4.4	3.3	2.2	6.9	6.4	4.4	4.6	2.8	100.0
26-Jun	4.4	3.7	5.1	4.1	4.2	3.3	6.1	12.7	2.7	1.1	2.1	2.3	2.3	1.7	1.4	2.7	3.8	3.4	2.6	4.7	8.9	6.2	5.7	4.8	100.0
27-Jun	5.0	6.2	6.6	5.7	4.3	5.2	2.8	6.5	4.3	4.1	2.5	2.8	3.0	3.8	3.4	9.3	5.5	6.5	3.6	2.0	2.3	2.7	1.0	1.0	100.0
28-Jun	2.0	4.4	3.3	2.1	3.0	1.7	0.8	1.2	4.1	6.0	4.5	2.4	9.4	7.9	5.3	4.0	3.6	4.0	9.9	4.5	3.9	5.9	3.9	1.9	100.0
29-Jun	3.4	4.6	5.6	5.7	5.8	7.4	8.3	8.5	8.0	9.6	5.2	2.4	1.9	1.6	2.5	1.7	2.9	2.6	3.8	1.9	1.9	1.0	2.1	1.6	100.0
30-Jun	2.1	3.9	4.2	3.3	2.0	2.3	0.9	0.4	1.7	3.5	5.0	2.9	0.6	3.0	3.4	7.3	7.1	6.4	3.1	5.0	5.0	3.1	7.7	16.0	100.0
1-Jul	2.9	1.9	3.4	2.9	4.9	3.6	2.9	2.0	2.6	4.4	6.2	6.6	8.2	6.0	2.7	8.7	3.7	5.6	4.5	2.2	1.0	3.1	3.6	6.2	100.0
2-Jul	5.0	3.1	2.8	3.5	4.8	3.5	4.0	5.4	6.1	3.8	3.5	4.1	9.6	8.9	5.6	4.0	3.0	3.5	2.0	1.7	2.3	1.4	2.5	5.9	100.0
3-Jul	12.8	7.3	8.5	6.4	5.1	3.2	2.1	2.1	2.5	1.6	3.1	4.1	2.5	8.0	8.8	5.9	3.6	3.5	4.0	1.4	1.1	0.9	1.1	0.4	100.0
4-Jul	0.7	1.7	2.1	1.6	2.1	3.3	1.3	1.4	1.8	1.0	1.6	3.4	2.3	5.4	6.2	8.0	8.5	4.9	5.7	9.5	6.5	8.0	8.3	4.9	100.0
5-Jul	3.4	6.5	6.5	6.1	6.9	6.4	6.4	5.1	4.2	3.7	3.2	2.4	2.7	3.6	3.4	4.3	5.7	3.9	2.8	3.1	2.5	2.9	2.2	2.4	100.0
6-Jul	2.0	4.0	5.0	6.9	6.1	5.7	4.4	5.8	4.4	2.2	2.4	1.7	2.6	4.0	4.5	4.3	7.1	8.1	5.1	3.9	3.4	2.1	1.5	2.6	100.0
7-Jul	6.4	4.8	5.4	3.9	5.7	5.1	4.2	3.2	3.3	3.4	2.4	3.0	2.1	3.3	2.2	3.4	4.0	8.3	6.9	4.0	3.0	5.8	3.0	3.4	100.0
8-Jul	2.4	2.4	2.4	1.8	1.7	4.4	3.2	2.5	3.5	3.9	4.1	4.1	6.5	2.9	3.4	4.2	5.4	7.7	11.8	7.7	4.0	3.0	3.9	3.1	100.0
9-Jul	2.0	2.2	2.8	3.2	3.1	5.7	8.0	8.7	4.6	4.7	3.3	3.6	3.6	2.7	3.0	2.6	2.8	5.1	7.9	7.2	3.5	3.3	3.6	2.9	100.0
10-Jul	3.9	4.8	3.6	4.4	3.7	5.7	9.5	12.6	7.3	4.4	4.3	3.8	2.8	2.1	2.4	2.4	2.7	3.2	5.2	4.0	2.6	1.5	1.7	1.4	100.0
11-Jul	5.1	3.9	4.8	3.1	4.9	2.9	4.6	9.9	4.0	3.9	2.3	1.8	4.1	6.8	3.2	2.7	4.5	3.4	3.6	3.7	4.4	3.5	5.0	3.5	100.0
12-Jul	2.3	1.9	3.2	2.3	1.9	2.6	2.9	2.9	6.6	2.9	5.1	3.2	6.6	4.4	5.8	2.2	4.5	3.5	5.2	2.2	8.2	4.5	8.0	7.0	100.0
13-Jul	2.6	3.9	4.0	2.5	3.6	1.9	2.1	4.6	8.6	8.1	2.0	3.1	4.9	3.6	4.9	5.1	5.2	4.4	2.2	3.4	4.6	6.0	5.9	3.0	100.0
14-Jul	4.0	1.3	1.5	1.4	1.2	1.6	0.9	1.5	3.2	6.8	5.3	3.6	6.2	4.2	4.7	5.4	5.1	4.1	3.2	4.9	7.5	10.8	8.3	3.2	100.0

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Appendix A.15. (p.2 of 2)

Date	Counts by Hour																								Daily Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
15-Jul	3.5	1.6	1.4	1.3	2.0	1.4	1.2	1.7	2.0	4.9	6.7	5.3	3.2	5.5	7.2	6.8	7.1	5.6	5.5	4.7	4.7	3.9	5.2	7.7	100.0
16-Jul	4.6	4.0	4.8	4.7	3.5	2.9	3.4	3.3	2.5	4.9	5.4	7.3	7.6	5.3	4.3	5.0	4.8	4.8	5.3	2.6	2.3	1.5	2.7	2.4	100.0
17-Jul	4.1	3.1	4.3	6.0	4.8	5.2	5.2	5.7	6.4	3.7	5.1	5.5	6.0	7.3	5.0	4.7	3.1	2.7	2.9	1.7	2.4	1.9	1.7	1.7	100.0
18-Jul	4.7	4.5	1.8	1.9	2.2	2.6	2.8	3.7	2.9	2.9	4.9	4.5	5.5	6.0	6.7	7.6	4.9	5.5	6.0	5.1	4.1	4.0	2.8	2.5	100.0
19-Jul	3.4	4.7	6.1	4.0	3.5	4.2	3.5	3.2	2.9	3.3	3.7	2.4	4.5	5.6	7.5	9.0	6.7	4.7	4.2	4.5	3.8	1.6	1.1	1.7	100.0
20-Jul	2.0	4.5	7.0	7.5	6.0	3.1	3.9	3.4	3.7	2.9	4.2	3.9	4.3	4.8	4.0	4.7	6.7	7.0	4.0	3.5	3.5	2.4	1.7	1.4	100.0
21-Jul	2.0	1.7	2.6	1.1	1.4	2.8	1.7	1.9	4.0	2.6	2.3	2.4	3.5	6.1	3.5	7.9	5.8	10.7	5.7	4.0	5.4	7.7	5.4	7.7	100.0
22-Jul	5.2	3.9	3.9	7.4	9.3	5.7	3.4	2.5	3.0	3.3	3.4	1.8	3.3	2.9	4.2	4.4	5.4	7.3	3.2	2.0	4.0	4.0	2.6	3.9	100.0
23-Jul	5.1	6.3	5.8	6.5	7.2	8.6	6.5	4.3	4.9	4.1	5.2	3.6	2.7	3.7	3.4	2.8	2.0	4.3	3.2	1.9	1.1	2.0	2.6	2.2	100.0
24-Jul	5.1	4.3	4.1	5.2	5.4	5.2	10.1	4.6	2.8	2.1	5.4	6.3	5.0	3.4	2.9	2.0	2.6	3.2	5.3	3.0	2.8	1.6	2.0	5.6	100.0
25-Jul	6.2	6.2	6.6	7.2	4.2	2.9	6.3	6.4	3.5	2.2	3.6	4.8	3.6	3.2	3.6	3.6	3.0	3.1	4.1	6.4	3.4	1.8	1.0	3.1	100.0
26-Jul	6.2	4.5	3.6	3.7	3.7	3.1	3.9	6.0	8.1	4.3	2.5	5.7	5.0	4.4	6.6	4.8	2.8	2.8	3.0	3.3	4.6	3.3	1.5	2.5	100.0
27-Jul	4.5	4.2	5.4	3.7	5.0	5.8	6.3	6.3	5.8	2.9	1.9	4.9	5.6	5.8	3.5	3.3	3.3	3.8	4.7	3.4	2.7	3.1	2.2	1.8	100.0
28-Jul	3.1	4.2	3.4	4.5	5.1	5.7	5.9	4.8	5.2	4.1	3.8	5.0	5.4	5.6	4.2	3.7	3.2	3.9	3.0	3.3	3.8	3.9	3.0	2.2	100.0
29-Jul	4.2	5.2	5.8	4.7	3.9	5.8	5.3	3.1	4.2	3.8	6.2	6.1	5.6	5.2	2.9	3.7	2.6	3.1	3.1	3.8	2.7	1.6	4.3	3.2	100.0
30-Jul	4.5	3.9	4.3	2.7	6.2	5.5	7.4	4.5	4.7	4.1	4.5	4.9	5.1	3.4	4.3	2.4	3.1	5.6	2.0	3.0	2.2	3.8	3.4	4.3	100.0
31-Jul	3.7	2.6	2.8	4.8	5.5	6.4	4.6	5.6	2.2	3.0	3.6	4.7	5.2	4.2	5.1	6.1	4.0	4.1	4.0	4.5	2.3	4.0	4.6	2.6	100.0
1-Aug	3.5	3.4	4.9	3.6	5.6	4.4	5.5	2.2	2.7	3.7	3.4	4.1	4.6	5.2	4.9	10.2	8.7	6.6	2.9	2.7	1.1	2.0	2.2	1.8	100.0
2-Aug	5.0	4.3	3.7	4.8	7.8	5.3	6.2	6.1	4.5	2.8	3.6	4.8	5.9	3.4	6.2	4.2	2.5	3.7	2.3	4.7	1.6	3.3	2.2	1.2	100.0
3-Aug	2.8	1.7	0.4	1.5	2.6	2.2	4.5	4.5	4.8	8.9	8.4	3.9	6.7	5.4	5.4	5.2	3.7	3.9	5.0	4.5	4.1	4.3	1.9	3.7	100.0
4-Aug	1.7	1.5	2.2	3.7	3.7	5.4	5.0	6.7	2.4	3.9	1.7	1.1	4.3	4.7	5.6	6.2	7.3	3.9	5.2	5.0	7.9	4.1	3.4	3.2	100.0
5-Aug	3.3	1.3	2.5	1.4	2.2	4.3	3.7	4.9	4.9	4.4	7.0	3.0	5.4	7.3	4.3	3.8	6.5	5.7	3.7	5.2	5.2	2.9	4.9	2.1	100.0
6-Aug	2.8	2.1	2.8	2.1	4.7	5.2	4.5	3.8	5.0	4.5	2.4	3.8	5.0	4.7	6.1	4.2	3.5	4.5	3.5	7.8	5.9	5.7	2.4	3.1	100.0
7-Aug	2.9	1.7	2.6	3.3	2.2	3.6	5.7	7.9	6.7	2.9	3.3	2.6	4.1	5.7	4.3	5.5	7.7	6.5	3.1	6.5	2.6	2.9	2.6	3.1	100.0
8-Aug	1.2	3.0	1.2	2.2	1.5	3.5	4.2	6.7	5.2	4.2	3.0	4.7	2.2	5.4	4.5	5.2	3.7	4.0	5.7	5.7	4.2	7.2	7.2	4.5	100.0
Total	3.9	4.4	4.8	4.7	4.6	4.6	4.7	4.9	4.1	3.8	3.9	3.8	4.4	4.3	4.0	4.4	4.2	4.6	4.8	4.0	3.5	3.3	3.0	3.2	100.0

Appendix A.16. Kasilof River south bank sonar counts by hour, 15 June through 8 August 1998. Counts expressed as percentage of daily total.

Date	Counts by Hour																								Daily Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
15-Jun	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	3.5	0.0	2.1	0.4	4.3	0.0	2.1	6.0	7.8	8.2	4.3	10.3	100.0
16-Jun	9.4	9.9	7.5	8.2	10.8	6.0	6.5	2.4	1.4	2.9	1.0	2.7	2.7	2.4	4.6	4.6	0.7	1.2	2.4	1.7	4.8	1.0	1.9	3.4	100.0
17-Jun	6.2	5.3	7.1	1.6	2.3	0.9	1.8	1.1	2.7	1.1	2.1	0.5	1.6	2.7	10.3	9.6	2.5	1.8	3.4	3.9	2.3	5.5	13.9	9.8	100.0
18-Jun	4.5	7.3	7.9	4.0	5.9	4.0	3.8	2.7	4.5	2.8	1.3	1.8	1.8	4.7	4.0	10.2	5.0	6.2	3.4	2.4	4.1	2.4	2.6	2.6	100.0
19-Jun	5.4	6.0	5.8	5.8	2.8	1.5	1.2	1.0	0.7	0.7	1.3	2.5	2.9	3.0	2.3	5.6	8.2	7.5	6.1	6.2	4.0	3.6	7.7	8.1	100.0
20-Jun	5.3	4.9	6.0	6.1	8.0	3.2	2.0	1.3	0.7	0.6	2.3	2.5	3.4	2.0	3.4	3.4	7.6	7.1	7.8	6.1	4.1	3.9	4.2	4.2	100.0
21-Jun	2.4	2.0	3.7	4.8	6.3	4.8	3.8	4.0	1.3	2.0	3.2	3.6	3.6	2.7	4.1	2.1	4.3	15.3	7.6	3.5	2.7	3.7	4.0	4.3	100.0
22-Jun	2.2	4.2	3.1	5.4	12.1	7.3	1.9	3.2	3.2	2.9	2.1	1.4	1.1	1.2	2.2	5.3	4.8	3.3	8.0	5.6	7.9	4.6	2.8	4.0	100.0
23-Jun	3.1	3.8	1.9	1.9	8.1	9.1	4.7	3.5	3.5	3.0	4.8	3.3	3.3	4.7	3.6	4.2	3.4	2.2	4.5	5.5	5.5	5.0	4.9	2.5	100.0
24-Jun	2.3	4.6	2.6	2.8	2.5	12.0	12.4	3.3	1.4	3.6	3.4	3.3	3.2	4.2	3.7	3.1	3.6	1.0	1.7	8.2	7.5	4.4	2.7	2.7	100.0
25-Jun	2.6	3.6	3.3	2.6	2.4	4.9	9.9	7.0	2.6	1.6	2.8	2.2	3.2	2.9	3.3	2.7	1.3	3.1	2.3	4.5	7.3	9.3	9.4	5.1	100.0
26-Jun	5.5	3.4	3.3	2.1	3.4	2.6	4.6	11.3	5.2	1.3	0.7	4.1	5.1	4.2	4.8	4.3	4.1	3.4	3.4	2.8	4.9	4.7	5.5	5.5	100.0
27-Jun	2.6	2.0	2.8	2.1	1.5	2.1	2.0	4.6	5.9	3.3	2.4	3.9	5.9	6.2	4.8	5.7	2.3	3.1	1.8	2.9	6.4	9.5	8.6	7.5	100.0
28-Jun	6.0	6.0	3.7	2.5	2.9	2.4	2.4	4.1	4.5	8.8	5.4	5.2	6.3	6.0	4.5	2.8	2.6	2.9	2.6	2.8	3.9	5.2	4.0	2.3	100.0
29-Jun	3.5	4.7	4.7	5.8	4.3	3.2	2.7	3.7	5.2	8.8	8.5	3.8	2.8	6.8	5.4	4.1	2.7	1.9	2.3	3.7	2.8	2.8	3.0	2.8	100.0
30-Jun	3.3	4.0	2.1	1.9	1.8	2.0	2.4	1.8	3.0	2.8	8.0	4.4	3.2	4.5	5.6	3.3	4.0	2.8	2.6	6.3	6.0	5.0	9.4	9.9	100.0
1-Jul	2.8	1.9	2.0	2.3	2.4	2.6	2.3	2.2	2.6	3.7	4.4	7.5	8.8	4.6	4.7	4.8	4.8	4.5	2.7	3.5	6.1	6.1	6.2	6.2	100.0
2-Jul	7.3	3.9	3.6	3.9	5.3	5.7	3.8	5.5	5.4	4.9	7.0	4.6	5.3	3.6	3.3	2.8	1.9	2.0	2.4	2.7	2.9	3.4	3.3	5.5	100.0
3-Jul	11.1	9.7	6.9	4.8	3.4	4.6	4.9	4.7	2.3	3.4	3.2	2.1	5.5	4.7	5.4	3.2	4.7	3.7	2.5	4.1	1.5	1.6	1.2	0.8	100.0
4-Jul	1.3	3.2	3.8	3.7	3.1	4.3	2.9	2.0	2.7	3.5	3.0	4.3	3.2	5.4	5.0	9.3	3.9	3.2	6.4	5.4	3.2	5.3	5.6	6.5	100.0
5-Jul	3.8	2.1	3.4	3.6	3.3	1.8	2.5	2.5	2.5	1.8	2.7	1.9	4.2	4.2	4.2	4.2	11.9	4.1	4.6	6.3	6.2	7.5	6.3	4.7	100.0
6-Jul	5.0	3.3	7.8	10.2	8.7	4.5	2.0	1.3	2.3	4.5	3.7	3.4	3.5	4.3	3.9	2.6	6.5	6.7	2.7	2.1	1.5	4.5	3.5	1.7	100.0
7-Jul	4.0	3.7	3.4	3.7	5.1	7.6	7.0	3.4	3.1	2.2	3.0	3.2	4.4	3.0	2.4	1.9	3.0	3.0	5.2	2.8	7.7	5.9	6.5	4.9	100.0
8-Jul	2.5	3.8	2.6	2.4	3.7	5.4	8.0	8.7	8.8	6.3	5.3	4.7	2.8	3.1	2.8	2.5	2.6	2.9	4.3	3.5	2.2	2.8	3.3	4.7	100.0
9-Jul	2.7	2.8	2.0	2.5	4.5	8.3	14.1	5.2	5.8	4.5	4.5	3.1	2.5	2.4	4.2	3.8	2.9	3.9	4.1	4.2	2.9	1.7	4.1	3.2	100.0
10-Jul	2.1	2.2	1.8	2.2	2.0	7.0	12.7	12.0	3.1	2.7	4.1	3.1	3.3	4.2	3.5	3.3	4.9	3.5	3.7	7.6	3.8	2.2	2.5	2.5	100.0
11-Jul	4.3	3.5	3.6	3.6	2.4	3.2	5.4	7.0	2.5	3.5	4.0	3.7	6.3	7.4	4.6	3.1	3.4	5.2	2.9	4.4	3.1	5.0	5.3	2.8	100.0
12-Jul	1.9	1.6	0.9	1.3	1.4	1.2	2.3	3.5	5.6	6.5	5.2	3.6	6.7	2.8	2.5	4.5	2.7	2.9	4.2	5.6	11.4	9.5	6.7	5.5	100.0
13-Jul	3.7	3.1	3.3	2.3	3.3	3.1	3.2	6.8	12.1	6.4	4.3	3.7	3.3	6.1	4.5	3.1	4.0	2.7	3.8	3.0	4.0	4.3	1.8	4.0	100.0
14-Jul	2.6	3.6	3.4	2.5	2.9	2.3	3.6	3.4	4.9	9.4	9.1	4.7	3.4	2.6	2.9	1.9	3.4	5.0	2.5	5.4	3.1	5.0	6.4	6.0	100.0

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Appendix A.16. (p.2 of 2)

Counts by Hour																									
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total
15-Jul	2.8	1.8	2.6	2.1	1.8	1.7	3.0	2.2	3.5	6.2	11.0	7.8	4.6	4.7	2.7	2.4	2.4	4.1	5.6	4.1	5.0	6.3	7.2	4.5	100.0
16-Jul	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.6	2.3	2.1	3.4	3.4	4.1	6.8	3.2	5.9	5.0	3.9	5.6	100.0
17-Jul	1.8	2.2	2.4	2.4	3.5	4.9	4.9	5.8	6.4	9.5	6.7	6.8	6.6	9.2	4.8	3.0	2.5	2.2	2.2	2.8	3.1	3.1	2.0	1.3	100.0
18-Jul	4.2	3.3	2.5	1.5	2.0	4.1	6.5	4.8	4.6	6.1	4.2	5.1	4.7	5.0	8.7	4.0	4.0	2.9	4.3	3.0	2.2	3.6	4.6	4.1	100.0
19-Jul	3.4	7.2	8.3	5.8	5.6	6.0	5.8	4.7	3.8	3.4	4.9	5.1	2.4	3.2	2.3	1.7	4.5	2.4	3.6	2.8	3.0	4.1	3.4	2.6	100.0
20-Jul	2.4	2.5	3.1	5.9	4.6	5.3	6.4	5.9	5.2	3.8	4.3	4.1	4.9	3.8	3.9	3.6	6.9	5.5	2.2	2.4	4.4	3.8	2.6	2.5	100.0
21-Jul	4.0	3.7	3.1	3.1	3.1	4.6	4.3	4.3	4.2	3.8	2.7	3.3	3.7	3.9	5.4	3.8	4.2	5.0	2.8	2.4	5.1	8.4	6.0	5.0	100.0
22-Jul	3.7	3.1	3.7	4.6	7.6	8.3	5.5	2.3	4.6	5.4	4.3	3.1	2.8	2.8	3.7	3.6	3.8	4.8	2.5	2.9	2.4	3.0	6.4	5.2	100.0
23-Jul	2.5	2.6	2.4	3.2	3.7	10.7	6.9	2.8	3.1	5.3	8.2	4.1	4.4	3.2	4.0	3.9	3.1	3.0	4.3	2.1	1.1	2.5	6.6	6.1	100.0
24-Jul	3.2	3.3	2.4	1.9	3.8	4.9	8.9	5.8	3.3	4.1	6.1	5.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	5.6	1.8	1.3	3.2	5.8	100.0
25-Jul	7.6	4.9	3.8	2.8	3.2	4.7	8.6	10.4	5.0	2.4	3.1	5.7	3.8	3.7	3.7	2.3	1.8	2.7	1.7	4.5	5.7	2.2	2.6	3.1	100.0
26-Jul	5.7	4.7	4.0	3.6	3.0	3.7	3.9	8.9	8.7	7.0	4.3	5.3	5.9	4.3	3.5	3.6	2.0	2.1	2.5	2.5	3.9	3.3	1.7	1.8	100.0
27-Jul	3.3	3.7	3.0	2.5	3.1	3.6	4.3	4.4	8.7	8.7	7.4	2.6	5.2	5.1	3.9	2.3	1.8	2.3	1.8	4.9	5.5	3.6	4.3	4.0	100.0
28-Jul	4.3	4.4	3.7	3.3	3.7	6.1	5.8	5.0	4.4	7.8	6.9	7.6	2.8	5.1	4.2	3.3	3.0	2.4	2.0	2.6	2.5	4.5	3.3	1.6	100.0
29-Jul	2.3	3.0	2.5	2.3	3.2	4.0	7.0	4.5	6.2	5.8	7.0	7.2	4.8	4.7	6.7	4.1	3.6	2.8	2.7	3.0	4.1	3.1	3.6	1.6	100.0
30-Jul	3.0	3.3	2.6	2.5	3.1	4.3	5.4	4.2	4.3	5.4	6.5	5.9	5.6	6.2	5.9	4.7	3.6	4.7	3.3	3.2	3.5	3.0	3.1	2.8	100.0
31-Jul	2.5	2.3	1.9	2.9	3.1	6.6	5.1	5.7	4.4	5.5	4.8	5.4	5.3	6.7	4.8	3.0	3.3	5.3	4.2	3.5	3.8	3.7	2.9	3.4	100.0
1-Aug	3.0	3.1	2.6	2.8	3.9	7.8	7.2	6.1	5.7	6.2	4.5	4.3	5.5	6.2	4.9	3.3	4.4	3.9	3.7	2.3	2.2	2.4	2.5	1.3	100.0
2-Aug	4.0	4.2	3.9	3.0	4.5	5.0	8.6	7.9	5.8	5.1	3.6	4.6	2.6	4.1	4.7	4.0	3.3	3.2	4.4	4.2	4.4	1.5	1.9	1.2	100.0
3-Aug	2.4	2.6	3.4	1.8	2.6	3.4	8.0	7.8	5.3	4.4	4.4	5.5	4.2	3.9	3.5	4.9	4.0	7.8	5.5	3.4	3.7	3.2	3.1	1.2	100.0
4-Aug	1.5	2.0	2.9	1.5	2.0	2.8	6.0	4.6	5.1	5.3	4.8	5.9	4.4	5.7	6.8	4.3	3.8	4.0	7.4	7.9	3.7	1.7	2.6	3.3	100.0
5-Aug	2.6	0.9	2.1	1.4	2.1	2.9	6.1	8.6	5.3	4.8	5.6	5.3	5.0	5.2	5.5	4.3	6.3	3.5	4.7	4.9	3.1	4.7	4.0	1.2	100.0
6-Aug	4.6	1.8	2.6	4.0	1.4	1.8	5.0	5.8	4.5	4.4	4.6	4.1	5.0	7.3	5.6	6.1	4.3	5.5	5.3	4.8	3.0	3.5	2.9	2.0	100.0
7-Aug	3.8	2.3	2.7	2.2	1.5	1.9	4.5	2.3	7.5	7.0	3.6	6.2	4.9	5.0	5.7	5.5	3.7	6.6	5.3	5.1	3.9	3.3	2.6	2.9	100.0
8-Aug	0.9	3.2	1.5	1.4	0.8	1.7	3.5	6.6	3.5	6.5	5.7	5.6	5.9	6.6	5.0	3.8	5.0	6.6	6.6	7.2	2.9	4.4	2.4	3.3	100.0
Total	3.6	3.6	3.4	3.4	3.9	4.9	5.4	5.0	4.7	5.1	5.0	4.7	4.4	4.7	4.3	3.6	3.8	3.7	3.6	3.7	3.9	4.0	4.1	3.6	100.0

Appendix A.17. Kasilof River north bank sonar counts by sector. 15 June through 8 August 1998.

Counts by Sector														
Date	1	2	3	4	5	6	7	8	9	10	11	12	Daily Total	Cum Total
15-Jun	2	1	1	0	0	1	0	0	0	8	0	1	14	14
16-Jun	9	5	0	1	0	0	0	0	0	1	0	1	17	31
17-Jun	44	64	71	45	48	53	1	4	2	1	0	4	337	368
18-Jun	147	727	444	175	103	196	0	0	0	0	0	0	1,792	2,160
19-Jun	298	767	297	102	53	95	4	1	10	61	112	178	1,978	4,138
20-Jun	81	55	71	22	4	3	3	19	16	39	110	304	727	4,865
21-Jun	88	101	92	23	11	12	5	21	41	132	300	560	1,386	6,251
22-Jun	125	341	241	107	54	88	89	74	80	110	103	95	1,507	7,758
23-Jun	72	471	418	161	50	77	49	94	114	179	176	170	2,031	9,789
24-Jun	50	339	388	162	45	60	45	53	99	130	121	118	1,610	11,399
25-Jun	34	295	336	146	47	82	44	58	130	105	111	97	1,485	12,884
26-Jun	61	550	533	139	49	73	60	57	99	106	144	102	1,973	14,857
27-Jun	212	1,698	963	268	99	95	43	54	87	100	108	79	3,806	18,663
28-Jun	338	2,205	792	144	37	65	17	35	38	61	67	69	3,868	22,531
29-Jun	464	2,533	674	80	17	45	15	29	36	37	48	32	4,010	26,541
30-Jun	93	518	224	27	9	21	6	11	19	38	35	25	1,026	27,567
01-Jul	209	1,341	709	124	28	68	36	54	69	72	83	91	2,884	30,451
02-Jul	148	876	1,138	288	69	157	66	60	87	130	180	213	3,412	33,863
03-Jul	99	407	503	213	58	95	48	28	65	93	177	147	1,933	35,796
04-Jul	109	391	219	87	16	50	4	10	30	61	50	45	1,072	36,868
05-Jul	458	1,328	619	120	21	58	17	35	46	69	95	64	2,930	39,798
06-Jul	780	1,944	702	145	26	86	28	56	63	107	82	83	4,102	43,900
07-Jul	611	449	147	19	7	19	7	12	30	34	20	28	1,383	45,283
08-Jul	675	661	786	264	65	52	10	25	15	59	66	89	2,767	48,050
09-Jul	1,201	1,239	1,322	377	54	16	6	11	16	89	76	163	4,570	52,620
10-Jul	1,552	1,379	1,212	317	20	8	2	10	14	65	52	113	4,744	57,364
11-Jul	448	159	184	74	12	2	0	3	3	36	39	57	1,017	58,381
12-Jul	314	97	88	16	5	7	0	3	5	26	32	93	686	59,067
13-Jul	815	246	217	67	8	4	0	6	3	31	45	41	1,483	60,550
14-Jul	527	158	103	38	0	1	0	5	5	16	19	52	924	61,474
15-Jul	816	352	199	90	7	2	6	7	4	45	46	74	1,648	63,122
16-Jul	1,260	624	245	118	14	10	2	11	3	42	82	64	2,475	65,597
17-Jul	1,451	1,124	316	107	10	5	0	1	2	22	65	104	3,207	68,804
18-Jul	776	882	382	145	13	3	0	2	5	31	78	66	2,383	71,187
19-Jul	1,073	806	417	144	2	5	2	1	4	33	68	77	2,632	73,819
20-Jul	789	377	231	80	11	5	0	3	8	44	51	63	1,662	75,481
21-Jul	528	306	164	59	5	10	1	6	2	22	51	60	1,214	76,695
22-Jul	1,130	829	230	61	3	3	0	6	3	29	47	114	2,455	79,150
23-Jul	1,127	1,020	246	54	13	1	2	4	3	32	21	66	2,589	81,739
24-Jul	950	766	187	43	3	4	1	2	7	41	31	58	2,093	83,832

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Appendix A.17. (p. 2 of 2)

Counts by Sector														
Date	1	2	3	4	5	6	7	8	9	10	11	12	Daily Total	Cum Total
25-Jul	820	800	344	94	26	8	1	0	3	20	10	18	2,144	85,976
26-Jul	731	614	142	43	7	9	0	6	14	40	19	32	1,657	87,633
27-Jul	598	562	103	21	3	2	1	3	5	17	28	48	1,391	89,024
28-Jul	599	660	114	19	4	10	1	1	5	26	15	61	1,515	90,539
29-Jul	466	514	102	19	5	8	1	4	6	16	18	44	1,203	91,742
30-Jul	617	491	81	28	8	8	0	8	5	35	29	75	1,385	93,127
31-Jul	671	446	83	20	6	13	1	2	3	26	20	48	1,339	94,466
1-Aug	662	481	76	20	3	2	1	0	10	28	17	54	1,354	95,820
2-Aug	234	221	45	26	8	4	1	4	5	27	42	27	644	96,464
3-Aug	158	143	57	17	25	6	0	2	1	11	18	25	463	96,927
4-Aug	208	194	54	16	6	5	1	2	4	15	23	7	535	97,462
5-Aug	242	194	59	14	6	13	1	3	3	20	35	40	630	98,092
6-Aug	130	152	48	10	13	4	1	5	10	8	14	29	424	98,516
7-Aug	138	168	54	8	5	3	0	2	9	6	10	15	418	98,934
8-Aug	109	136	41	25	8	10	5	8	10	17	11	24	404	99,338
Total	26,347	34,207	17,514	5,032	1,229	1,742	634	921	1,356	2,649	3,300	4,407	99,338	

Appendix A.18. Kasilof River south bank sonar counts by sector, 15 June through 8 August 1998.

Date	Counts by Sector												Daily Total	Cum Total
	1	2	3	4	5	6	7	8	9	10	11	12		
15-Jun	21	17	18	37	30	16	21	18	20	32	28	24	282	282
16-Jun	27	8	10	16	34	24	23	37	43	63	67	63	415	697
17-Jun	19	20	14	33	85	7	5	10	18	65	76	86	438	1,135
18-Jun	29	20	15	34	133	36	83	75	114	208	195	171	1,113	2,248
19-Jun	92	45	50	103	141	96	179	132	176	230	156	111	1,511	3,759
20-Jun	62	32	36	59	99	85	148	142	146	139	119	88	1,155	4,914
21-Jun	50	30	24	81	125	151	202	239	260	286	252	327	2,027	6,941
22-Jun	70	77	55	118	283	276	232	372	365	421	396	388	3,053	9,994
23-Jun	53	70	52	88	138	104	170	316	430	466	404	345	2,636	12,630
24-Jun	24	10	32	73	71	65	112	240	321	247	217	216	1,628	14,258
25-Jun	29	14	17	65	72	66	195	381	449	299	256	261	2,104	16,362
26-Jun	34	29	34	68	97	95	226	460	554	424	275	296	2,592	18,954
27-Jun	50	49	57	151	171	194	412	704	829	635	391	327	3,970	22,924
28-Jun	99	63	20	127	261	331	465	659	805	517	326	211	3,884	26,808
29-Jun	155	97	64	201	526	369	415	502	627	724	496	514	4,690	31,498
30-Jun	32	31	15	81	181	119	176	278	372	359	277	291	2,212	33,710
1-Jul	114	92	69	271	438	252	243	509	830	773	568	485	4,644	38,354
2-Jul	101	75	36	167	293	218	221	471	470	415	358	314	3,139	41,493
3-Jul	43	19	15	85	139	104	153	258	266	262	193	279	1,816	43,309
4-Jul	66	32	21	50	115	67	76	116	118	128	94	88	971	44,280
5-Jul	208	437	493	242	230	237	264	277	245	268	336	516	3,753	48,033
6-Jul	297	247	830	521	303	298	274	272	240	220	276	602	4,380	52,413
7-Jul	342	209	456	292	140	79	77	73	35	41	70	172	1,986	54,399
8-Jul	314	367	821	461	168	95	74	56	40	28	153	195	2,772	57,171
9-Jul	404	214	478	575	409	196	100	59	19	21	10	110	2,595	59,766
10-Jul	423	180	54	526	549	349	228	109	52	37	17	34	2,558	62,324
11-Jul	182	103	64	136	178	167	88	33	23	26	15	27	1,042	63,366
12-Jul	205	79	65	213	206	135	56	26	9	26	12	24	1,056	64,422
13-Jul	173	108	112	416	545	458	135	64	35	41	29	51	2,167	66,589
14-Jul	136	81	64	258	500	243	111	78	35	24	14	24	1,568	68,157
15-Jul	724	382	175	669	1,056	579	248	110	94	53	34	56	4,180	72,337
16-Jul	541	460	424	861	1,086	682	236	115	91	93	94	94	4,777	77,114
17-Jul	1,139	467	301	2,927	3,145	1,301	648	398	159	107	83	91	10,766	87,880
18-Jul	345	237	183	1,388	2,000	795	323	229	78	84	56	64	5,782	93,662
19-Jul	374	284	175	1,137	3,114	1,734	522	280	135	53	63	71	7,942	101,604
20-Jul	466	316	207	929	2,154	1,436	359	167	81	59	39	56	6,269	107,873
21-Jul	515	165	139	608	1,019	547	101	47	22	15	33	35	3,246	111,119
22-Jul	832	232	113	768	1,440	748	133	50	28	18	27	27	4,416	115,535
23-Jul	779	364	214	924	1,363	662	227	105	50	38	54	53	4,833	120,368
24-Jul	680	608	476	1,317	2,202	1,154	234	108	70	61	49	43	7,002	127,370

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Counts by Sector														
Date	1	2	3	4	5	6	7	8	9	10	11	12	Daily Total	Cum Total
25-Jul	619	259	307	1,337	1,445	640	171	77	47	30	30	17	4,979	132,349
26-Jul	646	249	316	1,032	1,004	439	142	78	33	31	17	27	4,014	136,363
27-Jul	367	266	394	1,163	840	450	164	71	41	31	35	39	3,861	140,224
28-Jul	850	363	731	2,153	1,413	812	337	146	58	32	52	66	7,013	147,237
29-Jul	493	311	539	1,281	1,100	688	228	105	52	42	39	56	4,934	152,171
30-Jul	547	274	518	1,106	941	493	160	49	54	32	33	23	4,230	156,401
31-Jul	675	409	778	1,736	750	482	212	97	59	50	53	37	5,338	161,739
1-Aug	720	444	901	2,158	989	489	209	101	64	43	51	44	6,213	167,952
2-Aug	404	137	283	626	339	232	119	67	51	25	20	27	2,330	170,282
3-Aug	223	102	149	292	197	177	73	42	28	42	24	6	1,355	171,637
4-Aug	297	148	236	353	144	144	57	31	17	14	22	5	1,468	173,105
5-Aug	386	146	357	540	273	193	67	36	30	21	17	22	2,088	175,193
6-Aug	179	85	222	330	129	123	47	16	33	18	12	14	1,208	176,401
7-Aug	263	100	212	261	97	110	38	25	6	20	11	6	1,149	177,550
8-Aug	138	61	125	176	56	29	19	10	9	15	17	11	666	178,216
Total	17,056	9,724	12,566	31,620	34,956	20,071	10,238	9,526	9,336	8,452	7,041	7,630	178,216	

Appendix A.19. Kasilof River north bank sonar counts by sector, 15 June through 8 August 1998. Counts expressed as percentage of daily total.

Date	Counts by Sector												Daily Total
	1	2	3	4	5	6	7	8	9	10	11	12	
15-Jun	14.3	7.1	7.1	0.0	0.0	7.1	0.0	0.0	0.0	57.1	0.0	7.1	100.0
16-Jun	52.9	29.4	0.0	5.9	0.0	0.0	0.0	0.0	0.0	5.9	0.0	5.9	100.0
17-Jun	13.1	19.0	21.1	13.4	14.2	15.7	0.3	1.2	0.6	0.3	0.0	1.2	100.0
18-Jun	8.2	40.6	24.8	9.8	5.7	10.9	0.0	0.0	0.0	0.0	0.0	0.0	100.0
19-Jun	15.1	38.8	15.0	5.2	2.7	4.8	0.2	0.1	0.5	3.1	5.7	9.0	100.0
20-Jun	11.1	7.6	9.8	3.0	0.6	0.4	0.4	2.6	2.2	5.4	15.1	41.8	100.0
21-Jun	6.3	7.3	6.6	1.7	0.8	0.9	0.4	1.5	3.0	9.5	21.6	40.4	100.0
22-Jun	8.3	22.6	16.0	7.1	3.6	5.8	5.9	4.9	5.3	7.3	6.8	6.3	100.0
23-Jun	3.5	23.2	20.6	7.9	2.5	3.8	2.4	4.6	5.6	8.8	8.7	8.4	100.0
24-Jun	3.1	21.1	24.1	10.1	2.8	3.7	2.8	3.3	6.1	8.1	7.5	7.3	100.0
25-Jun	2.3	19.9	22.6	9.8	3.2	5.5	3.0	3.9	8.8	7.1	7.5	6.5	100.0
26-Jun	3.1	27.9	27.0	7.0	2.5	3.7	3.0	2.9	5.0	5.4	7.3	5.2	100.0
27-Jun	5.6	44.6	25.3	7.0	2.6	2.5	1.1	1.4	2.3	2.6	2.8	2.1	100.0
28-Jun	8.7	57.0	20.5	3.7	1.0	1.7	0.4	0.9	1.0	1.6	1.7	1.8	100.0
29-Jun	11.6	63.2	16.8	2.0	0.4	1.1	0.4	0.7	0.9	0.9	1.2	0.8	100.0
30-Jun	9.1	50.5	21.8	2.6	0.9	2.0	0.6	1.1	1.9	3.7	3.4	2.4	100.0
1-Jul	7.2	46.5	24.6	4.3	1.0	2.4	1.2	1.9	2.4	2.5	2.9	3.2	100.0
2-Jul	4.3	25.7	33.4	8.4	2.0	4.6	1.9	1.8	2.5	3.8	5.3	6.2	100.0
3-Jul	5.1	21.1	26.0	11.0	3.0	4.9	2.5	1.4	3.4	4.8	9.2	7.6	100.0
4-Jul	10.2	36.5	20.4	8.1	1.5	4.7	0.4	0.9	2.8	5.7	4.7	4.2	100.0
5-Jul	15.6	45.3	21.1	4.1	0.7	2.0	0.6	1.2	1.6	2.4	3.2	2.2	100.0
6-Jul	19.0	47.4	17.1	3.5	0.6	2.1	0.7	1.4	1.5	2.6	2.0	2.0	100.0
7-Jul	44.2	32.5	10.6	1.4	0.5	1.4	0.5	0.9	2.2	2.5	1.4	2.0	100.0
8-Jul	24.4	23.9	28.4	9.5	2.3	1.9	0.4	0.9	0.5	2.1	2.4	3.2	100.0
9-Jul	26.3	27.1	28.9	8.2	1.2	0.4	0.1	0.2	0.4	1.9	1.7	3.6	100.0
10-Jul	32.7	29.1	25.5	6.7	0.4	0.2	0.0	0.2	0.3	1.4	1.1	2.4	100.0
11-Jul	44.1	15.6	18.1	7.3	1.2	0.2	0.0	0.3	0.3	3.5	3.8	5.6	100.0
12-Jul	45.8	14.1	12.8	2.3	0.7	1.0	0.0	0.4	0.7	3.8	4.7	13.6	100.0
13-Jul	55.0	16.6	14.6	4.5	0.5	0.3	0.0	0.4	0.2	2.1	3.0	2.8	100.0
14-Jul	57.0	17.1	11.1	4.1	0.0	0.1	0.0	0.5	0.5	1.7	2.1	5.6	100.0
15-Jul	49.5	21.4	12.1	5.5	0.4	0.1	0.4	0.4	0.2	2.7	2.8	4.5	100.0
16-Jul	50.9	25.2	9.9	4.8	0.6	0.4	0.1	0.4	0.1	1.7	3.3	2.6	100.0
17-Jul	45.2	35.0	9.9	3.3	0.3	0.2	0.0	0.0	0.1	0.7	2.0	3.2	100.0
18-Jul	32.6	37.0	16.0	6.1	0.5	0.1	0.0	0.1	0.2	1.3	3.3	2.8	100.0
19-Jul	40.8	30.6	15.8	5.5	0.1	0.2	0.1	0.0	0.2	1.3	2.6	2.9	100.0
20-Jul	47.5	22.7	13.9	4.8	0.7	0.3	0.0	0.2	0.5	2.6	3.1	3.8	100.0
21-Jul	43.5	25.2	13.5	4.9	0.4	0.8	0.1	0.5	0.2	1.8	4.2	4.9	100.0
22-Jul	46.0	33.8	9.4	2.5	0.1	0.1	0.0	0.2	0.1	1.2	1.9	4.6	100.0
23-Jul	43.5	39.4	9.5	2.1	0.5	0.0	0.1	0.2	0.1	1.2	0.8	2.5	100.0
24-Jul	45.4	36.6	8.9	2.1	0.1	0.2	0.0	0.1	0.3	2.0	1.5	2.8	100.0

-Continued-

Counts by Sector													
Date	1	2	3	4	5	6	7	8	9	10	11	12	Daily Total
25-Jul	38.2	37.3	16.0	4.4	1.2	0.4	0.0	0.0	0.1	0.9	0.5	0.8	100.0
26-Jul	44.1	37.1	8.6	2.6	0.4	0.5	0.0	0.4	0.8	2.4	1.1	1.9	100.0
27-Jul	43.0	40.4	7.4	1.5	0.2	0.1	0.1	0.2	0.4	1.2	2.0	3.5	100.0
28-Jul	39.5	43.6	7.5	1.3	0.3	0.7	0.1	0.1	0.3	1.7	1.0	4.0	100.0
29-Jul	38.7	42.7	8.5	1.6	0.4	0.7	0.1	0.3	0.5	1.3	1.5	3.7	100.0
30-Jul	44.5	35.5	5.8	2.0	0.6	0.6	0.0	0.6	0.4	2.5	2.1	5.4	100.0
31-Jul	50.1	33.3	6.2	1.5	0.4	1.0	0.1	0.1	0.2	1.9	1.5	3.6	100.0
1-Aug	48.9	35.5	5.6	1.5	0.2	0.1	0.1	0.0	0.7	2.1	1.3	4.0	100.0
2-Aug	36.3	34.3	7.0	4.0	1.2	0.6	0.2	0.6	0.8	4.2	6.5	4.2	100.0
3-Aug	34.1	30.9	12.3	3.7	5.4	1.3	0.0	0.4	0.2	2.4	3.9	5.4	100.0
4-Aug	38.9	36.3	10.1	3.0	1.1	0.9	0.2	0.4	0.7	2.8	4.3	1.3	100.0
5-Aug	38.4	30.8	9.4	2.2	1.0	2.1	0.2	0.5	0.5	3.2	5.6	6.3	100.0
6-Aug	30.7	35.8	11.3	2.4	3.1	0.9	0.2	1.2	2.4	1.9	3.3	6.8	100.0
7-Aug	33.0	40.2	12.9	1.9	1.2	0.7	0.0	0.5	2.2	1.4	2.4	3.6	100.0
8-Aug	27.0	33.7	10.1	6.2	2.0	2.5	1.2	2.0	2.5	4.2	2.7	5.9	100.0
Total	26.5	34.4	17.6	5.1	1.2	1.8	0.6	0.9	1.4	2.7	3.3	4.4	100.0

Appendix A.20. Kasilof River south bank sonar counts by sector, 15 June through 8 August 1998. Counts expressed as percentage of daily total.

Counts by Sector													
Date	1	2	3	4	5	6	7	8	9	10	11	12	Daily Total
15-Jun	7.4	6.0	6.4	13.1	10.6	5.7	7.4	6.4	7.1	11.3	9.9	8.5	100.0
16-Jun	6.5	1.9	2.4	3.9	8.2	5.8	5.5	8.9	10.4	15.2	16.1	15.2	100.0
17-Jun	4.3	4.6	3.2	7.5	19.4	1.6	1.1	2.3	4.1	14.8	17.4	19.6	100.0
18-Jun	2.6	1.8	1.3	3.1	11.9	3.2	7.5	6.7	10.2	18.7	17.5	15.4	100.0
19-Jun	6.1	3.0	3.3	6.8	9.3	6.4	11.8	8.7	11.6	15.2	10.3	7.3	100.0
20-Jun	5.4	2.8	3.1	5.1	8.6	7.4	12.8	12.3	12.6	12.0	10.3	7.6	100.0
21-Jun	2.5	1.5	1.2	4.0	6.2	7.4	10.0	11.8	12.8	14.1	12.4	16.1	100.0
22-Jun	2.3	2.5	1.8	3.9	9.3	9.0	7.6	12.2	12.0	13.8	13.0	12.7	100.0
23-Jun	2.0	2.7	2.0	3.3	5.2	3.9	6.4	12.0	16.3	17.7	15.3	13.1	100.0
24-Jun	1.5	0.6	2.0	4.5	4.4	4.0	6.9	14.7	19.7	15.2	13.3	13.3	100.0
25-Jun	1.4	0.7	0.8	3.1	3.4	3.1	9.3	18.1	21.3	14.2	12.2	12.4	100.0
26-Jun	1.3	1.1	1.3	2.6	3.7	3.7	8.7	17.7	21.4	16.4	10.6	11.4	100.0
27-Jun	1.3	1.2	1.4	3.8	4.3	4.9	10.4	17.7	20.9	16.0	9.8	8.2	100.0
28-Jun	2.5	1.6	0.5	3.3	6.7	8.5	12.0	17.0	20.7	13.3	8.4	5.4	100.0
29-Jun	3.3	2.1	1.4	4.3	11.2	7.9	8.8	10.7	13.4	15.4	10.6	11.0	100.0
30-Jun	1.4	1.4	0.7	3.7	8.2	5.4	8.0	12.6	16.8	16.2	12.5	13.2	100.0
1-Jul	2.5	2.0	1.5	5.8	9.4	5.4	5.2	11.0	17.9	16.6	12.2	10.4	100.0
2-Jul	3.2	2.4	1.1	5.3	9.3	6.9	7.0	15.0	15.0	13.2	11.4	10.0	100.0
3-Jul	2.4	1.0	0.8	4.7	7.7	5.7	8.4	14.2	14.6	14.4	10.6	15.4	100.0
4-Jul	6.8	3.3	2.2	5.1	11.8	6.9	7.8	11.9	12.2	13.2	9.7	9.1	100.0
5-Jul	5.5	11.6	13.1	6.4	6.1	6.3	7.0	7.4	6.5	7.1	9.0	13.7	100.0
6-Jul	6.8	5.6	18.9	11.9	6.9	6.8	6.3	6.2	5.5	5.0	6.3	13.7	100.0
7-Jul	17.2	10.5	23.0	14.7	7.0	4.0	3.9	3.7	1.8	2.1	3.5	8.7	100.0
8-Jul	11.3	13.2	29.6	16.6	6.1	3.4	2.7	2.0	1.4	1.0	5.5	7.0	100.0
9-Jul	15.6	8.2	18.4	22.2	15.8	7.6	3.9	2.3	0.7	0.8	0.4	4.2	100.0
10-Jul	16.5	7.0	2.1	20.6	21.5	13.6	8.9	4.3	2.0	1.4	0.7	1.3	100.0
11-Jul	17.5	9.9	6.1	13.1	17.1	16.0	8.4	3.2	2.2	2.5	1.4	2.6	100.0
12-Jul	19.4	7.5	6.2	20.2	19.5	12.8	5.3	2.5	0.9	2.5	1.1	2.3	100.0
13-Jul	8.0	5.0	5.2	19.2	25.1	21.1	6.2	3.0	1.6	1.9	1.3	2.4	100.0
14-Jul	8.7	5.2	4.1	16.5	31.9	15.5	7.1	5.0	2.2	1.5	0.9	1.5	100.0
15-Jul	17.3	9.1	4.2	16.0	25.3	13.9	5.9	2.6	2.2	1.3	0.8	1.3	100.0
16-Jul	11.3	9.6	8.9	18.0	22.7	14.3	4.9	2.4	1.9	1.9	2.0	2.0	100.0
17-Jul	10.6	4.3	2.8	27.2	29.2	12.1	6.0	3.7	1.5	1.0	0.8	0.8	100.0
18-Jul	6.0	4.1	3.2	24.0	34.6	13.7	5.6	4.0	1.3	1.5	1.0	1.1	100.0
19-Jul	4.7	3.6	2.2	14.3	39.2	21.8	6.6	3.5	1.7	0.7	0.8	0.9	100.0
20-Jul	7.4	5.0	3.3	14.8	34.4	22.9	5.7	2.7	1.3	0.9	0.6	0.9	100.0
21-Jul	15.9	5.1	4.3	18.7	31.4	16.9	3.1	1.4	0.7	0.5	1.0	1.1	100.0
22-Jul	18.8	5.3	2.6	17.4	32.6	16.9	3.0	1.1	0.6	0.4	0.6	0.6	100.0
23-Jul	16.1	7.5	4.4	19.1	28.2	13.7	4.7	2.2	1.0	0.8	1.1	1.1	100.0
24-Jul	9.7	8.7	6.8	18.8	31.4	16.5	3.3	1.5	1.0	0.9	0.7	0.6	100.0

-Continued-

Counts by Sector													
Date	1	2	3	4	5	6	7	8	9	10	11	12	Daily Total
25-Jul	12.4	5.2	6.2	26.9	29.0	12.9	3.4	1.5	0.9	0.6	0.6	0.3	100.0
26-Jul	16.1	6.2	7.9	25.7	25.0	10.9	3.5	1.9	0.8	0.8	0.4	0.7	100.0
27-Jul	9.5	6.9	10.2	30.1	21.8	11.7	4.2	1.8	1.1	0.8	0.9	1.0	100.0
28-Jul	12.1	5.2	10.4	30.7	20.1	11.6	4.8	2.1	0.8	0.5	0.7	0.9	100.0
29-Jul	10.0	6.3	10.9	26.0	22.3	13.9	4.6	2.1	1.1	0.9	0.8	1.1	100.0
30-Jul	12.9	6.5	12.2	26.1	22.2	11.7	3.8	1.2	1.3	0.8	0.8	0.5	100.0
31-Jul	12.6	7.7	14.6	32.5	14.1	9.0	4.0	1.8	1.1	0.9	1.0	0.7	100.0
1-Aug	11.6	7.1	14.5	34.7	15.9	7.9	3.4	1.6	1.0	0.7	0.8	0.7	100.0
2-Aug	17.3	5.9	12.1	26.9	14.5	10.0	5.1	2.9	2.2	1.1	0.9	1.2	100.0
3-Aug	16.5	7.5	11.0	21.5	14.5	13.1	5.4	3.1	2.1	3.1	1.8	0.4	100.0
4-Aug	20.2	10.1	16.1	24.0	9.8	9.8	3.9	2.1	1.2	1.0	1.5	0.3	100.0
5-Aug	18.5	7.0	17.1	25.9	13.1	9.2	3.2	1.7	1.4	1.0	0.8	1.1	100.0
6-Aug	14.8	7.0	18.4	27.3	10.7	10.2	3.9	1.3	2.7	1.5	1.0	1.2	100.0
7-Aug	22.9	8.7	18.5	22.7	8.4	9.6	3.3	2.2	0.5	1.7	1.0	0.5	100.0
8-Aug	20.7	9.2	18.8	26.4	8.4	4.4	2.9	1.5	1.4	2.3	2.6	1.7	100.0
Total	9.6	5.5	7.1	17.7	19.6	11.3	5.7	5.3	5.2	4.7	4.0	4.3	100.0

Appendix A.21. Estimated salmon escapement adjacent to the north bank of the Crescent River, 27 June through 7 August 1998. Species composition of daily sonar counts based on fish wheel catches.^a

Date	Sockeye		Pink		Chum		Coho		Dolly Varden	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
27-Jun	277	277	0	0	0	0	0	0	2	2
28-Jun	230	507	0	0	0	0	0	0	1	3
29-Jun	152	659	0	0	0	0	0	0	1	4
30-Jun	339	998	0	0	0	0	0	0	2	6
1-Jul	142	1,140	0	0	0	0	0	0	1	7
2-Jul	110	1,250	0	0	0	0	0	0	1	8
3-Jul	68	1,318	0	0	0	0	0	0	0	8
4-Jul	104	1,422	0	0	0	0	0	0	1	9
5-Jul	70	1,492	0	0	0	0	0	0	0	9
6-Jul	27	1,519	0	0	0	0	0	0	0	9
7-Jul	349	1,868	0	0	0	0	0	0	2	11
8-Jul	813	2,681	0	0	0	0	0	0	5	16
9-Jul	2,293	4,974	0	0	14	14	0	0	14	30
10-Jul	2,542	7,516	0	0	16	30	0	0	15	45
11-Jul	1,823	9,339	50	50	0	30	0	0	86	131
12-Jul	1,764	11,103	48	98	0	30	0	0	83	214
13-Jul	751	11,854	20	118	0	30	0	0	36	250
14-Jul	984	12,838	26	144	0	30	0	0	47	297
15-Jul	1,005	13,843	36	180	0	30	0	0	18	315
16-Jul	1,758	15,601	63	243	0	30	0	0	31	346
17-Jul	2,090	17,691	74	317	0	30	0	0	37	383
18-Jul	2,055	19,746	34	351	0	30	0	0	11	394
19-Jul	2,676	22,422	43	394	0	30	0	0	15	409
20-Jul	1,965	24,387	32	426	0	30	0	0	11	420
21-Jul	435	24,822	2	428	9	39	0	0	26	446
22-Jul	587	25,409	3	431	12	51	0	0	35	481
23-Jul	2,602	28,011	0	431	35	86	0	0	18	499
24-Jul	1,390	29,401	0	431	19	105	0	0	9	508
25-Jul	455	29,856	17	448	27	132	7	7	20	528
26-Jul	755	30,611	28	476	45	177	11	18	34	562
27-Jul	1,350	31,961	50	526	80	257	20	38	60	622
28-Jul	730	32,691	27	553	43	300	11	49	32	654
29-Jul	1,734	34,425	64	617	103	403	26	75	77	731
30-Jul	1,742	36,167	71	688	172	575	0	75	0	731
31-Jul	1,897	38,064	77	765	188	763	0	75	0	731
1-Aug	1,490	39,554	61	826	147	910	0	75	0	731
2-Aug	734	40,288	35	861	185	1,095	24	99	12	743
3-Aug	736	41,024	36	897	185	1,280	24	123	12	755
4-Aug	627	41,651	30	927	158	1,438	21	144	10	765
5-Aug	656	42,307	33	960	165	1,603	21	165	11	776
6-Aug	619	42,926	30	990	156	1,759	20	185	10	786
7-Aug	397	43,323	20	1,010	100	1,859	13	198	6	792

^aCounts in Dolly Varden column are combined Dolly Varden char and chinook salmon counts.

Appendix A.22. Estimated salmon escapement adjacent to the south bank of the Crescent River, 27 June through 7 August 1998.
Species composition of daily sonar counts based on fish wheel catches.^a

Date	Sockeye		Pink		Chum		Coho		Dolly Varden	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
27-Jun	302	302	0	0	0	0	0	0	2	2
28-Jun	184	486	0	0	0	0	0	0	1	3
29-Jun	218	704	0	0	0	0	0	0	1	4
30-Jun	214	918	0	0	0	0	0	0	1	5
1-Jul	78	996	0	0	0	0	0	0	0	5
2-Jul	131	1,127	0	0	0	0	0	0	1	6
3-Jul	59	1,186	0	0	0	0	0	0	0	6
4-Jul	53	1,239	0	0	0	0	0	0	0	6
5-Jul	8	1,247	0	0	0	0	0	0	0	6
6-Jul	28	1,275	0	0	0	0	0	0	0	6
7-Jul	336	1,611	0	0	0	0	0	0	2	8
8-Jul	929	2,540	0	0	0	0	0	0	6	14
9-Jul	1,341	3,881	0	0	8	8	0	0	8	22
10-Jul	824	4,705	0	0	5	13	0	0	5	27
11-Jul	707	5,412	20	20	0	13	0	0	33	60
12-Jul	429	5,841	12	32	0	13	0	0	20	80
13-Jul	582	6,423	15	47	0	13	0	0	28	108
14-Jul	633	7,056	17	64	0	13	0	0	30	138
15-Jul	749	7,805	27	91	0	13	0	0	13	151
16-Jul	830	8,635	29	120	0	13	0	0	15	166
17-Jul	720	9,355	25	145	0	13	0	0	13	179
18-Jul	1,224	10,579	20	165	0	13	0	0	7	186
19-Jul	975	11,554	16	181	0	13	0	0	5	191
20-Jul	816	12,370	14	195	0	13	0	0	4	195
21-Jul	560	12,930	4	199	11	24	0	0	33	228
22-Jul	406	13,336	3	202	8	32	0	0	24	252
23-Jul	981	14,317	0	202	13	45	0	0	7	259
24-Jul	725	15,042	0	202	10	55	0	0	5	264
25-Jul	308	15,350	11	213	19	74	4	4	14	278
26-Jul	248	15,598	10	223	14	88	4	8	11	289
27-Jul	329	15,927	12	235	20	108	4	12	15	304
28-Jul	257	16,184	10	245	15	123	4	16	11	315
29-Jul	360	16,544	13	258	22	145	5	21	16	331
30-Jul	379	16,923	16	274	37	182	0	21	0	331
31-Jul	414	17,337	17	291	41	223	0	21	0	331
1-Aug	304	17,641	12	303	30	253	0	21	0	331
2-Aug	208	17,849	10	313	53	306	7	28	3	334
3-Aug	190	18,039	9	322	48	354	6	34	3	337
4-Aug	201	18,240	10	332	50	404	7	41	3	340
5-Aug	253	18,493	13	345	64	468	8	49	4	344
6-Aug	233	18,726	11	356	59	527	7	56	4	348
7-Aug	208	18,934	10	366	53	580	7	63	3	351

^aCounts in Dolly Varden column are combined Dolly Varden char and chinook salmon counts.

Appendix A.23. Crescent River north bank sonar counts by hour, 27 June through 7 August 1998.

		Counts by Hour																								Daily	Cum
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total	Total	
27-Jun	3	4	7	6	2	3	4	0	8	6	1	6	7	15	44	29	34	14	13	21	1	39	8	4	279	279	
28-Jun	5	2	4	9	0	2	12	6	5	0	7	7	7	3	24	20	43	20	24	4	18	1	0	8	231	510	
29-Jun	6	9	15	6	6	5	0	2	8	0	7	5	4	12	17	17	13	11	3	1	1	0	1	4	153	663	
30-Jun	16	24	25	25	32	59	57	16	24	15	12	0	2	0	7	13	7	1	4	2	0	0	0	0	341	1,004	
1-Jul	1	3	1	6	4	1	0	5	6	2	6	3	7	5	2	11	8	17	13	21	21	0	0	0	143	1,147	
2-Jul	0	0	0	0	0	2	0	0	6	5	3	11	6	13	6	8	19	11	5	1	3	5	5	2	111	1,258	
3-Jul	0	0	4	0	0	1	0	5	0	19	2	1	6	2	4	5	5	0	2	3	1	4	1	3	68	1,326	
4-Jul	4	2	1	8	2	19	5	18	10	7	20	0	0	1	0	0	0	2	0	1	0	1	3	1	105	1,431	
5-Jul	4	2	1	5	2	4	8	4	2	6	6	8	8	5	2	3	0	0	0	0	0	0	0	0	70	1,501	
6-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	2	3	1	0	0	1	8	6	27	1,528	
7-Jul	4	6	0	2	0	0	3	2	4	3	8	14	17	12	43	21	30	55	21	42	34	13	10	7	351	1,879	
8-Jul	2	2	1	10	0	0	10	8	4	4	10	26	45	31	116	141	71	60	76	111	54	23	11	2	818	2,697	
9-Jul	1	4	3	3	3	4	8	6	15	10	19	67	92	62	147	206	270	173	124	254	378	290	115	67	2,321	5,018	
10-Jul	14	21	19	2	8	4	21	21	22	34	47	34	77	74	129	127	224	119	122	232	567	513	118	24	2,573	7,591	
11-Jul	15	10	9	3	8	8	77	22	19	14	60	109	126	161	248	196	132	171	85	48	137	176	85	40	1,959	9,550	
12-Jul	9	3	6	11	2	31	20	5	51	99	66	59	87	153	153	38	50	69	109	60	330	208	213	63	1,895	11,445	
13-Jul	25	9	8	17	6	6	11	12	7	2	2	11	10	62	56	108	77	88	57	46	25	71	50	41	807	12,252	
14-Jul	20	5	3	1	44	44	44	44	3	19	22	34	12	20	94	132	104	51	52	34	24	70	128	53	1,057	13,309	
15-Jul	18	10	5	8	3	18	23	29	19	28	28	58	166	178	112	76	45	34	57	34	14	7	25	64	1,059	14,368	
16-Jul	32	19	13	5	14	23	24	11	19	36	100	176	271	371	284	138	111	48	25	40	24	6	3	59	1,852	16,220	
17-Jul	69	17	23	31	20	31	35	34	21	19	33	92	65	122	469	321	151	128	146	117	65	27	41	124	2,201	18,421	
18-Jul	57	25	32	27	45	17	22	20	12	8	21	28	68	88	291	474	298	237	168	70	50	29	10	3	2,100	20,521	
19-Jul	9	15	18	19	7	14	18	42	48	29	169	305	158	161	114	265	403	379	264	126	87	56	22	6	2,734	23,255	
20-Jul	5	20	22	39	90	74	17	41	24	82	101	96	159	112	75	154	232	253	205	94	78	13	17	5	2,008	25,263	
21-Jul	8	5	8	20	20	35	40	28	18	27	36	26	23	22	25	19	14	13	21	26	17	14	3	4	472	25,735	

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Counts by Hour

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total	Cum Total
22-Jul	3	2	2	1	5	4	13	3	31	16	41	20	27	23	56	47	68	38	50	81	39	41	16	10	637	26,372
23-Jul	22	17	8	7	40	41	43	38	41	116	164	154	195	174	232	137	171	98	168	297	298	122	54	18	2655	29,027
24-Jul	12	9	10	2	13	22	28	20	27	21	24	43	50	52	100	67	76	84	94	193	209	180	56	26	1418	30,445
25-Jul	13	14	11	2	10	20	8	22	12	3	8	22	22	20	33	35	49	25	28	32	32	38	34	33	526	30,971
26-Jul	8	9	10	5	14	13	19	14	21	20	14	27	38	37	52	104	68	85	99	54	37	58	45	22	873	31,844
27-Jul	22	7	4	18	9	18	18	14	22	43	86	81	74	160	198	166	82	70	58	36	88	135	99	52	1560	33,404
28-Jul	11	16	19	5	28	13	17	17	12	7	10	39	54	66	61	60	59	36	51	18	31	72	72	69	843	34,247
29-Jul	23	26	35	32	31	66	66	8	16	9	24	71	90	113	112	202	134	104	68	42	137	175	256	164	2004	36,251
30-Jul	39	47	12	26	24	39	32	18	33	24	70	98	73	176	209	200	137	170	51	85	59	106	161	96	1985	38,236
31-Jul	59	85	59	66	35	20	14	15	63	52	48	114	255	236	213	158	172	97	42	55	72	59	77	96	2162	40,398
1-Aug	51	36	22	9	8	29	57	18	12	33	12	51	137	163	161	205	208	151	143	82	42	24	22	22	1698	42,096
2-Aug	22	12	13	23	16	32	21	42	22	40	22	24	56	58	74	139	96	78	62	51	45	11	26	5	990	43,086
3-Aug	5	10	12	16	48	22	19	23	14	8	12	35	23	39	49	122	153	85	66	57	37	82	38	18	993	44,079
4-Aug	12	15	1	11	51	40	1	4	7	18	12	15	22	51	56	75	63	38	68	138	59	38	23	28	846	44,925
5-Aug	19	23	4	2	2	11	11	12	13	6	9	7	48	29	50	99	94	88	56	98	97	68	30	10	886	45,811
6-Aug	10	10	10	1	1	3	15	23	20	12	14	21	18	49	54	67	45	28	31	101	141	76	68	17	835	46,646
7-Aug	9	10	5	10	6	6	36	27	14	6	30	23	30	30	41	45	19	26	21	47	24	27	34	10	536	47,182
Total	667	565	465	499	659	804	877	699	735	908	1,386	2,021	2,635	3,164	4,216	4,450	4,037	3,258	2,753	2,855	3,376	2,879	1,988	1,286	47,182	

Appendix A.24. Crescent River south bank sonar counts by hour, 27 June through 7 August 1998.

		Counts by Hour																								Daily	Cum
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total	Total	
27-Jun	13	13	1	0	2	1	0	0	0	0	5	0	14	25	24	50	32	20	9	6	13	41	31	4	304	304	
28-Jun	0	0	0	1	0	0	0	3	0	8	8	8	15	22	17	16	19	21	23	11	3	7	1	2	185	489	
29-Jun	10	0	4	5	0	1	0	9	0	1	5	6	20	17	24	22	50	15	15	9	0	3	2	1	219	708	
30-Jun	0	0	3	2	0	4	4	3	3	9	3	6	5	20	15	37	25	26	24	9	9	5	1	2	215	923	
1-Jul	0	2	0	0	0	3	0	0	0	1	2	2	2	4	5	8	12	12	10	9	3	2	1	0	78	1,001	
2-Jul	0	5	0	1	3	2	1	0	0	1	5	10	6	6	4	32	11	10	11	14	5	3	1	1	132	1,133	
3-Jul	1	0	3	0	0	0	0	2	0	0	1	1	6	5	3	8	4	7	8	5	0	1	2	2	59	1,192	
4-Jul	2	2	2	2	0	3	2	0	0	0	2	2	3	2	3	3	2	4	10	2	2	1	3	1	53	1,245	
5-Jul	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	1	0	0	3	0	0	8	1,253	
6-Jul	1	0	0	2	1	1	0	0	3	0	0	0	2	1	0	0	1	1	2	0	4	3	5	1	28	1,281	
7-Jul	2	0	0	0	1	1	3	4	10	14	7	9	29	16	42	19	14	45	19	13	38	45	3	4	338	1,619	
8-Jul	3	2	0	11	0	2	10	35	37	24	21	37	70	61	73	60	26	103	65	70	50	102	53	20	935	2,554	
9-Jul	5	9	0	55	55	55	59	1	43	39	55	20	58	57	132	157	68	64	25	135	103	88	66	8	1,357	3,911	
10-Jul	15	18	0	6	5	9	11	10	34	35	14	58	39	42	37	56	37	29	41	61	45	113	95	24	834	4,745	
11-Jul	20	24	24	5	8	2	3	9	3	15	13	27	19	62	78	29	79	42	28	26	87	32	91	34	760	5,505	
12-Jul	16	17	2	4	4	1	3	10	19	12	31	18	28	27	21	22	20	11	16	11	38	49	61	20	461	5,966	
13-Jul	15	35	6	12	11	8	20	16	6	8	8	6	68	83	27	29	29	38	23	13	19	56	57	32	625	6,591	
14-Jul	12	3	1	6	28	28	8	6	4	12	9	24	27	34	41	74	62	53	48	27	15	53	77	28	680	7,271	
15-Jul	17	15	4	12	12	33	12	15	33	11	25	72	91	83	142	33	29	27	25	49	18	4	15	12	789	8,060	
16-Jul	14	10	17	8	11	16	19	17	14	17	58	108	122	147	82	64	55	14	17	13	33	6	5	7	874	8,934	
17-Jul	11	16	7	3	5	13	11	15	20	12	32	32	28	74	169	94	42	45	28	27	17	18	16	23	758	9,692	
18-Jul	49	52	55	52	52	51	52	14	39	29	6	30	26	110	150	149	130	42	36	49	45	10	16	7	1,251	10,943	
19-Jul	6	21	37	46	34	16	22	41	41	49	28	95	62	59	36	45	53	102	70	47	31	25	15	15	996	11,939	
20-Jul	6	8	7	47	128	26	11	4	13	13	20	52	52	39	30	24	61	95	78	21	35	32	14	18	834	12,773	
21-Jul	18	10	9	13	23	75	39	28	27	24	37	28	14	11	21	15	18	20	48	47	56	12	15	0	608	13,381	

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Counts by Hour

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total	Cum Total
22-Jul	2	1	14	18	0	7	2	26	3	10	13	10	24	15	43	92	23	28	19	40	27	17	1	6	441	13,822
23-Jul	2	1	1	0	1	9	8	26	22	43	52	45	116	101	82	61	51	38	39	87	76	64	55	21	1,001	14,823
24-Jul	24	18	8	7	31	10	17	9	31	2	10	16	7	30	24	25	69	32	25	42	114	117	37	35	740	15,563
25-Jul	15	12	6	11	9	7	13	16	9	2	22	14	6	8	18	27	16	26	13	15	19	18	26	28	356	15,919
26-Jul	8	5	6	6	4	9	26	6	7	1	6	1	14	19	30	16	12	27	21	11	8	17	19	8	287	16,206
27-Jul	13	18	10	11	15	9	10	8	7	12	11	17	9	24	24	35	12	9	22	10	9	17	36	32	380	16,586
28-Jul	19	10	8	4	6	9	3	7	6	2	11	5	15	21	19	27	15	8	18	6	4	10	35	29	297	16,883
29-Jul	38	32	23	27	17	18	3	14	10	7	4	5	8	20	29	18	26	13	7	9	15	21	21	31	416	17,299
30-Jul	18	21	12	11	13	28	20	16	9	15	6	9	10	17	18	37	25	19	25	25	13	14	30	21	432	17,731
31-Jul	16	17	13	5	5	27	20	13	20	29	7	22	19	35	28	36	30	33	18	18	12	14	20	15	472	18,203
1-Aug	6	4	1	9	14	8	26	14	9	11	3	6	50	15	30	14	26	16	31	18	13	13	4	5	346	18,549
2-Aug	1	2	1	1	5	8	22	11	26	24	8	4	17	12	19	34	29	8	12	7	13	6	3	8	281	18,830
3-Aug	3	2	6	4	30	25	17	11	3	11	3	1	12	7	7	12	12	18	12	8	16	13	10	13	256	19,086
4-Aug	12	3	6	10	25	23	4	2	3	10	5	5	3	8	9	11	11	11	13	24	30	11	15	17	271	19,357
5-Aug	17	11	0	7	12	14	19	14	5	7	5	7	21	11	12	15	20	10	23	11	32	34	29	6	342	19,699
6-Aug	7	6	4	4	5	5	11	12	8	9	12	15	6	8	16	12	17	4	10	24	41	36	29	13	314	20,013
7-Aug	15	6	8	6	2	12	14	14	6	12	25	17	7	2	15	21	6	17	4	6	12	19	28	7	281	20,294
Total	452	431	309	434	577	579	525	461	533	541	598	854	1,150	1,360	1,599	1,539	1,279	1,163	992	1,035	1,123	1,155	1,044	561	20,294	

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Appendix A.25. Crescent River north bank sonar counts by hour, 27 June through 7 August 1998. Counts expressed as percentage of daily total.

		Counts by Hour																								Daily
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total	
27-Jun	1.1	1.4	2.5	2.2	0.7	1.1	1.4	0.0	2.9	2.2	0.4	2.2	2.5	5.4	15.8	10.4	12.2	5.0	4.7	7.5	0.4	14.0	2.9	1.4	100.0	
28-Jun	2.2	0.9	1.7	3.9	0.0	0.9	5.2	2.6	2.2	0.0	3.0	3.0	3.0	1.3	10.4	8.7	18.6	8.7	10.4	1.7	7.8	0.4	0.0	3.5	100.0	
29-Jun	3.9	5.9	9.8	3.9	3.9	3.3	0.0	1.3	5.2	0.0	4.6	3.3	2.6	7.8	11.1	11.1	8.5	7.2	2.0	0.7	0.7	0.0	0.7	2.6	100.0	
30-Jun	4.7	7.0	7.3	7.3	9.4	17.3	16.7	4.7	7.0	4.4	3.5	0.0	0.6	0.0	2.1	3.8	2.1	0.3	1.2	0.6	0.0	0.0	0.0	0.0	100.0	
1-Jul	0.7	2.1	0.7	4.2	2.8	0.7	0.0	3.5	4.2	1.4	4.2	2.1	4.9	3.5	1.4	7.7	5.6	11.9	9.1	14.7	14.7	0.0	0.0	0.0	100.0	
2-Jul	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	5.4	4.5	2.7	9.9	5.4	11.7	5.4	7.2	17.1	9.9	4.5	0.9	2.7	4.5	4.5	1.8	100.0	
3-Jul	0.0	0.0	5.9	0.0	0.0	1.5	0.0	7.4	0.0	27.9	2.9	1.5	8.8	2.9	5.9	7.4	7.4	0.0	2.9	4.4	1.5	5.9	1.5	4.4	100.0	
4-Jul	3.8	1.9	1.0	7.6	1.9	18.1	4.8	17.1	9.5	6.7	19.0	0.0	0.0	1.0	0.0	0.0	0.0	1.9	0.0	1.0	0.0	1.0	2.9	1.0	100.0	
5-Jul	5.7	2.9	1.4	7.1	2.9	5.7	11.4	5.7	2.9	8.6	8.6	11.4	11.4	7.1	2.9	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	
6-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	11.1	0.0	7.4	11.1	3.7	0.0	0.0	3.7	29.6	22.2	100.0	
7-Jul	1.1	1.7	0.0	0.6	0.0	0.0	0.9	0.6	1.1	0.9	2.3	4.0	4.8	3.4	12.3	6.0	8.5	15.7	6.0	12.0	9.7	3.7	2.8	2.0	100.0	
8-Jul	0.2	0.2	0.1	1.2	0.0	0.0	1.2	1.0	0.5	0.5	1.2	3.2	5.5	3.8	14.2	17.2	8.7	7.3	9.3	13.6	6.6	2.8	1.3	0.2	100.0	
9-Jul	0.0	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.6	0.4	0.8	2.9	4.0	2.7	6.3	8.9	11.6	7.5	5.3	10.9	16.3	12.5	5.0	2.9	100.0	
10-Jul	0.5	0.8	0.7	0.1	0.3	0.2	0.8	0.8	0.9	1.3	1.8	1.3	3.0	2.9	5.0	4.9	8.7	4.6	4.7	9.0	22.0	19.9	4.6	0.9	100.0	
11-Jul	0.8	0.5	0.5	0.2	0.4	0.4	3.9	1.1	1.0	0.7	3.1	5.6	6.4	8.2	12.7	10.0	6.7	8.7	4.3	2.5	7.0	9.0	4.3	2.0	100.0	
12-Jul	0.5	0.2	0.3	0.6	0.1	1.6	1.1	0.3	2.7	5.2	3.5	3.1	4.6	8.1	8.1	2.0	2.6	3.6	5.8	3.2	17.4	11.0	11.2	3.3	100.0	
13-Jul	3.1	1.1	1.0	2.1	0.7	0.7	1.4	1.5	0.9	0.2	0.2	1.4	1.2	7.7	6.9	13.4	9.5	10.9	7.1	5.7	3.1	8.8	6.2	5.1	100.0	
14-Jul	1.9	0.5	0.3	0.1	4.2	4.2	4.2	4.2	0.3	1.8	2.1	3.2	1.1	1.9	8.9	12.5	9.8	4.8	4.9	3.2	2.3	6.6	12.1	5.0	100.0	
15-Jul	1.7	0.9	0.5	0.8	0.3	1.7	2.2	2.7	1.8	2.6	2.6	5.5	15.7	16.8	10.6	7.2	4.2	3.2	5.4	3.2	1.3	0.7	2.4	6.0	100.0	
16-Jul	1.7	1.0	0.7	0.3	0.8	1.2	1.3	0.6	1.0	1.9	5.4	9.5	14.6	20.0	15.3	7.5	6.0	2.6	1.3	2.2	1.3	0.3	0.2	3.2	100.0	
17-Jul	3.1	0.8	1.0	1.4	0.9	1.4	1.6	1.5	1.0	0.9	1.5	4.2	3.0	5.5	21.3	14.6	6.9	5.8	6.6	5.3	3.0	1.2	1.9	5.6	100.0	
18-Jul	2.7	1.2	1.5	1.3	2.1	0.8	1.0	1.0	0.6	0.4	1.0	1.3	3.2	4.2	13.9	22.6	14.2	11.3	8.0	3.3	2.4	1.4	0.5	0.1	100.0	
19-Jul	0.3	0.5	0.7	0.7	0.3	0.5	0.7	1.5	1.8	1.1	6.2	11.2	5.8	5.9	4.2	9.7	14.7	13.9	9.7	4.6	3.2	2.0	0.8	0.2	100.0	
20-Jul	0.2	1.0	1.1	1.9	4.5	3.7	0.8	2.0	1.2	4.1	5.0	4.8	7.9	5.6	3.7	7.7	11.6	12.6	10.2	4.7	3.9	0.6	0.8	0.2	100.0	
21-Jul	1.7	1.1	1.7	4.2	4.2	7.4	8.5	5.9	3.8	5.7	7.6	5.5	4.9	4.7	5.3	4.0	3.0	2.8	4.4	5.5	3.6	3.0	0.6	0.8	100.0	

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Appendix A.25. (p.2 of 2)

Counts by Hour																									
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total
22-Jul	0.5	0.3	0.3	0.2	0.8	0.6	2.0	0.5	4.9	2.5	6.4	3.1	4.2	3.6	8.8	7.4	10.7	6.0	7.8	12.7	6.1	6.4	2.5	1.6	100.0
23-Jul	0.8	0.6	0.3	0.3	1.5	1.5	1.6	1.4	1.5	4.4	6.2	5.8	7.3	6.6	8.7	5.2	6.4	3.7	6.3	11.2	11.2	4.6	2.0	0.7	100.0
24-Jul	0.8	0.6	0.7	0.1	0.9	1.6	2.0	1.4	1.9	1.5	1.7	3.0	3.5	3.7	7.1	4.7	5.4	5.9	6.6	13.6	14.7	12.7	3.9	1.8	100.0
25-Jul	2.5	2.7	2.1	0.4	1.9	3.8	1.5	4.2	2.3	0.6	1.5	4.2	4.2	3.8	6.3	6.7	9.3	4.8	5.3	6.1	6.1	7.2	6.5	6.3	100.0
26-Jul	0.9	1.0	1.1	0.6	1.6	1.5	2.2	1.6	2.4	2.3	1.6	3.1	4.4	4.2	6.0	11.9	7.8	9.7	11.3	6.2	4.2	6.6	5.2	2.5	100.0
27-Jul	1.4	0.4	0.3	1.2	0.6	1.2	1.2	0.9	1.4	2.8	5.5	5.2	4.7	10.3	12.7	10.6	5.3	4.5	3.7	2.3	5.6	8.7	6.3	3.3	100.0
28-Jul	1.3	1.9	2.3	0.6	3.3	1.5	2.0	2.0	1.4	0.8	1.2	4.6	6.4	7.8	7.2	7.1	7.0	4.3	6.0	2.1	3.7	8.5	8.5	8.2	100.0
29-Jul	1.1	1.3	1.7	1.6	1.5	3.3	3.3	0.4	0.8	0.4	1.2	3.5	4.5	5.6	5.6	10.1	6.7	5.2	3.4	2.1	6.8	8.7	12.8	8.2	100.0
30-Jul	2.0	2.4	0.6	1.3	1.2	2.0	1.6	0.9	1.7	1.2	3.5	4.9	3.7	8.9	10.5	10.1	6.9	8.6	2.6	4.3	3.0	5.3	8.1	4.8	100.0
31-Jul	2.7	3.9	2.7	3.1	1.6	0.9	0.6	0.7	2.9	2.4	2.2	5.3	11.8	10.9	9.9	7.3	8.0	4.5	1.9	2.5	3.3	2.7	3.6	4.4	100.0
1-Aug	3.0	2.1	1.3	0.5	0.5	1.7	3.4	1.1	0.7	1.9	0.7	3.0	8.1	9.6	9.5	12.1	12.2	8.9	8.4	4.8	2.5	1.4	1.3	1.3	100.0
2-Aug	2.2	1.2	1.3	2.3	1.6	3.2	2.1	4.2	2.2	4.0	2.2	2.4	5.7	5.9	7.5	14.0	9.7	7.9	6.3	5.2	4.5	1.1	2.6	0.5	100.0
3-Aug	0.5	1.0	1.2	1.6	4.8	2.2	1.9	2.3	1.4	0.8	1.2	3.5	2.3	3.9	4.9	12.3	15.4	8.6	6.6	5.7	3.7	8.3	3.8	1.8	100.0
4-Aug	1.4	1.8	0.1	1.3	6.0	4.7	0.1	0.5	0.8	2.1	1.4	1.8	2.6	6.0	6.6	8.9	7.4	4.5	8.0	16.3	7.0	4.5	2.7	3.3	100.0
5-Aug	2.1	2.6	0.5	0.2	0.2	1.2	1.2	1.4	1.5	0.7	1.0	0.8	5.4	3.3	5.6	11.2	10.6	9.9	6.3	11.1	10.9	7.7	3.4	1.1	100.0
6-Aug	1.2	1.2	1.2	0.1	0.1	0.4	1.8	2.8	2.4	1.4	1.7	2.5	2.2	5.9	6.5	8.0	5.4	3.4	3.7	12.1	16.9	9.1	8.1	2.0	100.0
7-Aug	1.7	1.9	0.9	1.9	1.1	1.1	6.7	5.0	2.6	1.1	5.6	4.3	5.6	5.6	7.6	8.4	3.5	4.9	3.9	8.8	4.5	5.0	6.3	1.9	100.0
Total	1.4	1.2	1.0	1.1	1.4	1.7	1.9	1.5	1.6	1.9	2.9	4.3	5.6	6.7	8.9	9.4	8.6	6.9	5.8	6.1	7.2	6.1	4.2	2.7	100.0

Appendix A.26. Crescent River south bank sonar counts by hour, 27 June through 7 August 1998. Counts expressed as percentage of daily total.

		Counts by Hour																								Daily
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total	
27-Jun	4.3	4.3	0.3	0.0	0.7	0.3	0.0	0.0	0.0	0.0	1.6	0.0	4.6	8.2	7.9	16.4	10.5	6.6	3.0	2.0	4.3	13.5	10.2	1.3	100.0	
28-Jun	0.0	0.0	0.0	0.5	0.0	0.0	0.0	1.6	0.0	4.3	4.3	4.3	8.1	11.9	9.2	8.6	10.3	11.4	12.4	5.9	1.6	3.8	0.5	1.1	100.0	
29-Jun	4.6	0.0	1.8	2.3	0.0	0.5	0.0	4.1	0.0	0.5	2.3	2.7	9.1	7.8	11.0	10.0	22.8	6.8	6.8	4.1	0.0	1.4	0.9	0.5	100.0	
30-Jun	0.0	0.0	1.4	0.9	0.0	1.9	1.9	1.4	1.4	4.2	1.4	2.8	2.3	9.3	7.0	17.2	11.6	12.1	11.2	4.2	4.2	2.3	0.5	0.9	100.0	
1-Jul	0.0	2.6	0.0	0.0	0.0	3.8	0.0	0.0	0.0	1.3	2.6	2.6	2.6	5.1	6.4	10.3	15.4	15.4	12.8	11.5	3.8	2.6	1.3	0.0	100.0	
2-Jul	0.0	3.8	0.0	0.8	2.3	1.5	0.8	0.0	0.0	0.8	3.8	7.6	4.5	4.5	3.0	24.2	8.3	7.6	8.3	10.6	3.8	2.3	0.8	0.8	100.0	
3-Jul	1.7	0.0	5.1	0.0	0.0	0.0	0.0	3.4	0.0	0.0	1.7	1.7	10.2	8.5	5.1	13.6	6.8	11.9	13.6	8.5	0.0	1.7	3.4	3.4	100.0	
4-Jul	3.8	3.8	3.8	3.8	0.0	5.7	3.8	0.0	0.0	0.0	3.8	3.8	5.7	3.8	5.7	5.7	3.8	7.5	18.9	3.8	3.8	1.9	5.7	1.9	100.0	
5-Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0	37.5	0.0	0.0	100.0	
6-Jul	3.6	0.0	0.0	7.1	3.6	3.6	0.0	0.0	10.7	0.0	0.0	0.0	7.1	3.6	0.0	0.0	3.6	3.6	7.1	0.0	14.3	10.7	17.9	3.6	100.0	
7-Jul	0.6	0.0	0.0	0.0	0.3	0.3	0.9	1.2	3.0	4.1	2.1	2.7	8.6	4.7	12.4	5.6	4.1	13.3	5.6	3.8	11.2	13.3	0.9	1.2	100.0	
8-Jul	0.3	0.2	0.0	1.2	0.0	0.2	1.1	3.7	4.0	2.6	2.2	4.0	7.5	6.5	7.8	6.4	2.8	11.0	7.0	7.5	5.3	10.9	5.7	2.1	100.0	
9-Jul	0.4	0.7	0.0	4.1	4.1	4.1	4.3	0.1	3.2	2.9	4.1	1.5	4.3	4.2	9.7	11.6	5.0	4.7	1.8	9.9	7.6	6.5	4.9	0.6	100.0	
10-Jul	1.8	2.2	0.0	0.7	0.6	1.1	1.3	1.2	4.1	4.2	1.7	7.0	4.7	5.0	4.4	6.7	4.4	3.5	4.9	7.3	5.4	13.5	11.4	2.9	100.0	
11-Jul	2.6	3.2	3.2	0.7	1.1	0.3	0.4	1.2	0.4	2.0	1.7	3.6	2.5	8.2	10.3	3.8	10.4	5.5	3.7	3.4	11.4	4.2	12.0	4.5	100.0	
12-Jul	3.5	3.7	0.4	0.9	0.9	0.2	0.7	2.2	4.1	2.6	6.7	3.9	6.1	5.9	4.6	4.8	4.3	2.4	3.5	2.4	8.2	10.6	13.2	4.3	100.0	
13-Jul	2.4	5.6	1.0	1.9	1.8	1.3	3.2	2.6	1.0	1.3	1.3	1.0	10.9	13.3	4.3	4.6	4.6	6.1	3.7	2.1	3.0	9.0	9.1	5.1	100.0	
14-Jul	1.8	0.4	0.1	0.9	4.1	4.1	1.2	0.9	0.6	1.8	1.3	3.5	4.0	5.0	6.0	10.9	9.1	7.8	7.1	4.0	2.2	7.8	11.3	4.1	100.0	
15-Jul	2.2	1.9	0.5	1.5	1.5	4.2	1.5	1.9	4.2	1.4	3.2	9.1	11.5	10.5	18.0	4.2	3.7	3.4	3.2	6.2	2.3	0.5	1.9	1.5	100.0	
16-Jul	1.6	1.1	1.9	0.9	1.3	1.8	2.2	1.9	1.6	1.9	6.6	12.4	14.0	16.8	9.4	7.3	6.3	1.6	1.9	1.5	3.8	0.7	0.6	0.8	100.0	
17-Jul	1.5	2.1	0.9	0.4	0.7	1.7	1.5	2.0	2.6	1.6	4.2	4.2	3.7	9.8	22.3	12.4	5.5	5.9	3.7	3.6	2.2	2.4	2.1	3.0	100.0	
18-Jul	3.9	4.2	4.4	4.2	4.2	4.1	4.2	1.1	3.1	2.3	0.5	2.4	2.1	8.8	12.0	11.9	10.4	3.4	2.9	3.9	3.6	0.8	1.3	0.6	100.0	
19-Jul	0.6	2.1	3.7	4.6	3.4	1.6	2.2	4.1	4.1	4.9	2.8	9.5	6.2	5.9	3.6	4.5	5.3	10.2	7.0	4.7	3.1	2.5	1.5	1.5	100.0	
20-Jul	0.7	1.0	0.8	5.6	15.3	3.1	1.3	0.5	1.6	1.6	2.4	6.2	6.2	4.7	3.6	2.9	7.3	11.4	9.4	2.5	4.2	3.8	1.7	2.2	100.0	
21-Jul	3.0	1.6	1.5	2.1	3.8	12.3	6.4	4.6	4.4	3.9	6.1	4.6	2.3	1.8	3.5	2.5	3.0	3.3	7.9	7.7	9.2	2.0	2.5	0.0	100.0	

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		Counts by Hour																								Daily
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total	
22-Jul	0.5	0.2	3.2	4.1	0.0	1.6	0.5	5.9	0.7	2.3	2.9	2.3	5.4	3.4	9.8	20.9	5.2	6.3	4.3	9.1	6.1	3.9	0.2	1.4	100.0	
23-Jul	0.2	0.1	0.1	0.0	0.1	0.9	0.8	2.6	2.2	4.3	5.2	4.5	11.6	10.1	8.2	6.1	5.1	3.8	3.9	8.7	7.6	6.4	5.5	2.1	100.0	
24-Jul	3.2	2.4	1.1	0.9	4.2	1.4	2.3	1.2	4.2	0.3	1.4	2.2	0.9	4.1	3.2	3.4	9.3	4.3	3.4	5.7	15.4	15.8	5.0	4.7	100.0	
25-Jul	4.2	3.4	1.7	3.1	2.5	2.0	3.7	4.5	2.5	0.6	6.2	3.9	1.7	2.2	5.1	7.6	4.5	7.3	3.7	4.2	5.3	5.1	7.3	7.9	100.0	
26-Jul	2.8	1.7	2.1	2.1	1.4	3.1	9.1	2.1	2.4	0.3	2.1	0.3	4.9	6.6	10.5	5.6	4.2	9.4	7.3	3.8	2.8	5.9	6.6	2.8	100.0	
27-Jul	3.4	4.7	2.6	2.9	3.9	2.4	2.6	2.1	1.8	3.2	2.9	4.5	2.4	6.3	6.3	9.2	3.2	2.4	5.8	2.6	2.4	4.5	9.5	8.4	100.0	
28-Jul	6.4	3.4	2.7	1.3	2.0	3.0	1.0	2.4	2.0	0.7	3.7	1.7	5.1	7.1	6.4	9.1	5.1	2.7	6.1	2.0	1.3	3.4	11.8	9.8	100.0	
29-Jul	9.1	7.7	5.5	6.5	4.1	4.3	0.7	3.4	2.4	1.7	1.0	1.2	1.9	4.8	7.0	4.3	6.3	3.1	1.7	2.2	3.6	5.0	5.0	7.5	100.0	
30-Jul	4.2	4.9	2.8	2.5	3.0	6.5	4.6	3.7	2.1	3.5	1.4	2.1	2.3	3.9	4.2	8.6	5.8	4.4	5.8	5.8	3.0	3.2	6.9	4.9	100.0	
31-Jul	3.4	3.6	2.8	1.1	1.1	5.7	4.2	2.8	4.2	6.1	1.5	4.7	4.0	7.4	5.9	7.6	6.4	7.0	3.8	3.8	2.5	3.0	4.2	3.2	100.0	
1-Aug	1.7	1.2	0.3	2.6	4.0	2.3	7.5	4.0	2.6	3.2	0.9	1.7	14.5	4.3	8.7	4.0	7.5	4.6	9.0	5.2	3.8	3.8	1.2	1.4	100.0	
2-Aug	0.4	0.7	0.4	0.4	1.8	2.8	7.8	3.9	9.3	8.5	2.8	1.4	6.0	4.3	6.8	12.1	10.3	2.8	4.3	2.5	4.6	2.1	1.1	2.8	100.0	
3-Aug	1.2	0.8	2.3	1.6	11.7	9.8	6.6	4.3	1.2	4.3	1.2	0.4	4.7	2.7	2.7	4.7	4.7	7.0	4.7	3.1	6.3	5.1	3.9	5.1	100.0	
4-Aug	4.4	1.1	2.2	3.7	9.2	8.5	1.5	0.7	1.1	3.7	1.8	1.8	1.1	3.0	3.3	4.1	4.1	4.1	4.8	8.9	11.1	4.1	5.5	6.3	100.0	
5-Aug	5.0	3.2	0.0	2.0	3.5	4.1	5.6	4.1	1.5	2.0	1.5	2.0	6.1	3.2	3.5	4.4	5.8	2.9	6.7	3.2	9.4	9.9	8.5	1.8	100.0	
6-Aug	2.2	1.9	1.3	1.3	1.6	1.6	3.5	3.8	2.5	2.9	3.8	4.8	1.9	2.5	5.1	3.8	5.4	1.3	3.2	7.6	13.1	11.5	9.2	4.1	100.0	
7-Aug	5.3	2.1	2.8	2.1	0.7	4.3	5.0	5.0	2.1	4.3	8.9	6.0	2.5	0.7	5.3	7.5	2.1	6.0	1.4	2.1	4.3	6.8	10.0	2.5	100.0	
Total	2.2	2.1	1.5	2.1	2.8	2.9	2.6	2.3	2.6	2.7	2.9	4.2	5.7	6.7	7.9	7.6	6.3	5.7	4.9	5.1	5.5	5.7	5.1	2.8	100	

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Appendix A.27. Crescent River north bank sonar counts by sector, 27 June through 7 August 1998.

Date	Counts by Sector												Daily Total	Cum Total
	1	2	3	4	5	6	7	8	9	10	11	12		
27-Jun	37	106	93	21	12	4	2	3	0	1	0	0	279	279
28-Jun	33	77	58	25	10	11	5	8	1	0	1	2	231	510
29-Jun	30	56	38	18	3	2	2	3	1	0	0	0	153	663
30-Jun	292	32	13	3	0	0	0	1	0	0	0	0	341	1,004
01-Jul	91	34	14	2	0	0	2	0	0	0	0	0	143	1,147
02-Jul	71	28	9	1	0	0	0	1	1	0	0	0	111	1,258
03-Jul	56	10	0	1	1	0	0	0	0	0	0	0	68	1,326
04-Jul	92	10	3	0	0	0	0	0	0	0	0	0	105	1,431
05-Jul	52	17	0	0	1	0	0	0	0	0	0	0	70	1,501
06-Jul	26	1	0	0	0	0	0	0	0	0	0	0	27	1,528
07-Jul	274	60	14	0	1	0	0	0	0	2	0	0	351	1,879
08-Jul	325	372	100	10	3	2	1	3	1	1	0	0	818	2,697
09-Jul	1,490	664	145	13	0	4	2	3	0	0	0	0	2,321	5,018
10-Jul	1,320	1,046	177	23	2	0	1	3	0	0	1	0	2,573	7,591
11-Jul	733	1,022	179	20	0	1	2	0	0	1	1	0	1,959	9,550
12-Jul	752	774	312	47	4	1	0	0	0	1	1	3	1,895	11,445
13-Jul	107	300	342	37	7	2	4	3	0	0	4	1	807	12,252
14-Jul	194	643	191	17	2	2	0	1	1	3	1	2	1,057	13,309
15-Jul	274	594	165	18	1	1	1	0	1	1	3	0	1,059	14,368
16-Jul	284	1,183	361	17	3	0	2	0	0	0	1	1	1,852	16,220
17-Jul	541	1,315	333	5	3	0	1	0	1	0	0	2	2,201	18,421
18-Jul	369	958	695	57	9	3	2	2	3	1	1	0	2,100	20,521
19-Jul	356	1,064	1,174	126	11	0	0	2	1	0	0	0	2,734	23,255
20-Jul	342	989	629	37	2	1	1	1	2	1	1	2	2,008	25,263
21-Jul	203	192	60	8	2	0	1	1	0	2	1	2	472	25,735
22-Jul	286	239	94	11	1	2	1	0	0	0	0	3	637	26,372
23-Jul	970	1,242	400	34	4	0	0	0	0	0	2	3	2,655	29,027
24-Jul	390	771	219	32	0	1	0	0	1	1	1	2	1,418	30,445
25-Jul	140	274	101	6	0	0	0	4	0	1	0	0	526	30,971
26-Jul	238	488	132	10	3	0	0	0	0	0	0	2	873	31,844
27-Jul	242	916	374	25	2	0	0	0	0	1	0	0	1,560	33,404
28-Jul	107	445	265	23	3	0	0	0	0	0	0	0	843	34,247
29-Jul	342	1,256	378	17	4	0	1	0	0	1	3	2	2,004	36,251
30-Jul	369	1,255	338	13	0	1	0	0	0	3	1	5	1,985	38,236
31-Jul	624	1,220	271	20	4	0	0	0	1	3	10	9	2,162	40,398
01-Aug	690	875	122	6	1	0	0	0	0	0	0	4	1,698	42,096
02-Aug	432	463	80	6	0	0	0	0	0	0	1	8	990	43,086
03-Aug	252	601	127	10	1	0	0	0	0	0	2	0	993	44,079
04-Aug	142	559	134	9	0	0	0	0	0	0	0	2	846	44,925
05-Aug	213	552	111	7	0	0	0	0	0	0	0	3	886	45,811
06-Aug	110	515	190	13	0	0	2	1	0	0	2	2	835	46,646
07-Aug	62	304	149	15	1	0	0	1	0	2	1	1	536	47,182
Total	13,953	23,522	8,590	763	101	38	33	41	15	26	39	61	47,182	

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Appendix A.28. Crescent River south bank sonar counts by sector. 27 June through 7 August 1998.

Date	Counts by Sector												Daily Total	Cum Total	
	1	2	3	4	5	6	7	8	9	10	11	12			
27-Jun	304	0	0	0	0	0	0	0	0	0	0	0	0	304	304
28-Jun	181	4	0	0	0	0	0	0	0	0	0	0	0	185	489
29-Jun	217	2	0	0	0	0	0	0	0	0	0	0	0	219	708
30-Jun	212	3	0	0	0	0	0	0	0	0	0	0	0	215	923
01-Jul	74	4	0	0	0	0	0	0	0	0	0	0	0	78	1,001
02-Jul	129	3	0	0	0	0	0	0	0	0	0	0	0	132	1,133
03-Jul	58	1	0	0	0	0	0	0	0	0	0	0	0	59	1,192
04-Jul	46	7	0	0	0	0	0	0	0	0	0	0	0	53	1,245
05-Jul	3	5	0	0	0	0	0	0	0	0	0	0	0	8	1,253
06-Jul	25	3	0	0	0	0	0	0	0	0	0	0	0	28	1,281
07-Jul	317	21	0	0	0	0	0	0	0	0	0	0	0	338	1,619
08-Jul	891	44	0	0	0	0	0	0	0	0	0	0	0	935	2,554
09-Jul	1,320	37	0	0	0	0	0	0	0	0	0	0	0	1,357	3,911
10-Jul	821	13	0	0	0	0	0	0	0	0	0	0	0	834	4,745
11-Jul	735	25	0	0	0	0	0	0	0	0	0	0	0	760	5,505
12-Jul	448	13	0	0	0	0	0	0	0	0	0	0	0	461	5,966
13-Jul	612	13	0	0	0	0	0	0	0	0	0	0	0	625	6,591
14-Jul	671	9	0	0	0	0	0	0	0	0	0	0	0	680	7,271
15-Jul	789	0	0	0	0	0	0	0	0	0	0	0	0	789	8,060
16-Jul	873	1	0	0	0	0	0	0	0	0	0	0	0	874	8,934
17-Jul	739	19	0	0	0	0	0	0	0	0	0	0	0	758	9,692
18-Jul	1,229	22	0	0	0	0	0	0	0	0	0	0	0	1,251	10,943
19-Jul	992	4	0	0	0	0	0	0	0	0	0	0	0	996	11,939
20-Jul	814	20	0	0	0	0	0	0	0	0	0	0	0	834	12,773
21-Jul	585	23	0	0	0	0	0	0	0	0	0	0	0	608	13,381
22-Jul	439	2	0	0	0	0	0	0	0	0	0	0	0	441	13,822
23-Jul	999	2	0	0	0	0	0	0	0	0	0	0	0	1,001	14,823
24-Jul	736	4	0	0	0	0	0	0	0	0	0	0	0	740	15,563
25-Jul	354	2	0	0	0	0	0	0	0	0	0	0	0	356	15,919
26-Jul	280	7	0	0	0	0	0	0	0	0	0	0	0	287	16,206
27-Jul	374	6	0	0	0	0	0	0	0	0	0	0	0	380	16,586
28-Jul	297	0	0	0	0	0	0	0	0	0	0	0	0	297	16,883
29-Jul	416	0	0	0	0	0	0	0	0	0	0	0	0	416	17,299
30-Jul	431	1	0	0	0	0	0	0	0	0	0	0	0	432	17,731
31-Jul	472	0	0	0	0	0	0	0	0	0	0	0	0	472	18,203
01-Aug	345	1	0	0	0	0	0	0	0	0	0	0	0	346	18,549
02-Aug	281	0	0	0	0	0	0	0	0	0	0	0	0	281	18,830
03-Aug	256	0	0	0	0	0	0	0	0	0	0	0	0	256	19,086
04-Aug	270	1	0	0	0	0	0	0	0	0	0	0	0	271	19,357
05-Aug	341	1	0	0	0	0	0	0	0	0	0	0	0	342	19,699
06-Aug	304	10	0	0	0	0	0	0	0	0	0	0	0	314	20,013
07-Aug	268	13	0	0	0	0	0	0	0	0	0	0	0	281	20,294
Total	19,948	346	0	0	0	0	0	0	0	0	0	0	0	20,294	

Appendix A.29. Crescent River north bank sonar counts by sector, 27 June through 7 August 1998. Counts expressed as percentage of daily total.

Counts by Sector													
Date	1	2	3	4	5	6	7	8	9	10	11	12	Daily Total
27-Jun	42.9	19.6	27.0	6.5	2.3	0.7	0.2	0.0	0.0	0.0	0.0	0.7	99.9
28-Jun	7.8	27.7	40.3	19.7	3.8	0.0	0.2	0.2	0.0	0.0	0.2	0.0	99.9
29-Jun	7.8	23.8	54.0	10.5	1.9	0.6	0.3	0.2	0.0	0.0	0.0	0.8	99.9
30-Jun	11.1	41.6	43.5	2.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.4	100.1
1-Jul	5.8	26.8	55.4	8.3	1.1	0.4	0.7	0.4	0.2	0.2	0.2	0.4	99.9
2-Jul	6.6	36.6	35.4	12.1	4.7	2.8	1.3	0.2	0.2	0.0	0.0	0.1	100.0
3-Jul	2.8	36.1	34.3	15.2	8.0	2.0	0.7	0.5	0.2	0.2	0.0	0.0	100.0
4-Jul	6.4	49.9	26.4	11.1	2.3	1.2	1.1	0.5	0.3	0.6	0.2	0.0	100.0
5-Jul	4.9	48.9	25.1	12.8	5.3	1.4	0.3	0.5	0.5	0.1	0.0	0.1	99.9
6-Jul	9.0	35.9	31.0	16.1	4.4	1.6	0.7	0.6	0.4	0.3	0.0	0.0	100.0
7-Jul	8.4	27.0	42.9	10.3	5.7	2.4	1.2	0.8	0.9	0.2	0.2	0.3	100.3
8-Jul	5.3	22.1	48.4	14.7	6.6	1.6	0.5	0.4	0.3	0.0	0.0	0.0	99.9
9-Jul	7.3	19.3	40.4	22.7	7.4	1.2	1.2	0.2	0.2	0.2	0.1	0.0	100.2
10-Jul	3.4	13.9	51.4	22.9	4.5	2.2	0.9	0.2	0.4	0.1	0.0	0.0	99.9
11-Jul	3.3	15.4	50.3	18.7	6.3	4.4	0.7	0.2	0.2	0.1	0.2	0.0	99.8
12-Jul	1.5	11.6	50.0	23.6	8.6	3.1	0.7	0.2	0.4	0.2	0.0	0.0	99.9
13-Jul	2.1	13.0	48.3	20.9	7.1	4.2	1.7	0.4	1.3	0.5	0.2	0.2	99.9
14-Jul	4.8	19.7	39.1	15.0	9.2	5.4	3.5	0.8	1.4	0.7	0.4	0.1	100.1
15-Jul	12.2	34.0	36.0	9.3	4.1	1.6	0.7	0.4	0.7	0.4	0.4	0.3	100.1
16-Jul	14.6	36.7	26.7	8.6	4.0	0.8	0.4	0.9	3.1	2.2	1.5	0.7	100.2
17-Jul	10.7	57.3	24.4	4.1	0.5	0.2	0.0	0.0	0.4	0.9	0.9	0.5	99.9
18-Jul	7.8	53.0	29.1	4.0	0.7	0.3	0.0	0.2	0.5	2.3	1.5	0.6	100.0
19-Jul	9.6	36.2	24.0	2.9	0.2	2.2	1.3	1.3	3.8	8.7	7.6	2.3	100.1
20-Jul	9.0	34.9	25.5	3.1	0.9	1.8	1.5	1.7	3.6	6.5	6.7	5.0	100.2
21-Jul	8.0	30.4	26.8	6.9	1.8	1.8	1.8	1.9	1.9	5.0	9.3	4.6	100.2
22-Jul	9.3	37.2	24.7	6.0	2.2	1.7	0.8	1.4	2.0	5.6	5.3	4.0	100.2
23-Jul	6.8	35.4	30.3	6.6	2.5	1.4	1.2	1.9	2.3	4.0	4.9	2.6	99.9
24-Jul	6.2	38.7	34.5	5.2	1.5	1.4	0.9	1.6	2.3	3.4	3.2	1.0	99.9
25-Jul	9.5	42.1	29.3	7.0	2.2	1.8	1.8	1.7	0.8	1.9	1.7	0.3	100.1
26-Jul	7.4	49.8	30.9	6.8	1.4	1.0	0.2	0.1	0.1	1.0	1.1	0.2	100.0
27-Jul	5.9	47.4	36.9	5.4	1.5	0.7	0.3	0.3	0.3	0.7	0.7	0.1	100.2
28-Jul	5.7	49.0	37.4	5.6	0.7	0.4	0.3	0.1	0.3	0.1	0.4	0.1	100.1
29-Jul	5.6	40.7	44.2	7.1	1.3	0.3	0.2	0.1	0.1	0.2	0.3	0.0	100.1
30-Jul	7.2	50.1	34.1	6.2	0.6	0.5	0.6	0.2	0.1	0.3	0.2	0.0	100.1
31-Jul	7.5	38.9	42.3	7.6	1.4	0.3	0.4	0.6	0.2	0.1	0.5	0.3	100.1
1-Aug	8.9	44.1	34.5	6.5	2.5	0.3	0.6	0.2	0.9	0.8	0.2	0.7	100.2
2-Aug	7.0	33.6	37.3	12.5	4.0	0.2	1.3	1.2	0.9	1.3	0.2	0.4	99.9
3-Aug	10.0	34.2	37.0	11.3	1.8	0.6	0.8	1.1	0.6	0.8	1.1	0.7	100.0
4-Aug	15.7	23.4	32.5	17.0	3.1	0.9	2.1	1.9	1.2	1.0	0.3	0.7	99.8
5-Aug	11.1	26.9	43.0	11.3	3.0	1.8	0.8	0.4	0.4	0.8	0.4	0.1	100.0
6-Aug	13.2	61.7	22.8	1.6	0.0	0.0	0.2	0.1	0.0	0.0	0.2	0.2	100.0
7-Aug	11.6	56.7	27.8	2.8	0.2	0.0	0.0	0.2	0.0	0.4	0.2	0.2	100.0
Total	29.6	49.9	18.2	1.6	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	100.0

Appendix A.30. Crescent River south bank sonar counts by sector. 27 June through 7 August 1998. Counts expressed as percentage of daily total.

Date	Counts by Sector												Daily Total
	1	2	3	4	5	6	7	8	9	10	11	12	
27-Jun	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
28-Jun	97.8	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
29-Jun	99.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
30-Jun	98.6	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
1-Jul	94.9	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
2-Jul	97.7	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
3-Jul	98.3	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
4-Jul	86.8	13.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
5-Jul	37.5	62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
6-Jul	89.3	10.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
7-Jul	93.8	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
8-Jul	95.3	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
9-Jul	97.3	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
10-Jul	98.4	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
11-Jul	96.7	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
12-Jul	97.2	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
13-Jul	97.9	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
14-Jul	98.7	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
15-Jul	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
16-Jul	99.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
17-Jul	97.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
18-Jul	98.2	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
19-Jul	99.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
20-Jul	97.6	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
21-Jul	96.2	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
22-Jul	99.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
23-Jul	99.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
24-Jul	99.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
25-Jul	99.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
26-Jul	97.6	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
27-Jul	98.4	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
28-Jul	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
29-Jul	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
30-Jul	99.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
31-Jul	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
1-Aug	99.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
2-Aug	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
3-Aug	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
4-Aug	99.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
5-Aug	99.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
6-Aug	96.8	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
7-Aug	95.4	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Total	98.3	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0

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Appendix A.31. Estimated salmon escapement adjacent to the north bank of the Yentna River, 7 July through 21 August 1998. Species composition of daily sonar counts based on fish wheel catches.

Date	Sockeye		Pink		Chum		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7-Jul	298	298	14	14	10	10	2	2	18	18
8-Jul	282	580	13	27	10	20	1	3	17	35
9-Jul	375	955	17	44	13	33	2	5	23	58
10-Jul	507	1,462	23	67	18	51	2	7	31	89
11-Jul	907	2,369	13	80	20	71	7	14	0	89
12-Jul	632	3,001	50	130	19	90	36	50	20	109
13-Jul	502	3,503	39	169	16	106	28	78	16	125
14-Jul	397	3,900	84	253	46	152	61	139	4	129
15-Jul	223	4,123	104	357	29	181	54	193	11	140
16-Jul	267	4,390	237	594	65	246	73	266	0	140
17-Jul	228	4,618	202	796	52	298	75	341	8	148
18-Jul	583	5,201	630	1,426	68	366	236	577	0	148
19-Jul	3,132	8,333	2,419	3,845	165	531	461	1,038	16	164
20-Jul	3,451	11,784	3,023	6,868	135	666	510	1,548	6	170
21-Jul	2,917	14,701	3,199	10,067	149	815	474	2,022	25	195
22-Jul	1,135	15,836	2,124	12,191	107	922	340	2,362	7	202
23-Jul	416	16,252	1,311	13,502	63	985	141	2,503	6	208
24-Jul	716	16,968	2,546	16,048	89	1,074	269	2,772	6	214
25-Jul	1,346	18,314	4,302	20,350	126	1,200	259	3,031	0	214
26-Jul	1,437	19,751	4,437	24,787	100	1,300	106	3,137	9	223
27-Jul	1,607	21,358	6,210	30,997	96	1,396	178	3,315	0	223
28-Jul	1,517	22,875	5,509	36,506	82	1,478	218	3,533	7	230
29-Jul	3,114	25,989	8,018	44,524	165	1,643	546	4,079	0	230
30-Jul	5,463	31,452	5,091	49,615	235	1,878	849	4,928	0	230
31-Jul	5,270	36,722	4,879	54,494	281	2,159	731	5,659	0	230
1-Aug	4,943	41,665	5,058	59,552	228	2,387	640	6,299	0	230
2-Aug	6,135	47,800	4,981	64,533	397	2,784	670	6,969	0	230
3-Aug	3,938	51,738	3,769	68,302	213	2,997	306	7,275	0	230
4-Aug	3,348	55,086	2,638	70,940	262	3,259	105	7,380	0	230
5-Aug	1,490	56,576	1,594	72,534	184	3,443	103	7,483	4	234
6-Aug	818	57,394	813	73,347	110	3,553	35	7,518	0	234
7-Aug	597	57,991	939	74,286	154	3,707	53	7,571	4	238
8-Aug	455	58,446	785	75,071	124	3,831	81	7,652	3	241
9-Aug	210	58,656	438	75,509	119	3,950	68	7,720	2	243
10-Aug	458	59,114	619	76,128	193	4,143	125	7,845	0	243
11-Aug	312	59,426	214	76,342	81	4,224	113	7,958	0	243
12-Aug	383	59,809	212	76,554	91	4,315	61	8,019	0	243
13-Aug	316	60,125	183	76,737	58	4,373	95	8,114	3	246
14-Aug	256	60,381	99	76,836	77	4,450	73	8,187	0	246
15-Aug	174	60,555	82	76,918	45	4,495	44	8,231	0	246
16-Aug	105	60,660	49	76,967	28	4,523	26	8,257	0	246
17-Aug	122	60,782	17	76,984	26	4,549	19	8,276	3	249
18-Aug	142	60,924	20	77,004	30	4,579	22	8,298	4	253
19-Aug	220	61,144	40	77,044	42	4,621	11	8,309	2	255
20-Aug	120	61,264	22	77,066	23	4,644	6	8,315	1	256
21-Aug	152	61,416	28	77,094	29	4,673	7	8,322	2	258

Appendix A.32. Estimated salmon escapement adjacent to the south bank of the Yentna River, 7 July through 21 August 1998. Species composition of daily sonar counts based on fish wheel catches.

Date	Sockeye		Pink		Chum		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7-Jul	55	55	2	2	1	1	1	1	2	2
8-Jul	72	127	2	4	2	3	0	1	3	5
9-Jul	63	190	1	5	2	5	1	2	2	7
10-Jul	385	575	10	15	10	15	4	6	14	21
11-Jul	608	1,183	16	31	3	18	6	12	0	21
12-Jul	999	2,182	18	49	22	40	90	102	13	34
13-Jul	379	2,561	27	76	16	56	25	127	2	36
14-Jul	219	2,780	20	96	12	68	32	159	0	36
15-Jul	179	2,959	63	159	25	93	56	215	2	38
16-Jul	322	3,281	142	301	62	155	90	305	2	40
17-Jul	687	3,968	173	474	61	216	108	413	0	40
18-Jul	2,056	6,024	864	1,338	149	365	479	892	31	71
19-Jul	4,711	10,735	3,107	4,445	184	549	583	1,475	31	102
20-Jul	6,085	16,820	4,996	9,441	260	809	733	2,208	39	141
21-Jul	4,871	21,691	3,765	13,206	90	899	728	2,936	27	168
22-Jul	1,604	23,295	2,505	15,711	71	970	474	3,410	16	184
23-Jul	961	24,256	2,102	17,813	67	1,037	487	3,897	13	197
24-Jul	1,450	25,706	3,977	21,790	182	1,219	691	4,588	4	201
25-Jul	1,208	26,914	4,086	25,876	212	1,431	523	5,111	3	204
26-Jul	1,616	28,530	5,153	31,029	154	1,585	356	5,467	0	204
27-Jul	1,131	29,661	5,453	36,482	106	1,691	271	5,738	0	204
28-Jul	1,788	31,449	5,978	42,460	159	1,850	685	6,423	7	211
29-Jul	1,505	32,954	6,188	48,648	149	1,999	706	7,129	0	211
30-Jul	2,548	35,502	5,866	54,514	211	2,210	1,392	8,521	0	211
31-Jul	2,172	37,674	5,775	60,289	211	2,421	1,355	9,876	0	211
1-Aug	2,476	40,150	3,725	64,014	255	2,676	1,199	11,075	9	220
2-Aug	3,172	43,322	3,422	67,436	493	3,169	1,142	12,217	0	220
3-Aug	4,221	47,543	3,562	70,998	418	3,587	738	12,955	3	223
4-Aug	2,182	49,725	1,714	72,712	82	3,669	207	13,162	0	223
5-Aug	2,200	51,925	1,407	74,119	193	3,862	358	13,520	4	227
6-Aug	1,551	53,476	925	75,044	216	4,078	229	13,749	0	227
7-Aug	689	54,165	604	75,648	156	4,234	148	13,897	2	229
8-Aug	726	54,891	702	76,350	194	4,428	412	14,309	5	234
9-Aug	398	55,289	440	76,790	219	4,647	550	14,859	3	237
10-Aug	353	55,642	464	77,254	194	4,841	460	15,319	0	237
11-Aug	493	56,135	270	77,524	95	4,936	446	15,765	0	237
12-Aug	469	56,604	175	77,699	87	5,023	175	15,940	3	240
13-Aug	385	56,989	193	77,892	157	5,180	152	16,092	3	243
14-Aug	298	57,287	81	77,973	114	5,294	171	16,263	3	246
15-Aug	150	57,437	30	78,003	54	5,348	56	16,319	0	246
16-Aug	128	57,565	33	78,036	56	5,404	48	16,367	0	246
17-Aug	189	57,754	18	78,054	39	5,443	28	16,395	0	246
18-Aug	100	57,854	10	78,064	20	5,463	15	16,410	0	246
19-Aug	97	57,951	13	78,077	20	5,483	10	16,420	0	246
20-Aug	111	58,062	15	78,092	23	5,506	11	16,431	0	246
21-Aug	145	58,207	7	78,099	33	5,539	16	16,447	1	247

Appendix A.33. Yentna River north bank sonar counts by hour, 7 July through 21 August 1998.

Counts by Hour																									Daily	Cum
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total	Total
7-Jul	12	5	35	7	8	10	4	29	26	17	24	25	7	13	16	4	4	7	14	12	7	24	24	8	342	342
8-Jul	26	5	18	13	10	8	12	4	7	12	33	1	10	14	13	10	17	26	8	34	19	2	6	15	323	665
9-Jul	18	21	45	7	10	14	30	25	7	25	22	9	22	18	10	15	20	18	19	13	23	3	19	17	430	1,095
10-Jul	17	21	11	21	25	17	28	56	20	14	38	13	25	8	18	15	31	25	31	26	21	25	51	24	581	1,676
11-Jul	48	42	66	48	25	53	41	17	45	43	40	9	27	39	36	17	34	26	42	52	38	42	66	51	947	2,623
12-Jul	48	28	24	45	26	46	28	59	25	33	27	25	47	43	19	13	37	47	21	9	20	37	36	14	757	3,380
13-Jul	28	37	18	7	30	23	13	8	27	19	10	19	22	23	11	39	38	37	51	26	35	30	40	10	601	3,981
14-Jul	25	22	31	13	28	19	9	8	30	29	21	32	35	36	15	36	36	20	25	14	9	37	35	27	592	4,573
15-Jul	23	29	15	24	29	11	19	15	9	12	26	27	23	17	29	16	19	4	15	10	7	14	20	8	421	4,994
16-Jul	27	20	11	17	16	31	16	15	43	32	10	25	44	39	37	34	34	17	51	11	28	56	15	13	642	5,636
17-Jul	30	10	15	34	33	16	10	13	9	29	21	22	35	19	37	21	11	20	19	37	36	40	36	12	565	6,201
18-Jul	42	38	43	60	41	56	66	82	28	137	54	49	34	82	71	103	28	52	55	20	49	111	75	141	1,517	7,718
19-Jul	241	202	147	200	103	138	173	296	181	183	131	252	497	145	407	301	262	230	214	534	403	286	330	337	6,193	13,911
20-Jul	524	360	390	424	237	335	283	136	228	280	219	91	311	397	404	157	460	397	187	410	325	167	259	144	7,125	21,036
21-Jul	424	382	312	187	309	267	179	112	125	104	216	195	471	422	420	491	212	418	252	376	286	134	305	165	6,764	27,800
22-Jul	409	303	252	187	156	113	154	113	83	115	92	187	189	183	155	151	156	156	88	80	169	120	45	57	3,713	31,513
23-Jul	140	112	107	70	58	42	46	61	32	53	40	113	92	68	142	86	109	61	71	129	97	93	46	69	1,937	33,450
24-Jul	101	157	133	115	84	82	156	102	109	102	115	154	212	184	223	158	235	260	150	188	140	100	163	203	3,626	37,076
25-Jul	252	324	222	375	235	199	228	176	243	177	251	272	375	263	252	165	271	213	277	240	325	304	198	196	6,033	43,109
26-Jul	281	372	229	319	297	243	199	217	228	240	166	284	204	162	253	213	187	200	201	241	288	288	362	415	6,089	49,198
27-Jul	420	360	347	348	286	371	323	210	304	323	226	273	269	252	293	291	273	348	374	536	474	440	335	415	8,091	57,289
28-Jul	462	463	360	300	302	289	292	203	269	197	246	198	231	297	172	236	344	274	284	368	434	433	356	323	7,333	64,622
29-Jul	575	517	516	513	434	437	294	428	333	210	305	287	308	286	682	636	645	595	600	540	732	600	749	621	11,843	76,465
30-Jul	675	787	569	757	407	487	411	297	427	420	457	470	510	385	295	552	464	340	438	434	402	542	655	457	11,638	88,103
31-Jul	845	1,030	742	640	401	345	439	309	446	444	204	442	420	370	290	417	520	409	439	389	424	433	396	367	11,161	99,264
1-Aug	602	1,057	429	387	371	325	313	375	436	534	278	395	567	486	481	359	456	394	332	337	421	523	419	592	10,869	110,133
2-Aug	689	972	554	390	364	503	450	290	362	443	327	382	526	508	302	732	724	510	598	553	562	404	517	521	12,183	122,316
3-Aug	531	289	471	284	449	273	252	254	283	275	347	300	395	461	357	298	346	470	380	306	295	318	246	346	8,226	130,542
4-Aug	325	219	237	151	256	202	162	164	234	225	211	222	290	355	420	358	389	363	280	245	224	297	305	219	6,353	136,895
5-Aug	290	202	233	76	108	99	45	88	53	82	60	105	125	165	196	177	173	145	165	204	155	122	217	90	3,375	140,270

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Counts by Hour

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total	Cum Total
6-Aug	113	139	101	51	75	61	68	68	77	42	41	62	73	52	73	69	62	94	46	85	72	65	117	70	1,776	142,046
7-Aug	68	79	55	77	37	19	79	67	51	40	62	81	90	52	104	102	73	81	99	85	106	73	90	77	1,747	143,793
8-Aug	137	73	81	84	62	79	84	48	43	35	19	37	64	39	53	44	68	38	61	57	58	55	68	61	1,448	145,241
9-Aug	48	49	32	26	31	33	26	30	37	17	13	29	45	44	31	29	53	34	33	37	38	58	36	28	837	146,078
10-Aug	53	73	58	47	55	34	51	22	77	56	49	68	54	80	79	94	101	69	33	38	51	40	66	47	1,395	147,473
11-Aug	36	30	47	45	27	31	11	24	19	6	23	19	26	31	37	36	23	23	34	44	34	30	64	20	720	148,193
12-Aug	27	32	26	55	27	25	45	46	44	34	25	62	37	39	30	30	13	24	23	15	20	50	9	9	747	148,940
13-Aug	33	49	29	30	23	10	16	25	11	59	8	13	12	29	34	12	36	30	23	25	31	50	35	32	655	149,595
14-Aug	64	26	34	29	3	21	15	15	24	27	4	16	23	25	20	12	13	34	12	14	21	13	24	16	505	150,100
15-Aug	47	19	22	11	20	12	17	11	11	4	16	38	10	16	9	12	8	7	6	10	19	3	13	4	345	150,445
16-Aug	24	7	13	5	8	5	1	9	0	0	5	10	4	4	10	24	7	11	14	3	10	21	10	3	208	150,653
17-Aug	5	2	15	5	11	2	7	1	7	1	7	2	1	6	5	14	15	9	7	23	15	7	5	15	187	150,840
18-Aug	5	8	0	2	3	2	9	13	12	8	6	14	14	2	17	5	12	16	14	13	25	12	2	4	218	151,058
19-Aug	21	3	13	17	16	28	23	7	19	6	19	2	3	12	7	21	15	5	6	10	8	12	12	30	315	151,373
20-Aug	26	8	14	9	11	3	2	6	3	7	10	3	9	7	1	1	8	4	5	6	1	12	9	7	172	151,545
21-Aug	6	5	12	8	7	2	3	8	1	2	5	2	11	11	17	19	12	5	11	9	18	4	23	17	218	151,763
Total	8,843	8,988	7,134	6,520	5,554	5,421	5,132	4,562	5,088	5,153	4,529	5,336	6,799	6,189	6,583	6,625	7,054	6,566	6,108	6,848	6,975	6,530	6,909	6,317	151,763	

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Appendix A.34. Yentna River south bank sonar counts by hour, 7 July through 21 August 1998.

Counts by Hour

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Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total	Cum Total
7-Jul	2	1	1	0	3	1	0	0	2	3	4	1	1	5	6	23	0	0	0	4	3	0	1	0	61	61
8-Jul	9	2	2	13	5	3	1	1	0	0	0	0	0	0	0	12	0	2	15	1	6	3	0	4	79	140
9-Jul	3	2	1	2	0	0	1	1	1	6	1	1	1	6	5	5	9	4	3	5	0	4	3	5	69	209
10-Jul	21	4	6	4	1	5	9	9	6	4	11	17	16	14	11	18	8	9	20	9	15	47	148	11	423	632
11-Jul	7	10	26	31	32	17	25	12	20	12	22	19	10	25	40	29	22	46	31	32	30	40	50	45	633	1,265
12-Jul	76	27	24	40	57	54	41	18	58	103	24	49	54	44	61	68	61	72	53	40	27	26	43	22	1,142	2,407
13-Jul	18	37	20	21	11	9	12	6	13	11	16	11	19	21	11	19	21	20	22	25	41	39	17	9	449	2,856
14-Jul	19	20	6	12	9	4	19	15	5	16	6	13	11	11	19	10	13	10	26	4	11	7	11	6	283	3,139
15-Jul	32	21	3	3	6	3	14	15	4	9	26	14	6	6	12	5	18	10	11	20	15	35	12	25	325	3,464
16-Jul	20	25	7	11	15	9	16	13	21	13	19	12	32	38	44	51	41	68	35	20	35	21	31	21	618	4,082
17-Jul	46	21	42	45	52	50	27	58	19	27	22	45	44	50	68	53	32	30	43	62	43	52	48	50	1,029	5,111
18-Jul	77	78	44	35	58	51	41	49	31	29	65	117	112	142	163	289	282	262	259	292	277	281	299	246	3,579	8,690
19-Jul	310	298	260	234	210	210	214	215	103	153	160	218	305	327	389	565	789	648	717	451	631	520	408	281	8,616	17,306
20-Jul	528	434	252	299	355	267	281	338	236	395	493	437	645	493	717	791	776	714	614	785	668	632	407	556	12,113	29,419
21-Jul	589	561	396	376	291	282	234	184	219	391	520	189	355	555	593	489	530	404	454	533	399	454	215	268	9,481	38,900
22-Jul	233	276	211	154	114	162	136	148	165	162	233	192	151	211	157	192	223	201	208	230	243	213	217	238	4,670	43,570
23-Jul	204	199	216	143	113	186	127	137	110	70	177	104	125	90	138	110	153	186	162	129	131	184	159	277	3,630	47,200
24-Jul	271	224	252	248	256	257	225	183	161	166	234	226	260	329	278	414	367	299	255	287	306	305	271	230	6,304	53,504
25-Jul	268	303	299	321	197	193	171	180	140	197	222	173	193	268	271	369	293	262	313	311	291	275	300	222	6,032	59,536
26-Jul	230	277	261	224	187	172	161	137	204	169	248	242	303	329	353	427	452	456	435	414	526	306	420	346	7,279	66,815
27-Jul	323	309	245	243	240	217	275	175	201	292	292	294	349	325	288	239	319	281	345	357	331	303	372	346	6,961	73,776
28-Jul	317	333	268	295	263	303	280	255	342	259	343	397	360	388	388	369	588	419	487	469	472	373	370	279	8,617	82,393
29-Jul	357	278	279	319	330	270	292	288	259	252	277	359	425	489	476	390	462	354	354	451	420	371	372	424	8,548	90,941
30-Jul	503	472	533	499	443	443	310	254	306	337	277	438	533	388	654	480	559	412	431	282	309	397	367	390	10,017	100,958
31-Jul	560	558	404	333	396	357	282	285	270	305	393	414	389	459	416	409	342	386	466	428	346	336	478	501	9,513	110,471
1-Aug	390	366	430	304	203	232	244	166	129	199	298	320	285	256	306	306	447	383	465	405	392	335	345	458	7,664	118,135
2-Aug	418	529	397	331	261	195	268	215	232	261	256	297	372	433	412	307	478	381	362	334	259	383	414	434	8,229	126,364
3-Aug	465	421	429	368	319	387	358	267	291	274	279	250	226	385	431	423	439	456	551	515	421	346	344	297	8,942	135,306
4-Aug	384	267	226	316	218	163	140	144	150	175	113	130	66	119	108	144	174	174	220	225	134	122	152	121	4,185	139,491
5-Aug	157	171	195	129	228	191	158	155	177	197	215	173	184	189	194	206	201	187	201	174	108	131	112	129	4,162	143,653

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Appendix A.34. (p.2 of 2)

Counts by Hour

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total	Cum Total
6-Aug	165	186	118	126	99	104	116	120	113	143	118	160	139	102	179	94	123	131	106	79	74	89	133	104	2,921	146,574
7-Aug	78	72	66	76	30	44	52	70	63	51	42	64	50	40	69	106	66	74	85	113	73	55	78	82	1,599	148,173
8-Aug	53	54	43	73	54	44	50	55	61	64	87	86	96	78	85	120	96	106	125	144	129	115	121	100	2,039	150,212
9-Aug	111	65	67	58	66	44	90	58	40	36	52	45	86	91	77	71	87	78	78	54	73	57	72	54	1,610	151,822
10-Aug	68	68	68	65	81	67	81	63	80	55	66	48	60	62	46	72	39	52	46	59	70	47	48	60	1,471	153,293
11-Aug	73	51	71	47	72	77	70	55	41	62	45	52	29	38	49	55	34	74	62	46	51	54	67	29	1,304	154,597
12-Aug	45	43	37	24	14	33	39	35	60	38	36	50	20	31	28	26	62	41	30	32	39	51	36	59	909	155,506
13-Aug	67	28	31	16	22	33	37	48	34	45	45	24	52	29	54	25	41	23	21	42	36	54	43	40	890	156,396
14-Aug	30	34	39	54	32	32	42	33	37	30	19	38	38	40	18	17	20	16	25	10	17	13	11	22	667	157,063
15-Aug	10	7	10	18	11	2	7	11	12	11	15	10	21	18	18	20	15	14	9	18	7	11	4	11	290	157,353
16-Aug	16	8	12	6	12	17	20	8	4	12	24	15	10	5	22	6	15	8	9	9	2	4	9	12	265	157,618
17-Aug	7	8	34	7	10	18	19	15	7	7	8	22	8	10	6	4	39	11	7	11	6	3	2	5	274	157,892
18-Aug	10	9	3	7	9	4	5	10	4	6	17	4	11	4	8	9	5	2	3	2	2	3	6	2	145	158,037
19-Aug	11	7	7	1	7	5	4	4	1	5	10	9	5	4	12	5	4	7	7	7	3	3	9	3	140	158,177
20-Aug	8	6	0	6	5	8	4	8	10	6	4	6	4	4	5	17	9	8	11	12	4	4	7	4	160	158,337
21-Aug	0	4	5	10	10	8	5	11	4	6	10	4	14	10	7	10	4	5	8	7	12	15	8	25	202	158,539
Total	7,589	7,174	6,346	5,947	5,407	5,233	5,003	4,527	4,446	5,064	5,844	5,789	6,475	6,961	7,692	7,869	8,758	7,786	8,190	7,939	7,488	7,119	7,040	6,853	158,539	

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Appendix A.35. Yentna River north bank sonar counts by hour, 7 July through 21 August 1998. Counts expressed as percentage of daily total.

Date	Counts by Hour																							Daily Total	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		24
7-Jul	3.5	1.5	10.2	2.0	2.3	2.9	1.2	8.5	7.6	5.0	7.0	7.3	2.0	3.8	4.7	1.2	1.2	2.0	4.1	3.5	2.0	7.0	7.0	2.3	100.0
8-Jul	8.0	1.5	5.6	4.0	3.1	2.5	3.7	1.2	2.2	3.7	10.2	0.3	3.1	4.3	4.0	3.1	5.3	8.0	2.5	10.5	5.9	0.6	1.9	4.6	100.0
9-Jul	4.2	4.9	10.5	1.6	2.3	3.3	7.0	5.8	1.6	5.8	5.1	2.1	5.1	4.2	2.3	3.5	4.7	4.2	4.4	3.0	5.3	0.7	4.4	4.0	100.0
10-Jul	2.9	3.6	1.9	3.6	4.3	2.9	4.8	9.6	3.4	2.4	6.5	2.2	4.3	1.4	3.1	2.6	5.3	4.3	5.3	4.5	3.6	4.3	8.8	4.1	100.0
11-Jul	5.1	4.4	7.0	5.1	2.6	5.6	4.3	1.8	4.8	4.5	4.2	1.0	2.9	4.1	3.8	1.8	3.6	2.7	4.4	5.5	4.0	4.4	7.0	5.4	100.0
11-Jul	6.3	3.7	3.2	5.9	3.4	6.1	3.7	7.8	3.3	4.4	3.6	3.3	6.2	5.7	2.5	1.7	4.9	6.2	2.8	1.2	2.6	4.9	4.8	1.8	100.0
12-Jul	4.7	6.2	3.0	1.2	5.0	3.8	2.2	1.3	4.5	3.2	1.7	3.2	3.7	3.8	1.8	6.5	6.3	6.2	8.5	4.3	5.8	5.0	6.7	1.7	100.0
13-Jul	4.2	3.7	5.2	2.2	4.7	3.2	1.5	1.4	5.1	4.9	3.5	5.4	5.9	6.1	2.5	6.1	6.1	3.4	4.2	2.4	1.5	6.3	5.9	4.6	100.0
14-Jul	5.5	6.9	3.6	5.7	6.9	2.6	4.5	3.6	2.1	2.9	6.2	6.4	5.5	4.0	6.9	3.8	4.5	1.0	3.6	2.4	1.7	3.3	4.8	1.9	100.0
15-Jul	4.2	3.1	1.7	2.6	2.5	4.8	2.5	2.3	6.7	5.0	1.6	3.9	6.9	6.1	5.8	5.3	5.3	2.6	7.9	1.7	4.4	8.7	2.3	2.0	100.0
17-Jul	5.3	1.8	2.7	6.0	5.8	2.8	1.8	2.3	1.6	5.1	3.7	3.9	6.2	3.4	6.5	3.7	1.9	3.5	3.4	6.5	6.4	7.1	6.4	2.1	100.0
18-Jul	2.8	2.5	2.8	4.0	2.7	3.7	4.4	5.4	1.8	9.0	3.6	3.2	2.2	5.4	4.7	6.8	1.8	3.4	3.6	1.3	3.2	7.3	4.9	9.3	100.0
19-Jul	3.9	3.3	2.4	3.2	1.7	2.2	2.8	4.8	2.9	3.0	2.1	4.1	8.0	2.3	6.6	4.9	4.2	3.7	3.5	8.6	6.5	4.6	5.3	5.4	100.0
20-Jul	7.4	5.1	5.5	6.0	3.3	4.7	4.0	1.9	3.2	3.9	3.1	1.3	4.4	5.6	5.7	2.2	6.5	5.6	2.6	5.8	4.6	2.3	3.6	2.0	100.0
21-Jul	6.3	5.6	4.6	2.8	4.6	3.9	2.6	1.7	1.8	1.5	3.2	2.9	7.0	6.2	6.2	7.3	3.1	6.2	3.7	5.6	4.2	2.0	4.5	2.4	100.0
22-Jul	11.0	8.2	6.8	5.0	4.2	3.0	4.1	3.0	2.2	3.1	2.5	5.0	5.1	4.9	4.2	4.1	4.2	4.2	2.4	2.2	4.6	3.2	1.2	1.5	100.0
23-Jul	7.2	5.8	5.5	3.6	3.0	2.2	2.4	3.1	1.7	2.7	2.1	5.8	4.7	3.5	7.3	4.4	5.6	3.1	3.7	6.7	5.0	4.8	2.4	3.6	100.0
24-Jul	2.8	4.3	3.7	3.2	2.3	2.3	4.3	2.8	3.0	2.8	3.2	4.2	5.8	5.1	6.2	4.4	6.5	7.2	4.1	5.2	3.9	2.8	4.5	5.6	100.0
25-Jul	4.2	5.4	3.7	6.2	3.9	3.3	3.8	2.9	4.0	2.9	4.2	4.5	6.2	4.4	4.2	2.7	4.5	3.5	4.6	4.0	5.4	5.0	3.3	3.2	100.0
26-Jul	4.6	6.1	3.8	5.2	4.9	4.0	3.3	3.6	3.7	3.9	2.7	4.7	3.4	2.7	4.2	3.5	3.1	3.3	3.3	4.0	4.7	4.7	5.9	6.8	100.0
27-Jul	5.2	4.4	4.3	4.3	3.5	4.6	4.0	2.6	3.8	4.0	2.8	3.4	3.3	3.1	3.6	3.6	3.4	4.3	4.6	6.6	5.9	5.4	4.1	5.1	100.0
28-Jul	6.3	6.3	4.9	4.1	4.1	3.9	4.0	2.8	3.7	2.7	3.4	2.7	3.2	4.1	2.3	3.2	4.7	3.7	3.9	5.0	5.9	5.9	4.9	4.4	100.0
29-Jul	4.9	4.4	4.4	4.3	3.7	3.7	2.5	3.6	2.8	1.8	2.6	2.4	2.6	2.4	5.8	5.4	5.4	5.0	5.1	4.6	6.2	5.1	6.3	5.2	100.0
30-Jul	5.8	6.8	4.9	6.5	3.5	4.2	3.5	2.6	3.7	3.6	3.9	4.0	4.4	3.3	2.5	4.7	4.0	2.9	3.8	3.7	3.5	4.7	5.6	3.9	100.0
31-Jul	7.6	9.2	6.6	5.7	3.6	3.1	3.9	2.8	4.0	4.0	1.8	4.0	3.8	3.3	2.6	3.7	4.7	3.7	3.9	3.5	3.8	3.9	3.5	3.3	100.0
1-Aug	5.5	9.7	3.9	3.6	3.4	3.0	2.9	3.5	4.0	4.9	2.6	3.6	5.2	4.5	4.4	3.3	4.2	3.6	3.1	3.1	3.9	4.8	3.9	5.4	100.0
2-Aug	5.7	8.0	4.5	3.2	3.0	4.1	3.7	2.4	3.0	3.6	2.7	3.1	4.3	4.2	2.5	6.0	5.9	4.2	4.9	4.5	4.6	3.3	4.2	4.3	100.0
3-Aug	6.5	3.5	5.7	3.5	5.5	3.3	3.1	3.1	3.4	3.3	4.2	3.6	4.8	5.6	4.3	3.6	4.2	5.7	4.6	3.7	3.6	3.9	3.0	4.2	100.0
4-Aug	5.1	3.4	3.7	2.4	4.0	3.2	2.5	2.6	3.7	3.5	3.3	3.5	4.6	5.6	6.6	5.6	6.1	5.7	4.4	3.9	3.5	4.7	4.8	3.4	100.0
5-Aug	8.6	6.0	6.9	2.3	3.2	2.9	1.3	2.6	1.6	2.4	1.8	3.1	3.7	4.9	5.8	5.2	5.1	4.3	4.9	6.0	4.6	3.6	6.4	2.7	100.0

-Continued-

Appendix A.35. (p.2 of 2)

Counts by Hour

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total
6-Aug	6.4	7.8	5.7	2.9	4.2	3.4	3.8	3.8	4.3	2.4	2.3	3.5	4.1	2.9	4.1	3.9	3.5	5.3	2.6	4.8	4.1	3.7	6.6	3.9	100.0
7-Aug	3.9	4.5	3.1	4.4	2.1	1.1	4.5	3.8	2.9	2.3	3.5	4.6	5.2	3.0	6.0	5.8	4.2	4.6	5.7	4.9	6.1	4.2	5.2	4.4	100.0
8-Aug	9.5	5.0	5.6	5.8	4.3	5.5	5.8	3.3	3.0	2.4	1.3	2.6	4.4	2.7	3.7	3.0	4.7	2.6	4.2	3.9	4.0	3.8	4.7	4.2	100.0
9-Aug	5.7	5.9	3.8	3.1	3.7	3.9	3.1	3.6	4.4	2.0	1.6	3.5	5.4	5.3	3.7	3.5	6.3	4.1	3.9	4.4	4.5	6.9	4.3	3.3	100.0
10-Aug	3.8	5.2	4.2	3.4	3.9	2.4	3.7	1.6	5.5	4.0	3.5	4.9	3.9	5.7	5.7	6.7	7.2	4.9	2.4	2.7	3.7	2.9	4.7	3.4	100.0
11-Aug	5.0	4.2	6.5	6.3	3.8	4.3	1.5	3.3	2.6	0.8	3.2	2.6	3.6	4.3	5.1	5.0	3.2	3.2	4.7	6.1	4.7	4.2	8.9	2.8	100.0
12-Aug	3.6	4.3	3.5	7.4	3.6	3.3	6.0	6.2	5.9	4.6	3.3	8.3	5.0	5.2	4.0	4.0	1.7	3.2	3.1	2.0	2.7	6.7	1.2	1.2	100.0
13-Aug	5.0	7.5	4.4	4.6	3.5	1.5	2.4	3.8	1.7	9.0	1.2	2.0	1.8	4.4	5.2	1.8	5.5	4.6	3.5	3.8	4.7	7.6	5.3	4.9	100.0
14-Aug	12.7	5.1	6.7	5.7	0.6	4.2	3.0	3.0	4.8	5.3	0.8	3.2	4.6	5.0	4.0	2.4	2.6	6.7	2.4	2.8	4.2	2.6	4.8	3.2	100.0
15-Aug	13.6	5.5	6.4	3.2	5.8	3.5	4.9	3.2	3.2	1.2	4.6	11.0	2.9	4.6	2.6	3.5	2.3	2.0	1.7	2.9	5.5	0.9	3.8	1.2	100.0
16-Aug	11.5	3.4	6.3	2.4	3.8	2.4	0.5	4.3	0.0	0.0	2.4	4.8	1.9	1.9	4.8	11.5	3.4	5.3	6.7	1.4	4.8	10.1	4.8	1.4	100.0
17-Aug	2.7	1.1	8.0	2.7	5.9	1.1	3.7	0.5	3.7	0.5	3.7	1.1	0.5	3.2	2.7	7.5	8.0	4.8	3.7	12.3	8.0	3.7	2.7	8.0	100.0
18-Aug	2.3	3.7	0.0	0.9	1.4	0.9	4.1	6.0	5.5	3.7	2.8	6.4	6.4	0.9	7.8	2.3	5.5	7.3	6.4	6.0	11.5	5.5	0.9	1.8	100.0
19-Aug	6.7	1.0	4.1	5.4	5.1	8.9	7.3	2.2	6.0	1.9	6.0	0.6	1.0	3.8	2.2	6.7	4.8	1.6	1.9	3.2	2.5	3.8	3.8	9.5	100.0
20-Aug	15.1	4.7	8.1	5.2	6.4	1.7	1.2	3.5	1.7	4.1	5.8	1.7	5.2	4.1	0.6	0.6	4.7	2.3	2.9	3.5	0.6	7.0	5.2	4.1	100.0
21-Aug	2.8	2.3	5.5	3.7	3.2	0.9	1.4	3.7	0.5	0.9	2.3	0.9	5.0	5.0	7.8	8.7	5.5	2.3	5.0	4.1	8.3	1.8	10.6	7.8	100.0
Total	5.8	5.9	4.7	4.3	3.7	3.6	3.4	3.0	3.4	3.4	3.0	3.5	4.5	4.1	4.3	4.4	4.6	4.3	4.0	4.5	4.6	4.3	4.6	4.2	100.0

Appendix A.36. Yentna River south bank sonar counts by hour, 7 July through 21 August 1998. Counts expressed as percentage of daily total.

Date	Counts by Hour																								Daily Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
7-Jul	3.3	1.6	1.6	0.0	4.9	1.6	0.0	0.0	3.3	4.9	6.6	1.6	1.6	8.2	9.8	37.7	0.0	0.0	0.0	6.6	4.9	0.0	1.6	0.0	100.0
8-Jul	11.4	2.5	2.5	16.5	6.3	3.8	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.2	0.0	2.5	19.0	1.3	7.6	3.8	0.0	5.1	100.0
9-Jul	4.3	2.9	1.4	2.9	0.0	0.0	1.4	1.4	1.4	8.7	1.4	1.4	1.4	8.7	7.2	7.2	13.0	5.8	4.3	7.2	0.0	5.8	4.3	7.2	100.0
10-Jul	5.0	0.9	1.4	0.9	0.2	1.2	2.1	2.1	1.4	0.9	2.6	4.0	3.8	3.3	2.6	4.3	1.9	2.1	4.7	2.1	3.5	11.1	35.0	2.6	100.0
11-Jul	1.1	1.6	4.1	4.9	5.1	2.7	3.9	1.9	3.2	1.9	3.5	3.0	1.6	3.9	6.3	4.6	3.5	7.3	4.9	5.1	4.7	6.3	7.9	7.1	100.0
11-Jul	6.7	2.4	2.1	3.5	5.0	4.7	3.6	1.6	5.1	9.0	2.1	4.3	4.7	3.9	5.3	6.0	5.3	6.3	4.6	3.5	2.4	2.3	3.8	1.9	100.0
12-Jul	4.0	8.2	4.5	4.7	2.4	2.0	2.7	1.3	2.9	2.4	3.6	2.4	4.2	4.7	2.4	4.2	4.7	4.5	4.9	5.6	9.1	8.7	3.8	2.0	100.0
13-Jul	6.7	7.1	2.1	4.2	3.2	1.4	6.7	5.3	1.8	5.7	2.1	4.6	3.9	3.9	6.7	3.5	4.6	3.5	9.2	1.4	3.9	2.5	3.9	2.1	100.0
14-Jul	9.8	6.5	0.9	0.9	1.8	0.9	4.3	4.6	1.2	2.8	8.0	4.3	1.8	1.8	3.7	1.5	5.5	3.1	3.4	6.2	4.6	10.8	3.7	7.7	100.0
15-Jul	3.2	4.0	1.1	1.8	2.4	1.5	2.6	2.1	3.4	2.1	3.1	1.9	5.2	6.1	7.1	8.3	6.6	11.0	5.7	3.2	5.7	3.4	5.0	3.4	100.0
17-Jul	4.5	2.0	4.1	4.4	5.1	4.9	2.6	5.6	1.8	2.6	2.1	4.4	4.3	4.9	6.6	5.2	3.1	2.9	4.2	6.0	4.2	5.1	4.7	4.9	100.0
18-Jul	2.2	2.2	1.2	1.0	1.6	1.4	1.1	1.4	0.9	0.8	1.8	3.3	3.1	4.0	4.6	8.1	7.9	7.3	7.2	8.2	7.7	7.9	8.4	6.9	100.0
19-Jul	3.6	3.5	3.0	2.7	2.4	2.4	2.5	2.5	1.2	1.8	1.9	2.5	3.5	3.8	4.5	6.6	9.2	7.5	8.3	5.2	7.3	6.0	4.7	3.3	100.0
20-Jul	4.4	3.6	2.1	2.5	2.9	2.2	2.3	2.8	1.9	3.3	4.1	3.6	5.3	4.1	5.9	6.5	6.4	5.9	5.1	6.5	5.5	5.2	3.4	4.6	100.0
21-Jul	6.2	5.9	4.2	4.0	3.1	3.0	2.5	1.9	2.3	4.1	5.5	2.0	3.7	5.9	6.3	5.2	5.6	4.3	4.8	5.6	4.2	4.8	2.3	2.8	100.0
22-Jul	5.0	5.9	4.5	3.3	2.4	3.5	2.9	3.2	3.5	3.5	5.0	4.1	3.2	4.5	3.4	4.1	4.8	4.3	4.5	4.9	5.2	4.6	4.6	5.1	100.0
23-Jul	5.6	5.5	6.0	3.9	3.1	5.1	3.5	3.8	3.0	1.9	4.9	2.9	3.4	2.5	3.8	3.0	4.2	5.1	4.5	3.6	3.6	5.1	4.4	7.6	100.0
24-Jul	4.3	3.6	4.0	3.9	4.1	4.1	3.6	2.9	2.6	2.6	3.7	3.6	4.1	5.2	4.4	6.6	5.8	4.7	4.0	4.6	4.9	4.8	4.3	3.6	100.0
25-Jul	4.4	5.0	5.0	5.3	3.3	3.2	2.8	3.0	2.3	3.3	3.7	2.9	3.2	4.4	4.5	6.1	4.9	4.3	5.2	5.2	4.8	4.6	5.0	3.7	100.0
26-Jul	3.2	3.8	3.6	3.1	2.6	2.4	2.2	1.9	2.8	2.3	3.4	3.3	4.2	4.5	4.8	5.9	6.2	6.3	6.0	5.7	7.2	4.2	5.8	4.8	100.0
27-Jul	4.6	4.4	3.5	3.5	3.4	3.1	4.0	2.5	2.9	4.2	4.2	4.2	5.0	4.7	4.1	3.4	4.6	4.0	5.0	5.1	4.8	4.4	5.3	5.0	100.0
28-Jul	3.7	3.9	3.1	3.4	3.1	3.5	3.2	3.0	4.0	3.0	4.0	4.6	4.2	4.5	4.5	4.3	6.8	4.9	5.7	5.4	5.5	4.3	4.3	3.2	100.0
29-Jul	4.2	3.3	3.3	3.7	3.9	3.2	3.4	3.4	3.0	2.9	3.2	4.2	5.0	5.7	5.6	4.6	5.4	4.1	4.1	5.3	4.9	4.3	4.4	5.0	100.0
30-Jul	5.0	4.7	5.3	5.0	4.4	4.4	3.1	2.5	3.1	3.4	2.8	4.4	5.3	3.9	6.5	4.8	5.6	4.1	4.3	2.8	3.1	4.0	3.7	3.9	100.0
31-Jul	5.9	5.9	4.2	3.5	4.2	3.8	3.0	3.0	2.8	3.2	4.1	4.4	4.1	4.8	4.4	4.3	3.6	4.1	4.9	4.5	3.6	3.5	5.0	5.3	100.0
1-Aug	5.1	4.8	5.6	4.0	2.6	3.0	3.2	2.2	1.7	2.6	3.9	4.2	3.7	3.3	4.0	4.0	5.8	5.0	6.1	5.3	5.1	4.4	4.5	6.0	100.0
2-Aug	5.1	6.4	4.8	4.0	3.2	2.4	3.3	2.6	2.8	3.2	3.1	3.6	4.5	5.3	5.0	3.7	5.8	4.6	4.4	4.1	3.1	4.7	5.0	5.3	100.0
3-Aug	5.2	4.7	4.8	4.1	3.6	4.3	4.0	3.0	3.3	3.1	3.1	2.8	2.5	4.3	4.8	4.7	4.9	5.1	6.2	5.8	4.7	3.9	3.8	3.3	100.0
4-Aug	9.2	6.4	5.4	7.6	5.2	3.9	3.3	3.4	3.6	4.2	2.7	3.1	1.6	2.8	2.6	3.4	4.2	4.2	5.3	5.4	3.2	2.9	3.6	2.9	100.0
5-Aug	3.8	4.1	4.7	3.1	5.5	4.6	3.8	3.7	4.3	4.7	5.2	4.2	4.4	4.5	4.7	4.9	4.8	4.5	4.8	4.2	2.6	3.1	2.7	3.1	100.0

Counts by Hour

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total
6-Aug	5.6	6.4	4.0	4.3	3.4	3.6	4.0	4.1	3.9	4.9	4.0	5.5	4.8	3.5	6.1	3.2	4.2	4.5	3.6	2.7	2.5	3.0	4.6	3.6	100.0
7-Aug	4.9	4.5	4.1	4.8	1.9	2.8	3.3	4.4	3.9	3.2	2.6	4.0	3.1	2.5	4.3	6.6	4.1	4.6	5.3	7.1	4.6	3.4	4.9	5.1	100.0
8-Aug	2.6	2.6	2.1	3.6	2.6	2.2	2.5	2.7	3.0	3.1	4.3	4.2	4.7	3.8	4.2	5.9	4.7	5.2	6.1	7.1	6.3	5.6	5.9	4.9	100.0
9-Aug	6.9	4.0	4.2	3.6	4.1	2.7	5.6	3.6	2.5	2.2	3.2	2.8	5.3	5.7	4.8	4.4	5.4	4.8	4.8	3.4	4.5	3.5	4.5	3.4	100.0
10-Aug	4.6	4.6	4.6	4.4	5.5	4.6	5.5	4.3	5.4	3.7	4.5	3.3	4.1	4.2	3.1	4.9	2.7	3.5	3.1	4.0	4.8	3.2	3.3	4.1	100.0
11-Aug	5.6	3.9	5.4	3.6	5.5	5.9	5.4	4.2	3.1	4.8	3.5	4.0	2.2	2.9	3.8	4.2	2.6	5.7	4.8	3.5	3.9	4.1	5.1	2.2	100.0
12-Aug	5.0	4.7	4.1	2.6	1.5	3.6	4.3	3.9	6.6	4.2	4.0	5.5	2.2	3.4	3.1	2.9	6.8	4.5	3.3	3.5	4.3	5.6	4.0	6.5	100.0
13-Aug	7.5	3.1	3.5	1.8	2.5	3.7	4.2	5.4	3.8	5.1	5.1	2.7	5.8	3.3	6.1	2.8	4.6	2.6	2.4	4.7	4.0	6.1	4.8	4.5	100.0
14-Aug	4.5	5.1	5.8	8.1	4.8	4.8	6.3	4.9	5.5	4.5	2.8	5.7	5.7	6.0	2.7	2.5	3.0	2.4	3.7	1.5	2.5	1.9	1.6	3.3	100.0
15-Aug	3.4	2.4	3.4	6.2	3.8	0.7	2.4	3.8	4.1	3.8	5.2	3.4	7.2	6.2	6.2	6.9	5.2	4.8	3.1	6.2	2.4	3.8	1.4	3.8	100.0
16-Aug	6.0	3.0	4.5	2.3	4.5	6.4	7.5	3.0	1.5	4.5	9.1	5.7	3.8	1.9	8.3	2.3	5.7	3.0	3.4	3.4	0.8	1.5	3.4	4.5	100.0
17-Aug	2.6	2.9	12.4	2.6	3.6	6.6	6.9	5.5	2.6	2.6	2.9	8.0	2.9	3.6	2.2	1.5	14.2	4.0	2.6	4.0	2.2	1.1	0.7	1.8	100.0
18-Aug	6.9	6.2	2.1	4.8	6.2	2.8	3.4	6.9	2.8	4.1	11.7	2.8	7.6	2.8	5.5	6.2	3.4	1.4	2.1	1.4	1.4	2.1	4.1	1.4	100.0
19-Aug	7.9	5.0	5.0	0.7	5.0	3.6	2.9	2.9	0.7	3.6	7.1	6.4	3.6	2.9	8.6	3.6	2.9	5.0	5.0	5.0	2.1	2.1	6.4	2.1	100.0
20-Aug	5.0	3.8	0.0	3.8	3.1	5.0	2.5	5.0	6.3	3.8	2.5	3.8	2.5	2.5	3.1	10.6	5.6	5.0	6.9	7.5	2.5	2.5	4.4	2.5	100.0
21-Aug	0.0	2.0	2.5	5.0	5.0	4.0	2.5	5.4	2.0	3.0	5.0	2.0	6.9	5.0	3.5	5.0	2.0	2.5	4.0	3.5	5.9	7.4	4.0	12.4	100.0
Total	4.8	4.5	4.0	3.8	3.4	3.3	3.2	2.9	2.8	3.2	3.7	3.7	4.1	4.4	4.9	5.0	5.5	4.9	5.2	5.0	4.7	4.5	4.4	4.3	100.0

Appendix A.37. Yentna River north bank sonar counts by sector, 7 July through 21 August 1998.

Date	Counts by Sector												Daily Total	Cum Total
	1	2	3	4	5	6	7	8	9	10	11	12		
7-Jul	32	43	54	94	47	36	14	13	6	2	1	0	342	342
8-Jul	24	34	45	61	77	46	16	12	5	0	1	2	323	665
9-Jul	27	49	66	90	70	84	24	8	9	2	0	1	430	1,095
10-Jul	47	10	89	91	106	81	45	40	18	20	18	16	581	1,676
11-Jul	68	54	114	147	136	139	86	77	44	31	25	26	947	2,623
12-Jul	27	42	63	101	143	161	85	55	17	24	26	13	757	3,380
13-Jul	20	52	111	126	91	89	49	22	9	17	3	12	601	3,981
14-Jul	10	41	59	107	111	89	78	29	18	21	16	13	592	4,573
15-Jul	8	18	37	79	77	88	49	28	11	10	6	10	421	4,994
16-Jul	34	44	65	101	102	115	45	41	27	31	13	24	642	5,636
17-Jul	28	59	41	61	64	76	37	73	26	44	22	34	565	6,201
18-Jul	33	85	169	221	211	179	171	170	72	81	53	72	1,517	7,718
19-Jul	32	289	1,064	1,582	968	631	504	317	429	133	108	136	6,193	13,911
20-Jul	14	195	767	1,975	1,290	772	812	825	286	114	36	39	7,125	21,036
21-Jul	215	131	886	1,826	1,410	564	409	737	426	66	46	48	6,764	27,800
22-Jul	85	160	533	880	796	377	165	460	145	55	32	25	3,713	31,513
23-Jul	34	60	184	303	474	567	149	70	49	25	12	10	1,937	33,450
24-Jul	25	92	355	623	893	1,016	296	151	96	60	12	7	3,626	37,076
25-Jul	96	339	822	871	1,256	1,451	577	171	283	119	24	24	6,033	43,109
26-Jul	104	646	756	838	1,046	1,426	722	276	98	128	31	18	6,089	49,198
27-Jul	117	717	886	1,153	1,577	1,934	971	322	153	192	42	27	8,091	57,289
28-Jul	86	665	816	1,113	989	1,479	849	354	330	523	90	39	7,333	64,622
29-Jul	160	838	1,717	1,941	1,676	2,008	1,364	542	349	817	337	94	11,843	76,465
30-Jul	188	862	2,387	2,367	2,027	1,664	998	535	152	224	78	156	11,638	88,103
31-Jul	40	718	2,312	2,285	1,967	1,653	1,093	514	157	178	73	171	11,161	99,264
1-Aug	50	347	1,484	2,387	2,547	1,868	1,178	551	144	141	66	106	10,869	110,133
2-Aug	77	387	1,700	2,696	2,915	2,336	1,154	457	111	199	52	99	12,183	122,316
3-Aug	60	289	1,323	1,776	1,859	1,570	782	313	92	80	29	53	8,226	130,542
4-Aug	27	279	1,358	1,540	1,202	919	661	233	77	30	5	22	6,353	136,895
5-Aug	26	89	558	818	738	590	300	126	61	36	13	20	3,375	140,270
6-Aug	66	103	367	369	289	266	154	80	33	22	10	17	1,776	142,046
7-Aug	64	307	628	358	210	61	45	24	16	17	10	7	1,747	143,793
8-Aug	139	263	387	189	165	149	55	26	23	29	9	14	1,448	145,241
9-Aug	81	137	106	72	118	156	61	27	25	28	14	12	837	146,078
10-Aug	69	94	157	257	300	189	113	116	42	20	16	22	1,395	147,473
11-Aug	49	68	102	136	123	79	43	54	17	23	15	11	720	148,193
12-Aug	33	77	215	153	66	71	45	32	13	17	12	13	747	148,940
13-Aug	23	82	199	120	71	56	47	19	11	17	0	10	655	149,595
14-Aug	11	58	135	79	61	46	35	23	16	36	1	4	505	150,100
15-Aug	16	41	63	85	55	35	13	15	3	17	1	1	345	150,445
16-Aug	13	39	24	30	35	20	14	13	7	5	5	3	208	150,653
17-Aug	18	23	31	32	25	21	10	6	15	2	4	0	187	150,840
18-Aug	15	45	62	38	12	12	13	5	6	2	4	4	218	151,058
19-Aug	24	83	72	44	38	10	13	14	7	5	2	3	315	151,373
20-Aug	14	52	31	12	19	6	7	13	7	3	5	3	172	151,545
21-Aug	51	57	31	30	22	6	3	8	2	3	1	4	218	151,763
Total	2,480	9,163	23,431	30,257	28,474	25,191	14,354	7,997	3,943	3,649	1,379	1,445	151,763	

Appendix A.38. Yentna River south bank sonar counts by sector, 7 July through 21 August 1998.

Date	Counts by Sector												Daily Total	Cum Total
	1	2	3	4	5	6	7	8	9	10	11	12		
7-Jul	0	19	12	12	7	0	5	3	0	1	2	0	61	61
8-Jul	19	14	6	5	4	1	0	6	19	2	2	1	79	140
9-Jul	13	21	10	7	3	6	0	1	2	1	1	4	69	209
10-Jul	40	44	78	61	51	28	26	27	20	16	17	15	423	632
11-Jul	71	78	92	85	84	100	31	13	28	14	15	22	633	1,265
12-Jul	26	43	214	279	153	313	32	16	14	17	19	16	1,142	2,407
13-Jul	12	20	92	101	70	115	7	9	6	7	6	4	449	2,856
14-Jul	4	14	62	74	43	55	5	4	4	8	5	5	283	3,139
15-Jul	4	12	69	72	49	61	8	2	5	25	7	11	325	3,464
16-Jul	7	35	109	129	108	171	9	12	11	8	12	7	618	4,082
17-Jul	9	55	217	244	120	296	11	13	25	10	15	14	1,029	5,111
18-Jul	12	114	666	788	516	1,125	91	39	62	77	48	41	3,579	8,690
19-Jul	36	416	1,803	1,711	1,127	2,953	136	106	119	110	51	48	8,616	17,306
20-Jul	37	669	2,705	2,515	1,366	4,105	173	125	165	110	88	55	12,113	29,419
21-Jul	17	325	1,881	1,934	1,055	3,634	196	96	96	110	53	84	9,481	38,900
22-Jul	81	207	912	942	512	1,701	106	46	47	47	35	34	4,670	43,570
23-Jul	7	95	710	806	572	1,115	138	39	39	56	29	24	3,630	47,200
24-Jul	27	244	1,242	1,468	842	2,141	127	42	58	53	35	25	6,304	53,504
25-Jul	39	237	1,261	1,514	881	1,769	131	41	66	41	26	26	6,032	59,536
26-Jul	102	368	1,517	1,790	995	2,109	121	39	48	55	108	27	7,279	66,815
27-Jul	63	352	1,643	1,782	978	1,687	120	64	64	60	117	31	6,961	73,776
28-Jul	91	500	2,111	1,984	1,096	2,134	335	91	93	76	58	48	8,617	82,393
29-Jul	151	631	2,208	1,899	1,252	1,637	229	114	142	130	77	78	8,548	90,941
30-Jul	74	653	2,398	2,187	1,422	2,160	332	185	194	184	111	117	10,017	100,958
31-Jul	61	637	2,575	2,208	1,361	1,763	306	152	133	152	83	82	9,513	110,471
1-Aug	74	348	2,042	1,939	1,117	1,411	267	112	109	110	62	73	7,664	118,135
2-Aug	38	457	2,435	2,067	1,231	1,304	281	96	103	119	47	51	8,229	126,364
3-Aug	110	467	2,666	2,305	1,271	1,421	283	96	105	94	66	58	8,942	135,306
4-Aug	24	221	1,190	1,176	576	683	128	43	46	58	18	22	4,185	139,491
5-Aug	68	254	1,077	956	566	732	184	86	68	79	41	51	4,162	143,653
6-Aug	24	222	775	732	359	488	123	58	46	40	23	31	2,921	146,574
7-Aug	20	123	407	370	223	322	40	37	22	12	9	14	1,599	148,173
8-Aug	12	140	473	435	252	441	85	53	44	37	38	29	2,039	150,212
9-Aug	23	99	407	337	200	332	52	36	39	37	24	24	1,610	151,822
10-Aug	22	95	305	304	182	354	54	36	45	24	22	28	1,471	153,293
11-Aug	36	116	277	273	152	259	42	36	35	34	18	26	1,304	154,597
12-Aug	34	3	112	268	149	137	41	58	44	24	23	16	909	155,506
13-Aug	30	7	61	302	140	149	57	35	41	38	14	16	890	156,396
14-Aug	34	7	71	195	123	102	40	28	28	18	6	15	667	157,063
15-Aug	23	18	94	44	25	45	8	6	10	5	6	6	290	157,353
16-Aug	59	21	78	33	23	27	5	5	3	4	4	3	265	157,618
17-Aug	25	29	44	69	46	32	10	7	2	4	2	4	274	157,892
18-Aug	20	10	24	29	16	17	13	3	7	5	1	0	145	158,037
19-Aug	5	7	38	41	17	12	6	4	5	4	1	0	140	158,177
20-Aug	8	16	36	34	26	15	11	3	7	3	1	0	160	158,337
21-Aug	17	13	43	64	24	20	4	1	9	4	2	1	202	158,539
Total	1,709	8,476	37,248	36,570	21,385	39,482	4,409	2,124	2,278	2,123	1,448	1,287	158,539	

Appendix A.39. Yentna River north bank sonar counts by sector, 7 July through 21 August 1998.
 Counts expressed as percentage of daily total.

Date	Counts by Sector												Daily Total
	1	2	3	4	5	6	7	8	9	10	11	12	
7-Jul	9.4	12.6	15.8	27.5	13.7	10.5	4.1	3.8	1.8	0.6	0.3	0.0	100.0
8-Jul	7.4	10.5	13.9	18.9	23.8	14.2	5.0	3.7	1.5	0.0	0.3	0.6	100.0
9-Jul	6.3	11.4	15.3	20.9	16.3	19.5	5.6	1.9	2.1	0.5	0.0	0.2	100.0
10-Jul	8.1	1.7	15.3	15.7	18.2	13.9	7.7	6.9	3.1	3.4	3.1	2.8	100.0
11-Jul	7.2	5.7	12.0	15.5	14.4	14.7	9.1	8.1	4.6	3.3	2.6	2.7	100.0
12-Jul	3.6	5.5	8.3	13.3	18.9	21.3	11.2	7.3	2.2	3.2	3.4	1.7	100.0
13-Jul	3.3	8.7	18.5	21.0	15.1	14.8	8.2	3.7	1.5	2.8	0.5	2.0	100.0
14-Jul	1.7	6.9	10.0	18.1	18.8	15.0	13.2	4.9	3.0	3.5	2.7	2.2	100.0
15-Jul	1.9	4.3	8.8	18.8	18.3	20.9	11.6	6.7	2.6	2.4	1.4	2.4	100.0
16-Jul	5.3	6.9	10.1	15.7	15.9	17.9	7.0	6.4	4.2	4.8	2.0	3.7	100.0
17-Jul	5.0	10.4	7.3	10.8	11.3	13.5	6.5	12.9	4.6	7.8	3.9	6.0	100.0
18-Jul	2.2	5.6	11.1	14.6	13.9	11.8	11.3	11.2	4.7	5.3	3.5	4.7	100.0
19-Jul	0.5	4.7	17.2	25.5	15.6	10.2	8.1	5.1	6.9	2.1	1.7	2.2	100.0
20-Jul	0.2	2.7	10.8	27.7	18.1	10.8	11.4	11.6	4.0	1.6	0.5	0.5	100.0
21-Jul	3.2	1.9	13.1	27.0	20.8	8.3	6.0	10.9	6.3	1.0	0.7	0.7	100.0
22-Jul	2.3	4.3	14.4	23.7	21.4	10.2	4.4	12.4	3.9	1.5	0.9	0.7	100.0
23-Jul	1.8	3.1	9.5	15.6	24.5	29.3	7.7	3.6	2.5	1.3	0.6	0.5	100.0
24-Jul	0.7	2.5	9.8	17.2	24.6	28.0	8.2	4.2	2.6	1.7	0.3	0.2	100.0
25-Jul	1.6	5.6	13.6	14.4	20.8	24.1	9.6	2.8	4.7	2.0	0.4	0.4	100.0
26-Jul	1.7	10.6	12.4	13.8	17.2	23.4	11.9	4.5	1.6	2.1	0.5	0.3	100.0
27-Jul	1.4	8.9	11.0	14.3	19.5	23.9	12.0	4.0	1.9	2.4	0.5	0.3	100.0
28-Jul	1.2	9.1	11.1	15.2	13.5	20.2	11.6	4.8	4.5	7.1	1.2	0.5	100.0
29-Jul	1.4	7.1	14.5	16.4	14.2	17.0	11.5	4.6	2.9	6.9	2.8	0.8	100.0
30-Jul	1.6	7.4	20.5	20.3	17.4	14.3	8.6	4.6	1.3	1.9	0.7	1.3	100.0
31-Jul	0.4	6.4	20.7	20.5	17.6	14.8	9.8	4.6	1.4	1.6	0.7	1.5	100.0
1-Aug	0.5	3.2	13.7	22.0	23.4	17.2	10.8	5.1	1.3	1.3	0.6	1.0	100.0
2-Aug	0.6	3.2	14.0	22.1	23.9	19.2	9.5	3.8	0.9	1.6	0.4	0.8	100.0
3-Aug	0.7	3.5	16.1	21.6	22.6	19.1	9.5	3.8	1.1	1.0	0.4	0.6	100.0
4-Aug	0.4	4.4	21.4	24.2	18.9	14.5	10.4	3.7	1.2	0.5	0.1	0.3	100.0
5-Aug	0.8	2.6	16.5	24.2	21.9	17.5	8.9	3.7	1.8	1.1	0.4	0.6	100.0
6-Aug	3.7	5.8	20.7	20.8	16.3	15.0	8.7	4.5	1.9	1.2	0.6	1.0	100.0
7-Aug	3.7	17.6	35.9	20.5	12.0	3.5	2.6	1.4	0.9	1.0	0.6	0.4	100.0
8-Aug	9.6	18.2	26.7	13.1	11.4	10.3	3.8	1.8	1.6	2.0	0.6	1.0	100.0
9-Aug	9.7	16.4	12.7	8.6	14.1	18.6	7.3	3.2	3.0	3.3	1.7	1.4	100.0
10-Aug	4.9	6.7	11.3	18.4	21.5	13.5	8.1	8.3	3.0	1.4	1.1	1.6	100.0
11-Aug	6.8	9.4	14.2	18.9	17.1	11.0	6.0	7.5	2.4	3.2	2.1	1.5	100.0
12-Aug	4.4	10.3	28.8	20.5	8.8	9.5	6.0	4.3	1.7	2.3	1.6	1.7	100.0
13-Aug	3.5	12.5	30.4	18.3	10.8	8.5	7.2	2.9	1.7	2.6	0.0	1.5	100.0
14-Aug	2.2	11.5	26.7	15.6	12.1	9.1	6.9	4.6	3.2	7.1	0.2	0.8	100.0
15-Aug	4.6	11.9	18.3	24.6	15.9	10.1	3.8	4.3	0.9	4.9	0.3	0.3	100.0
16-Aug	6.3	18.8	11.5	14.4	16.8	9.6	6.7	6.3	3.4	2.4	2.4	1.4	100.0
17-Aug	9.6	12.3	16.6	17.1	13.4	11.2	5.3	3.2	8.0	1.1	2.1	0.0	100.0
18-Aug	6.9	20.6	28.4	17.4	5.5	5.5	6.0	2.3	2.8	0.9	1.8	1.8	100.0
19-Aug	7.6	26.3	22.9	14.0	12.1	3.2	4.1	4.4	2.2	1.6	0.6	1.0	100.0
20-Aug	8.1	30.2	18.0	7.0	11.0	3.5	4.1	7.6	4.1	1.7	2.9	1.7	100.0
21-Aug	23.4	26.1	14.2	13.8	10.1	2.8	1.4	3.7	0.9	1.4	0.5	1.8	100.0
Total	1.6	6.0	15.4	19.9	18.8	16.6	9.5	5.3	2.6	2.4	0.9	1.0	100.0

Appendix A.40. Yentna River south bank sonar counts by sector, 7 July through 21 August 1998.
 Counts expressed as percentage of daily total.

Date	Counts by Sector												Daily Total
	1	2	3	4	5	6	7	8	9	10	11	12	
7-Jul	0.0	31.1	19.7	19.7	11.5	0.0	8.2	4.9	0.0	1.6	3.3	0.0	100.0
8-Jul	24.1	17.7	7.6	6.3	5.1	1.3	0.0	7.6	24.1	2.5	2.5	1.3	100.0
9-Jul	18.8	30.4	14.5	10.1	4.3	8.7	0.0	1.4	2.9	1.4	1.4	5.8	100.0
10-Jul	9.5	10.4	18.4	14.4	12.1	6.6	6.1	6.4	4.7	3.8	4.0	3.5	100.0
11-Jul	11.2	12.3	14.5	13.4	13.3	15.8	4.9	2.1	4.4	2.2	2.4	3.5	100.0
12-Jul	2.3	3.8	18.7	24.4	13.4	27.4	2.8	1.4	1.2	1.5	1.7	1.4	100.0
13-Jul	2.7	4.5	20.5	22.5	15.6	25.6	1.6	2.0	1.3	1.6	1.3	0.9	100.0
14-Jul	1.4	4.9	21.9	26.1	15.2	19.4	1.8	1.4	1.4	2.8	1.8	1.8	100.0
15-Jul	1.2	3.7	21.2	22.2	15.1	18.8	2.5	0.6	1.5	7.7	2.2	3.4	100.0
16-Jul	1.1	5.7	17.6	20.9	17.5	27.7	1.5	1.9	1.8	1.3	1.9	1.1	100.0
17-Jul	0.9	5.3	21.1	23.7	11.7	28.8	1.1	1.3	2.4	1.0	1.5	1.4	100.0
18-Jul	0.3	3.2	18.6	22.0	14.4	31.4	2.5	1.1	1.7	2.2	1.3	1.1	100.0
19-Jul	0.4	4.8	20.9	19.9	13.1	34.3	1.6	1.2	1.4	1.3	0.6	0.6	100.0
20-Jul	0.3	5.5	22.3	20.8	11.3	33.9	1.4	1.0	1.4	0.9	0.7	0.5	100.0
21-Jul	0.2	3.4	19.8	20.4	11.1	38.3	2.1	1.0	1.0	1.2	0.6	0.9	100.0
22-Jul	1.7	4.4	19.5	20.2	11.0	36.4	2.3	1.0	1.0	1.0	0.7	0.7	100.0
23-Jul	0.2	2.6	19.6	22.2	15.8	30.7	3.8	1.1	1.1	1.5	0.8	0.7	100.0
24-Jul	0.4	3.9	19.7	23.3	13.4	34.0	2.0	0.7	0.9	0.8	0.6	0.4	100.0
25-Jul	0.6	3.9	20.9	25.1	14.6	29.3	2.2	0.7	1.1	0.7	0.4	0.4	100.0
26-Jul	1.4	5.1	20.8	24.6	13.7	29.0	1.7	0.5	0.7	0.8	1.5	0.4	100.0
27-Jul	0.9	5.1	23.6	25.6	14.0	24.2	1.7	0.9	0.9	0.9	1.7	0.4	100.0
28-Jul	1.1	5.8	24.5	23.0	12.7	24.8	3.9	1.1	1.1	0.9	0.7	0.6	100.0
29-Jul	1.8	7.4	25.8	22.2	14.6	19.2	2.7	1.3	1.7	1.5	0.9	0.9	100.0
30-Jul	0.7	6.5	23.9	21.8	14.2	21.6	3.3	1.8	1.9	1.8	1.1	1.2	100.0
31-Jul	0.6	6.7	27.1	23.2	14.3	18.5	3.2	1.6	1.4	1.6	0.9	0.9	100.0
1-Aug	1.0	4.5	26.6	25.3	14.6	18.4	3.5	1.5	1.4	1.4	0.8	1.0	100.0
2-Aug	0.5	5.6	29.6	25.1	15.0	15.8	3.4	1.2	1.3	1.4	0.6	0.6	100.0
3-Aug	1.2	5.2	29.8	25.8	14.2	15.9	3.2	1.1	1.2	1.1	0.7	0.6	100.0
4-Aug	0.6	5.3	28.4	28.1	13.8	16.3	3.1	1.0	1.1	1.4	0.4	0.5	100.0
5-Aug	1.6	6.1	25.9	23.0	13.6	17.6	4.4	2.1	1.6	1.9	1.0	1.2	100.0
6-Aug	0.8	7.6	26.5	25.1	12.3	16.7	4.2	2.0	1.6	1.4	0.8	1.1	100.0
7-Aug	1.3	7.7	25.5	23.1	13.9	20.1	2.5	2.3	1.4	0.8	0.6	0.9	100.0
8-Aug	0.6	6.9	23.2	21.3	12.4	21.6	4.2	2.6	2.2	1.8	1.9	1.4	100.0
9-Aug	1.4	6.1	25.3	20.9	12.4	20.6	3.2	2.2	2.4	2.3	1.5	1.5	100.0
10-Aug	1.5	6.5	20.7	20.7	12.4	24.1	3.7	2.4	3.1	1.6	1.5	1.9	100.0
11-Aug	2.8	8.9	21.2	20.9	11.7	19.9	3.2	2.8	2.7	2.6	1.4	2.0	100.0
12-Aug	3.7	0.3	12.3	29.5	16.4	15.1	4.5	6.4	4.8	2.6	2.5	1.8	100.0
13-Aug	3.4	0.8	6.9	33.9	15.7	16.7	6.4	3.9	4.6	4.3	1.6	1.8	100.0
14-Aug	5.1	1.0	10.6	29.2	18.4	15.3	6.0	4.2	4.2	2.7	0.9	2.2	100.0
15-Aug	7.9	6.2	32.4	15.2	8.6	15.5	2.8	2.1	3.4	1.7	2.1	2.1	100.0
16-Aug	22.3	7.9	29.4	12.5	8.7	10.2	1.9	1.9	1.1	1.5	1.5	1.1	100.0
17-Aug	9.1	10.6	16.1	25.2	16.8	11.7	3.6	2.6	0.7	1.5	0.7	1.5	100.0
18-Aug	13.8	6.9	16.6	20.0	11.0	11.7	9.0	2.1	4.8	3.4	0.7	0.0	100.0
19-Aug	3.6	5.0	27.1	29.3	12.1	8.6	4.3	2.9	3.6	2.9	0.7	0.0	100.0
20-Aug	5.0	10.0	22.5	21.3	16.3	9.4	6.9	1.9	4.4	1.9	0.6	0.0	100.0
21-Aug	8.4	6.4	21.3	31.7	11.9	9.9	2.0	0.5	4.5	2.0	1.0	0.5	100.0
Total	1.1	5.3	23.5	23.1	13.5	24.9	2.8	1.3	1.4	1.3	0.9	0.8	100.0

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