

UPPER COOK INLET SALMON ESCAPEMENT STUDIES, 2003

by

David L. Westerman

T. Mark Willette

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Alaska Department of Fish and Game
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ABSTRACT

Sockeye salmon *Oncorhynchus nerka* escapements into four river systems of Upper Cook Inlet, Alaska, were estimated using side-scanning sonar equipment. Fish wheel catch was used to apportion sonar counts in the Crescent and Yentna Rivers. Estimated sockeye salmon escapements were 1,181,309 into the Kenai River, 359,633 into the Kasilof River, 122,457 into the Crescent River, and 180,813 into the Yentna River. Indices of escapements of other salmon species into the Yentna River were also obtained by sonar: pink *O. gorbuscha*, chum *O. keta*, and coho *O. kitsutch* salmon. Sockeye salmon in the Kenai River consisted primarily of age classes: 1.3 (57.9%); 1.2 (14.4%) and 2.3 (18.7%). Kasilof River sockeye salmon were primarily age: 1.2 (37.3%); 1.3 (26.1%); and 2.2 (29.3%). Age-1.3 sockeye salmon were the most abundant (51.1%) age class in the Crescent River, followed by age class 2.3 (20.3%), 1.2 (14.4%) and 2.2 (13.4%). Yentna River sockeye salmon were primarily age: 1.3 (63.6%), 1.2 (16.1%) and 2.3 (10.3%). 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 afternoon and evening in the Kenai River. The Kasilof River peak hourly counts on the north bank generally occurred in the afternoon and evening, but south bank peak hourly counts occurred during the morning hours. Peak hourly counts in the Crescent River occurred in the afternoon and evening and did not always reflect post meridiem high tides. Peak hourly counts for the Yentna River were recorded during the evening and early morning hours on both banks.

In addition to achieving project objectives, counts were again compared between substrate and substrateless counters on the north bank of the Kasilof River in 2003. Unlike the results from 2002 comparison counts, there was no substantial difference in escapement counts between the two methods.

KEY WORDS: Upper Cook Inlet, sockeye salmon, Kenai River, Kasilof River, Crescent River, Yentna River, Susitna River, age/sex/size, sonar, escapement enumeration, fish wheel, substrateless.

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 with the use of multiple transducer systems (MTS) which were arrayed linearly in up-looking positions (Namtvedt et al. 1977). Transition from MTS to side-scanning sonar (SSS) occurred in the Kenai River in 1977 when all counts were derived with a 1974 model MTS, except during the period 12 July through 3 August when a 1977 model SSS was employed on the north bank. Similarly, SSS was utilized on the north bank of the Kasilof River in 1977, but south bank counts were derived by use of a MTS array. By 1979, both banks of the Kasilof River were utilizing side scan sonar. An attempt to utilize MTS equipment in the Susitna River in 1976 failed, but enumeration of salmon escapement with SSS was expanded to the Susitna River in 1978. Escapement enumeration utilizing SSS began at the Crescent River in 1980 below the outlet of Crescent Lake. The Kenai River counting site is located at river mile (RM) 19.5. The Kasilof River counting site was relocated from the outlet area of the lake to approximately RM 10.5 in 1985. The Susitna River counting site was abandoned in 1985 when recurrent flooding rendered the site untenable, and counting operations began on the Yentna River, a major tributary of the Susitna River, in 1986. The Crescent River counting site was relocated to approximately RM 1.5 in 1984. Prior to 2003, artificial substrates were utilized in all the rivers except the Kasilof. Substrateless counters were deployed for the first time in the Kenai River in 1987 (north bank) and 1993 (south bank), Crescent River (both banks) 1988, Yentna River in 1994 (south bank) and 1995 (north bank) and in the Kasilof River in 2003 (both banks). Various authors between 1974 and 2002 have documented results of escapement enumeration studies.

The primary program objectives of UCI escapement projects in 2003 were to estimate: (1) the daily and cumulative number of sockeye salmon entering the Kenai, Kasilof, Crescent, and Yentna Rivers; and, (2) determine the age, length, and sex composition of those escapements.

METHODS

Bendix Corporation 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 transducer frequency was 515Khz. Two- and four-degree transducer elements were multiplexed in an alternating mode. The manufacturer preset the counting threshold at approximately -38dB. 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 and for the first time in the Kasilof River. Technicians tested the counters for proper operation prior to deployment and counter repairs were completed by Russ Thynes of *Petersburg Electronics*¹ prior to the start of operations.

Project operational dates were: 1 July through 10 August on the Kenai River; 15 June through 10 August on the Kasilof River; 27 June through 3 August on the Crescent River; and 7 July through 6 August on the Yentna River. Counting operations ceased when daily counts were < 1% of the cumulative count for 3 consecutive days. Kenai and Kasilof River escapement projects cessation criteria were not instituted until the end of commercial fishing.

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 database program (Excel) that calculated a daily average hourly count for sonar sectors by

$$C_a = C_b/N, \quad (1)$$

where:

C_a = average count per sector per hour;

C_b = valid hourly counts for affected sector and adjacent 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.

Temporal and spatial 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.

Transducer orientation was accomplished by remotely controlled rotators on the north bank of the Kenai River, the north bank of the Kasilof River and both banks of the Yentna River. Correct orientation of the acoustic axis was tested periodically by the use of an artificial target. A sealed, weighted plastic sphere was 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. A transducer would be moved nearer shore as water depth increased. Short weirs placed downstream within a few feet of the transducer prevented fish from passing behind or too near the transducer.

Counters were generally monitored from 0700 to 0300 hours on the Kenai River and 0700 hours to 2400 hours on the Kasilof River. At Crescent River, counters were monitored throughout the day, but observations were concentrated when passage rates were at daily peaks. Yentna River counters were monitored 0600 to 0200 hours on the south bank and 0700 to 2400 hours on the north bank. In addition to regularly scheduled monitoring, intensified monitoring was conducted during episodic periods of high rates of 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. The visual counts were compared to counts produced by the counter and adjustments to the counter (calibration) were made if a relative error greater than

20% existed. However, operators typically made adjustments to the counters to adjust for less than 10% relative error. The basic counter adjustment consisted of changing the pulse repetition rate. During periods of low density passage (<500 fish per hour), Kenai and Yentna River oscilloscope/counter observations were made at a minimum of 1 hour per bank each day. When passage rates reached 500 fish per hour, minimum observation time increased to more than 2 hours per bank per day. Kasilof and Crescent River counters were generally monitored for a minimum of 2 hours per bank per day

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 for different lengths of time each day at all four sonar sites, depending on the strength of the salmon run. The Yentna and Crescent River fish wheels were generally stopped when operators estimated the minimum sample size of 1% of the previous day's escapement had been achieved. In 2003, a minimum of 500 sockeye salmon was needed each week for age, length and sex evaluations from the Kenai and Kasilof Rivers. Crews on the Kasilof and Kenai Rivers attempted to catch an average of 70 to 80 fish per day. Scale samples for aging and mid-eye to fork-of-tail length (mm) and sex information were collected for all sockeye salmon sampled and were used to aid in the determination of river-of-origin of stocks caught in the commercial fishery. Age, sex ratios and mean lengths were calculated by grouping samples together by weekly time (sample) periods for the Kasilof and Kenai Rivers, and for the season for the Crescent or Yentna Rivers.

Because of their size and number, Dolly Varden char were included in sonar count apportionment at Crescent River. Typically, few Chinook salmon have been captured in the fish wheel at Crescent River. The low catch rate for Chinook salmon may be attributed to run timing for this species which places the majority of the run in the river before counting operations begin or that Chinook salmon are not accessible to the fish wheel because of where they migrate in the river. Dolly Varden char and Chinook salmon had been lumped together for sonar count apportionment purposes prior to 2000, but sonar counts were apportioned to each of these species in 2000 - 2003.

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 recorded in the Kasilof and Kenai Rivers were treated as sockeye salmon in 2003.

A second counter with the transducer mounted on an 18 m aluminum substrate was deployed for 18 days on the north bank of the Kasilof River beginning 23 July. The substrateless counter was moved upstream approximately 13 m from its original position and the substrate counter was deployed in its place. Data from the substrateless counter continued to be used for escapement estimates. Both counting units used a 515 kHz transducer, a 12 - V battery/solar power source, pulse width of 100 ms, beam widths of 2° and 4° or alternated between the two. Both counters were monitored and calibrated in a similar manner by comparing oscilloscope counts to those generated by the counter. Data was compiled and tabulated in a similar manner. Counting ranges for both counters depended on fish distribution, but in the case of the substrateless counter,

counting range was also dependent on bottom profile. Some of the differences between the two units include hit criteria which was fixed and could not be adjusted, power output (voltage peak to peak), and weir width. The weir for the substrate counter was wider than that for the substrateless counter. The power output of the substrate counter was 30 V, and 40 V or more for the substrateless counter, depending on acoustic noise levels observed near the transducer (rock induced). Consequently, the dead range was set to avoid rock induced acoustic noise and the intermittent counts produced by such noise. The substrate transducer was located 1.2 m. from shore and the substrateless transducer was deployed 2.1 m. from shore as dictated by the bottom profile.

Fish counts from the substrateless and substrate-mounted sonars were visually compared by plotting counts from the two units by date, time of day, and sector (distance from shore). Two autocorrelation functions were calculated using the data from each unit to determine the time between independent observations. Two regression analyses were then conducted with the counts from the substrateless and substrate-mounted sonars used as dependent variables. F-tests were conducted to test whether the slope of each regression equation differed between the two.

RESULTS

Kenai River

An estimated 1,181,309 sockeye salmon migrated past the Kenai River sonar site (Table 1) from 1 July through 10 August. No other species of salmon were apportioned from the escapement estimates during this time period (Table 2). The pre-season return estimate for the Kenai River was 2.04 million sockeye salmon, but as the season progressed the estimate was increased to 3.2-3.9 million sockeye salmon. The late-run sockeye salmon optimum escapement goal (OEG) is 500,000-1,000,000 sockeye salmon. The desired in-river goal range for total returns <2.0 million is 600,000 to 850,000 sockeye salmon, for returns ranging from 2.0 to 4.0 million is 750,000 to 950,000 and for over 4.0 million is 850,000 to 1.1 million. The escapement in 2003 was the third highest since 1978.

Eighty percent of the sockeye salmon escapement passed the sonar counters in 21 d (Table 3; mean = 21 d; range for 1979 to 2002 is 6 to 39 d). In 2003, the midpoint of the escapement was 19 July, 3 days earlier than the mean. The escapement peaked on 17 July when 108,890 salmon were detected (Figure 2). Two other distinct peaks in the daily escapement also occurred on 12 July and 22 July. Sockeye salmon migration along the north bank of the river accounted for 49% of the total escapement (Table 4). Run timing was similar for both banks throughout the season (Figure 3). Passage rates were greater on the south bank during the 2 days of the peak (17 and 18 July).

Salmon were most abundant on the north bank in sector 3 (Table 5; Figure 4). The north bank 12 sector counting range depended primarily upon fish distribution from shore and varied through the season from 14.3 to 25.9 m., with 81% of the migration occurring within the first 6 sectors (7-13 m)

of the counting range. The north bank transducer was located approximately 5 m from the bank. Salmon were most abundant in sector 3 along the south bank. The south bank 12-sector counting range varied slightly from 5.2 to 6.1 m. with 82% of the migration occurring within the first 5 sectors (2 m) of the counting range. Fish distribution from shore was not as variable on the south bank as the north bank. The south bank transducer was located approximately 3 m from the bank.

Salmon passage along the north bank was consistent over the 24-hour period, with passage rates exceeding 4.2% of the daily total (required for a constant passage rate) from 1500 through 0300 hours (Figure 5 & 6). North bank fish targets recorded during the hours when fish passage exceeded 4.2% per hour accounted for 62.3% of the bank total. A similarly pronounced pattern of fish passage occurred on the south bank, where 71.5% of the fish migrated past the counter from 1200 through 2400 hours.

Actual fish wheel catch was 2,749 sockeye salmon (Table 6), from which 1,068 scale samples, sex determinations, and lengths were obtained (Table 7). The largest component of the sockeye salmon escapement was age-1.3 fish (57.9%), followed by -1.2 (14.4%), -2.3 (18.7%) and -2.2 (8.0%). Mean length by sex and male-to-female ratios (Table 8) were within historical bounds for age-1.2 and -1.3 fish. Female spawners of the major age classes constituted 56% of the total escapement.

Late run sockeye salmon escapement through the Russian River weir (Berkhahn, 2003 pers. comm.) amounted to 157,469 in 2003, the highest return past the weir on record (Table 9). An additional 27,474 sockeye salmon were estimated below the Russian River weir bringing the total Russian River sockeye salmon escapement estimate to 184,943. The escapement of sockeye salmon into Hidden Lake was the lowest since 1995, with 12,094 migrating past the Hidden Creek weir (Fandrei, 2003 pers. comm.) A linear regression analysis of the Russian River, Hidden Creek and Kenai River sonar escapement estimates is shown in figure 7.

Kasilof River

The optimal escapement range for this system is 150,000 to 300,000 sockeye salmon. A total of 359,633 sockeye salmon were counted at the Kasilof River sonar site from 15 June through 10 August (Table 10). The midpoint of the sockeye salmon escapement occurred on 14 July, 2 d later than the mean for the previous 24 years (Table 11). Peak passage was recorded on 16 July when 28,756 salmon passed the counters (Figure 2). Eighty percent of the escapement occurred in 34 d, 2 d less than the historical mean (1979-2002). No other species of salmon was apportioned from the sonar counts.

Salmon counts were evenly distributed between both banks (Table 4). Spatial distribution adjacent to the north bank was near shore (Figure 8), where 80% of the salmon migrated within the first 4 sectors of the transducer (Table 5). Salmon were most abundant in sectors 2 and 3. The counting range (12 sectors) for the north bank varied from 18.6 m early in the run to 5.2 m at the end. Fish passage was slightly less shore oriented on the south bank where 84% of the salmon passed within the first 6 sectors (5.8 m) of the transducer. Fish were most abundant in sectors 2-4. The south

bank counting range was also variable (12 sectors), ranging from 18 m during the first half of the run to 4.0 m near the end.

The average hourly passage rate on the north bank met or exceeded the average for a consistent passage rate (4.2%) between 1200-2400 hours (Figure 6 & 9). Fish detected during these hours accounted for 61.9% of the north bank total. Passage rates adjacent to the south bank exceeded 4.2% of the total between 0500-0900 and 1400-1700 hours. Salmon counted during these hours accounted for 42.7% of the south bank total.

Sockeye salmon escapement was also estimated for three index streams (Bear, Moose and Glacier Flats). The escapement estimate for Bear Creek was 71,654 sockeye salmon, of which 9,997 were killed for artificial propagation at the Trail Lakes hatchery (Fandrei pers. comm., Table 12). Stream surveys estimated 14,514 sockeye salmon in Moose Creek and 9,580 sockeye salmon in Glacier Flat Creek (peak surveys). Four regression analyses were conducted to compare escapement counts at these three streams with Kasilof River sonar counts (Figure 10).

A total of 1,704 sockeye salmon were captured in the Kasilof River fish wheel (Table 13), of which 1,298 were sampled for age, length, and sex characteristics (Table 14). Age, -1.2 (37.3%), -2.2 (29.3%) and -1.3 (26.1%) sockeye salmon were the predominant age classes. Mean lengths and male to female ratios for the major age classes fell within historical bounds (Table 15). Female spawners comprised 55% of the major age classes.

Sonar counts using two slightly different techniques were compiled over the last 18 days (32%) of the season. Daily sonar estimates produced by the substrate and substrateless counters are provided in Table 16 and are illustrated in Figure 11. The 22,555 fish recorded by the substrateless counter represented approximately 12.5% of the total fish passage enumerated on the north bank (23 Jul – 10 Aug.). The substrate counter counted 24,372 fish, 7% more than the substrateless unit. The hourly trend for 18+ days of data collection was not substantially different between counters (Figure 12). Distribution from shore by sector suggested the fish passing the substrateless counter were slightly more bank-oriented. However, 90% or more of the fish passage occurred within the first 5 sectors (within 3 m) of each transducer indicating little off shore movement of salmon passing either counter. Counting ranges for both counters varied from 5.2 m to 9.1 m, with the substrate averaging 6.9 m and the substrateless 5.9 m. The dead range for both counters was .75 m. The substrate was located 1.2 m from shore and the substrateless 2.1 m from shore making the area effectively covered from shore by both counters nearly the same (~8-9 m).

Autocorrelation functions indicated the time between independent counts was 10 hrs with the substrateless sonar and 24 hrs or more with the substrate-mounted sonar (Figure 13). Since hourly counts could not be considered independent, daily total counts were used in subsequent regression analyses to compare counts between the two units. The slopes of two regression equations estimated using the substrateless and substrate sonar counts as dependent variables were not significantly different from one.

Crescent River

Sockeye salmon escapement into the Crescent River was second highest on record (Table 1). The total escapement of sockeye salmon was estimated at 122,457 fish from 27 June through 3 August (Table 17) out of a total of 138,260 fish counted. The desired sockeye salmon escapement goal for this system is 25,000 to 50,000 fish.

The midpoint of the sockeye salmon escapement occurred on 14 July (Table 18), 3 d earlier than the historical average date of 17 July. The peak in daily salmon passage occurred on 13 July (Figure 2) when 14,224 fish targets were recorded. Eighty percent of the escapement passed the site in 28 d, five days longer than the historical mean. Run timing between banks was similar (Figure 3), however, 65% of the fish migrated along the north bank (Table 4).

Spatial distribution of fish targets was strongly shore oriented, with > 80% of the counts within 1.0 m of the transducer on the north bank (Table 5 & Figure 14) and >90% of the counts within 1.0 m of the south bank transducer. A greater than expected (4.2% of the daily total) passage rate occurred adjacent to the north bank from 1100-2200 hours (Figure 6 & 15), accounting for 75.9% of the bank total. On the south bank the highest hourly passage rates occurred between 1200-2000 hours, accounting for 63.4% of the bank total.

The Crescent River fish wheel captured 2,278 sockeye salmon (Table 19), of which 1,080 (Table 20) were sampled for age, length, and sex data. Age-1.3 fish were the most abundant (51.1%), with other major components of the escapement represented by age-2.3 (20.3%), -2.2 (13.4%) and -1.2 (14.4%) fish. Mean lengths and male-to female ratios for the major age classes fell within historical bounds (Table 21). Females accounted for 53.1% of the total sockeye salmon escapement.

Crescent River hourly fish passage rates peaked during the afternoon and evening hours but not necessarily following high tides (Figure 16). The association with post meridiem high tide was not as clearly evident as observed in 2002.

Yentna River

From 7 July through 6 August, 425,219 salmon were counted at the Yentna River sonar site, of which an estimated 180,813 were apportioned to sockeye salmon (Table 22). The return of sockeye salmon in 2003 was the highest on record since sonar operations began on the Yentna River in 1981. The escapement goal range for the Yentna River is 100,000 to 150,000 sockeye salmon. Sonar counts apportioned to species other than sockeye salmon were: pink salmon, 167,384; coho salmon, 45,222; chum salmon, 30,349; and other fish including chinook salmon, 1,451.

The midpoint of the sockeye salmon escapement occurred on 21 July, two days earlier than the historical mean (Table 23). Eighty percent of the escapement passed the counters in 17 d. The

peak in daily passage rate occurred on 20 and 21 July, when 21,227 and 21,999 sockeye salmon passed the counting site on consecutive days. Run timing was slightly different by bank (Figure 3) with peaks being more pronounced on the south bank. In accord with the historical trend, 71% of the salmon migrated adjacent to the south bank (Table 4).

Salmon passage was shore oriented (Figure 17). On the north bank, 83% of the salmon migration occurred within the first 3 sectors or within an average range of 3.5-4 m from the transducer. On the south bank, 81% of the salmon were counted within the first 5 sectors, an average range of 3.5-4 m from the transducer.

Fish passage rates increased during early evening hours (Figure 18) and generally remained above the 4.2% required for a constant passage rate through the early morning hours. The seasonal hourly passage rate on the north bank met or exceeded the average for a constant hourly passage rate (4.2%) from 1700 through 0300 hours, except 2000 hours (Figure 6). Higher than average passage rates occurred between 1200 and 0200 hours on the south bank with the exception of 1500 hours. Counts accumulated during periods of above average passage rate accounted for 59.8% of the north bank total and 68.6% of the south bank total.

A total of 6,785 fish were captured in the north bank fish wheel and 13,573 in the south bank fish wheel at the Yentna River sonar site (Tables 24 & 25) for a total catch of 20,358 fish. The north bank fish wheel caught 2,331 sockeye salmon (34%), and 6,095 (45%) sockeye salmon were caught in the south bank fish wheel. Both banks combined for a total fish wheel catch of 8,426 sockeye salmon, 41.4% of the total fish wheel catch by species. Age, sex, and length data was collected from 812 sockeye salmon (Table 26). The major components of the escapement were ages 1.3 (63.6%), 1.2 (16.1%) and 2.3 (10.3%). The number of age-1.3 sockeye salmon was considerably higher than average and is second only to the contribution of age-1.3 sockeye salmon in 1986. Average lengths for all age classes and male-to-female ratios fell within historical bounds (Table 27). Female spawners composed 46.2% of the major age classes sampled.

Pink salmon counts peaked on the 21, 22 and 23 July when approximately 40,000 passed the counters. Another 22,000 passed on the 2 and 3 August and were still running strong when operations ceased on the 6 August. Peak counts of chum and coho salmon occurred during the first week of August and these species were also still running strong when operations ceased.

DISCUSSION

The 2003 field season and sonar counting operations were similar to past years except that all rivers had unusually high escapement numbers of returning sockeye salmon. 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 (42.5 %).

Kenai River

The sockeye salmon escapement for 2003 was the third highest since sonar operations officially began on the Kenai River in 1970. The sockeye salmon escapements in 1987 and 1989 were greater when about 1.6 million sockeye salmon were counted each year. The higher escapements in these years can be attributed to the Glacier Bay oil spill in 1987 and the Exxon Valdez oil spill of 1989 when commercial fishing was restricted for part of or all of the fishing season during these years.

Species apportionment of sonar counts was discontinued in 1995 and ensuing years because we perceived a potential problem in the apportionment process when a disproportionate number of non-sockeye salmon species appeared in the fish wheel catch (Davis 2001). 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 except those years when pink salmon enter the river (usually starting in August). Salmon species other than sockeye salmon composed 1.0% of the total fish wheel catch in 1995, and 4.0% in 1996 (a pink salmon year). In 1997, protracted run timing required 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 by species was made when pink salmon numbers accounted for 2.0% of total targets. Species apportionment began in August 1999 when species other than sockeye salmon exceeded 5.0% of the total fish wheel catch. The fish wheel catch prior to 1 August 1999 had been 97.4% sockeye salmon. In 2003, 97.2% of the fish wheel catch was sockeye salmon. Counts of species other than sockeye salmon are of no value as index counts as extended run duration (coho or pink salmon), passage upstream outside the ensonified area (coho and chinook salmon), and disproportionate fish wheel catch combine to limit the usefulness of these data. Based on these data we have established criteria for beginning apportionment to species in the Kenai River. When the fish wheel species composition contains 5 % of a species other than sockeye, and in our best professional judgement the presence of other species at or near the 5 % level is a trend, then apportionment of sonar counts will begin. This guideline was developed primarily to accommodate situations where run timing of sockeye and pink salmon overlap.

Prior to 1999, a minimum fish wheel sample of 150 fish was required to constitute a period for apportionment. Several days may have been required to attain an adequate sample size. This method of apportioning sonar counts was replaced by daily apportionment based on actual fish wheel catch in year 2000 and was continued through year 2001. Altering the method by which sonar counts were apportioned did not significantly change the final estimates ($p < 0.05$; S. Carlson, ADF&G, Soldotna, personal communication) and was more defensible from a biostatistical viewpoint. In 2002 and 2003, a minimum of 500 sockeye salmon was sampled from the fish wheel on a weekly basis.

Fish distribution on the south bank was occasionally affected by human disturbances in the water or from activity on the boat dock which is located immediately below the weir. Fish usually moved offshore and out of the counting range for several minutes until such activities ceased (sometimes as much as 10-15 minutes or longer, depending on the duration of the disturbance). Experimental sonar counters were deployed side by side with the Bendix counters in 2001, 2002 and 2003 on both banks and activity in the water and on the south bank dock were higher than in years when only the Bendix counters were deployed.

In 2002, a computer was successfully interfaced with the south bank counter and used to tabulate daily escapement estimates. In 2003, the north bank counter was interfaced with a laptop computer and used to tabulate north bank escapement estimates. Midway through the season, the north bank counter malfunctioned and was replaced by a backup counter, eliminating the availability of computer generated escapement data. Data had to be entered into a computer manually for the second half of the season. Recording escapement data directly onto a computer eliminated transcription errors and reduced the amount of time needed to finalize the previous day's data.

Kasilof River

Sockeye salmon escapement into the Kasilof River was the second highest estimate on record since sonar operations began in 1970. The highest estimate occurred in 1985 when over 505,000 sockeye salmon passed the counters.

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 enter the river primarily in August (G. Kyle, ADF&G, Soldotna, personal communication). 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 is 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. We are uncertain as to the causes of this perceived bias, but fish wheel position, river current pattern or other similar environmental factors could be influencing chinook migration patterns at this site. The historical proportion of Chinook salmon in the north bank fish wheel catch is 2.4% (range 0.01% to 5.1%). Some of the captured Chinook salmon were adipose fin clipped in the past, indicating they were probably from the enhanced Crooked Creek stock, a stream located several miles downstream of the counting site. The error associated with apportionment of Chinook salmon counts to sockeye salmon is more acceptable than an inflated Chinook salmon estimate.

Due to the make-up of the natural substrate, the Kasilof River sonar site, was the last sonar site in UCI where artificial substrates were utilized. In 2002, comparison counts between substrateless and artificial substrate counters were made to evaluate the feasibility of using substrateless counters in 2003. The 2002 results indicated that substrateless counters would work on the Kasilof River

(Westerman, 2002). The north bank comparison results in 2002, however, were substantially different, with the substrateless unit counting twice as many fish as the substrate counter. Because of this count discrepancy on the north bank in 2002, the substrate was again deployed 23 July through 10 August 2003 for additional analysis.

Adequate water depth in late July allowed for the satisfactory deployment of both substrate and substrateless counters and minimized the risk of off shore dispersion of fish. The counters were deployed within 13 m of each other, and in the only locations that would support two different transducers. Fish are more dispersed offshore early in the migration, when water levels are relatively low, and exposed or shallow gravel bars influence fish distribution. The artificial substrate is also known to disperse fish, particularly when water levels are low. The deployment and successful operation of two independent counters on the north bank is best achieved during mid or late July because of the effects that shallow water level, bottom profile and boulders have on fish behavior in early July.

In 2003, comparison of daily counts indicated no significant difference between the substrate and substrateless counters (Figure 13). No substantial difference in fish distribution between the two units was apparent when considering the overall area covered by both transducers; which includes counting ranges, dead ranges and distance from shore. Sector counts indicate that the majority of fish passed within the counting range of both counters. Offshore distribution of fish at both locations was related to the influence of short weirs, which force fish to move far enough offshore to ensure passage through the transducer beam. The substrate weir, wider of the two, diverted fish away from shore for about 4.5-6.0 m, whereas the substrateless weir diverted fish only about 3.3-3.6 m, from shore. The substrateless weir, according to Technicians, may not have been wide enough to prevent a few fish from passing inside the dead range of the transducer, that area nearest the transducer where fish signals may not be counted because of extraneous noise. Technicians noted that on two different occasions (26 July and 2 August), the substrateless weir had been bumped by large debris (tree) during the night and had shifted position enough to allow fish to pass behind the transducer and go undetected. The differences in counts from these days were two of the highest during the 18 days of comparisons. Problems with fish passing too near the substrateless transducer were also noted on 24 July, probably accounting for the difference in counts on the 23 and 24 July. The substrate counter did not experience the problem of fish passing too close to the dead range because of the width of the weir. Boulders immediately upstream (about 1-2 m at both sites) of the transducer influenced the dead range setting for both counters, creating acoustic noise that forced us to maintain a dead range of about 0.75 m. A lesser dead range would have generated false counts in sector 1. Detection of fish (by oscilloscope) inside the dead range was more apparent on the substrateless counter than on the substrate. Adjustments to the weir, dead range and power output were made to help alleviate this problem. In both cases, fish were strongly shore oriented and most passed within the ensonified area.

Visual observations from the oscilloscope indicated that hit criteria on the Bendix sonar were set properly to ensure the most accurate reflection of fish passage by sector. The substrate (6" aluminum tube) is known to affect fish behavior by forcing a proportion of fish offshore, causing them to cross through the transducer beam in deeper water (King 1986). In 2002, a proportionately

higher number of fish passed farther offshore when crossing the substrate than when passing through the substrateless transducer beam. The low number of fish detected in the outer sectors, the high water level and water velocity of late July does not appear to have had a major impact on offshore fish distribution in 2003. Offshore movement was not visually observed on either counter. Increasing water level and water velocity forces fish to migrate closer to the bank, for ease of movement. Time of day and sunshine, factors known to influence fish behavior, did not influence distribution.

The substrateless counter offers several advantages over the substrate counter for estimating sockeye salmon escapement in the Kasilof River. 1.) The amount of debris, particularly large woody debris from limbs to full-size cottonwood or spruce trees, capable of catching on the substrate, has been a constant maintenance problem (and safety issue) with substrate counters. 2.) Fish will move more naturally, without having to cross a 6" aluminum obstacle, resulting in reduced fish speed and more natural fish distribution patterns. 3.) Adjustments to the pulse repetition rate will more accurately reflect fish distribution in the middle sectors. 4.) The manpower requirement to deploy, maintain and breakdown equipment will be much less.

Crescent River

Escapement estimates for sockeye salmon were the second highest on record since sonar began operating on the Crescent River in 1979. The estimate in 1985 of 128,628 is the highest on record.

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 (1993) 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 1994a). We believe 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 after 1993 (Davis and King, 1993). We also concluded that these fish were migratory based on morphological characteristics and results of marking all Dolly Varden char captured in 1993 through 1995. Of the Dolly Varden char marked in 1993 through 1995, 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 1994a, 1996). In 2003, fish wheel catch resulted in 6,339 counts being apportioned to Dolly Varden char, or 4.6 % of the total count. The fish wheel catch of Chinook and coho salmon was insignificant (>1%), and the chum and pink salmon catches were still high when counting operations ceased.

The physical characteristics of the riverbed are changing at the Crescent River sonar site. Flooding in the fall of 2002 cut a small channel into the north bank about 100 m downstream of the counting site and added to the size of gravel bars that have been building in the middle in the river for the

past 10 years. The main current remains on the south side of the river, but the river filled in some of the channel on that bank, making the slope a little less steep and more suitable as a site for the sonar counter. The north bank has an adequate location for counting purposes, but is more influenced by gravel bars.

Yentna River

Sockeye salmon escapement in 2003 was the highest ever recorded since sonar operations began on the Yentna River in 1981.

River levels did not halt any aspect of sonar operations in 2003 except on 29 July, when the south bank fish wheel was not operated because of high water. The south bank fish wheel catch from the previous day was used to apportion sonar counts on the south bank for 29 July only. River flows were high (at times about 0.3 m. below flood stage at the Lake Creek gauging station) until 18 July when water levels dropped and remained low until 28 July when water levels increased again. Water level dropped over 1.3 m. between 30 July and the end of operations on August 6. Data collected by Barrett (1985) utilizing marked fish indicated that upstream migration in this system is slowed during episodic high flow events.

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 catches from 1200 to 2400 hours, and pink salmon were more frequently captured from 0600 to 1200 hours. This observation identified a potential source of error in the use of total daily adjusted fish wheel catches to apportion sonar counts. To evaluate this potential bias, fish wheels were operated in three 6-hour time blocks over a 24-hour period in 1993 and 1994. Analyses of data from these two years indicated the degree of bias did not justify the additional expense of operating the fish wheels in this manner, so this method of fish wheel operation was discontinued in 1995. In 2003, both fish wheels were usually operated for 4 to 8 hours per day, depending on catch rate, and three times daily: once in the morning, afternoon and evening.

Enumeration activities ceased on the Yentna River on 6 August. Migratory timing information and escapement estimates could not be calculated for pink, chum and coho salmon, because migration continued past the end of sonar operations in 2003. The mean coho and chum salmon escapement estimates for 1981 to 1984 was 78.7% of the chum salmon escapement and 84.8% of the coho salmon escapement, which was recorded by 12 August (King and Tarbox 1986). Spatial distribution of chinook salmon is not known to be as bank oriented as sockeye salmon and therefore an unknown proportion of the migrating fish may pass outside the ensounded areas and would also avoid capture by the fish wheel. Escapement estimates for other species of salmon in the Yentna River should not be considered a reliable analysis of run strength.

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Table 1. Estimated sockeye salmon escapement recorded by side-scanning sonar in the Kenai, Kasilof Crescent, Yentna and Susitna Rivers 1978-2003. Escapement revised for Kasilof, 1980.

Year	System					
	Kenai R. ^a	Kasilof R. ^b	Crescent R.	Yentna R.	Susitna R	Susitna R/Yentna R
1978	398,900	116,600	c	c	94,400	
1979	285,020	152,179	86,654	c	156,980	
1980	464,038	184,260 ^k	90,863	c	190,866	
1981	407,639	256,625	41,213	139,401	340,232	
1982	619,831	180,239	58,957	113,847		189,772 ^d 215,856 ^f - 265,332 ^g
1983	630,340	210,271	92,122	104,414	112,314	176,114 ^h
1984	344,571	231,685	118,345	149,375		194,480 ^h - 279,446 ^g
1985	502,820	505,049	128,628	107,124	c	227,924 ^h
1986	501,157	275,963	20,385 ⁱ	92,076		
1987	1,596,871	249,250	120,219	66,054		
1988	1,021,469	204,000 ^j	57,716	52,330		
1989	1,599,959	158,206	71,064	96,269		
1990	659,520	144,136	52,238	140,290		
1991	647,597	238,269	44,578	109,632		
1992	994,798	184,178	58,229	66,074		
1993	813,617	149,939	37,556	141,694		
1994	1,003,446	205,117	30,355	128,032		
1995	630,447	204,935	52,311	121,220		
1996	797,847	249,944	28,729	90,660		
1997	1,064,818	266,025	70,768	157,822		
1998	767,558	273,213	62,257	119,623		
1999	803,379	312,587	66,519	99,029		
2000	624,578	256,053	56,599	133,094		
2001	650,036	307,570	78,081	83,532		
2002	957,924	226,682	62,833	78,591		
2003	1,181,309	359,633	122,457	180,813		

^a Includes counts after 22 June (1978-87) and after 1 July (1988-02).

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

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^c No counts conducted

^d Combines sonar counts from Yentna and Sunshine stations.

^e Sonar counts discontinued

^f Sonar counts from mark-recapture estimates from Sunshine Station and west bank of the Susitna River.

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

^h Combined counts from Yentna Station and east bank, Susitna Station.

ⁱ Counts through 16 July only.

^j Combined counts from weirs on Bear and Glacier Flat Creeks and surveys of remaining spawning streams. (Sonar count was 151,856.)

Table 2 . Estimated sockeye salmon escapement and other apportioned species into the Kenai River.
1 July through 10 August 2003.

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
1-Jul	5,611	5,611	0	0	0	0	0	0
2-Jul	3,209	8,820	0	0	0	0	0	0
3-Jul	4,472	13,292	0	0	0	0	0	0
4-Jul	6,389	19,681	0	0	0	0	0	0
5-Jul	5,160	24,841	0	0	0	0	0	0
6-Jul	3,166	28,007	0	0	0	0	0	0
7-Jul	3,975	31,982	0	0	0	0	0	0
8-Jul	4,787	36,769	0	0	0	0	0	0
9-Jul	6,434	43,203	0	0	0	0	0	0
10-Jul	10,185	53,388	0	0	0	0	0	0
11-Jul	24,118	77,506	0	0	0	0	0	0
12-Jul	60,220	137,726	0	0	0	0	0	0
13-Jul	40,924	178,650	0	0	0	0	0	0
14-Jul	29,234	207,884	0	0	0	0	0	0
15-Jul	21,578	229,462	0	0	0	0	0	0
16-Jul	89,193	318,655	0	0	0	0	0	0
17-Jul	108,890	427,545	0	0	0	0	0	0
18-Jul	93,295	520,840	0	0	0	0	0	0
19-Jul	71,274	592,114	0	0	0	0	0	0
20-Jul	31,822	623,936	0	0	0	0	0	0
21-Jul	31,982	655,918	0	0	0	0	0	0
22-Jul	67,116	723,034	0	0	0	0	0	0
23-Jul	65,642	788,676	0	0	0	0	0	0
24-Jul	54,423	843,099	0	0	0	0	0	0
25-Jul	30,520	873,619	0	0	0	0	0	0
26-Jul	31,473	905,092	0	0	0	0	0	0
27-Jul	24,470	929,562	0	0	0	0	0	0
28-Jul	39,609	969,171	0	0	0	0	0	0
29-Jul	28,381	997,552	0	0	0	0	0	0
30-Jul	17,890	1,015,442	0	0	0	0	0	0
31-Jul	18,273	1,033,715	0	0	0	0	0	0
1-Aug	19,193	1,052,908	0	0	0	0	0	0
2-Aug	22,697	1,075,605	0	0	0	0	0	0
3-Aug	20,265	1,095,870	0	0	0	0	0	0
4-Aug	15,245	1,111,115	0	0	0	0	0	0
5-Aug	10,702	1,121,817	0	0	0	0	0	0
6-Aug	17,827	1,139,644	0	0	0	0	0	0
7-Aug	13,680	1,153,324	0	0	0	0	0	0
8-Aug	9,370	1,162,694	0	0	0	0	0	0
9-Aug	8,904	1,171,598	0	0	0	0	0	0
10-Aug	9,711	1,181,309	0	0	0	0	0	0

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Table 3. Cumulative proportion by date of sockeye salmon counts recorded in the Kenai River 1979 - 2003.

Date	Cumulative Proportion ^a																									
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	
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	0.001	0.003	0.002	0.005	0.005	0.007
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	0.003	0.005	0.010	0.013	0.017	0.017
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	0.004	0.011	0.017	0.018	0.021	0.021
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	0.005	0.021	0.016	0.023	0.027	0.027
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	0.006	0.019	0.028	0.036	0.041	0.041
06-Jul	0.030	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	0.008	0.023	0.033	0.083	0.083	0.083
07-Jul	0.037	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	0.034	0.025	0.008	0.023	0.033	0.083	0.083	0.083
08-Jul	0.037	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	0.031	0.016	0.035	0.046	0.139	0.139	0.139
09-Jul	0.042	0.018	0.016	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	0.022	0.047	0.056	0.201	0.201	0.201
10-Jul	0.046	0.018	0.016	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	0.026	0.060	0.063	0.221	0.221	0.221
11-Jul	0.049	0.019	0.022	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	0.029	0.068	0.070	0.234	0.234	0.234
12-Jul	0.049	0.020	0.026	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	0.032	0.075	0.075	0.241	0.241	0.241
13-Jul	0.049	0.020	0.026	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	0.034	0.115	0.080	0.249	0.249	0.249
14-Jul	0.109	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	0.039	0.260	0.096	0.260	0.260	0.260
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	0.049	0.386	0.141	0.285	0.194	0.194
16-Jul	0.170	0.057	0.559	0.047	0.242	0.112	0.101	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	0.054	0.459	0.187	0.323	0.270	0.270
17-Jul	0.238	0.110	0.572	0.067	0.297	0.173	0.111	0.073	0.052	0.303	0.290	0.138	0.058	0.220	0.485	0.073	0.122	0.402	0.416	0.150	0.067	0.496	0.251	0.352	0.362	0.362
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	0.097	0.545	0.295	0.398	0.441	0.441
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	0.138	0.584	0.348	0.497	0.501	0.501
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	0.104	0.284	0.557	0.190	0.232	0.498	0.522	0.231	0.164	0.604	0.389	0.562	0.528	0.528
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	0.212	0.269	0.531	0.542	0.246	0.200	0.624	0.411	0.596	0.555	0.555
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	0.249	0.643	0.434	0.621	0.612	0.612
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	0.331	0.308	0.673	0.466	0.648	0.668	0.668
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	0.360	0.714	0.523	0.676	0.714	0.714
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	0.447	0.752	0.597	0.702	0.740	0.740
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	0.515	0.787	0.676	0.735	0.766	0.766
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	0.589	0.816	0.730	0.747	0.787	0.787
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	0.647	0.842	0.759	0.758	0.820	0.820
29-Jul	0.939	0.952	0.932	0.901	0.878	0.913	0.864	0.816	0.766	0.844	0.811	0.796	0.711	0.798	0.773	0.440	0.450	0.794	0.681	0.602	0.685	0.868	0.782	0.771	0.841	0.841
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	0.614	0.713	0.882	0.809	0.783	0.860	0.860
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	0.731	0.893	0.832	0.797	0.875	0.875
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	0.755	0.905	0.854	0.810	0.891	0.891
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	0.779	0.913	0.877	0.825	0.911	0.911

- Continued -

Table 3. (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	1999	2000	2001	2002	2003	
03-Aug	0.958	0.961	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	0.796	0.927	0.894	0.841	0.928	
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	0.711	0.916	0.708	0.882	0.814	0.943	0.914	0.858	0.941	
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	0.829	0.955	0.928	0.876	0.950	
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	0.845	0.967	0.942	0.891	0.965	
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	0.869	0.976	0.957	0.907	0.976	
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	0.893	0.984	0.971	0.927	0.984	
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	0.912	0.991	0.978	0.952	0.992	
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	0.921	1.000	0.986	0.971	1.000	
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	0.930		0.989	0.984		
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	0.944		0.998	0.990		
13-Aug	0.995	0.992							0.991		0.994					0.835	0.857		0.841	1.000	0.951		1.000	0.996		
14-Aug	0.996	0.993							0.998		0.998					0.857	0.874		0.856		0.962			1.000		
15-Aug	1.000	0.993							1.000		1.000					0.874	0.896		0.874		0.976					
16-Aug		0.995														0.896	0.914		0.896		0.976					
17-Aug		0.996														0.914	0.926		0.893		0.976					
18-Aug		0.997														0.926	0.942		0.906		1.000					
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	26-Jul	18-Jul	24-Jul	20-Jul	19-Jul	
Average midpoint (1979-2002)				22-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	22	20	21	32	21	
Average (1979 - 2001)		21																								

^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 4. Distribution of sockeye salmon escapement by bank (% of total count) recorded by side-scanning sonar in the Kenai, Kasilof, Crescent, and Yentna Rivers 1979-2003.

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
1999	55	45	51	49	53	47	26	74
2000	64	36	51	49	63	37	22	78
2001	50	50	63	37	79	21	38	63
2002	49	51	48	52	74	26	25	75
2003	49	51	50	50	65	35	29	71
Average	54	46	49	51	69	31	26	74

Table 5. Fish distribution by sector (%) and average counting ranges for both banks of the Kenai, Kasilof, Crescent, and Yentna Rivers, 2003. Comparison of fish distribution between substrate and substrateless counters used on the north bank of the Kasilof River 23 July - 10 August is given at the bottom.

	Sector											
	1	2	3	4	5	6	7	8	9	10	11	12
Kenai River												
	north bank											
Daily %	4%	12%	23%	19%	15%	8%	4%	4%	3%	3%	2%	3%
Cum. %	4%	16%	39%	58%	73%	81%	85%	89%	92%	95%	97%	100%
Counting ranges: 14.3 - 25.9 m	average counting range											19.8 m
	south bank											
Daily %	1%	9%	38%	28%	6%	6%	5%	3%	2%	1%	1%	0%
Cum. %	1%	10%	48%	76%	82%	88%	93%	96%	98%	99%	100%	100%
Counting ranges: 5.2 - 6.1 m	average counting range											5.6 m
Kasilof River												
	north bank											
Daily %	8%	38%	24%	10%	6%	4%	3%	3%	1%	1%	1%	1%
Cum. %	8%	46%	70%	80%	86%	90%	93%	96%	97%	98%	99%	100%
Counting ranges: 5.2 - 18.6 m	average counting range											11.6 m
	south bank											
Daily %	14%	18%	19%	17%	11%	5%	5%	3%	2%	3%	2%	2%
Cum. %	14%	32%	51%	68%	79%	84%	89%	92%	94%	97%	99%	100%
Counting ranges: 4.0 - 18.6 m	average counting range											11.6 m
Crescent River												
	north bank											
Sec. %	63%	18%	8%	4%	2%	2%	1%	1%	0%	0%	0%	1%
Cum. %	63%	81%	89%	93%	95%	97%	98%	99%	99%	99%	99%	100%
Counting ranges: 3.4 - 6.1 m	average counting range											4.2 m
	south bank											
Sec. %	94%	4%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Cum. %	94%	98%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Counting ranges: 10.1 - 15.2 m	average counting range											12.0 m
Yentna River												
	north bank											
Daily %	13%	44%	26%	10%	3%	1%	1%	1%	0%	0%	0%	0%
Cum. %	13%	57%	83%	93%	96%	97%	98%	99%	99%	99%	100%	100%
Counting ranges: 8.7 - 12.2 m	average counting range											10.0 m
	south bank											
Daily %	1%	11%	27%	23%	19%	11%	4%	2%	1%	1%	0%	0%
Cum. %	1%	12%	39%	62%	81%	92%	96%	98%	99%	100%	100%	100%
Counting ranges: 6.4 - 9.1 m	average counting range											8.4 m
Kasilof River												
	north bank											
	substrateless counter (July 23 - August 10 only)											
Daily %	39%	22%	17%	8%	4%	5%	2%	1%	1%	0%	0%	0%
Cum. %	39%	61%	78%	86%	90%	95%	98%	98%	99%	100%	100%	100%
Counting ranges: 5.2 - 9.1 m	average counting range											6.9 m
	substrate counter (July 23 - August 10 only)											
Daily %	14%	41%	35%	5%	1%	1%	1%	1%	1%	1%	0%	0%
Cum. %	14%	54%	89%	94%	95%	96%	97%	98%	99%	99%	100%	100%
Counting ranges: 5.2 - 9.1 m	average counting range											5.9 m

03countingRptes.xls

Table 6. Daily fish wheel catch by species for the north bank of the Kenai River, 1 July through 10 August, 2003.

Date	Hours open	Sockeye		Pink		Chum		Coho		Chinook		Trout ^a	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
1-Jul	0.0	0	0	0	0	0	0	0	0	0	0	0	0
2-Jul	19.4	4	4	0	0	0	0	0	0	0	0	2	2
3-Jul	13.0	1	5	0	0	0	0	0	0	0	0	0	2
4-Jul	21.6	48	53	0	0	0	0	0	0	0	0	1	3
5-Jul	4.5	5	58	0	0	0	0	0	0	0	0	0	3
6-Jul	27.4	8	66	1	1	0	0	0	0	0	0	1	4
7-Jul	25.5	1	67	0	1	0	0	0	0	0	0	0	4
8-Jul	21.9	23	90	2	3	0	0	0	0	1	1	1	5
9-Jul	25.9	25	115	4	7	0	0	0	0	3	4	0	5
10-Jul	22.2	62	177	1	8	0	0	0	0	0	4	2	7
11-Jul	20.2	73	250	1	9	0	0	0	0	0	4	0	7
12-Jul	5.5	77	327	2	11	0	0	0	0	0	4	0	7
13-Jul	7.3	84	411	1	12	0	0	0	0	0	4	0	7
14-Jul	9.1	34	445	1	13	0	0	0	0	0	4	0	7
15-Jul	1.5	89	534	0	13	0	0	0	0	0	4	0	7
16-Jul	6.2	90	624	0	13	0	0	0	0	0	4	0	7
17-Jul	1.4	104	728	0	13	0	0	0	0	0	4	0	7
18-Jul	4.7	94	822	0	13	0	0	0	0	0	4	0	7
19-Jul	14.5	151	973	0	13	0	0	0	0	0	4	1	8
20-Jul	9.2	130	1,103	0	13	0	0	0	0	0	4	1	9
21-Jul	7.2	42	1,145	0	13	0	0	0	0	0	4	0	9
22-Jul	1.5	162	1,307	0	13	0	0	0	0	0	4	0	9
23-Jul	1.0	464	1,771	1	14	0	0	0	0	0	4	0	9
24-Jul	0.7	116	1,887	0	14	0	0	0	0	1	5	0	9
25-Jul	1.6	76	1,963	0	14	0	0	0	0	1	6	0	9
26-Jul	0.8	85	2,048	0	14	0	0	0	0	0	6	1	10
27-Jul	3.5	76	2,124	1	15	0	0	0	0	1	7	3	13
28-Jul	2.3	116	2,240	0	15	0	0	0	0	1	8	0	13
29-Jul	0.4	78	2,318	1	16	0	0	1	1	0	8	3	16
30-Jul	0.7	49	2,367	0	16	0	0	0	1	1	9	0	16
31-Jul	1.6	32	2,399	0	16	0	0	0	1	2	11	0	16
1-Aug	1.0	49	2,448	0	16	0	0	0	1	1	12	0	16
2-Aug	3.8	28	2,476	0	16	0	0	0	1	0	12	0	16
3-Aug	2.3	57	2,533	0	16	0	0	0	1	1	13	1	17
4-Aug	2.2	27	2,560	0	16	0	0	0	1	2	15	1	18
5-Aug	0.0	0	2,560	0	16	0	0	0	1	0	15	0	18
6-Aug	2.2	59	2,619	0	16	0	0	1	2	2	17	1	19
7-Aug	2.3	57	2,676	0	16	0	0	2	4	0	17	0	19
8-Aug	11.7	12	2,688	0	16	0	0	3	7	5	22	1	20
9-Aug	5.8	32	2,720	3	19	0	0	4	11	1	23	1	21
10-Aug	3.5	29	2,749	1	20	0	0	1	12	2	25	0	21

^a Trout includes 11 Dolly Varden char and 10 rainbow trout

Table 7. Age composition of Kenai River sockeye salmon sampled from the Kenai River fish-wheel, 1970-2003

Year	Percentage Composition by Age Class ^{a,b,c,d}								Sample Size
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	Other	
1970	0.0	10.0	17.0	0.0	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	0.0	7.0	10.0	0.0	1,265
1978	0.0	2.5	86.7	0.0	0.0	4.9	5.4	0.0	811
1979	0.2	19.6	63.0	0.0	0.0	10.6	6.6	0.0	601
1980	6.1	35.4	36.7	0.0	0.9	14.4	6.5	0.0	557
1981	0.0	19.7	66.4	0.0	0.5	7.9	5.3	0.2	624
1982	0.1	5.8	87.5	0.0	0.0	2.9	3.7	0.0	1,787
1983	0.3	8.4	79.0	0.3	0.5	2.2	8.9	0.4	1,765
1984	0.0	23.1	37.8	3.6	0.5	13.2	19.5	2.3	2,067
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	0.0	1,420
1989	0.2	5.6	26.7	0.9	0.8	7.6	57.4	0.8	1,587
1990	0.6	21.6	41.4	0.6	0.3	13.7	21.1	0.7	1,513
1991	0.1	48.2	31.6	0.2	0.4	5.7	11.4	2.4	2,502
1992	0.0	2.7	79.9	0.2	0.3	5.9	11.0	0.0	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	1.3	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
1999	0.0	15.1	55.4	0.4	1.2	16.8	9.6	1.5	733
2000	0.0	14.5	57.3	1.1	1.6	9.1	14.3	2.1	560
2001	0.3	10.8	68.9	0.8	1.5	8.3	9.2	0.2	601
2002	0.0	23.0	58.4	0.7	0.7	10.6	6.1	0.5	2,441
2003	0.0	14.4	57.9	0.4	0.1	8.0	18.7	0.5	1,555
Mean (1970-02)	0.4	16.6	53.7	0.6	2.0	11.6	14.1	0.8	1,068

^a Percentages weighted by total numbers in the escapement: 1978 (Bethz et al. 1980), 1979-1982, 1984-2002

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

^c 1998-2002 from Tobias, ADF&G, Soldotna

^d 2002 corrections made by Tobias

Table 8. Average length composition of the major age classes of sockeye salmon sampled from the Kenai River, 1980-2003. Length measured from mid-eye to fork-of-tail.^{ab}

Year	Age Class	Male		Female		Ratio Male-Female
		Ave Length (mm)	Sample Size	Ave Length (mm)	Sample Size	
1980	1.2	482	168	494	100	1.7:1
1981		493	85	513	73	1.2:1
1982		483	70	505	32	2.2:1
1983		524	25	520	30	0.8:1
1984		474	280	473	196	1.4:1
1985		492	184	490	186	1.0:1
1986		488	155	492	96	1.6:1
1987		514	39	503	56	0.7:1
1988		522	79	511	84	0.9:1
1989		493	114	494	92	1.2:1
1990		474	168	478	127	1.3:1
1991		488	613	497	577	1.1:1
1993		474	123	481	132	0.9:1
1994		452	46	462	42	1.1:1
1995		492	116	487	111	1.0:1
1996		507	47	519	27	1.7:1
1998		483	95	494	95	1.0:1
1999		490	72	488	39	1.9:1
2000		513	47	513	43	1.1:1
2001		522	35	507	30	1.2:1
2002		503	306	502	256	1.2:1
2003		483	116	466	117	1:1
Average (1980-02)		493	137	496	115	1.2:1
1980	1.3	580	180	561	192	0.9:1
1981		590	290	569	430	0.7:1
1982		596	723	572	841	0.9:1
1983		598	215	577	269	0.8:1
1984		582	385	559	395	1.0:1
1985		575	496	552	824	0.6:1
1986		584	112	564	200	0.6:1
1987		605	183	586	401	0.5:1
1988		598	428	572	624	0.7:1
1989		600	831	575	881	0.9:1
1990		586	358	559	318	1.1:1
1991		561	357	539	441	0.8:1
1992		572	370	547	714	0.5:1
1993		583	247	556	390	0.6:1
1994		579	367	552	452	0.8:1
1995		584	81	564	107	0.8:1
1996		607	243	589	273	0.9:1
1997		593	327	582	352	0.9:1
1998		577	146	547	139	1.1:1
1999		600	202	576	204	1.0:1
2000		605	150	584	165	1.0:1
2001		596	196	577	218	0.9:1
2002		606	665	580	760	0.9:1
2003		593	387	574	504	0.8:1
Average (1980-2002)		590	338	567	427	0.8:1

-Continued-

FN: KELECOMP.XLS

Table 8 (p. 2 of 2)

Year	Age Class	Male		Female		Ratio Male-Female
		Ave Length (mm)	Sample Size	Ave Length (mm)	Sample Size	
1984	2.2	505	116	508	159	0.7:1
1985		513	132	513	196	0.7:1
1994		481	67	488	171	0.4:1
1998		501	28	507	39	0.7:1
1999		517	38	512	85	0.5:1
2002		515	117	515	142	0.8:1
2003		514	45	515	73	0.6:1
Average (1984-2002)		505	83	507	132	0.6:1
1980	2.3	589	67	579	80	0.8:1
1982		598	46	580	21	2.2:1
1983		595	25	582	36	0.7:1
1984		570	210	557	192	1.1:1
1985		570	106	555	129	0.8:1
1986		585	52	568	89	0.6:1
1988		596	53	577	92	0.6:1
1989		600	112	579	108	1.0:1
1990		589	177	568	132	1.3:1
1991		572	153	543	159	1.1:1
1992		569	46	546	88	0.5:1
1993		583	357	560	503	0.7:1
1994		578	73	551	89	0.8:1
1995		588	114	569	109	1.1:1
1997		600	52	576	73	0.7:1
1998		574	48	559	49	1.0:1
2000		603	44	583	41	1.1:1
2002		604	75	579	74	1:1
2003		594	135	574	163	0.8:1
Average (1980-2002)		587	101	567	114	0.9:1
2003 summary (all ages)		546	683	532	857	0.8:1

FN: KELECOMP.XLS

* 1980-1997 from Waltemver, ADF&G, Soidoma

* 1998-2003 from Tobias, ADF&G, Soidoma

Table 9. Late-run sockeye salmon escapement counts in eight index areas, Kenai River drainage 1969-2003. (re

Year	Railroad Creek ^b	Johnson Creek ^b	Carter- Moose Creek ^b	Ptarmigan Creek ^b	Tern (Mud) Lake ^b	Quartz Creek ^{ce}	Hidden Lake ^d	Russian River ^d		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	9,790	30,790	45,000	175,713
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	27,784	92,660	3,000	190,787
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	2,764	1,750		112,792	78,175	22,267	218,498
1992			1,106	3,147	970		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	7,542	61,982	12,479	84,003
1996						4,181	55,526	34,691	31,601	121,818
1997						27,660	56,053	65,905	11,337	160,955
1998						11,128	67,727	113,480	14,593	206,928
1999						3,951	49,406	139,863	19,519	159,382
2000						1,389	45,685	56,580	13,930	117,585
2001						4,792	42,462	74,964	17,075	139,293
2002						66,294	72,871	62,115	6,858	208,090
2003						19,106	12,094	157,469	27,474	216,143

^a 1969-75, ADF&G archives, Division of Sport Fish, Anchorage. 1976-03, 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); 1990-03 (Cook Inlet Aquaculture Association)

^e Carter-Moose Crk. survey conducted on lower 1.0 mile of creek.

Ptarmigan Crk 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, 1995-2003.

Table 10. Estimated sockeye salmon escapement into the Kasilof River,
15 June through 10 August 2003.

Date	Daily	Cum	Date	Daily	Cum
15-Jun	1,516	1,516	14-Jul	8,958	181,433
16-Jun	964	2,480	15-Jul	6,536	187,969
17-Jun	697	3,177	16-Jul	28,756	216,725
18-Jun	951	4,128	17-Jul	25,910	242,635
19-Jun	2,030	6,158	18-Jul	11,417	254,052
20-Jun	5,472	11,630	19-Jul	5,486	259,538
21-Jun	7,577	19,207	20-Jul	4,490	264,028
22-Jun	4,039	23,246	21-Jul	8,294	272,322
23-Jun	9,913	33,159	22-Jul	10,861	283,183
24-Jun	7,608	40,767	23-Jul	11,582	294,765
25-Jun	5,377	46,144	24-Jul	5,193	299,958
26-Jun	8,684	54,828	25-Jul	6,547	306,505
27-Jun	959	55,787	26-Jul	4,067	310,572
28-Jun	457	56,244	27-Jul	6,647	317,219
29-Jun	3,240	59,484	28-Jul	6,769	323,988
30-Jun	8,223	67,707	29-Jul	5,783	329,771
1-Jul	3,210	70,917	30-Jul	4,201	333,972
2-Jul	5,990	76,907	31-Jul	3,621	337,593
3-Jul	12,425	89,332	1-Aug	3,142	340,735
4-Jul	5,439	94,771	2-Aug	3,038	343,773
5-Jul	1,753	96,524	3-Aug	2,682	346,455
6-Jul	5,675	102,199	4-Aug	1,469	347,924
7-Jul	10,843	113,042	5-Aug	2,024	349,948
8-Jul	5,442	118,484	6-Aug	2,111	352,059
9-Jul	7,834	126,318	7-Aug	2,153	354,212
10-Jul	10,075	136,393	8-Aug	1,694	355,906
11-Jul	10,913	147,306	9-Aug	1,719	357,625
12-Jul	19,381	166,687	10-Aug	2,008	359,633
13-Jul	5,788	172,475			

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Table 11. Cumulative proportion by date of salmon counts recorded in the Kaslof River 1979-2003.

Date	Cumulative Proportion ^a																									
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	
14-May			0.000																							
15-May			0.001																							
23-May	0.001		0.008																							
24-May	0.003		0.010																							
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																	
13-Jun	0.043		0.049	0.007	0.050	0.012	0.003	0.041	0.051						0.011	0.000										
14-Jun	0.044		0.051	0.008	0.051	0.013	0.003	0.045	0.062	0.009					0.026	0.002										
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	0.001	0.007	0.001	0.002	0.001	0.002	0.001	0.006	0.013
16-Jun	0.045		0.059	0.011	0.056	0.018	0.004	0.053	0.091	0.018	0.002	0.003	0.003	0.014	0.064	0.010	0.002	0.007	0.013	0.003	0.004	0.004	0.002	0.009	0.010	0.007
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	0.020	0.016	0.016	0.009	0.004	0.004	0.004	0.007
18-Jun	0.048		0.073	0.015	0.060	0.022	0.005	0.062	0.120	0.025	0.006	0.008	0.019	0.011	0.090	0.017	0.006	0.016	0.026	0.016	0.016	0.007	0.004	0.004	0.004	0.009
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	0.064	0.029	0.012	0.015	0.005	0.005	0.017	0.017
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	0.016	0.022	0.007	0.007	0.019	0.032
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	0.025	0.027	0.010	0.010	0.018	0.053
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	0.038	0.040	0.024	0.017	0.026	0.065
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	0.055	0.055	0.046	0.047	0.092	0.092
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	0.072	0.075	0.074	0.085	0.113	0.113
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	0.099	0.096	0.210	0.194	0.128	0.128
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	0.120	0.122	0.229	0.212	0.152	0.152
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	0.147	0.147	0.258	0.230	0.155	0.155
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	0.181	0.169	0.294	0.233	0.156	0.156
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	0.201	0.290	0.330	0.172	0.166	0.318	0.360	0.212	0.216	0.202	0.307	0.215	0.165	0.165
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	0.221	0.244	0.233	0.330	0.239	0.188	0.188
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	0.277	0.264	0.344	0.266	0.197	0.197
02-Jul	0.248	0.217	0.512	0.091	0.165	0.150	0.039	0.180	0.297	0.189	0.151	0.076	0.275	0.349	0.419	0.256	0.229	0.386	0.454	0.276	0.291	0.301	0.375	0.280	0.214	0.214
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	0.299	0.307	0.328	0.389	0.313	0.248	0.248
04-Jul	0.325	0.280	0.529	0.115	0.212	0.178	0.056	0.215	0.334	0.224	0.181	0.129	0.338	0.377	0.441	0.322	0.248	0.399	0.513	0.297	0.315	0.337	0.409	0.346	0.264	0.264
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	0.311	0.332	0.361	0.414	0.354	0.298	0.298
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	0.409	0.414	0.467	0.375	0.293	0.452	0.526	0.353	0.347	0.383	0.423	0.379	0.281	0.281
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	0.377	0.394	0.449	0.427	0.314	0.314
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	0.412	0.416	0.476	0.469	0.329	0.329
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	0.419	0.441	0.482	0.487	0.351	0.351
10-Jul	0.509	0.393	0.649	0.164	0.294	0.391	0.114	0.289	0.450	0.457	0.494	0.258	0.450	0.453	0.558	0.535	0.355	0.507	0.566	0.438	0.427	0.472	0.493	0.514	0.379	0.379
11-Jul	0.519	0.411	0.677	0.177	0.315	0.411	0.119	0.323	0.456	0.507	0.471	0.267	0.477	0.462	0.571	0.545	0.359	0.524	0.582	0.446	0.429	0.481	0.498	0.525	0.410	0.410
12-Jul	0.532	0.421	0.712	0.197	0.341	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	0.445	0.502	0.500	0.533	0.463	0.463
13-Jul	0.550	0.426	0.746	0.217	0.395	0.427	0.148	0.430	0.508	0.600	0.508	0.294	0.490	0.586	0.680	0.565	0.371	0.538	0.617	0.465	0.451	0.534	0.513	0.546	0.480	0.480
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	0.467	0.594	0.530	0.553	0.500	0.500

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Table 11. (p. 2 of 2)

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	1999	2000	2001	2002	2003	
15-Jul	0.629	0.461	0.838	0.291	0.514	0.484	0.267	0.513	0.587	0.659	0.432	0.317	0.504	0.608	0.748	0.623	0.395	0.710	0.630	0.496	0.473	0.664	0.562	0.570	0.523	
16-Jul	0.643	0.526	0.863	0.358	0.547	0.544	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	0.526	0.481	0.673	0.596	0.582	0.603	
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	0.488	0.728	0.673	0.573	0.488	0.691	0.640	0.597	0.675	
18-Jul	0.703	0.609	0.891	0.491	0.759	0.636	0.432	0.562	0.619	0.703	0.629	0.609	0.615	0.645	0.816	0.711	0.641	0.737	0.682	0.603	0.516	0.702	0.688	0.621	0.706	
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	0.534	0.730	0.706	0.642	0.722	
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	0.563	0.763	0.717	0.678	0.734	
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	0.619	0.777	0.729	0.687	0.757	
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	0.679	0.807	0.733	0.708	0.787	
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	0.721	0.843	0.746	0.723	0.820	
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	0.757	0.876	0.800	0.752	0.834	
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	0.792	0.895	0.901	0.791	0.852	
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	0.839	0.933	0.921	0.806	0.898	0.883	0.756	0.820	0.829	0.912	0.911	0.812	0.864	
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	0.865	0.911	0.927	0.823	0.882	
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	0.881	0.947	0.936	0.835	0.901	
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	0.900	0.965	0.950	0.852	0.917	
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	0.974	0.967	0.862	0.929		
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	0.925	0.981	0.980	0.873	0.939	
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	0.935	0.990	0.988	0.887	0.947	
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	0.948	1.000	0.993	0.908	0.956	
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	0.961		1.000	0.925	0.963	
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	0.972			0.940	0.967	
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	0.979			0.949	0.973	
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	0.986			0.958	0.970	
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	0.993			0.969	0.985	
08-Aug	0.989	0.946					0.927			1.000	0.963	0.951	1.000			0.981		1.000	0.925	1.000	1.000			0.978	0.990	
09-Aug	0.991	0.961					0.938				0.969	0.963				0.987			0.945						0.987	0.994
10-Aug	0.994	0.968					0.945				0.976	0.972				0.994			0.962						0.994	1.000
11-Aug	0.998	0.979					0.949				0.982	0.977				1.000			0.984						1.000	
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	4-Jul	16-Jul	17-Jul	12-Jul	12-Jul	10-Jul	14-Jul	
average midpoint (1979-2002)				12-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	34	31	35	44	34	
Average 1979-2002			36																							

^a Proportion for first day (1981-1988) 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 12. Peak sockeye salmon escapement counts in seven index areas, Kaslof River drainage 1975-2003.

Year	Nikolai Creek ^a	Crystal Creek ^a	Clear Creek ^a	Glacier Flat Creek ^{a, b, c}	Seepage Creek ^a	Moose Creek ^a	Bear Creek ^b	Total Index Count ^f
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							45,123	45,123
1994	63,723			13,347			52,720	116,170
1995							41,863	41,863
1996							58,692	58,692
1997							81,954	81,989
1998							113,510	113,500
1999							78,265	68,291
2000							85,220	84,993
2001							110,722	130,164
2002				19,568		14,432	97,678	131,678
2003				9,580		14,514	71,654	95,748

^a Commercial Fisheries Division stream survey counts (1975-85, 2002-03); FRED 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. 1993-03 counts are results of foot and aerial surveys, and weir counts, Cook Inlet Aquaculture Association, Gary Fandrei.

^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. Daily fish wheel catch by species for the north bank of the Kaslof River, 15 June, through 11 August, 2003.^a

Date	Hours open	Sockeye		Pink		Chum		Coho		Chinook		Trout	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
15-Jun	0.0	0	0	0	0	0	0	0	0	0	0	0	0
16-Jun	0.0	0	0	0	0	0	0	0	0	0	0	0	0
17-Jun	12.0	2	2	0	0	0	0	0	0	0	0	0	0
18-Jun	26.0	5	7	0	0	0	0	0	0	0	0	0	0
19-Jun	33.8	7	14	0	0	0	0	0	0	0	0	0	0
20-Jun	10.9	5	19	0	0	0	0	0	0	0	0	0	0
21-Jun	0.0	0	19	0	0	0	0	0	0	0	0	0	0
22-Jun	30.0	13	32	0	0	0	0	0	0	0	0	0	0
23-Jun	28.5	57	89	0	0	0	0	0	0	1	1	0	0
24-Jun	0.0	0	89	0	0	0	0	0	0	0	1	0	0
25-Jun	18.0	32	121	0	0	0	0	0	0	0	1	0	0
26-Jun	22.0	32	153	0	0	0	0	0	0	0	1	0	0
27-Jun	18.3	4	157	0	0	0	0	0	0	0	1	0	0
28-Jun	0.0	0	157	0	0	0	0	0	0	0	1	0	0
29-Jun	49.7	25	182	0	0	0	0	0	0	1	2	3	3
30-Jun	15.5	60	242	0	0	0	0	0	0	1	3	1	4
1-Jul	3.5	2	244	0	0	0	0	0	0	0	3	0	4
2-Jul	18.0	47	291	0	0	0	0	0	0	0	3	0	4
3-Jul	13.2	141	432	1	1	0	0	0	0	0	3	2	6
4-Jul	17.3	66	498	0	1	0	0	0	0	0	3	0	6
5-Jul	10.0	8	506	0	1	0	0	0	0	0	3	0	6
6-Jul	26.8	44	550	0	1	0	0	0	0	0	3	1	7
7-Jul	24.0	67	617	1	2	0	0	0	0	0	3	0	7
8-Jul	20.0	51	668	1	3	0	0	0	0	1	4	0	7
9-Jul	21.3	112	780	2	5	0	0	0	0	0	4	0	7
10-Jul	24.0	82	862	1	6	0	0	0	0	0	4	0	7
11-Jul	4.7	88	950	1	7	0	0	0	0	0	4	0	7
12-Jul	15.5	366	1316	2	9	0	0	0	0	0	4	0	7
13-Jul	12.5	17	1333	0	9	0	0	0	0	0	4	0	7
14-Jul	11.0	8	1341	1	10	0	0	0	0	0	4	0	7
15-Jul	15.8	27	1368	0	10	0	0	0	0	0	4	0	7
16-Jul	11.5	68	1436	1	11	0	0	0	0	0	4	0	7
17-Jul	4.0	63	1499	1	12	0	0	0	0	0	4	0	7
18-Jul	6.2	62	1561	0	12	0	0	0	0	1	5	0	7
19-Jul	12.0	42	1603	0	12	0	0	0	0	0	5	0	7
20-Jul	11.5	4	1607	1	13	0	0	0	0	0	5	0	7
21-Jul	15.0	5	1612	0	13	0	0	0	0	0	5	0	7
22-Jul	20.0	39	1651	0	13	0	0	0	0	2	7	0	7
23-Jul	17.3	22	1673	0	13	0	0	0	0	4	11	0	7
24-Jul	20.3	7	1680	1	14	0	0	0	0	2	13	0	7
25-Jul	21.8	6	1686	0	14	0	0	0	0	0	13	0	7
26-Jul	18.0	1	1687	0	14	0	0	0	0	0	13	0	7
27-Jul	18.3	2	1689	0	14	0	0	0	0	1	14	0	7
28-Jul	14.0	0	1689	0	14	0	0	0	0	0	14	0	7
29-Jul	14.0	4	1693	1	15	0	0	0	0	0	14	0	7
30-Jul	14.0	4	1697	0	15	0	0	0	0	0	14	0	7
31-Jul	26.0	4	1701	0	15	0	0	0	0	0	14	0	7
1-Aug	22.8	3	1704	0	15	0	0	0	0	0	14	0	7
2-Aug	12.0	0	1704	0	15	0	0	0	0	0	14	0	7
3-Aug	13.7	0	1704	0	15	0	0	0	0	0	14	0	7
4-Aug	27.8	0	1704	0	15	0	0	0	0	0	14	0	7
5-Aug	0.0	0	1704	0	15	0	0	0	0	0	14	0	7
6-Aug	0.0	0	1704	0	15	0	0	0	0	0	14	0	7
7-Aug	0.0	0	1704	0	15	0	0	0	0	0	14	0	7
8-Aug	0.0	0	1704	0	15	0	0	0	0	0	14	0	7
9-Aug	0.0	0	1704	0	15	0	0	0	0	0	14	0	7
10-Aug	0.0	0	1704	0	15	0	0	0	0	0	14	0	7
11-Aug	0.0	0	1704	0	15	0	0	0	0	0	14	0	7

FN: GKATPWR.XLS

^aFish wheel not operated after 5 August because of poor catch rate and damage to the equipment caused by trees.

Table 14. Age composition of sockeye salmon sampled from the Kasilof River 1969-2003.

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	0.2	35.9	24.1	0.0	tr	28.2	11.4	0.2	755
1977	0.3	29.4	30.0	0.0	0.8	27.8	11.7	0.0	1,209
1978	0.0	41.3	40.1	0.0	0.0	10.4	8.2	0.0	967
1979	0.7	58.9	28.2	0.0	0.0	10.5	1.6	0.1	590
1980	2.1	67.0	23.1	0.1	0.0	5.0	2.7	0.0	899
1981	0.0	28.9	63.6	0.0	0.0	5.9	1.6	0.0	1,479
1982	0.8	30.6	54.4	0.0	0.2	9.3	4.7	0.0	1,518
1983	0.0	49.5	33.1	0.0	0.0	12.9	4.5	0.0	1,997
1984	0.0	50.5	24.8	0.0	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	0.2	43.4	27.4	0.0	0.1	22.4	6.4	0.1	1,248
1988	0.1	33.7	36.4	0.2	0.1	17.5	12.0	0.1	2,282
1989	0.0	14.9	35.3	0.1	0.1	36.6	13.0	0.0	1,301
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	21.1	27.5	0.0	0.2	35.3	16.0	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	26.4	28.4	0.0	0.0	28.2	17.0	0.0	723
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
1999	0.0	29.7	33.8	0.2	0.1	26.7	9.4	0.1	964
2000	0.1	41.9	33.9	0.0	0.4	11.4	12.3	0.0	747
2001	0.4	29.3	48.6	0.2	0.2	16.5	4.8	0.2	564
2002	0.3	33.9	38.1	0.3	1.5	19.3	6.6	0.1	746
2003	0.7	37.3	26.1	0.0	0.2	29.3	6.5	0.0	1,298
Mean (1969-02)	0.2	33.0	36.1	0.2	0.2	20.1	9.2	0.2	1063

^a Percentages weighted by total numbers in the escapement, 1970-2002.^b 1978-1987 from Waterniver, ADF&G, Soldona.^c 1998-2002 from Tobias, ADF&G, Soldona.

Percentages corrected in historical table in 2002.

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Table 15. Length composition of the major age classes of sockeye salmon sampled from the Kasilof River, 1980-2003. Length measured from mid-eye to fork-of-tail.^{a, b}

Year	Age Class	Male		Female		Ratio Male:Female
		Ave Length ^a (mm)	Sample Size	Ave Length ^a (mm)	Sample Size	
1980	1.2	474	189	464	376	0.5:1
1981		503	241	492	146	1.7:1
1982		481	285	466	235	1.2:1
1983		495	113	491	78	1.4:1
1984		480	544	478	428	2.6:1
1985		474	723	472	897	0.8:1
1986		482	266	482	368	0.7:1
1987		472	282	470	257	1.1:1
1988		480	353	477	480	0.7:1
1989		481	245	480	290	0.8:1
1990		462	139	458	91	1.5:1
1991		467	326	461	305	1.1:1
1992		467	184	466	212	0.9:1
1993		479	40	479	53	0.8:1
1994		465	90	465	91	1.0:1
1995		491	117	483	141	0.8:1
1996		476	94	475	85	1.1:1
1997		456	80	452	80	1.0:1
1998		475	178	468	162	1.1:1
1999		479	140	474	146	1.0:1
2000	481	162	474	162	1.0:1	
2001	479	77	477	88	0.9:1	
2002	486	114	476	139	0.8:1	
2003	481	230	480	247	0.9:1	
Average (1980-02)		478	120	472	125	1.0:1
1980	1.3	531	35	516	115	0.3:1
1981		566	422	558	369	1.1:1
1982		549	377	542	428	0.9:1
1983		558	170	547	187	0.9:1
1984		539	304	533	383	0.8:1
1985		531	341	527	433	0.8:1
1986		550	342	543	405	0.8:1
1987		553	191	552	154	1.2:1
1988		550	311	543	382	0.8:1
1989		550	266	542	296	0.9:1
1990		518	81	523	106	0.8:1
1991		531	418	518	335	1.3:1
1992		536	195	527	197	1.0:1
1993		550	101	542	69	1.5:1
1994		538	98	530	99	1.1:1
1995		542	42	534	49	0.9:1
1996		566	213	556	135	1.6:1
1997		555	223	541	192	1.2:1
1998		527	110	525	131	0.8:1
1999		543	167	542	159	1.1:1
2000	555	140	547	122	1.2:1	
2001	549	149	545	125	1.2:1	
2002	555	144	544	140	1.1:1	
2003	546	167	546	207	0.8:1	
Average (1980-02)		545	210	538	218	1.0:1

-Continued-

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Table 15 (p. 2 of 2)

Year	Age Class	Male		Female		Ratio Male-Female
		Ave Length ^a (mm)	Sample Size	Ave Length ^a (mm)	Sample Size	
1982	2.2	479	65	472	81	0.8:1
1984		484	202	482	223	0.9:1
1985		482	348	476	319	0.8:1
1986		492	78	489	115	0.7:1
1987		478	137	475	141	1.0:1
1988		486	173	479	220	0.8:1
1990		453	104	457	111	0.9:1
1991		471	289	480	301	1.0:1
1992		464	264	464	427	0.6:1
1993		486	58	480	102	0.7:1
1994		469	97	468	102	1.0:1
1995		492	61	485	86	0.7:1
1996		482	69	472	85	0.8:1
1997		459	47	450	55	0.9:1
1998		473	95	469	95	1.0:1
1999		480	125	475	132	1.0:1
2000		486	36	482	52	0.7:1
2001		482	41	473	52	0.8:1
2002		480	50	470	94	0.5:1
2003		481	162	479	186	0.9:1
Average (1982-02)		478	118	474	147	0.8:1
1982	2.3	548	41	543	40	1.0:1
1984		533	102	526	80	1.3:1
1988		544	104	543	115	0.9:1
1990		514	63	529	61	1.0:1
1991		516	61	514	64	1.0:1
1992		534	112	532	122	0.9:1
1993		542	66	533	78	0.8:1
1994		545	49	529	71	0.7:1
1995		546	42	536	48	0.9:1
1997		546	39	526	42	0.9:1
2000		551	47	551	48	1.0:1
2002		550	25	546	24	1.0:1
2003		546	39	537	53	0.7:1
Average (1982-02)		539	63	534	66	1:1
2003 summary (all ages)		514	598	511	693	0.9:1

^a1980-1997 from Wahemeyer, ADF&G, Soldoma

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^b1998-2001 from Tobias, ADF&G, Soldoma

Table 16. Comparison sonar estimates between a counter with a transducer mounted on an artificial substrate and of a counter without artificial substrate (substrateless), north bank Kasilof River 2003. Results from a regression analyses between counters are provided at the bottom. P-values indicate whether the slope of the regression equation was different from one.

	Substrateless	Substrate	Difference ^a (sub'less - substrate)	% Difference (sub'less / substrate)
23-Jul	1,154	1,802	-648	64%
24-Jul	1,869	2,180	-311	86%
25-Jul	2,301	2,473	-172	93%
26-Jul	1,191	1,509	-318	79%
27-Jul	2,723	2,591	132	105%
28-Jul	2,353	2,223	130	106%
29-Jul	1,855	1,858	-3	100%
30-Jul	1,181	1,135	46	104%
31-Jul	1,004	1,134	-130	89%
1-Aug	966	903	63	107%
2-Aug	778	1,004	-226	77%
3-Aug	826	790	36	105%
4-Aug	586	597	-11	98%
5-Aug	595	748	-153	80%
6-Aug	725	902	-177	80%
7-Aug	649	731	-82	89%
8-Aug	581	592	-11	98%
9-Aug	555	607	-52	91%
10-Aug	663	593	70	112%
Total	22,555	24,372	-1,817	93%

^a1800 - 2400 hours only for 23 Jul..

Dependent Variable	Slope	Intercept	R ²	p-value
Substrateless	0.96	-40.59	0.925	0.524
Substrate	0.97	135.24	0.925	0.623

figures:03KasCompare.xls

Table 17. Estimated salmon escapement of the Crescent River, 27 June through 3 August, 2003.

Date	Sockeye		Pink		Chum		Coho		King		Dolly Varden	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
27-Jun	4,174	4,474	0	0	0	0	0	0	0	0	0	0
28-Jun	4,209	8,683	0	0	0	0	0	0	0	0	0	0
29-Jun	4,557	13,240	0	0	0	0	0	0	0	0	0	0
30-Jun	3,819	17,059	0	0	0	0	0	0	291	291	0	0
1-Jul	2,385	19,444	299	299	0	0	0	0	0	291	0	0
2-Jul	1,619	21,063	0	299	0	0	0	0	0	291	0	0
3-Jul	1,271	22,334	0	299	0	0	0	0	0	291	0	0
4-Jul	2,816	25,150	0	299	0	0	0	0	69	360	52	52
5-Jul	2,355	27,505	0	299	0	0	0	0	0	360	61	185
6-Jul	2,564	30,069	32	331	0	0	0	0	0	360	201	385
7-Jul	7,468	37,537	203	534	0	0	0	0	0	360	0	385
8-Jul	2,057	39,594	73	607	0	0	0	0	37	397	0	385
9-Jul	1,696	41,290	51	658	0	0	0	0	50	447	50	435
10-Jul	1,717	43,007	85	743	0	0	0	0	57	504	57	492
11-Jul	616	43,623	0	743	0	0	0	0	0	504	0	492
12-Jul	2,422	46,045	0	743	0	0	0	0	0	504	107	599
13-Jul	14,224	60,269	0	743	0	0	0	0	0	504	372	971
14-Jul	4,102	64,371	119	862	0	0	0	0	0	504	118	1,090
15-Jul	3,472	67,843	112	974	0	0	0	0	0	504	56	1,146
16-Jul	3,989	71,832	42	1,016	0	0	0	0	0	504	81	1,230
17-Jul	4,621	76,453	48	1,064	48	48	0	0	0	504	770	2,000
18-Jul	7,727	84,180	158	1,222	158	206	0	0	0	504	1,261	3,261
19-Jul	5,097	89,277	0	1,222	101	307	0	0	0	504	612	3,872
20-Jul	3,064	92,341	0	1,222	0	307	0	0	0	504	229	4,101
21-Jul	3,735	96,076	138	1,360	208	515	0	0	138	642	277	4,378
22-Jul	2,565	98,641	0	1,360	359	874	0	0	51	693	257	4,634
23-Jul	2,509	101,150	118	1,478	19	913	0	0	118	811	157	4,791
24-Jul	1,906	103,056	36	1,514	73	986	0	0	37	848	293	5,084
25-Jul	2,766	105,822	207	1,721	104	1,090	0	0	35	882	415	5,499
26-Jul	2,937	108,759	255	1,976	347	1,437	0	0	69	952	509	6,008
27-Jul	2,230	110,989	123	2,099	183	1,620	0	0	31	982	122	6,130
28-Jul	1,332	112,321	59	2,158	117	1,737	39	39	78	1,061	59	6,189
29-Jul	1,862	114,183	121	2,279	210	1,947	0	39	30	1,091	150	6,339
30-Jul	1,751	115,934	28	2,307	584	2,531	0	39	0	1,091	0	6,339
31-Jul	2,678	118,612	0	2,307	440	2,971	0	39	0	1,091	0	6,339
1-Aug	1,116	119,728	81	2,388	868	3,839	42	81	21	1,111	0	6,339
2-Aug	1,161	120,889	22	2,410	1,004	4,843	0	81	0	1,111	0	6,339
3-Aug	1,568	122,457	102	2,512	896	5,739	0	81	20	1,132	0	6,339

Table 18. Cumulative proportion by date of sockeye salmon counts recorded in the Crescent River 1984 - 2003.

Date	Cumulative Proportion ^a																			
	1984	1985	1986 ^h	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
16-Jun	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								0.010			0.011	0.014						
26-Jun	0.027	0.001					0.003	0.002		0.019			0.012	0.020						
27-Jun	0.036	0.002					0.007	0.004		0.022			0.013	0.029	0.009	0.001			0.016	0.037
28-Jun	0.041	0.002	0.001				0.013	0.006		0.031	0.001	0.000	0.015	0.037	0.016	0.002		0.006	0.072	0.071
29-Jun	0.049	0.005	0.005				0.021	0.010		0.034	0.002	0.000	0.018	0.049	0.022	0.007	0.001	0.008	0.112	0.108
30-Jun	0.069	0.007	0.008				0.025	0.013		0.038	0.008	0.002	0.036	0.058	0.031	0.038	0.002	0.016	0.149	0.139
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	0.086	0.006	0.036	0.186	0.159
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	0.115	0.008	0.074	0.225	0.172
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	0.137	0.011	0.136	0.271	0.182
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	0.161	0.028	0.199	0.310	0.205
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	0.184	0.093	0.253	0.351	0.225
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	0.204	0.178	0.307	0.398	0.246
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	0.215	0.292	0.338	0.440	0.307
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	0.247	0.365	0.356	0.465	0.323
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	0.267	0.399	0.383	0.480	0.337
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	0.278	0.410	0.399	0.489	0.351
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	0.284	0.418	0.449	0.497	0.356
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	0.328	0.422	0.471	0.521	0.376
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	0.375	0.426	0.505	0.562	0.492
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	0.403	0.433	0.557	0.614	0.526
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	0.410	0.444	0.595	0.628	0.554
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	0.458	0.494	0.638	0.648	0.587
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	0.548	0.658	0.677	0.673	0.624
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	0.600	0.795	0.697	0.682	0.687

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Table 18. (p. 2 of 2)

Date	Cumulative Proportion ^a																			
	1984	1985	1986 ^b	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
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	0.645	0.863	0.706	0.707	0.729
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	0.703	0.882	0.727	0.732	0.754
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	0.729	0.924	0.765	0.781	0.785
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	0.780	0.940	0.803	0.809	0.806
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	0.815	0.942	0.845	0.829	0.826
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	0.841	0.948	0.871	0.835	0.842
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	0.860	0.954	0.898	0.888	0.861
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	0.881	0.960	0.930	0.929	0.888
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	0.904	0.968	0.950	0.965	0.906
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	0.933	0.969	0.958	0.987	0.917
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	0.960	0.982	0.972	1.000	0.932
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	0.969	0.985	0.983		0.947
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	0.974	0.993	0.992		0.969
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	0.979	1.000	1.000		0.978
02-Aug				0.975			0.986	0.978	1.000	1.000	0.914	0.915	1.000	0.972	0.934	0.988				0.987
03-Aug				0.985			0.993	0.984			0.928	0.939		0.983	0.949	0.992				1.000
04-Aug				0.994			1.000	0.987			0.949	0.964		0.991	0.962	1.000				
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	27-Jul	17-Jul	13-Jul	12-Jul	14-Jul
Average midpoint (1984-2002)				17-Jul																
No. days for 80% ^c	31+	26+		21	23	22	25	21	23	23	24	23	22	27	24	26	16	24	28	28
Average 1984-2002				23 d																

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^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 19. Daily fish wheel catch by species for the Crescent River, 27 June through 3 August, 2003.

Date	Hours open	Sockeye		Pink		Chum		Coho		Chinook		Dolly Varden	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
27-Jun	19	4	4	0	0	0	0	0	0	0	0	0	0
28-Jun	26	9	13	0	0	0	0	0	0	0	0	0	0
29-Jun	22	13	26	0	0	0	0	0	0	0	0	0	0
30-Jun	24	13	39	0	0	0	0	0	0	1	1	0	0
1-Jul	24	8	47	1	1	0	0	0	0	0	1	0	0
2-Jul	24	43	90	0	1	0	0	0	0	0	1	0	0
3-Jul	20	98	188	0	1	0	0	0	0	0	1	4	4
4-Jul	10	41	229	0	1	0	0	0	0	1	2	1	5
5-Jul	4	60	289	0	1	0	0	0	0	0	2	0	5
6-Jul	16	80	369	1	2	0	0	0	0	0	2	2	7
7-Jul	14	37	406	1	3	0	0	0	0	0	2	1	8
8-Jul	17	56	462	2	5	0	0	0	0	1	3	0	8
9-Jul	13	34	496	1	6	0	0	0	0	1	4	1	9
10-Jul	15	60	556	3	9	0	0	0	0	2	6	2	11
11-Jul	12	44	600	0	9	0	0	0	0	0	6	0	11
12-Jul	12	68	668	0	9	0	0	0	0	0	6	3	14
13-Jul	4	153	821	0	9	0	0	0	0	0	6	3	17
14-Jul	4	104	925	3	12	0	0	0	0	0	6	3	20
15-Jul	4	62	987	2	14	0	0	0	0	0	6	1	21
16-Jul	4	95	1,082	1	15	0	0	0	0	0	6	2	23
17-Jul	5	96	1,178	1	16	1	1	0	0	0	6	16	39
18-Jul	4	49	1,227	1	17	1	2	0	0	0	6	8	47
19-Jul	3	50	1,277	0	17	1	3	0	0	0	6	6	53
20-Jul	4	67	1,344	0	17	0	3	0	0	0	6	5	58
21-Jul	7	54	1,398	2	19	3	6	0	0	2	8	4	62
22-Jul	8	50	1,448	0	19	7	13	0	0	1	9	5	67
23-Jul	12	64	1,512	3	22	1	14	0	0	3	12	4	71
24-Jul	12	52	1,564	1	23	2	16	0	0	1	13	8	79
25-Jul	22	80	1,644	6	29	3	19	0	0	1	14	12	91
26-Jul	18	127	1,771	11	40	15	34	0	0	3	17	22	113
27-Jul	8	73	1,844	4	44	6	40	0	0	1	18	4	117
28-Jul	9	68	1,912	3	47	6	46	2	2	4	22	3	120
29-Jul	8	62	1,974	4	51	7	53	0	2	1	23	5	125
30-Jul	3	60	2,034	1	52	20	73	0	2	0	23	0	125
31-Jul	8	61	2,095	0	52	10	83	0	2	0	23	0	125
1-Aug	10	54	2,149	4	56	42	125	2	4	1	24	0	125
2-Aug	10	52	2,201	1	57	45	170	0	4	0	24	0	125
3-Aug	11	77	2,278	5	62	44	214	0	4	1	25	0	125

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Table 20. Age composition of sockeye salmon sampled from the Crescent River 1979-2003.

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	0.8	30.9	67.4	0.1	0.1	0.7	0.0	0.0	643
1980	0.0	6.6	87.4	1.8	0.0	2.6	1.6	0.0	511
1981	0.0	8.0	34.0	0.1	0.1	10.6	47.2	0.0	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	42.3	0.2	0.6	27.4	18.6	0.0	731
1984	0.0	3.5	16.9	0.0	0.0	20.0	59.4	0.2	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	0.7	45.4	0.1	0.0	2.0	51.2	0.6	711
1990	0.0	4.1	51.4	0.3	0.2	3.4	40.1	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	1.5	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	15.3	25.4	0.0	0.0	23.9	34.9	0.5	393
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
1999	0.0	21.4	39.4	0.4	0.1	9.2	29.3	0.2	912
2000	0.0	2.5	72.8	0.0	0.0	2.2	22.4	0.0	357
2001	0.0	15.7	21.0	0.9	0.5	22.7	38.8	0.4	572
2002	0.0	19.1	33.7	0.3	0.1	11.2	35.5	0.1	750
2003	0.4	14.4	51.1	0.0	0.3	13.4	20.3	0.1	1,080
Mean (1979-02)	0.1	9.9	43.1	0.3	0.2	11.1	35.1	0.3	574

^a Percentages weighted by total numbers in the escapement. 1979-1981, 1986-2002

^b Source: Tobias, ADF&G, Soldotna

^c Corrections made to table by Tobias, October, 2002

Table 21. Length composition of the major age classes of sockeye salmon collected in the Crescent River, 1980-2003. Length measured from mid-eye to fork-of-tail.^{a, b}

Year	Age Class	Male		Female		Ratio Male-Female
		Ave Length* (mm)	Sample Size	Ave Length* (mm)	Sample Size	
1997	0.3	569	51	544	31	1.7:1
1980	1.2	472	47	471	31	1.5:1
1981		522	59	491	33	1.8:1
1982		467	47	487	25	1.9:1
1991		517	36	490	17	2.1:1
1996		477	41	510	19	2.2:1
1997		511	81	495	82	1.0:1
1999		468	136	478	59	2.3:1
2001		462	61	486	29	2.1:1
2002		471	104	481	39	2.7:1
2003		474	90	477	65	1.4:1
Average (1980-02)			485	68	488	37
1980	1.3	568	167	549	223	0.7:1
1981		576	121	555	172	0.7:1
1982		586	303	556	259	1.2:1
1983		570	111	542	169	0.7:1
1984		574	60	552	72	0.8:1
1985		565	75	551	111	0.7:1
1987		601	54	573	37	1.5:1
1988		581	195	550	138	1.4:1
1989		593	320	561	271	1.2:1
1990		592	184	571	120	1.5:1
1991		560	105	543	75	1.4:1
1992		555	24	535	18	1.3:1
1993		578	81	559	92	0.9:1
1994		563	124	547	147	0.8:1
1995		581	40	555	60	0.7:1
1996		607	50	586	50	1.0:1
1997		574	142	547	119	1.2:1
1998		583	114	556	143	0.8:1
1999		575	164	545	195	0.8:1
2000		598	99	565	161	1.1:1
2001	580	45	561	75	0.6:1	
2002	582	103	563	150	0.7:1	
2003	577	235	558	317	0.7:1	
Average (1980-02)		579	122	556	130	0.9:1

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Table 21 (p. 2 of 2)

Year	Age Class	Male		Female		Ratio Male-Female
		Ave Length ^a (mm)	Sample Size	Ave Length ^a (mm)	Sample Size	
1981	2.2	487	40	519	57	0.7:1
1983		494	93	488	89	1.0:1
1984		499	81	507	75	1.1:1
1985		496	75	490	47	1.6:1
1988		487	72	496	60	1.2:1
1991		515	42	498	18	2.3:1
1992		486	10	492	14	0.7:1
1994		466	54	481	13	4.2:1
1996		497	65	525	29	2.2:1
1998		497	27	515	31	0.9:1
2001		481	87	494	43	2.0:1
2002		492	48	506	36	1.3:1
2003		498	81	496	64	1.3:1
Average (1981-02)		491	58	501	43	1.3:1
1980	2.3	584	158	554	237	0.7:1
1983		569	43	550	80	0.5:1
1984		581	261	553	202	1.3:1
1985		568	94	551	161	0.6:1
1986		573	44	556	45	1.0:1
1987		595	49	573	37	1.3:1
1988		585	110	556	83	1.3:1
1989		594	72	568	37	1.9:1
1990		601	165	571	72	2.3:1
1991		558	36	537	23	1.6:1
1992		572	58	547	62	0.9:1
1993		585	104	558	114	0.9:1
1994		570	86	549	81	1.1:1
1995		581	154	553	181	0.9:1
1996		604	222	577	72	3.1:1
1997		590	84	569	86	1.0:1
1998		584	85	563	118	0.7:1
1999		575	138	545	129	1.1:1
2000		599	132	564	225	1.1:1
2001		578	91	559	131	0.7:1
2002		589	108	563	158	0.7:1
2003		579	96	559	123	0.8:1
Average (1980-02)		583	109	558	111	1.0:1
2003 summary (all ages)		532	502	523	569	0.9:1

^a 1980-1997 from Waltemyer, ADF&G, Soldotna^b 1998-2003 from Tobias, ADF&G, Soldotna

Table 22. Estimated salmon escapement in the Yentna River, 7 July through 6 August, 2003.

Date	Sockeye		Pink		Chum		Coho		Other*	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7-Jul	687	687	282	282	42	42	39	39	10	10
8-Jul	539	1,226	257	539	49	91	46	85	0	10
9-Jul	521	1,747	133	672	41	132	97	182	67	77
10-Jul	720	2,467	429	1,101	27	159	48	230	56	133
11-Jul	808	3,275	587	1,688	149	308	60	290	37	170
12-Jul	866	4,141	930	2,618	194	502	65	355	17	187
13-Jul	5,071	9,212	1,736	4,354	265	767	372	727	29	216
14-Jul	13,506	22,718	4,506	8,860	957	1,724	1,066	1,793	48	264
15-Jul	12,008	34,726	6,055	14,915	861	2,585	1,028	2,821	134	398
16-Jul	8,399	43,125	6,451	21,366	876	3,461	511	3,332	29	427
17-Jul	4,015	47,140	3,582	24,948	284	3,745	235	3,567	0	427
18-Jul	9,918	57,058	3,481	28,429	601	4,346	1,385	4,952	32	459
19-Jul	10,143	67,201	2,669	31,098	647	4,993	963	5,915	50	509
20-Jul	21,227	88,428	6,195	37,293	1,086	6,079	2,014	7,929	32	541
21-Jul	21,999	110,427	13,094	50,387	1,952	8,031	3,022	10,951	0	541
22-Jul	12,155	122,582	13,839	64,226	1,326	9,357	2,463	13,414	49	590
23-Jul	4,993	127,575	12,506	76,732	1,156	10,513	2,135	15,549	42	632
24-Jul	7,437	135,012	9,479	86,211	977	11,490	1,713	17,262	38	670
25-Jul	6,492	141,504	4,855	91,066	924	12,414	1,397	18,659	0	670
26-Jul	5,579	147,083	4,607	95,673	796	13,210	850	19,509	0	670
27-Jul	5,440	152,523	9,055	104,728	1,582	14,792	3,246	22,755	29	699
28-Jul	3,837	156,360	3,786	108,514	337	15,129	1,060	23,815	0	699
29-Jul	2,850	159,210	1,740	110,254	159	15,288	467	24,282	0	699
30-Jul	2,044	161,254	2,678	112,932	533	15,821	1,075	25,357	0	699
31-Jul	3,018	164,272	6,618	119,550	592	16,413	1,313	26,670	0	699
1-Aug	5,836	170,108	9,884	129,434	2,435	18,848	3,884	30,554	17	716
2-Aug	3,984	174,092	11,888	141,322	2,000	20,848	3,384	33,938	30	746
3-Aug	2,475	176,567	10,265	151,587	2,414	23,262	4,627	38,565	191	937
4-Aug	1,163	177,730	6,696	158,283	2,875	26,137	3,241	41,806	102	1,039
5-Aug	1,336	179,066	4,663	162,946	2,400	28,537	1,646	43,452	154	1,193
6-Aug	1,747	180,813	4,438	167,384	1,812	30,349	1,770	45,222	258	1,451

*Other species consisted of about 0.3% of the fish wheel catch (mostly chinook salmon, white fish and rainbow trout).

Table 23. Cumulative proportion by date of sockeye salmon counts recorded in the Yentna River 1981-2003.

Date	Cumulative Proportion ^a																						
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
28-Jun																							
29-Jun	0.001					0.001																	
30-Jun	0.004					0.002																	
01-Jul	0.008	0.001	0.001	0.001		0.002																	
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	0.000	0.007	0.005	0.029	0.004
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	0.001	0.013	0.010	0.101	0.007
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	0.002	0.020	0.015	0.155	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	0.005	0.024	0.023	0.187	0.014
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	0.010	0.033	0.029	0.207	0.018
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	0.017	0.046	0.041	0.226	0.023
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	0.024	0.075	0.050	0.236	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	0.031	0.124	0.058	0.251	0.126
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	0.044	0.263	0.068	0.271	0.192
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	0.057	0.407	0.098	0.328	0.239
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	0.068	0.490	0.184	0.446	0.261
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	0.081	0.600	0.270	0.535	0.316
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	0.108	0.730	0.359	0.570	0.372
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	0.160	0.849	0.414	0.628	0.489
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	0.222	0.910	0.423	0.684	0.611
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	0.319	0.950	0.429	0.734	0.678
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	0.433	0.969	0.480	0.754	0.706
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	0.510	0.978	0.563	0.783	0.747
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	0.567	0.984	0.630	0.807	0.783
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	0.605	0.989	0.704	0.820	0.813
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	0.653	0.994	0.803	0.835	0.844
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	0.702	0.996	0.880	0.855	0.865
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	0.767	0.996	0.921	0.871	0.881
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	0.804	0.997	0.944	0.891	0.892
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	0.848	0.999	0.954	0.906	0.909
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	0.878	1.000	0.970	0.918	0.941
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	0.895		0.985	0.931	0.963
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	0.914		0.991	0.947	0.977
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	0.934		0.994	0.964	0.983

- Continued -

Table 23. (p. 2 of 2)

Date	Cumulative Proportion ^a																						
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
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	0.947		1.000	0.979	0.990
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	0.955			0.990	1.000
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	0.963				0.996
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	0.971			1.000	
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	0.978				
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	0.988				
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	0.994				
12-Aug	0.996	0.981	0.968	0.962			0.996		0.966	1.000	1.000			1.000			1.000	0.973	0.997				
13-Aug	0.997	0.982	0.974	0.965			1.000		0.975									0.979	0.999				
14-Aug	0.997	0.984	0.977	0.968					0.985									0.984	1.000				
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																			
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	24-Jul	18-Jul	24-Jul	18-Jul	21-Jul
Average midpoint (1981-2002)				23-Jul																			
No days for 80% ^b	14	14	12	17	6	11+	17	11	18	15	17	17	16	19	15	13	22	18	16	8	13	24	17
Average 1981-2002		15 d																					

^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 24. Daily fish wheel catch by species for the north bank of the Yentna River, 7 July through 6 August, 2003.

Date	Sockeye		Pink		Chum		Coho		Chinook		Other ^a	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
07-Jul	2	2	1	1	2	2	0	0	1	1	0	0
08-Jul	11	13	10	11	2	4	0	0	0	1	0	0
09-Jul	14	27	5	16	1	5	6	6	3	4	1	1
10-Jul	2	29	5	21	0	5	1	7	0	4	1	2
11-Jul	2	31	3	24	3	8	1	8	2	6	0	2
12-Jul	13	44	32	56	9	17	2	10	0	6	1	3
13-Jul	112	156	62	118	12	29	10	20	0	6	0	3
14-Jul	207	363	91	209	15	44	15	35	0	6	1	4
15-Jul	168	531	106	315	13	57	12	47	0	6	3	7
16-Jul	100	631	106	421	15	72	3	50	0	6	1	8
17-Jul	50	681	61	482	3	75	3	53	0	6	0	8
18-Jul	99	780	79	561	9	84	4	57	0	6	2	10
19-Jul	72	852	24	585	5	89	5	62	0	6	1	11
20-Jul	249	1,101	86	671	16	105	21	83	1	7	0	11
21-Jul	150	1,251	103	774	19	124	12	95	0	7	0	11
22-Jul	136	1,387	237	1,011	34	158	34	129	1	8	0	11
23-Jul	51	1,438	203	1,214	20	178	18	147	0	8	1	12
24-Jul	88	1,526	226	1,440	16	194	12	159	1	9	0	12
25-Jul	155	1,681	167	1,607	49	243	23	182	0	9	0	12
26-Jul	176	1,857	196	1,803	37	280	25	207	0	9	0	12
27-Jul	55	1,912	258	2,061	38	318	26	233	1	10	0	12
28-Jul	41	1,953	83	2,144	6	324	4	237	0	10	0	12
29-Jul	41	1,994	83	2,227	6	330	4	241	0	10	0	12
30-Jul	75	2,069	98	2,325	28	358	24	265	0	10	1	13
31-Jul	75	2,144	201	2,526	27	385	40	305	0	10	0	13
01-Aug	65	2,209	194	2,720	47	432	39	344	0	10	1	14
02-Aug	37	2,246	196	2,916	40	472	25	369	0	10	2	16
03-Aug	32	2,278	171	3,087	29	501	26	395	0	10	2	18
04-Aug	9	2,287	110	3,197	40	541	23	418	1	11	3	21
05-Aug	29	2,316	103	3,300	45	586	15	433	0	11	5	26
06-Aug	15	2,331	67	3,367	16	602	9	442	1	12	5	31

^a Fish wheel included whitefish and long-nosed sucker.

FN: 03YEFWR.XLS

Table 25. Daily fish wheel catch by species for the south bank of the Yentna River, 7 July through 6 August, 2003.

Date	Sockeye		Pink		Chum		Coho		Chinook		Other ^a	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
07-Jul	46	46	7	7	0	0	4	4	1	1	0	0
08-Jul	52	98	12	19	2	2	7	11	0	1	0	0
09-Jul	48	146	9	28	4	6	1	12	1	2	0	0
10-Jul	70	216	26	54	3	9	1	13	2	4	0	0
11-Jul	91	307	63	117	11	20	5	18	0	4	0	0
12-Jul	74	381	69	186	13	33	5	23	1	5	0	0
13-Jul	265	646	72	258	9	42	18	41	1	6	1	1
14-Jul	403	1,049	98	356	28	70	34	75	1	7	0	1
15-Jul	442	1,491	186	542	30	100	42	117	2	9	1	2
16-Jul	337	1,828	207	749	27	127	26	143	0	9	0	2
17-Jul	310	2,138	245	994	23	150	18	161	0	9	0	2
18-Jul	328	2,466	87	1,081	18	168	52	213	0	9	0	2
19-Jul	165	2,631	37	1,118	10	178	18	231	0	9	0	2
20-Jul	346	2,977	90	1,208	15	193	35	266	0	9	0	2
21-Jul	316	3,293	176	1,384	23	216	51	317	0	9	0	2
22-Jul	323	3,616	311	1,695	22	238	61	378	1	10	0	2
23-Jul	204	3,820	417	2,112	37	275	92	470	1	11	0	2
24-Jul	244	4,064	259	2,371	30	305	60	530	1	12	0	2
25-Jul	287	4,351	179	2,550	22	327	69	599	0	12	0	2
26-Jul	272	4,623	153	2,703	22	349	44	643	0	12	0	2
27-Jul	257	4,880	339	3,042	63	412	157	800	1	13	0	2
28-Jul	259	5,139	224	3,266	21	433	77	877	0	13	0	2
29-Jul	242	5,381	77	3,343	9	442	43	920	0	13	0	2
30-Jul	138	5,519	181	3,524	27	469	89	1,009	0	13	0	2
31-Jul	142	5,661	288	3,812	20	489	57	1,066	0	13	0	2
01-Aug	116	5,777	161	3,973	40	529	79	1,145	0	13	0	2
02-Aug	122	5,899	319	4,292	50	579	107	1,252	0	13	0	2
03-Aug	61	5,960	227	4,519	61	640	137	1,389	1	14	4	6
04-Aug	41	6,001	189	4,708	87	727	116	1,505	0	14	1	7
05-Aug	43	6,044	147	4,855	90	817	90	1,595	1	15	1	8
06-Aug	51	6,095	72	4,927	52	869	64	1,659	0	15	0	8

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^a Other fish wheel catch; whitefish and long-nosed sucker.

Table 26. Age composition of sockeye salmon sampled from the Yentna River 1986-2003.

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	Other	
1986	1.0	1.1	0.0	21.2	65.3	0.2	0.3	4.7	6.2	0.0	0.0	688
1987	1.3	2.4	0.9	23.3	50.6	1.0	0.0	8.6	11.7	0.0	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	0.0	1,727
1989	4.1	6.2	0.7	20.3	53.7	0.3	0.5	5.5	8.6	0.0	0.0	1,602
1990	0.8	2.4	0.3	29.9	47.6	0.7	0.1	9.8	8.2	0.1	0.2	1,916
1991	2.1	10.6	0.1	25.2	43.6	0.1	0.1	7.1	11.0	0.1	0.1	1,509
1992	1.6	0.7	1.0	31.4	29.2	0.1	0.4	17.1	18.2	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	0.3	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	0.1	751
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
1999	3.6	3.4	0.0	23.4	52.0	0.9	0.0	8.6	8.1	0.0	0.0	444
2000	0.0	5.9	0.0	8.6	61.5	0.2	0.0	3.3	20.2	0.2	0.0	546
2001	0.0	3.4	0.8	21.3	47.8	0.0	0.4	8.4	17.7	0.0	0.2	475
2002	1.7	2.0	0.7	28.8	51.0	0.0	0.0	5.5	10.2	0.0	0.2	459
2003	0.5	2.5	0.1	16.1	63.6	0.4	0.5	6.0	10.3	0.0	0.0	812
Mean (1986-02)	1.8	4.4	0.4	24.6	48.5	0.3	0.3	7.8	11.8	0.0	0.1	1,043

^a Percentages weighted by total numbers in the escapement: 1979-1981, 1986-2002.

^b Source: Tobias, ADF&G, Soldotna.

^c Corrections to table made by Tobias, October, 2002.

Table 27. Length composition of the major age classes of sockeye salmon collected in the Yentna River 1986-2003. Length measured from mid-eye to fork-of-tail.^a

Year	Age Class	Male		Female		Ratio Male-Female
		Ave Length ^a (mm)	Sample Size	Ave Length ^a (mm)	Sample Size	
1991	0.3	572	59	550	100	0.6:1
1997		598	41	559	38	1.1:1
1986	1.2	455	104	472	52	2.0:1
1987		484	158	477	156	1.0:1
1988		461	408	486	170	2.4:1
1989		463	246	485	122	2.0:1
1990		446	305	446	238	1.3:1
1991		460	253	484	130	2.0:1
1992		443	360	469	115	3.1:1
1993		465	279	494	167	1.7:1
1994		468	107	484	41	2.6:1
1995		460	58	472	42	1.4:1
1996		463	78	469	41	1.9:0
1997		479	110	479	133	0.8:1
1998		485	104	486	132	0.8:1
1999		469	56	484	48	1.2:1
2001	477	53	490	48	1.1:1	
2002	486	76	495	56	1.4:1	
2003	473	77	486	54	1.4:1	
Average (1986-02)		473	75	481	64	1.2:1
1986	1.3	579	172	563	216	0.8:1
1987		591	246	565	222	1.1:1
1988		580	365	552	359	1.0:1
1989		575	390	553	474	0.8:1
1990		573	400	552	526	0.7:1
1991		562	301	542	356	0.9:1
1992		546	188	543	242	0.8:1
1993		561	288	549	266	0.9:1
1994		596	133	561	142	0.9:1
1995		568	124	545	136	0.9:1
1996		589	107	568	97	1.1:1
1997		585	155	555	173	0.9:1
1998		562	453	538	487	0.9:1
1999		581	135	553	96	1.4:1
2000	600	180	568	156	1.2:1	
2001	586	111	555	116	1.0:1	
2002	596	113	561	121	0.9:1	
2003	576	270	548	246	1.1:1	
Average (1986-02)		581	171	554	175	1.0:1

-Continued-

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Table 27. (p. 2 of 2)

Year	Age Class	Male		Female		Ratio Male-Female
		Ave Length ^a (mm)	Sample Size	Ave Length ^a (mm)	Sample Size	
1992	2.2	451	181	471	53	3.4:1
1993		476	93	487	69	1.3:1
2003		472	23	486	26	0.9:1
Average (1992-03)		466	99	481	49	2:1
1986	2.3	588	25	555	44	0.6:1
1987		583	62	566	52	1.2:1
1988		585	92	554	87	1.1:1
1990		574	73	542	96	0.8:1
1991		561	78	536	86	0.9:1
1992		564	123	538	126	1.0:1
1993		562	74	544	128	0.6:1
1994		600	56	561	56	1.0:1
1995		578	25	544	34	0.7:1
1996		585	31	558	34	0.9:1
1998		558	82	534	76	1.1:1
2000		597	55	563	55	1.0:1
2001		575	34	552	50	0.7:1
2002		589	21	551	26	0.8:1
2003		562	50	543	34	1.5:1
Average (1986-02)		579	40	551	45	0.9:1
2003 summary (all ages)		521	420	516	360	1.2:1

^a 1986-1997 from Waltemyer, ADF&G, Soldotna^b 1998-2003 from Tobias, ADF&G, Soldotna

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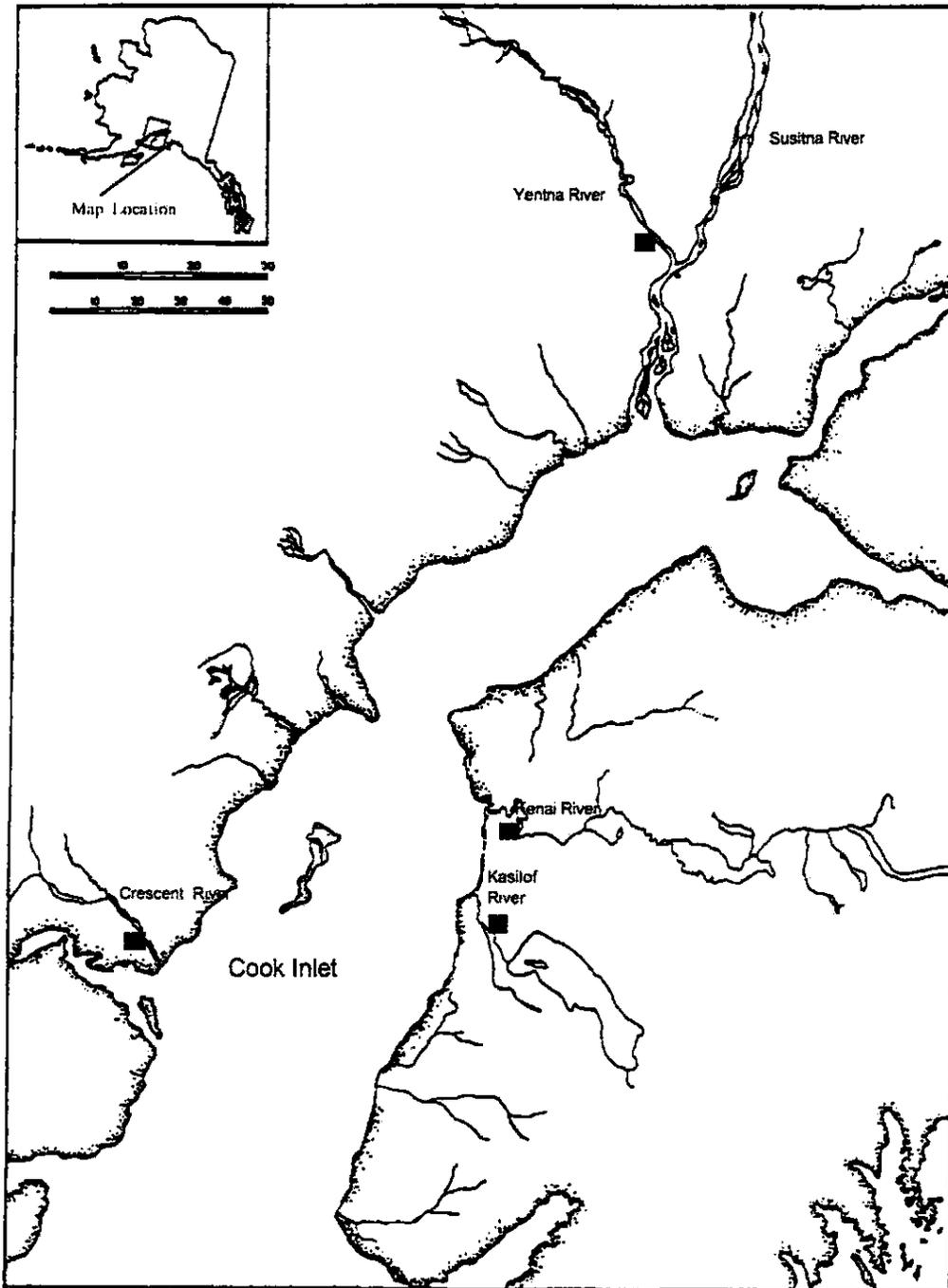


Figure 1. Upper Cook Inlet, Alaska, and sites where salmon escapement was monitored with side-scanning sonar.

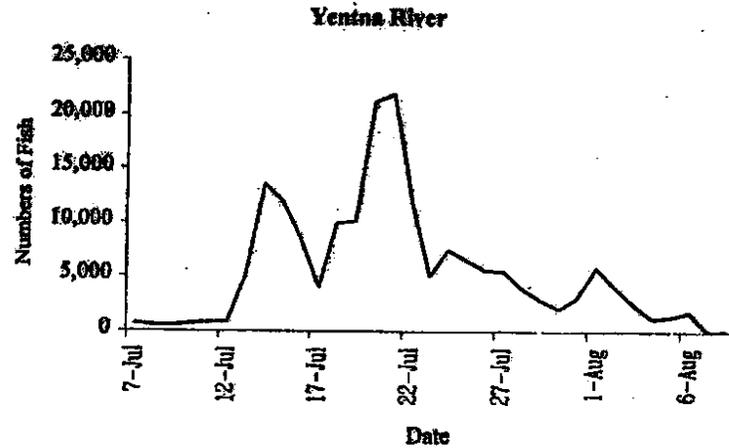
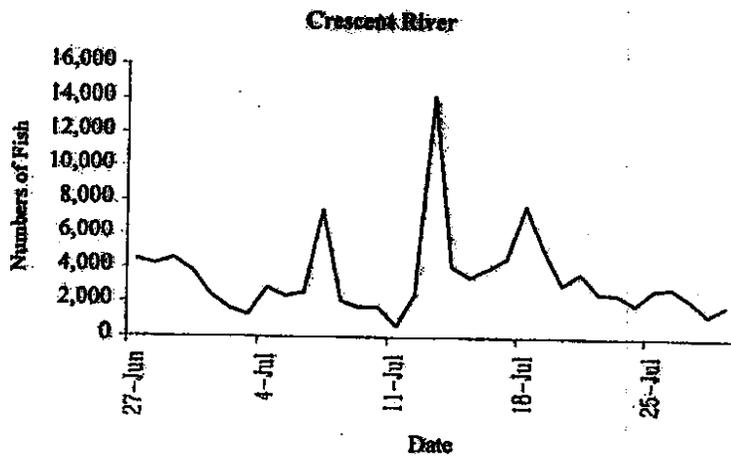
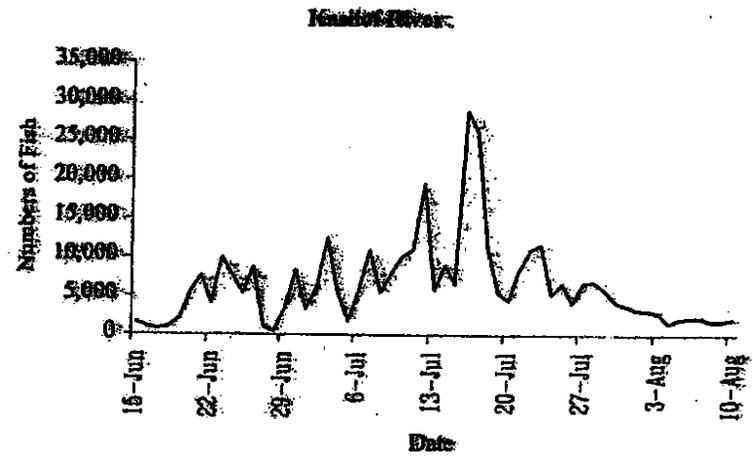
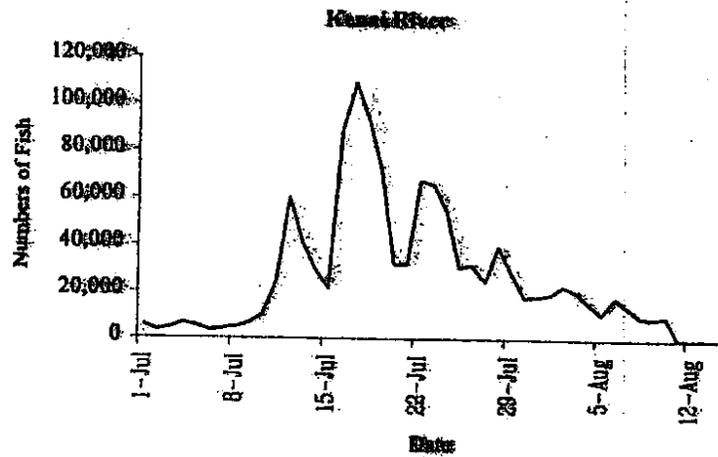
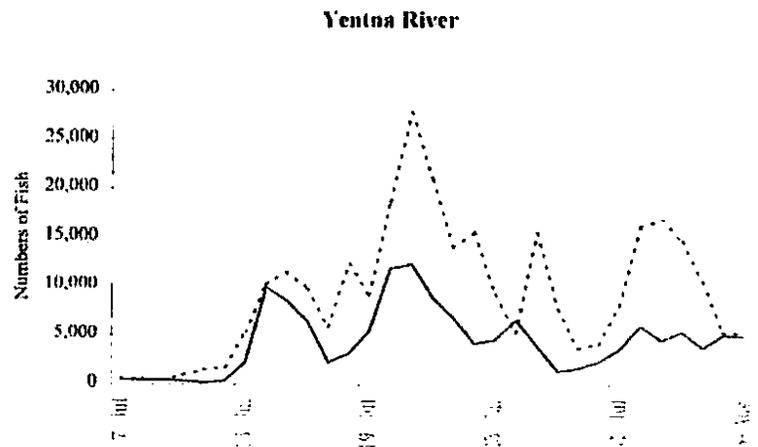
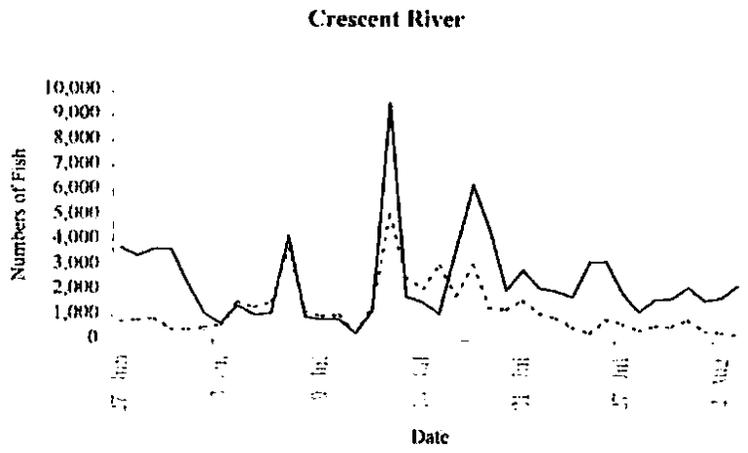
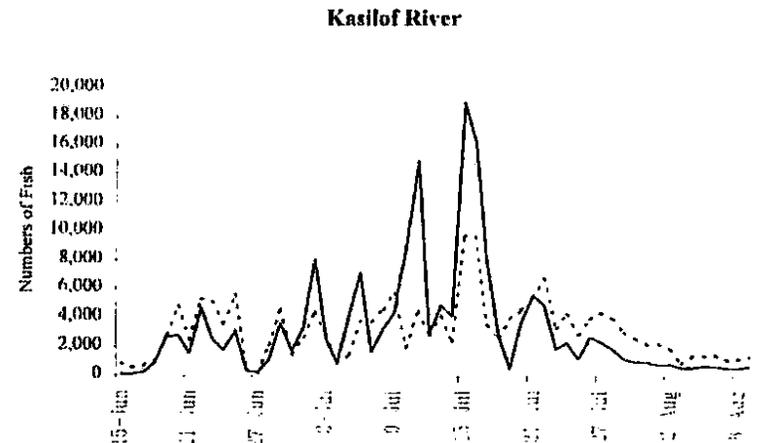
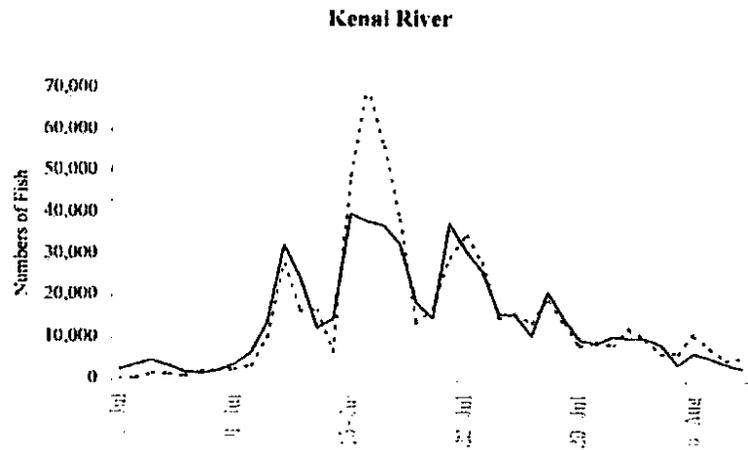


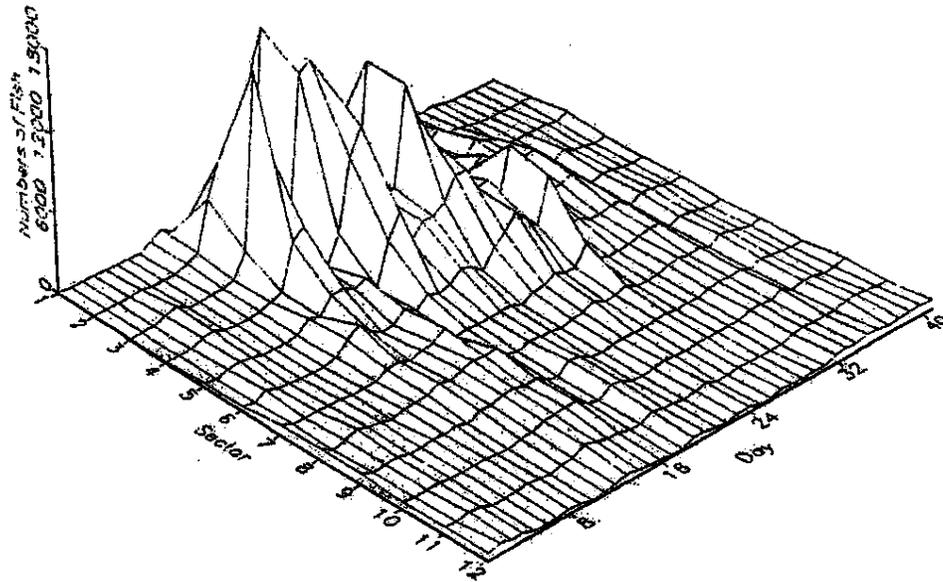
Figure 2. Daily escapement of sockeye salmon into the Kenai, Kasilof, Crescent and Yentna Rivers, 2005.



— North Bank - - - South Bank

Figure 3. Daily escapement of sockeye salmon by bank into the Kenai, Kasilof, Crescent and Yentna Rivers, 2003.

North Bank



South Bank

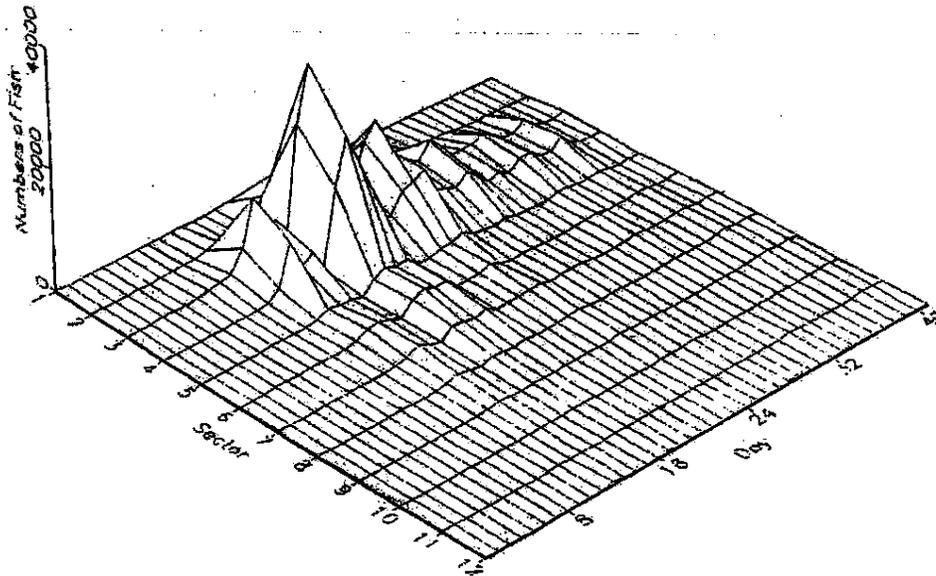
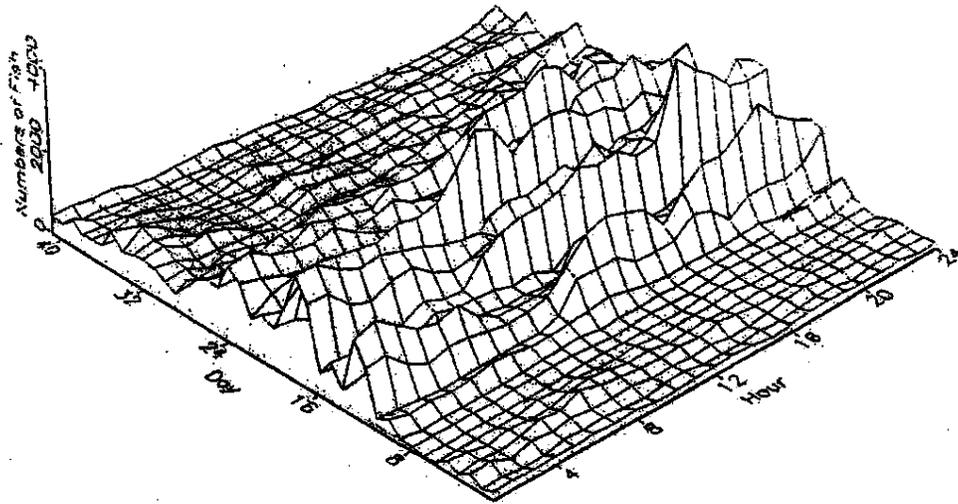


Figure 4. Distribution of salmon sonar counts by sector in the Kenai River, 2003

North Bank



South Bank

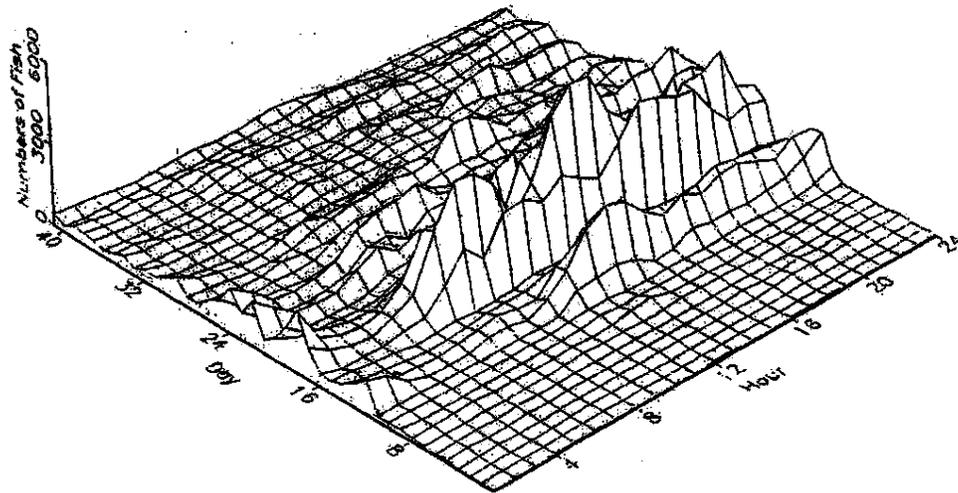


Figure 5. Distribution of salmon sonar counts by hour in the Kenai River, 2003.

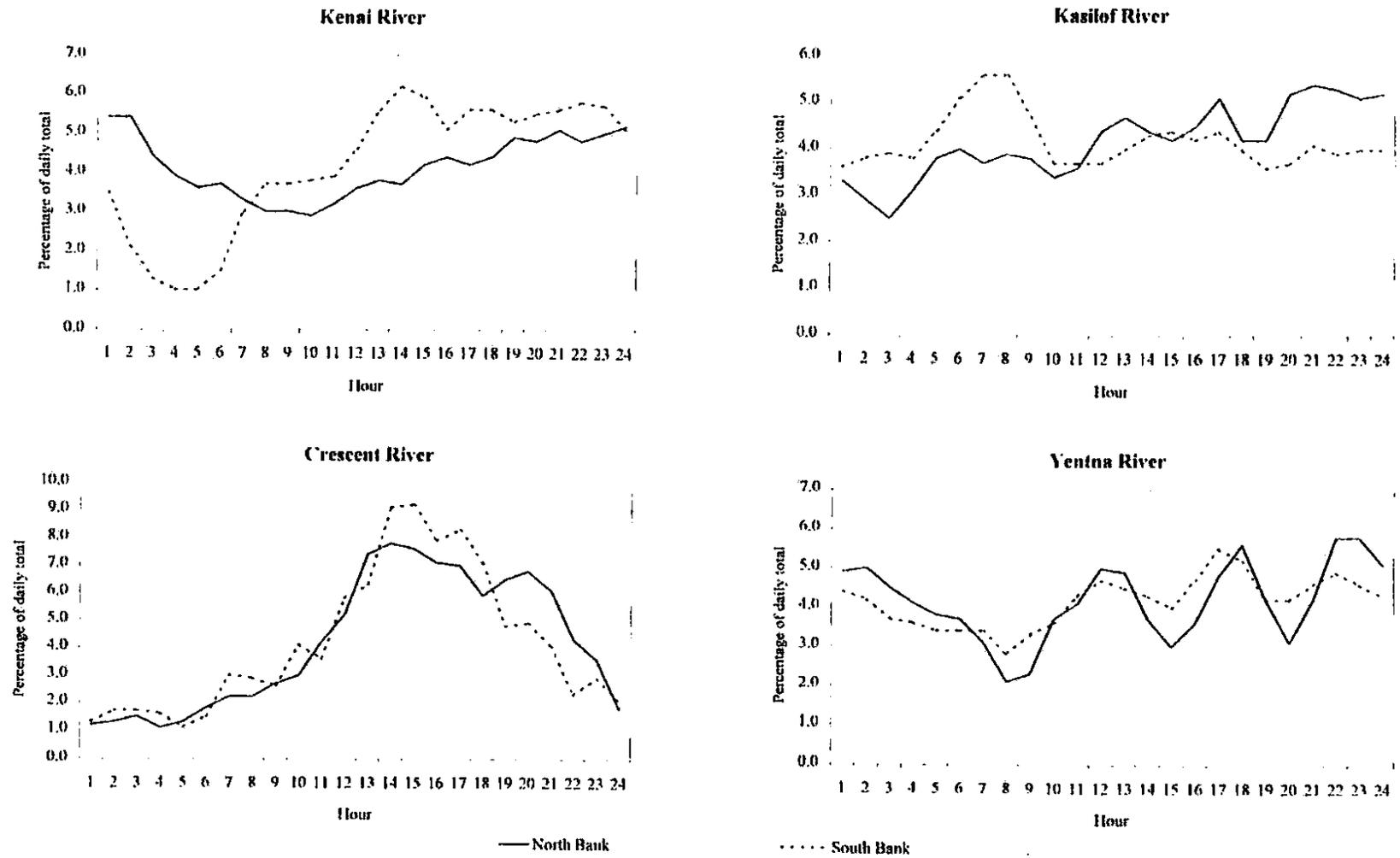


Figure 6. Mean hourly passage rates of salmon migrating past the Kenai, Kaslof, Crescent and Yentna River sonar counters, 2003.

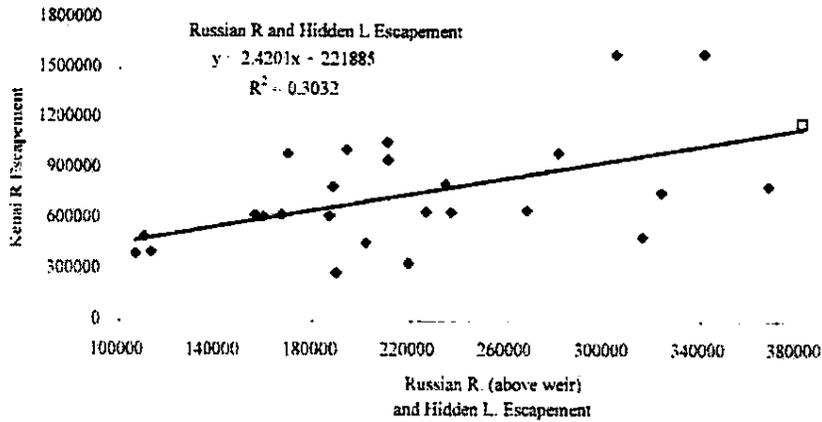
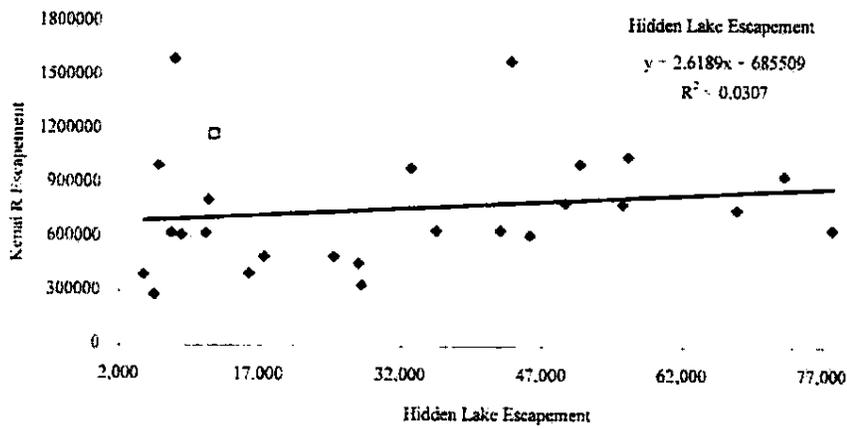
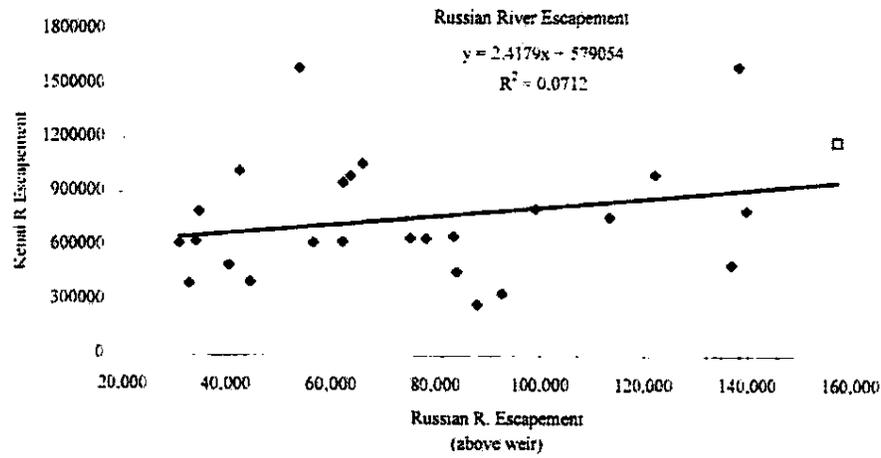
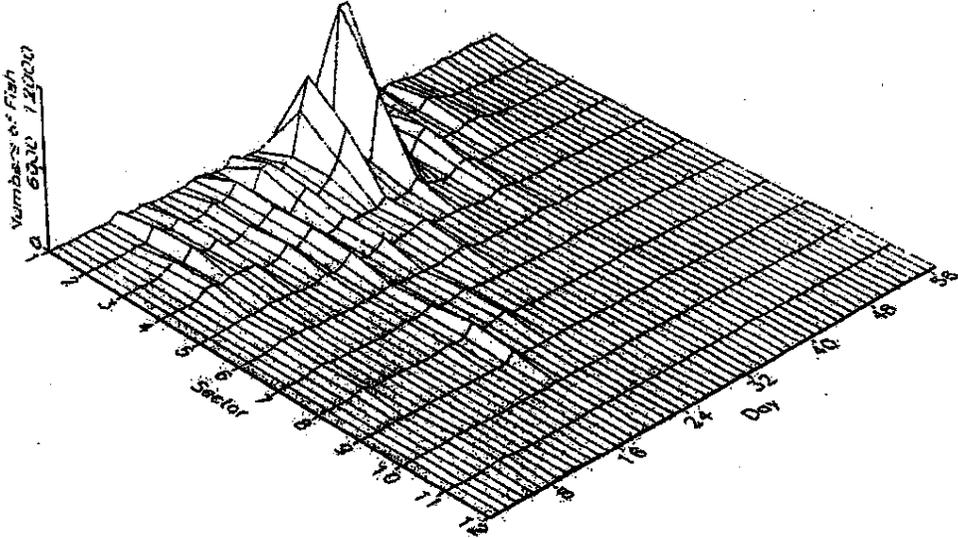


Figure 7. Linear relationships between Kenai River escapement and Russian River (top) escapement 1978-2003, Hidden Lake (middle) 1978-2003 and Russian and Hidden combined for 1979-2003. The square represents 2003 escapement.

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North Bank



South Bank

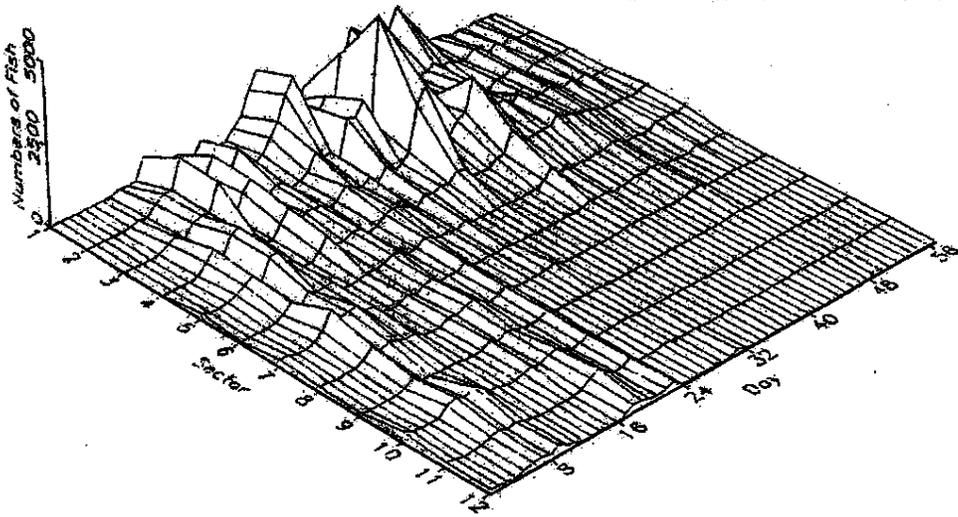
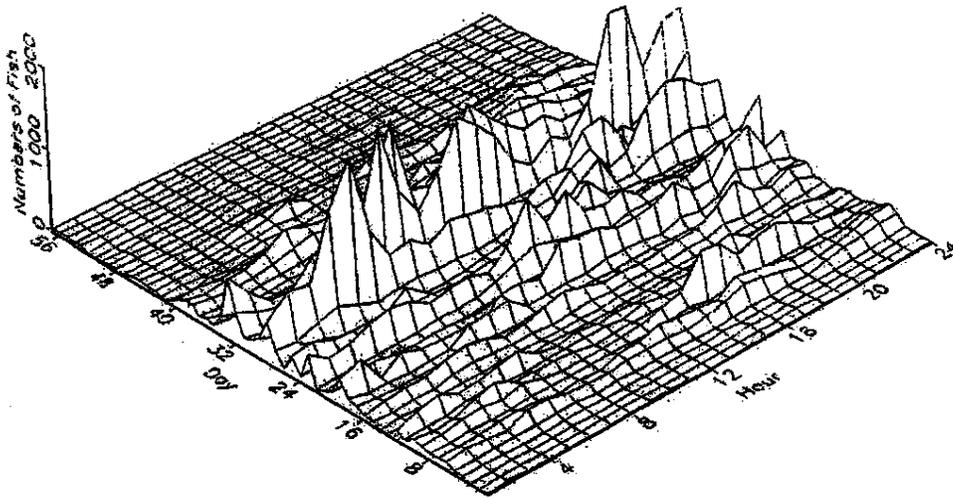


Figure 8. Distribution of salmon counts by sector in the Kasilof River, 2003.

North Bank



South Bank

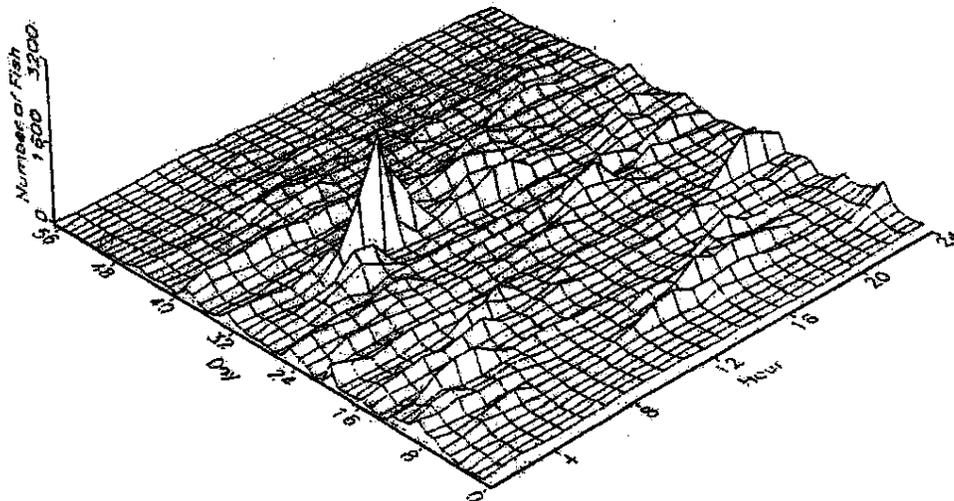


Figure 9. Distribution of salmon counts by hour in the Kasilof River, 2003.

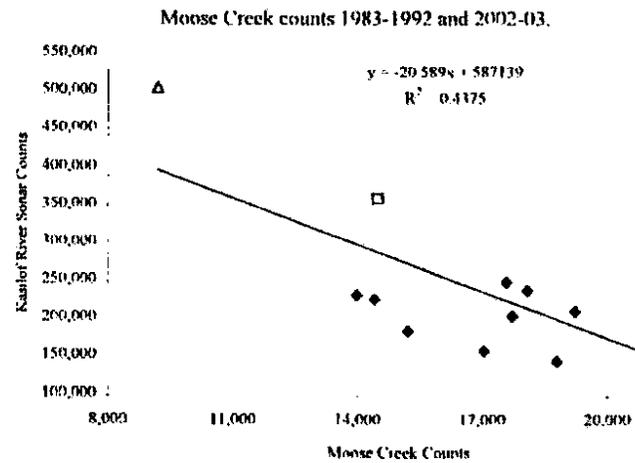
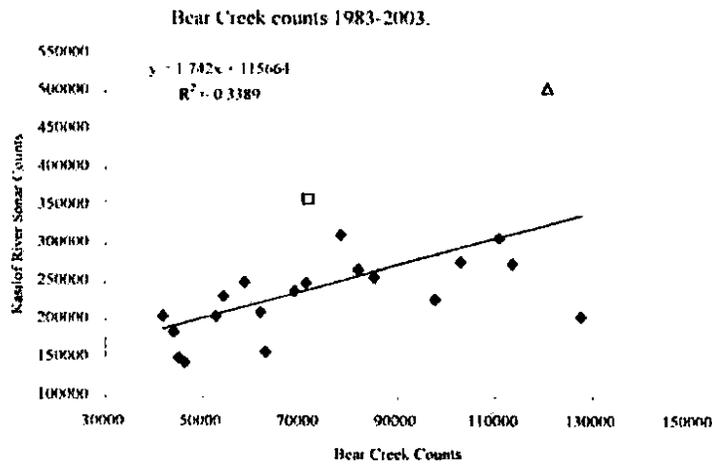
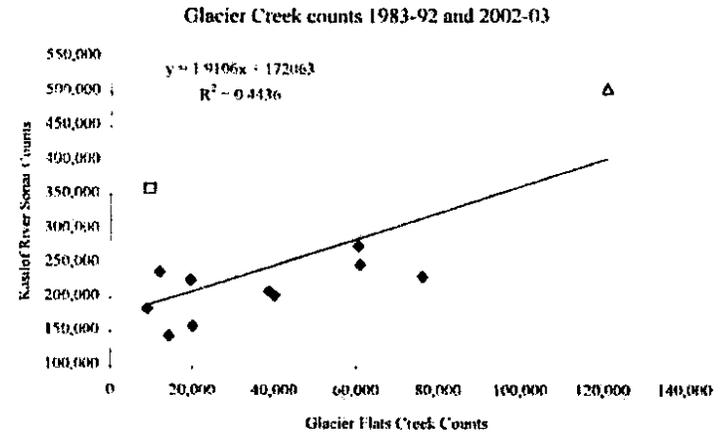
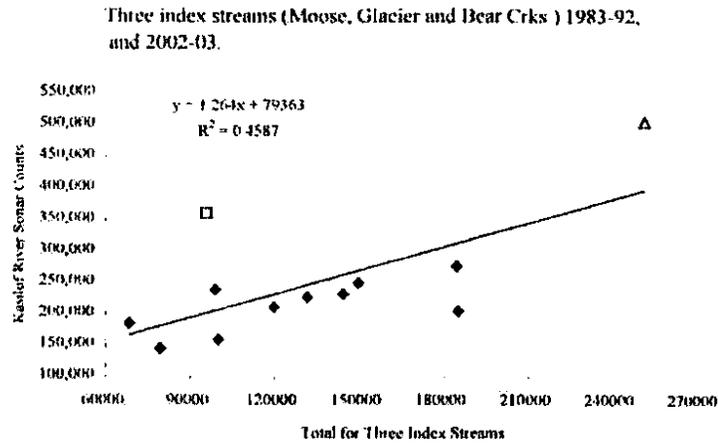


Figure 10. Regression analysis of 3 index stream counts and the Kaslof River sonar counts. Stream counts were obtained from weirs, ground or aerial surveys (see Table 12). The square represents 2003 counts and the triangle represents counts from 1985.

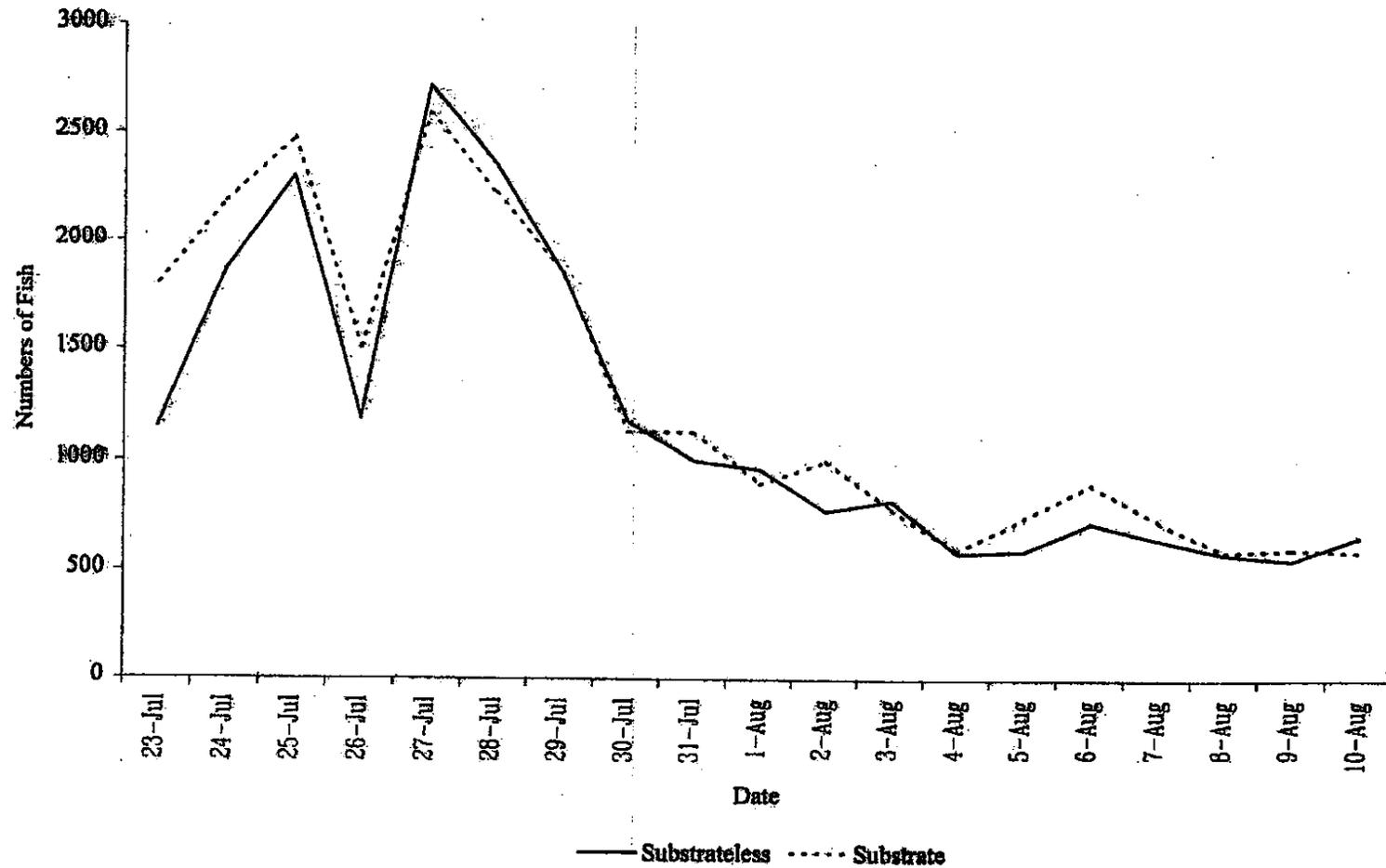


Figure 11. Comparison of daily substrateless and substrate sonar counts for the north bank, Kaslof River, 2003.

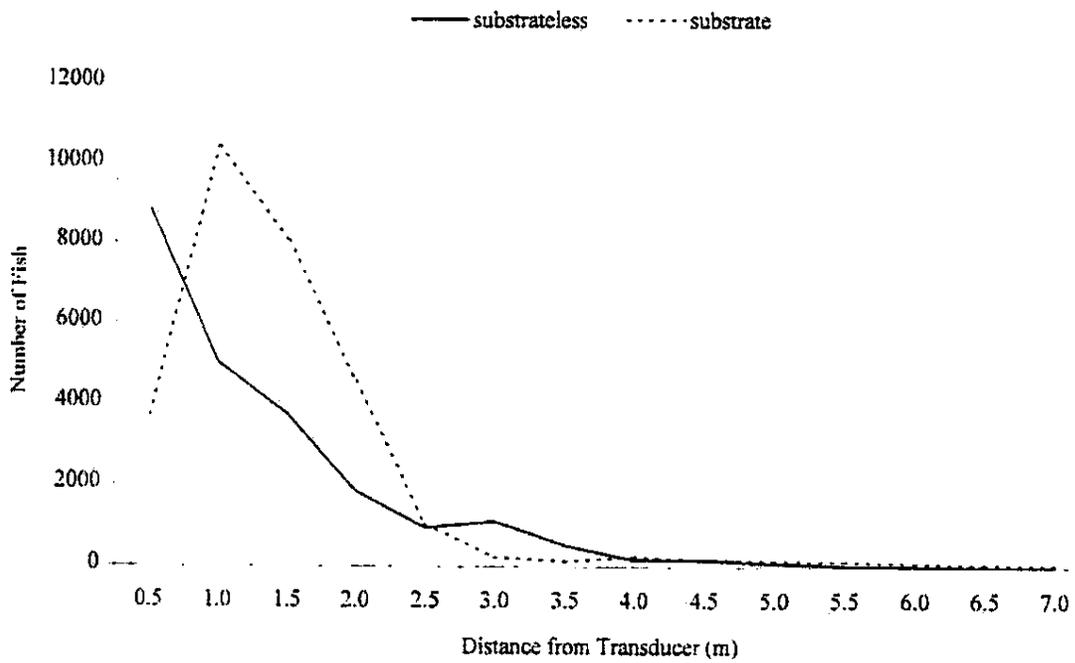
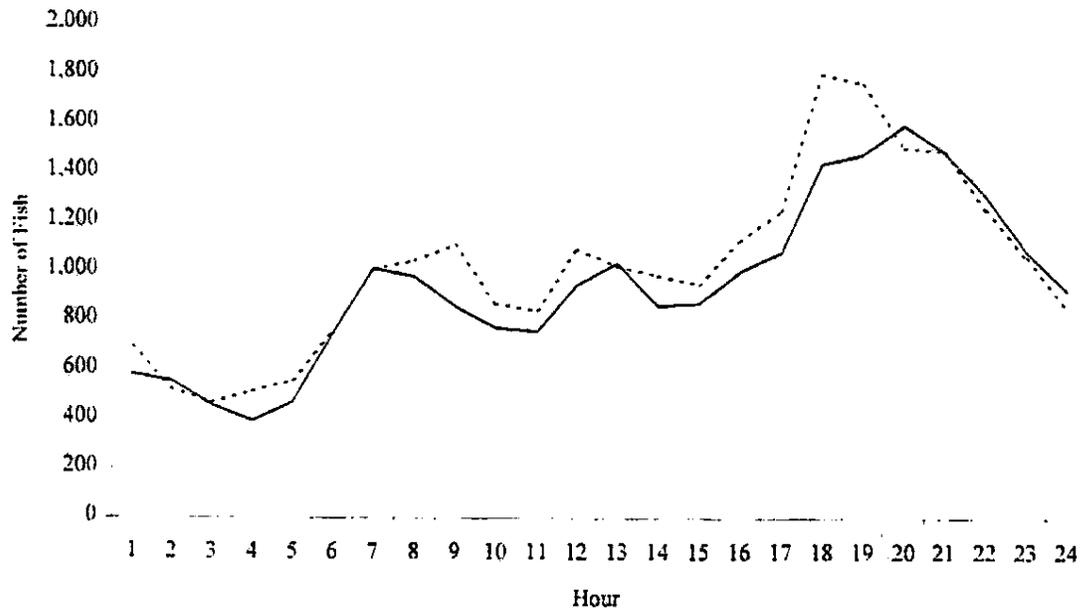


Figure 12. Comparison of hourly (top) and fish distribution counts (bottom) between substrate and substrateless counters for the north bank of the Kasilof River, 2003. The substrateless transducer was located 2.3 m. from shore and the substrate transducer was located 1.4 m. from shore.

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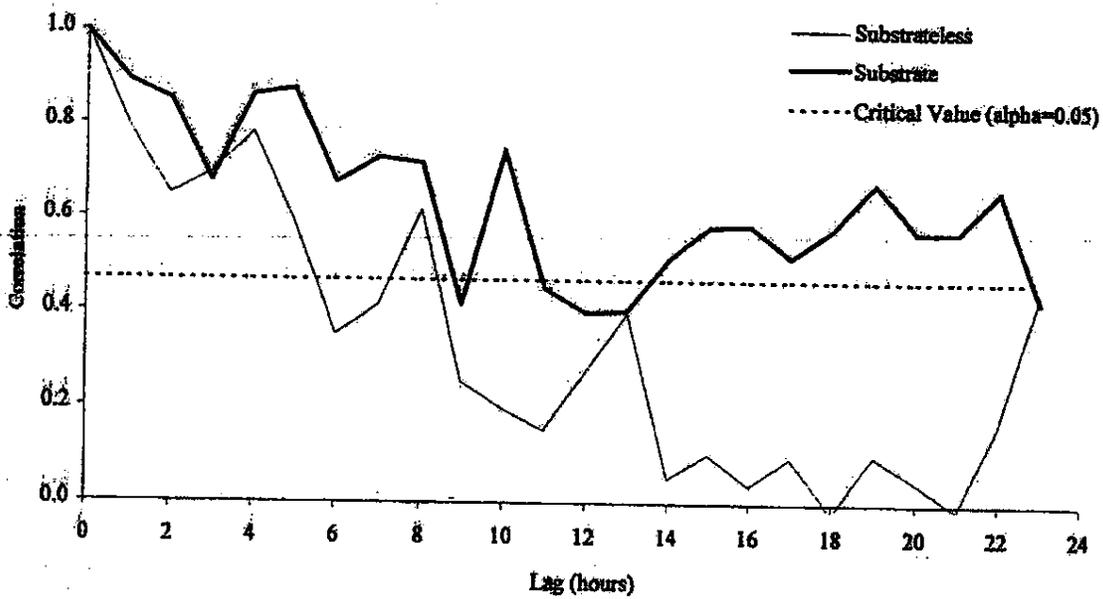
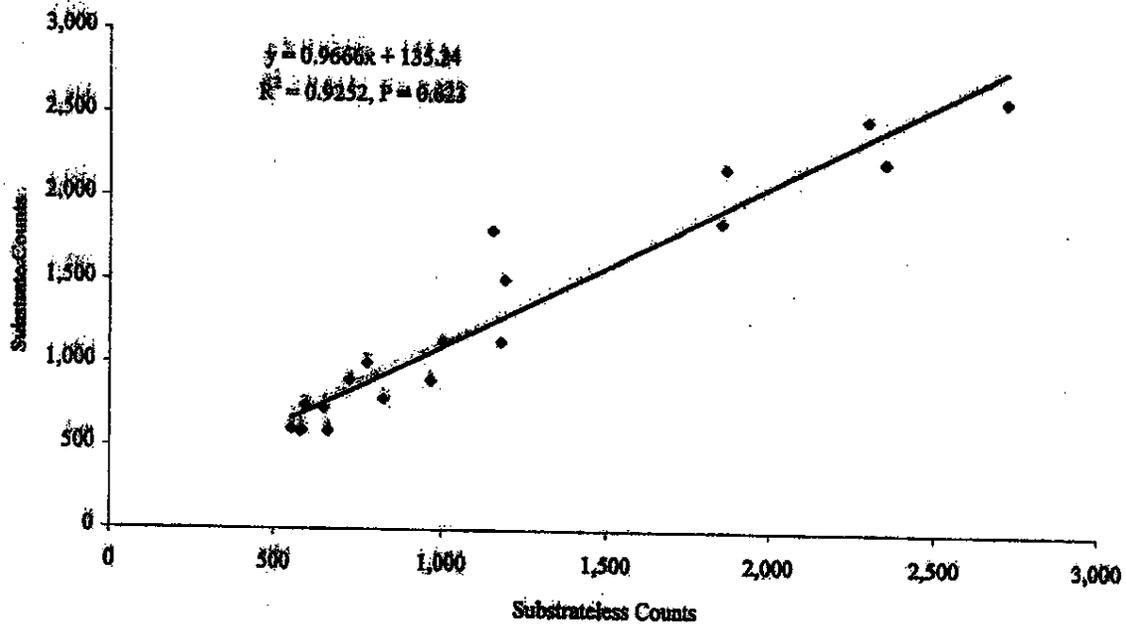
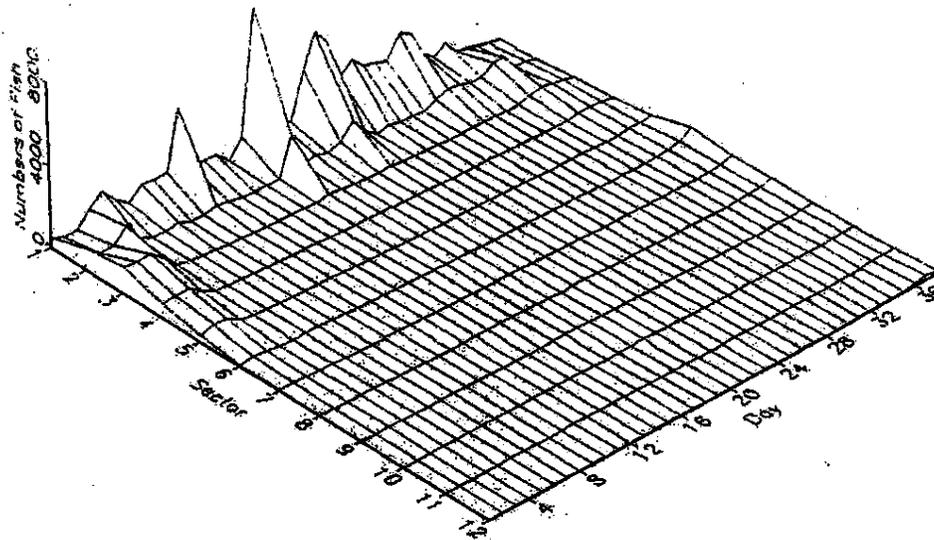


Figure 13. Linear regression analysis of paired daily sonar counts (top) of sockeye salmon escapement data collected with substrateless and substrate side-scanning counters on the north bank of the Kaslof River, 2003. Autocorrelation functions for both counters are also shown (bottom). P-values indicate whether the slope of the regression equation was different from one.

North Bank



South Bank

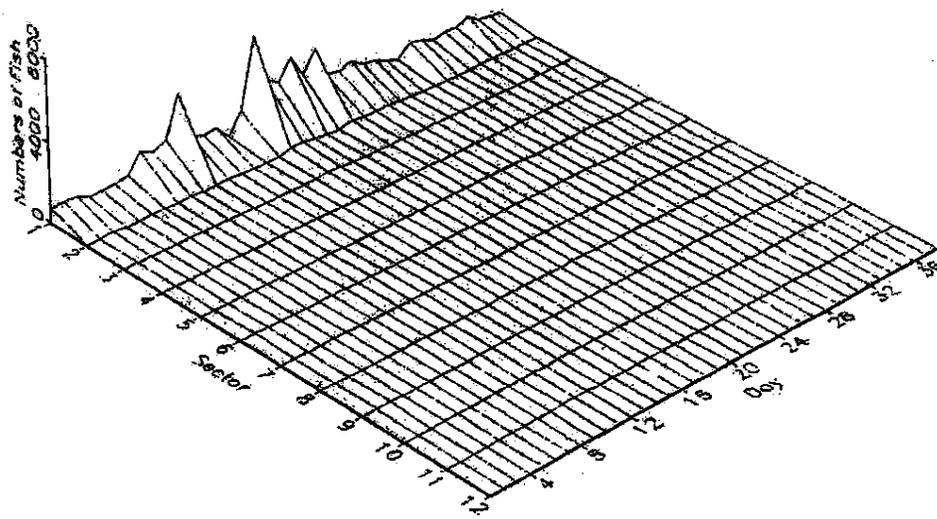
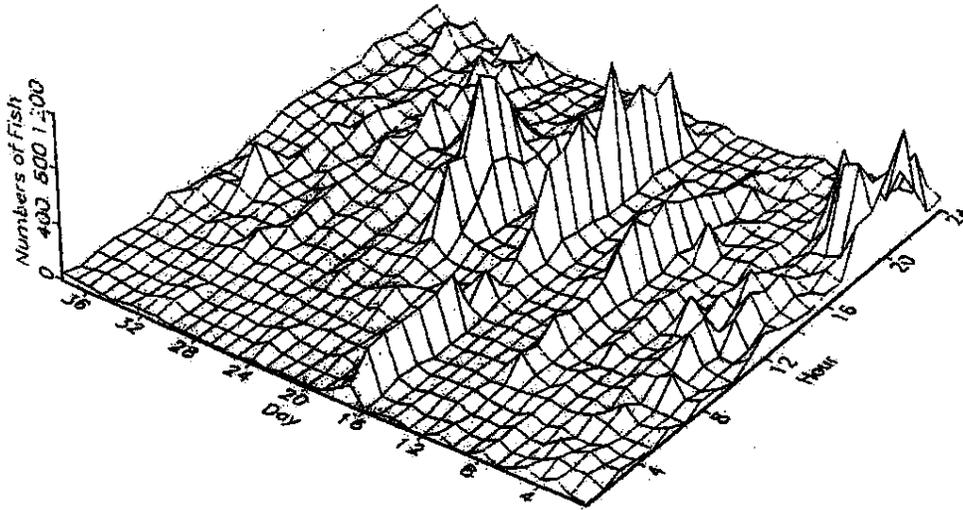


Figure 14. Distribution of salmon counts by sector in the Crescent River, 2003.

North Bank



South Bank

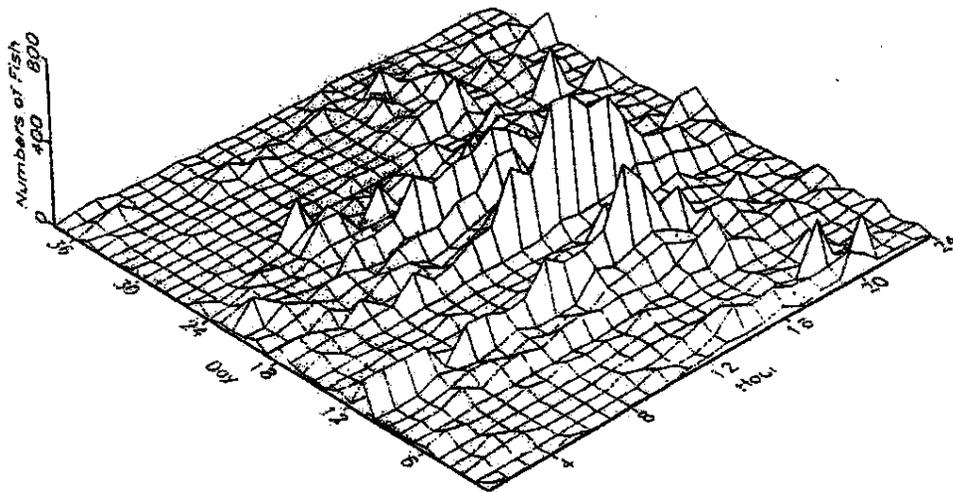


Figure 15. Distribution of salmon counts by hour in the Crescent River, 2003.

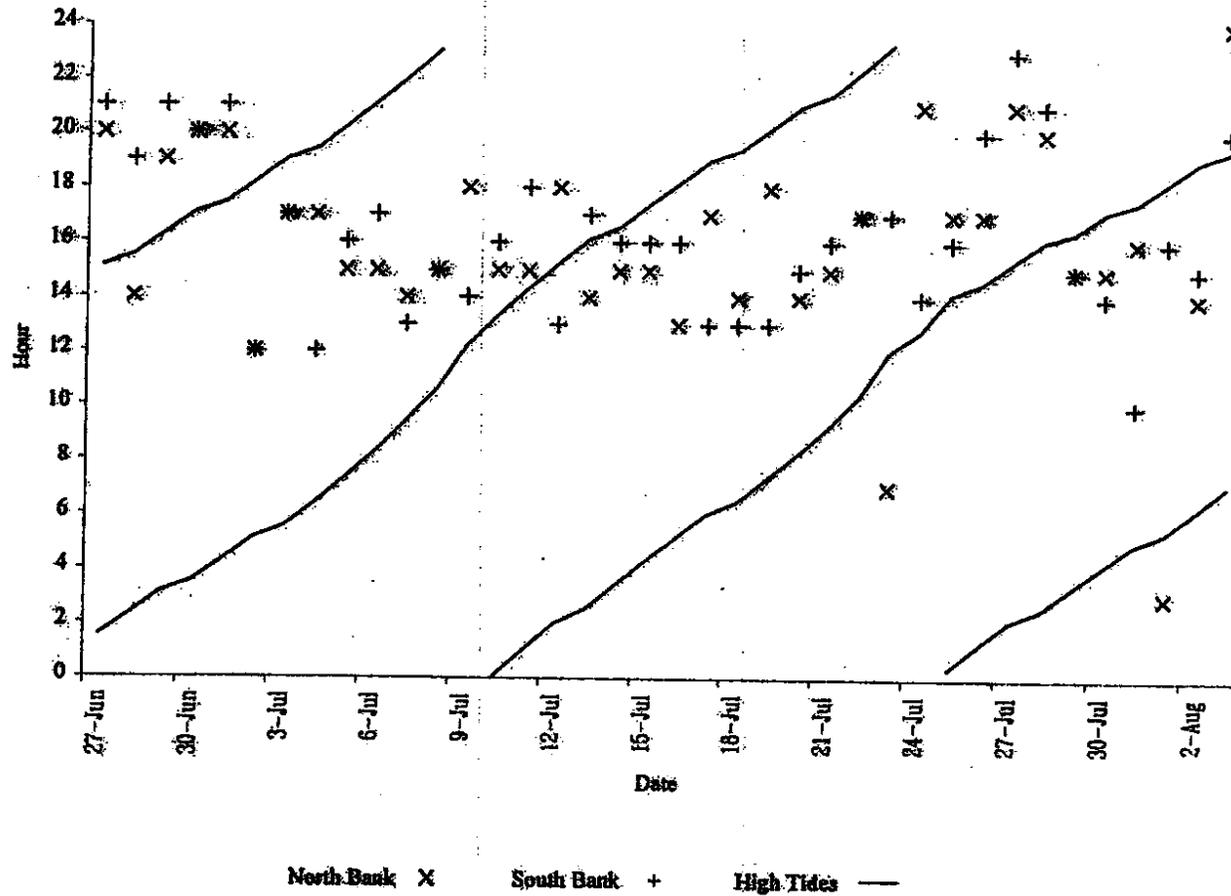
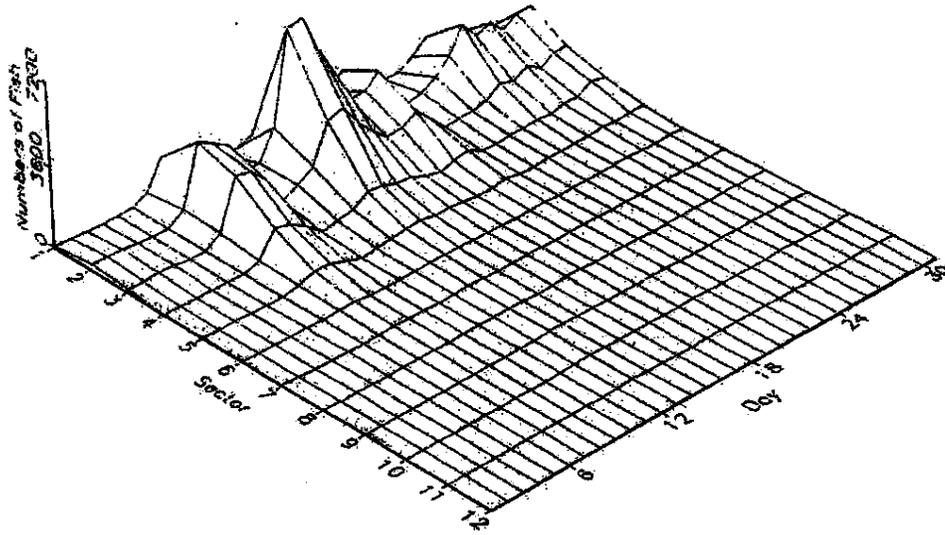


Figure 16. Peak daily high tides for Tuxedo Bay in relation to peak daily sonar counts for the Crescent River, 2003.

North Bank



South Bank

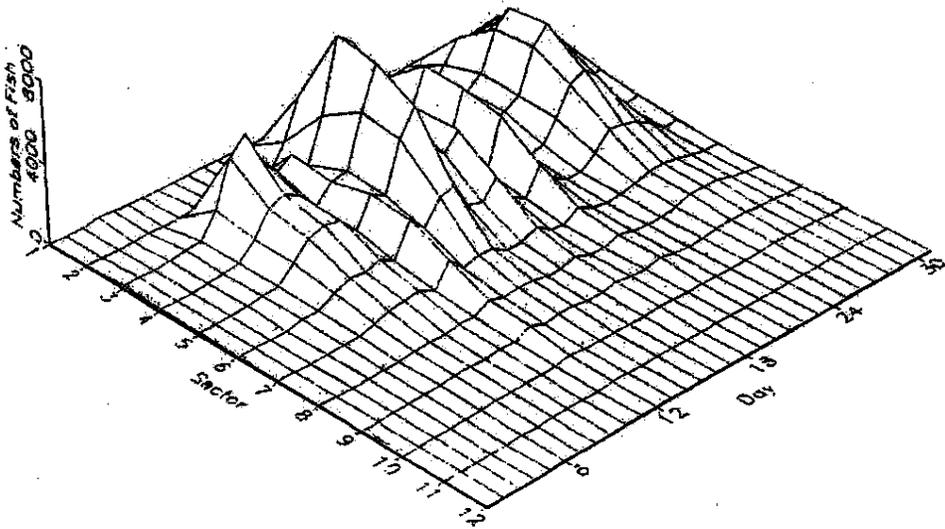
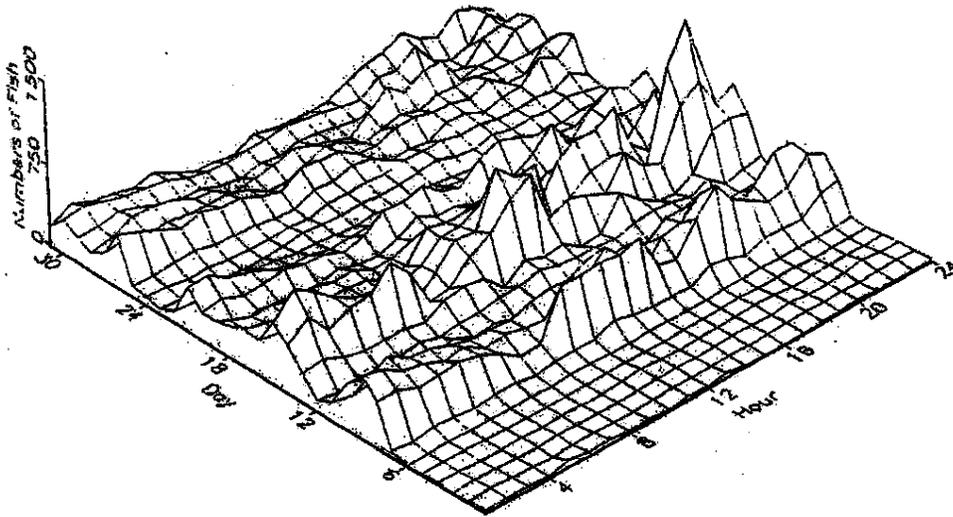


Figure 17. Distribution of salmon counts by sector in the Yentna River, 2003.

North Bank



South Bank

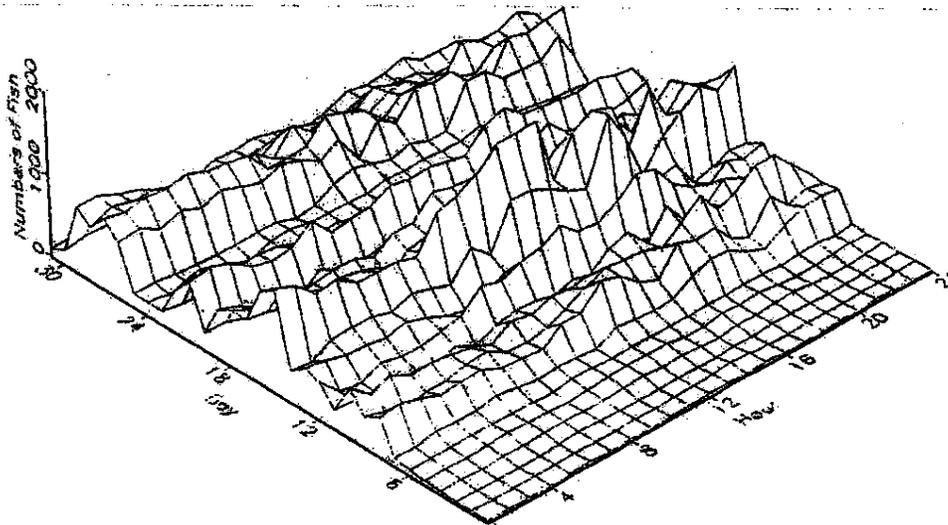


Figure 18. Distribution of salmon counts by hour in the Yentna River, 2003.

Appendix A.1. Estimated salmon escapement adjacent to the north bank of the Kenai River, 1 July through 10 August 2003.

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
1-Jul	4,481	4,481	0	0	0	0	0	0
2-Jul	2,681	7,162	0	0	0	0	0	0
3-Jul	3,849	11,011	0	0	0	0	0	0
4-Jul	4,775	15,786	0	0	0	0	0	0
5-Jul	3,556	19,342	0	0	0	0	0	0
6-Jul	2,129	21,471	0	0	0	0	0	0
7-Jul	1,728	23,199	0	0	0	0	0	0
8-Jul	2,373	25,572	0	0	0	0	0	0
9-Jul	3,792	29,364	0	0	0	0	0	0
10-Jul	6,575	35,939	0	0	0	0	0	0
11-Jul	13,876	49,815	0	0	0	0	0	0
12-Jul	32,357	82,172	0	0	0	0	0	0
13-Jul	24,468	106,640	0	0	0	0	0	0
14-Jul	12,533	119,173	0	0	0	0	0	0
15-Jul	14,715	133,888	0	0	0	0	0	0
16-Jul	40,004	173,892	0	0	0	0	0	0
17-Jul	38,221	212,113	0	0	0	0	0	0
18-Jul	37,209	249,322	0	0	0	0	0	0
19-Jul	32,653	281,975	0	0	0	0	0	0
20-Jul	18,251	300,226	0	0	0	0	0	0
21-Jul	14,949	315,175	0	0	0	0	0	0
22-Jul	37,658	352,833	0	0	0	0	0	0
23-Jul	30,922	383,755	0	0	0	0	0	0
24-Jul	26,181	409,936	0	0	0	0	0	0
25-Jul	15,763	425,699	0	0	0	0	0	0
26-Jul	15,613	441,312	0	0	0	0	0	0
27-Jul	10,678	451,990	0	0	0	0	0	0
28-Jul	20,824	472,814	0	0	0	0	0	0
29-Jul	14,678	487,492	0	0	0	0	0	0
30-Jul	9,650	497,142	0	0	0	0	0	0
31-Jul	8,939	506,081	0	0	0	0	0	0
1-Aug	10,616	516,697	0	0	0	0	0	0
2-Aug	10,223	526,920	0	0	0	0	0	0
3-Aug	10,167	537,087	0	0	0	0	0	0
4-Aug	8,720	545,807	0	0	0	0	0	0
5-Aug	3,975	549,782	0	0	0	0	0	0
6-Aug	6,698	556,480	0	0	0	0	0	0
7-Aug	5,651	562,131	0	0	0	0	0	0
8-Aug	4,219	566,350	0	0	0	0	0	0
9-Aug	3,203	569,553	0	0	0	0	0	0
10-Aug	4,532	574,085	0	0	0	0	0	0

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Appendix A.2. Estimated salmon escapement adjacent to the south bank of the Kenai River, 1 July through 10 August, 2003.

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
1-Jul	1,130	1,130	0	0	0	0	0	0
2-Jul	528	1,658	0	0	0	0	0	0
3-Jul	623	2,281	0	0	0	0	0	0
4-Jul	1,614	3,895	0	0	0	0	0	0
5-Jul	1,604	5,499	0	0	0	0	0	0
6-Jul	1,037	6,536	0	0	0	0	0	0
7-Jul	2,247	8,783	0	0	0	0	0	0
8-Jul	2,414	11,197	0	0	0	0	0	0
9-Jul	2,642	13,839	0	0	0	0	0	0
10-Jul	3,610	17,449	0	0	0	0	0	0
11-Jul	10,242	27,691	0	0	0	0	0	0
12-Jul	27,863	55,554	0	0	0	0	0	0
13-Jul	16,456	72,010	0	0	0	0	0	0
14-Jul	16,701	88,711	0	0	0	0	0	0
15-Jul	6,863	95,574	0	0	0	0	0	0
16-Jul	49,189	144,763	0	0	0	0	0	0
17-Jul	70,669	215,432	0	0	0	0	0	0
18-Jul	56,086	271,518	0	0	0	0	0	0
19-Jul	38,621	310,139	0	0	0	0	0	0
20-Jul	13,571	323,710	0	0	0	0	0	0
21-Jul	17,033	340,743	0	0	0	0	0	0
22-Jul	29,458	370,201	0	0	0	0	0	0
23-Jul	34,720	404,921	0	0	0	0	0	0
24-Jul	28,242	433,163	0	0	0	0	0	0
25-Jul	14,757	447,920	0	0	0	0	0	0
26-Jul	15,860	463,780	0	0	0	0	0	0
27-Jul	13,792	477,572	0	0	0	0	0	0
28-Jul	18,785	496,357	0	0	0	0	0	0
29-Jul	13,703	510,060	0	0	0	0	0	0
30-Jul	8,240	518,300	0	0	0	0	0	0
31-Jul	9,334	527,634	0	0	0	0	0	0
1-Aug	8,577	536,211	0	0	0	0	0	0
2-Aug	12,474	548,685	0	0	0	0	0	0
3-Aug	10,098	558,783	0	0	0	0	0	0
4-Aug	6,525	565,308	0	0	0	0	0	0
5-Aug	6,727	572,035	0	0	0	0	0	0
6-Aug	11,129	583,164	0	0	0	0	0	0
7-Aug	8,029	591,193	0	0	0	0	0	0
8-Aug	5,151	596,344	0	0	0	0	0	0
9-Aug	5,701	602,045	0	0	0	0	0	0
10-Aug	5,179	607,224	0	0	0	0	0	0

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Appendix A.3. Kenai River north bank sonar counts by hour, 1 July through 10 August 2003.

Date	Counts by Hour																								Daily Total	Cum 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	191	206	178	205	185	207	172	231	159	162	177	198	230	199	117	177	227	231	206	176	181	217	101	148	4,481	4,481
2-Jul	91	101	36	49	166	113	152	88	71	151	159	81	80	68	140	78	127	182	158	42	125	146	153	121	2,681	7,162
3-Jul	261	300	75	244	184	243	169	182	208	111	146	90	140	58	68	118	196	261	179	166	113	101	113	123	3,849	11,011
4-Jul	100	162	84	171	340	256	480	326	238	187	182	208	173	252	185	135	119	131	198	135	153	129	249	182	4,775	15,786
5-Jul	252	178	94	185	134	135	252	329	252	145	192	101	128	151	103	101	120	100	123	113	99	93	47	129	3,556	19,342
6-Jul	47	69	50	60	58	185	131	167	106	96	140	101	120	102	128	169	89	83	38	32	36	57	32	33	2,129	21,471
7-Jul	33	23	10	23	19	37	53	40	85	91	67	94	67	59	111	149	126	101	91	78	97	68	98	108	1,728	23,199
8-Jul	80	68	71	80	55	111	106	142	114	86	58	53	103	76	76	112	193	125	134	103	72	54	84	217	2,373	25,572
9-Jul	107	28	76	37	57	57	67	119	138	157	80	88	80	128	93	157	157	157	140	157	368	307	467	570	3,792	29,364
10-Jul	407	280	322	258	296	414	374	287	293	319	352	444	329	223	193	193	194	196	196	244	105	145	250	261	6,575	35,939
11-Jul	249	209	171	141	138	161	172	183	192	335	966	971	1,001	631	620	671	1,066	912	439	766	816	715	868	1,483	13,876	49,815
12-Jul	1,292	1,345	862	612	755	719	602	516	527	639	1,123	1,663	1,851	1,689	1,538	903	1,482	1,922	1,887	2,185	2,682	2,144	1,827	1,592	32,357	82,172
13-Jul	1,784	2,005	1,649	1,294	1,172	1,310	821	520	502	494	578	1,302	1,121	1,258	923	925	766	822	903	1,213	992	1,197	665	252	24,468	106,640
14-Jul	460	524	500	516	307	294	518	456	353	390	311	433	874	992	903	538	269	413	628	650	817	498	417	472	12,533	119,173
15-Jul	934	876	678	556	578	813	660	642	599	434	522	288	601	465	663	561	368	369	585	760	744	592	722	705	14,715	133,888
16-Jul	526	430	571	643	688	941	735	693	1,296	1,612	1,737	1,765	1,894	2,202	2,019	2,123	1,784	1,876	3,668	3,180	2,827	2,319	2,211	2,264	40,004	173,892
17-Jul	2,013	1,993	1,484	1,286	1,514	1,599	1,230	999	1,078	1,243	731	695	839	1,175	1,592	1,817	1,457	1,826	2,507	1,813	2,441	1,928	2,600	2,331	38,221	212,113
18-Jul	2,521	2,533	2,154	1,939	2,005	1,824	1,689	1,482	1,348	1,279	936	1,008	990	1,013	1,556	2,029	1,560	1,620	1,489	1,666	1,443	861	795	1,469	37,209	249,322
19-Jul	1,651	2,171	1,864	1,622	1,286	1,271	1,165	766	744	643	1,284	1,426	1,324	1,434	1,583	1,136	1,300	1,563	1,527	1,762	1,446	1,301	1,229	1,205	32,653	281,975
20-Jul	975	923	672	655	766	1,054	1,031	713	365	401	229	462	468	477	855	1,020	923	904	742	607	910	1,010	1,178	881	18,251	300,226
21-Jul	1,103	933	655	397	609	878	585	321	281	298	231	348	253	286	410	550	816	536	540	615	878	1,072	1,247	1,072	14,949	315,175
22-Jul	867	1,202	1,363	1,444	1,330	1,257	1,188	1,373	1,290	1,397	2,000	2,727	2,505	1,669	2,101	2,179	2,045	1,657	1,632	1,312	1,567	1,209	983	1,361	37,658	352,833
23-Jul	1,539	1,411	1,223	1,117	1,142	988	743	693	555	549	547	1,030	978	1,138	1,214	1,103	1,143	1,995	2,078	2,009	2,316	1,723	1,767	1,921	30,922	383,755
24-Jul	1,805	1,895	1,574	1,410	1,352	1,480	1,130	872	692	593	767	780	786	699	859	1,224	827	743	828	1,065	1,227	1,377	1,230	966	26,181	409,936
25-Jul	1,051	1,135	770	588	310	544	495	348	252	282	419	394	421	458	515	493	786	764	526	600	901	1,125	1,421	1,165	15,763	425,699

-Continued-

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
26-Jul	1,165	1,056	726	600	655	547	497	579	678	872	597	431	446	421	607	661	522	637	839	595	520	553	668	741	15,613	411,312
27-Jul	1,011	811	609	436	349	272	380	220	159	235	359	293	217	290	409	390	568	412	483	326	688	524	532	705	10,678	451,990
28-Jul	842	636	542	424	344	480	749	563	490	374	696	653	688	881	1,093	1,365	1,404	1,454	1,778	1,557	952	1,194	993	672	20,824	472,811
29-Jul	349	453	562	436	358	560	509	778	594	547	539	402	366	557	639	1,069	791	692	671	549	418	1,210	1,074	555	14,678	487,492
30-Jul	516	567	319	444	337	215	179	425	517	397	455	327	448	310	333	341	314	300	320	323	580	510	483	690	9,650	497,142
31-Jul	685	608	370	375	350	312	149	234	262	292	181	220	279	371	583	508	443	345	326	348	311	263	467	657	8,939	506,081
1-Aug	736	807	555	657	501	222	138	278	477	476	401	278	504	376	236	421	554	454	592	419	235	288	412	599	10,616	516,697
2-Aug	688	798	670	414	438	244	207	217	406	253	236	236	229	235	309	271	182	365	482	432	232	656	1,002	1,021	10,223	526,920
3-Aug	588	987	704	364	392	302	253	341	557	410	329	217	182	197	285	355	175	265	334	419	506	648	639	688	10,167	537,087
4-Aug	979	808	694	510	306	272	201	149	265	162	156	287	286	281	339	278	391	322	263	187	339	312	398	535	8,720	545,807
5-Aug	462	419	373	345	191	151	147	112	125	84	80	50	45	30	65	117	45	48	189	247	75	217	175	183	3,975	549,782
6-Aug	470	425	542	430	242	117	102	191	342	168	52	78	179	189	224	213	288	184	180	454	495	394	437	302	6,698	556,480
7-Aug	415	384	365	288	210	126	155	182	194	60	93	179	120	154	207	152	237	205	186	199	247	339	335	619	5,651	562,131
8-Aug	675	380	296	321	234	156	161	185	206	206	168	119	86	92	35	87	113	18	57	44	59	132	186	203	4,219	566,350
9-Aug	381	250	276	205	143	96	129	62	92	131	126	148	80	74	154	44	33	154	48	88	77	72	82	258	3,203	569,553
10-Aug	443	464	374	402	225	176	208	234	290	168	202	170	95	72	157	87	43	31	10	28	40	60	163	390	4,532	574,085
	30,744	30,803	25,163	22,183	20,721	21,139	18,884	17,238	17,392	16,929	18,604	20,838	21,606	21,432	24,240	25,020	24,243	25,375	28,200	27,754	29,160	27,760	28,800	29,857	574,085	

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Appendix A.4. Kenai River south bank sonar counts by hour, 1 July through 10 August 2003.

Date	Counts by Hour																								Daily Total	Cum 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	52	49	43	41	38	47	29	36	40	43	46	61	71	43	40	66	75	69	54	37	29	43	35	43	1,130	1,130
2-Jul	53	22	16	28	33	24	37	14	46	23	12	25	16	11	18	12	26	26	24	13	18	1	12	18	528	1,658
3-Jul	14	23	14	14	41	30	37	41	30	31	20	20	30	16	14	27	36	51	28	23	28	24	18	13	623	2,281
4-Jul	27	43	30	19	41	43	22	36	52	52	69	73	40	29	43	28	85	163	152	132	164	108	50	113	1,614	3,895
5-Jul	61	102	42	59	64	32	59	48	25	32	36	57	41	48	46	96	51	95	175	113	150	70	51	51	1,604	5,499
6-Jul	31	56	50	33	56	32	28	25	42	22	29	22	31	34	32	42	43	42	33	51	67	90	80	66	1,037	6,536
7-Jul	55	82	59	59	17	33	48	63	96	73	83	58	103	160	118	120	89	99	134	119	157	121	175	126	2,247	8,783
8-Jul	98	139	160	160	66	81	66	69	91	19	88	215	310	94	61	65	15	65	83	49	74	110	86	150	2,414	11,197
9-Jul	162	116	83	68	76	54	79	61	68	79	202	111	138	117	116	139	135	107	85	101	111	145	123	166	2,612	13,809
10-Jul	179	163	133	103	113	86	63	90	73	104	171	189	60	83	122	108	124	134	159	157	146	173	296	581	3,610	17,419
11-Jul	149	123	144	98	99	60	53	48	45	65	627	700	825	626	174	258	655	493	522	434	602	682	1,060	1,700	10,242	27,691
12-Jul	1,149	929	322	101	87	98	263	277	109	491	1,121	2,253	2,736	2,519	1,762	1,251	1,655	1,337	1,688	1,764	1,454	1,155	1,688	1,654	27,863	55,554
13-Jul	835	533	240	187	143	207	314	429	276	226	1,035	1,500	1,778	1,579	1,320	930	561	296	326	689	1,013	641	684	714	16,456	72,010
14-Jul	551	335	243	173	70	102	162	283	296	268	517	382	1,417	1,831	1,744	962	779	755	872	1,195	1,069	1,004	872	819	16,701	88,711
15-Jul	395	376	269	193	67	109	156	82	88	112	279	256	243	351	390	339	303	254	262	245	343	630	642	479	6,863	95,574
16-Jul	416	189	228	186	315	424	1,193	2,186	1,439	2,678	2,815	2,366	2,976	2,498	2,111	3,121	4,261	4,096	3,762	3,672	2,565	1,785	2,067	1,840	49,189	144,763
17-Jul	1,089	646	374	322	604	1,011	2,962	4,385	4,271	3,585	1,924	2,838	4,966	5,804	5,709	4,076	3,392	3,553	2,655	3,721	3,764	4,240	2,517	2,231	70,669	215,432
18-Jul	2,194	847	509	420	586	1,195	2,771	2,692	2,073	1,555	1,528	3,423	3,783	4,133	3,955	2,909	3,264	3,197	2,786	2,608	2,812	2,679	2,471	1,666	56,086	271,518
19-Jul	1,360	788	565	384	364	646	994	1,783	1,782	1,533	1,612	1,629	1,651	2,897	3,045	2,105	1,662	1,679	1,657	2,495	2,089	2,669	1,903	1,329	38,621	310,139
20-Jul	738	357	264	216	170	238	521	374	445	465	431	756	360	628	464	488	605	564	610	901	994	926	1,184	872	13,571	323,710
21-Jul	441	224	92	69	54	133	434	560	623	691	528	450	581	384	401	456	549	835	804	684	1,243	2,435	2,459	1,903	17,033	340,743
22-Jul	1,574	951	434	354	320	781	1,238	684	1,073	826	909	716	1,828	2,110	1,946	1,700	1,771	1,629	1,429	1,132	1,415	1,484	1,201	1,953	29,458	370,201
23-Jul	933	374	196	122	164	340	985	1,012	555	1,173	1,161	1,180	1,163	1,410	1,991	1,983	3,152	3,196	2,264	1,987	2,317	2,317	2,803	1,942	34,720	404,921
24-Jul	1,564	1,054	405	300	373	620	1,388	1,652	1,725	1,990	1,229	984	945	909	926	843	1,532	1,394	1,277	1,328	974	1,569	1,776	1,485	28,242	433,163
25-Jul	995	299	213	161	53	135	357	678	977	714	747	411	351	405	417	514	541	643	753	1,029	1,349	638	1,247	1,130	14,757	447,920

-Continued-

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
26-Jul	712	225	108	154	131	205	566	913	790	593	872	673	362	607	500	384	844	882	1,420	1,116	1,395	938	688	782	15,860	463,780
27-Jul	358	232	149	133	321	203	178	261	408	466	455	535	607	638	553	722	635	483	856	1,174	804	1,150	1,446	1,025	13,792	477,572
28-Jul	336	264	159	84	73	158	448	516	719	728	892	755	876	1,893	1,840	1,394	822	942	1,024	573	867	1,393	1,169	860	18,785	496,357
29-Jul	802	412	258	93	85	270	566	340	399	566	555	805	759	956	976	948	919	661	585	592	709	536	177	734	13,703	510,060
30-Jul	584	236	125	49	58	104	101	200	237	197	306	459	300	307	391	432	679	689	525	491	490	204	567	489	8,240	518,300
31-Jul	364	98	87	66	56	101	178	173	327	333	362	373	393	434	358	602	600	930	713	416	551	732	692	395	9,334	527,634
1-Aug	395	215	176	182	148	134	222	307	553	403	375	417	551	545	462	564	622	615	384	248	274	270	280	235	8,577	536,211
2-Aug	225	156	134	93	84	120	168	235	385	290	432	384	531	456	567	400	1,100	1,256	1,395	840	828	949	934	512	12,474	548,685
3-Aug	466	252	286	111	77	155	220	276	434	427	255	416	488	726	629	406	331	716	863	784	531	460	416	373	10,098	558,783
4-Aug	300	286	107	78	76	130	264	252	304	322	272	400	605	356	302	375	279	245	244	334	250	237	299	208	6,525	565,308
5-Aug	191	144	70	67	46	65	103	251	220	191	270	212	281	237	252	340	332	271	293	466	468	603	708	646	6,727	572,035
6-Aug	325	224	156	152	105	142	281	417	457	472	431	447	628	737	522	752	471	440	580	581	674	884	761	490	11,129	583,164
7-Aug	336	235	196	139	187	108	323	352	323	286	306	330	377	355	560	484	403	400	324	450	416	416	383	348	8,029	591,193
8-Aug	421	259	132	224	110	264	278	250	259	168	237	199	227	151	181	164	237	222	128	169	164	218	285	204	5,151	596,344
9-Aug	200	90	88	106	112	127	73	77	164	219	273	283	429	491	405	304	169	181	247	286	318	299	307	453	5,701	602,045
10-Aug	396	345	256	174	99	120	231	278	224	282	404	473	397	283	186	110	142	108	116	131	90	112	73	149	5,179	607,224
Total	21,526	12,493	7,615	5,775	5,782	8,967	18,459	22,706	22,563	22,793	23,916	27,836	34,254	37,891	35,649	31,019	33,946	33,813	32,291	33,330	33,806	35,140	34,715	30,939	607,224	

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Appendix A 5. Kenai River north bank sonar counts by hour, 1 July through 10 August, 2003. 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	4.3	4.6	4.0	4.6	4.1	4.6	3.8	5.2	3.5	3.6	4.0	4.4	5.1	4.4	2.6	4.0	5.1	5.2	4.6	3.9	4.0	4.8	2.3	3.3	100.0
2-Jul	3.4	3.8	1.3	1.8	6.2	4.2	5.7	3.3	2.6	5.6	5.9	3.0	3.0	2.5	5.2	2.9	4.7	6.8	5.9	1.6	4.7	5.4	5.7	4.6	100.0
3-Jul	6.8	7.8	1.9	6.3	4.8	6.3	4.4	4.7	5.4	2.9	3.8	2.3	3.6	1.5	1.8	3.1	5.1	6.8	4.7	4.3	2.9	2.6	2.9	3.2	100.0
4-Jul	2.1	3.4	1.8	3.6	7.1	5.4	10.1	6.8	5.0	3.9	3.8	4.4	3.6	5.3	3.9	2.8	2.5	2.7	4.1	2.8	3.2	2.7	5.2	3.8	100.0
5-Jul	7.1	5.0	2.6	5.2	3.8	3.8	7.1	9.3	7.1	4.1	5.4	2.8	3.6	4.2	2.9	2.8	3.4	2.8	3.5	3.2	2.8	2.6	1.3	3.6	100.0
6-Jul	2.2	3.2	2.3	2.8	2.7	8.7	6.2	7.8	5.0	4.5	6.6	4.7	5.6	4.8	6.0	7.9	4.2	3.9	1.8	1.5	1.7	2.7	1.5	1.6	100.0
7-Jul	1.9	1.3	0.6	1.3	1.1	2.1	3.1	2.3	4.9	5.3	3.9	5.4	3.9	3.4	6.4	8.6	7.3	5.8	5.3	4.5	5.6	3.9	5.7	6.2	100.0
8-Jul	3.4	2.9	3.0	3.4	2.3	4.7	4.5	6.0	4.8	3.6	2.4	2.2	4.3	3.2	3.2	4.7	8.1	5.3	5.6	4.3	3.0	2.3	3.5	9.1	100.0
9-Jul	2.8	0.7	2.0	1.0	1.5	1.5	1.8	3.1	3.6	4.1	2.1	2.7	2.1	3.4	2.5	4.1	4.1	4.1	3.7	4.1	9.7	8.1	12.3	15.0	100.0
10-Jul	6.2	4.3	4.9	3.9	4.5	6.3	5.7	4.4	4.5	4.9	5.4	6.8	5.0	3.4	2.9	2.9	3.0	3.0	3.0	3.7	1.6	2.2	3.8	4.0	100.0
11-Jul	1.8	1.5	1.2	1.0	1.0	1.2	1.2	1.3	1.4	2.4	7.0	7.0	7.2	4.5	4.5	4.8	7.7	6.6	3.2	5.5	5.9	5.2	6.3	10.7	100.0
12-Jul	4.0	4.2	2.7	1.9	2.3	2.2	1.9	1.6	1.6	2.0	3.5	5.1	5.7	5.2	4.8	2.8	4.6	5.9	5.8	6.8	8.3	6.6	5.6	4.9	100.0
13-Jul	7.3	8.2	6.7	5.3	4.8	5.4	3.4	2.1	2.1	2.0	2.4	5.3	4.6	5.1	3.8	3.8	3.1	3.4	3.7	5.0	4.1	4.9	2.7	1.0	100.0
14-Jul	3.7	4.2	4.0	4.1	2.4	2.3	4.1	3.6	2.8	3.1	2.5	3.5	7.0	7.9	7.2	4.3	2.1	3.3	5.0	5.2	6.5	4.0	3.3	3.8	100.0
15-Jul	6.3	6.0	4.6	3.8	3.9	5.5	4.5	4.4	4.1	2.9	3.5	2.0	4.1	3.2	4.5	3.8	2.5	2.5	4.0	5.2	5.1	4.0	4.9	4.8	100.0
16-Jul	1.3	1.1	1.1	1.6	1.7	2.4	1.8	1.7	3.2	4.0	4.3	4.4	4.7	5.5	5.0	5.3	4.5	4.7	9.2	7.9	7.1	5.8	5.5	5.7	100.0
17-Jul	5.3	5.2	3.9	3.4	4.0	4.2	3.2	2.6	2.8	3.3	1.9	1.8	2.2	3.1	4.2	4.8	3.8	4.8	6.6	4.8	6.4	5.0	6.8	6.1	100.0
18-Jul	6.8	6.8	5.8	5.2	5.4	4.9	4.5	4.0	3.6	3.4	2.5	2.7	2.7	2.7	4.2	5.5	4.2	4.4	4.0	4.5	3.9	2.3	2.1	3.9	100.0
19-Jul	5.1	6.5	5.7	5.0	3.9	3.9	3.6	2.3	2.3	2.0	3.9	4.4	4.1	4.4	4.8	3.5	4.0	4.8	4.7	5.4	4.4	4.0	3.8	3.7	100.0
20-Jul	5.3	5.1	3.7	3.6	4.2	5.8	5.6	3.9	2.0	2.2	1.3	2.5	2.6	2.6	4.7	5.6	5.1	5.0	4.1	3.3	5.2	5.5	6.5	4.8	100.0
21-Jul	7.4	6.2	4.4	2.7	4.1	5.9	3.9	2.1	1.9	2.0	1.5	2.3	1.7	1.9	2.7	3.7	5.5	3.6	3.6	4.3	5.9	7.2	8.3	7.2	100.0
22-Jul	2.3	3.2	3.6	3.8	3.5	3.3	3.2	3.6	3.4	3.7	5.3	7.2	6.7	4.4	5.6	5.8	5.4	4.4	4.3	3.5	4.2	3.2	2.6	3.6	100.0
23-Jul	5.0	4.6	4.0	3.6	3.7	3.2	2.4	2.2	1.8	1.8	1.8	3.3	3.2	3.7	3.9	3.6	3.7	6.5	6.7	6.5	7.5	5.6	5.7	6.2	100.0
24-Jul	6.9	7.2	6.0	5.4	5.2	5.7	4.3	3.3	2.6	2.3	2.9	3.0	3.0	2.7	3.3	4.7	3.2	2.8	3.2	4.1	4.7	5.3	4.7	3.7	100.0
25-Jul	6.7	7.2	4.9	3.7	2.0	3.5	3.1	2.2	1.6	1.8	2.7	2.5	2.7	2.9	3.3	3.1	5.0	4.8	3.3	3.8	5.7	7.1	9.0	7.4	100.0
26-Jul	7.5	6.8	4.6	3.8	4.2	3.5	3.2	3.7	4.3	5.6	3.8	2.8	2.9	2.7	3.9	4.2	3.3	4.1	5.4	3.8	3.3	3.5	4.3	4.7	100.0
27-Jul	9.5	7.6	5.7	4.1	3.3	2.5	3.6	2.1	1.5	2.2	3.4	2.7	2.0	2.7	3.8	3.7	5.3	3.9	4.5	3.1	6.4	4.9	5.0	6.6	100.0
28-Jul	4.0	3.1	2.6	2.0	1.7	2.3	3.6	2.7	2.4	1.8	3.3	3.1	3.3	4.2	5.2	6.6	6.7	7.0	8.5	7.5	4.6	5.7	4.8	3.2	100.0
29-Jul	2.4	3.1	3.8	3.0	2.4	3.8	3.5	5.3	4.0	3.7	3.7	2.7	2.5	3.8	4.4	7.3	5.4	4.7	4.6	3.7	2.8	8.2	7.3	3.8	100.0
30-Jul	5.3	5.9	3.3	4.6	3.5	2.2	1.9	4.4	5.4	4.1	4.7	3.4	4.6	3.2	3.5	3.5	3.3	3.1	3.3	3.3	6.0	5.3	5.0	7.2	100.0

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EN-03KFIHP-NIS

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	
31-Jul	7.7	6.8	4.1	4.2	3.9	3.5	1.7	2.6	2.9	3.3	2.0	2.5	3.1	4.2	6.5	5.7	5.0	3.9	3.6	3.9	3.5	2.9	5.2	7.3	100.0
1-Aug	6.9	7.6	5.2	6.2	4.7	2.1	1.3	2.6	4.5	4.5	3.8	2.6	4.7	3.5	2.2	4.0	5.2	4.3	5.6	3.9	2.2	2.7	3.9	5.6	100.0
2-Aug	6.7	7.8	6.6	4.0	4.3	2.4	2.0	2.1	4.0	2.5	2.3	2.3	2.2	2.3	3.0	2.7	1.8	3.6	4.7	4.2	2.3	6.4	9.8	10.0	100.0
3-Aug	5.8	9.7	6.9	3.6	3.9	3.0	2.5	3.4	5.5	4.0	3.2	2.1	1.8	1.9	2.8	3.5	1.7	2.6	3.3	4.4	5.0	6.4	6.3	6.8	100.0
4-Aug	11.2	9.3	8.0	5.8	3.5	3.1	2.3	1.7	3.0	1.9	1.8	3.3	3.3	3.2	3.9	3.2	4.5	3.7	3.0	2.1	3.9	3.6	4.6	6.1	100.0
5-Aug	11.6	10.5	9.4	8.7	4.8	3.8	3.7	2.8	3.1	2.1	2.0	1.3	1.1	0.8	1.6	2.9	1.1	1.2	4.8	6.2	1.9	5.5	4.4	4.6	100.0
6-Aug	7.0	6.3	8.1	6.4	3.6	1.7	1.5	2.9	5.1	2.5	0.8	1.2	2.7	2.8	3.3	3.2	4.3	2.7	2.7	6.8	7.4	5.9	6.5	4.5	100.0
7-Aug	7.3	6.8	6.5	5.1	3.7	2.2	2.7	3.2	3.4	1.1	1.6	3.2	2.1	2.7	3.7	2.7	4.2	3.6	3.3	3.5	4.4	6.0	5.9	11.0	100.0
8-Aug	16.0	9.0	7.0	7.6	5.5	3.7	3.8	4.4	4.9	4.9	4.0	2.8	2.0	2.2	9.8	2.1	2.7	0.4	1.4	1.0	1.4	3.1	4.4	4.8	100.0
9-Aug	11.9	7.8	8.6	6.4	4.5	3.0	4.0	1.9	2.9	4.1	3.9	4.6	2.5	2.3	4.8	1.4	1.0	4.8	1.5	2.7	2.4	2.2	2.6	8.1	100.0
10-Aug	9.8	10.2	8.3	8.9	5.0	3.9	4.6	5.2	6.4	3.7	4.5	3.8	2.1	1.6	3.5	1.9	0.9	0.7	0.2	0.6	0.9	1.3	1.6	8.6	100.0
Total	5.4	5.4	4.4	3.9	3.6	3.7	3.3	3.0	3.0	2.9	3.2	3.6	3.8	3.7	4.2	4.4	4.2	4.4	4.9	4.8	5.1	4.8	5.0	5.2	100.0

Appendix A.6. Kenai River south bank sonar counts by hour, 1 July through 10 August 2003. Counts expressed as percentage of daily total.

Counts by Hour																								Daily Total	
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
1-Jul	4.6	4.3	3.8	3.6	3.4	4.2	2.6	3.2	3.5	3.8	4.1	5.4	6.3	3.8	3.5	5.8	6.6	6.1	4.8	3.3	2.6	1.8	3.1	3.8	100.0
2-Jul	10.0	4.2	3.0	5.3	6.2	4.5	7.0	2.7	8.7	4.4	2.3	4.7	3.0	2.1	3.4	2.3	4.9	4.9	4.5	2.5	3.4	0.2	2.3	3.4	100.0
3-Jul	2.2	3.7	2.2	2.2	6.6	4.8	5.9	6.6	4.8	5.0	3.2	3.2	4.8	2.6	2.2	4.3	5.8	8.2	4.5	3.7	4.5	3.9	2.9	2.1	100.0
4-Jul	1.7	2.7	1.9	1.2	2.5	2.7	1.4	2.2	3.2	3.2	4.3	4.5	2.5	1.8	2.7	1.7	5.3	10.1	9.4	8.2	10.2	6.7	3.1	7.0	100.0
5-Jul	3.8	6.4	2.6	3.7	4.0	2.0	3.7	3.0	1.6	2.0	2.2	3.6	2.6	3.0	2.9	6.0	3.2	5.9	10.9	7.0	9.4	4.4	3.2	3.2	100.0
6-Jul	3.0	5.4	4.8	3.2	5.4	3.1	2.7	2.4	4.1	2.1	2.8	2.1	3.0	3.3	3.1	4.1	4.1	4.1	3.2	4.9	6.5	8.7	7.7	6.4	100.0
7-Jul	2.4	3.6	2.6	2.6	0.8	1.5	2.1	2.8	4.3	3.2	3.7	2.6	4.6	7.1	5.3	5.3	4.0	4.4	6.0	5.3	7.0	5.4	7.8	5.6	100.0
8-Jul	4.1	5.8	6.6	6.6	2.7	3.4	2.7	2.9	3.8	0.8	3.6	8.9	12.8	3.9	2.5	2.7	0.6	2.7	3.4	2.0	3.1	4.6	3.6	6.2	100.0
9-Jul	6.1	4.4	3.1	2.6	2.9	2.0	3.0	2.3	2.6	3.0	7.6	4.2	5.2	4.4	4.4	5.3	5.1	4.0	3.2	3.8	4.2	5.5	4.7	6.3	100.0
10-Jul	5.0	4.5	3.7	2.9	3.1	2.4	1.7	2.5	2.0	2.9	4.7	5.2	1.7	2.3	3.4	3.0	3.4	3.7	4.4	4.3	4.0	4.8	8.2	16.1	100.0
11-Jul	1.5	1.2	1.4	1.0	1.0	0.6	0.5	0.5	0.4	0.6	6.1	6.8	8.1	6.1	1.7	2.5	6.4	4.8	5.1	4.2	5.9	6.7	10.3	16.6	100.0
12-Jul	4.1	3.3	1.2	0.4	0.3	0.4	0.9	1.0	0.4	1.8	4.0	8.1	9.8	9.0	6.3	4.5	5.9	4.8	6.1	6.3	5.2	4.1	6.1	5.9	100.0
13-Jul	5.1	3.2	1.5	1.1	0.9	1.3	1.9	2.6	1.7	1.4	6.3	9.1	10.8	9.6	8.0	5.7	3.4	1.8	2.0	4.2	6.2	3.9	4.2	4.3	100.0
14-Jul	3.3	2.0	1.5	1.0	0.4	0.6	1.0	1.7	1.8	1.6	3.1	2.3	8.5	11.0	10.4	5.8	4.7	4.5	5.2	7.2	6.4	6.0	5.2	4.9	100.0
15-Jul	5.8	5.5	3.9	2.8	1.0	1.6	2.3	1.2	1.3	1.6	4.1	3.7	3.5	5.1	5.7	4.9	4.4	3.7	3.8	3.6	5.0	9.2	9.4	7.0	100.0
16-Jul	0.8	0.4	0.5	0.4	0.6	0.9	2.4	4.4	2.9	5.4	5.7	4.8	6.1	5.1	4.3	6.3	8.7	8.3	7.6	7.5	5.2	3.6	4.2	3.7	100.0
17-Jul	1.5	0.9	0.5	0.5	0.9	1.4	4.2	6.2	6.0	5.1	2.7	4.0	7.0	8.2	8.1	5.8	4.8	5.0	3.8	5.3	5.3	6.0	3.6	3.2	100.0
18-Jul	3.9	1.5	0.9	0.7	1.0	2.1	4.9	4.8	3.7	2.8	2.7	6.1	6.7	7.4	7.1	5.2	5.8	5.7	5.0	4.7	5.1	4.8	4.4	3.0	100.0
19-Jul	3.5	2.0	1.5	1.0	0.9	1.7	2.6	4.6	4.6	4.0	4.2	4.2	4.3	7.5	7.9	5.5	4.3	4.3	4.3	6.5	5.4	6.9	4.9	3.4	100.0
20-Jul	5.4	2.6	1.9	1.6	1.3	1.8	3.8	2.8	3.3	3.4	3.2	5.6	2.7	4.6	3.4	3.6	4.5	4.2	4.5	6.6	7.3	6.8	8.7	6.4	100.0
21-Jul	2.6	1.3	0.5	0.4	0.3	0.8	2.5	3.3	3.7	4.1	3.1	2.6	3.4	2.3	2.4	2.7	3.2	4.9	4.7	4.0	7.3	14.3	14.4	11.2	100.0
22-Jul	5.3	3.2	1.5	1.2	1.1	2.7	4.2	2.3	3.6	2.8	3.1	2.4	6.2	7.2	6.6	5.8	6.0	5.3	4.9	3.8	4.8	5.0	4.1	6.6	100.0
23-Jul	2.7	1.1	0.6	0.4	0.5	1.0	2.8	2.9	1.6	3.4	3.3	3.4	3.3	4.1	5.7	5.7	9.1	9.2	6.5	5.7	6.7	6.7	8.1	5.6	100.0
24-Jul	5.5	3.7	1.4	1.1	1.3	2.2	4.9	5.8	6.1	7.0	4.4	3.5	3.3	3.2	3.3	3.0	5.4	4.9	4.5	4.7	3.4	5.6	6.3	5.3	100.0
25-Jul	6.7	2.0	1.4	1.1	0.4	0.9	2.4	4.6	6.6	4.8	5.1	2.8	2.4	2.7	2.8	3.5	3.7	4.4	5.1	7.0	9.1	4.3	8.5	7.7	100.0
26-Jul	4.5	1.4	0.7	1.0	0.8	1.3	3.6	5.8	5.0	3.7	5.5	4.2	2.3	3.8	3.2	2.4	5.3	5.6	9.0	7.0	8.8	5.9	4.3	4.9	100.0
27-Jul	2.6	1.7	1.1	1.0	2.3	1.5	1.3	1.9	3.0	3.4	3.3	3.9	4.4	4.6	4.0	5.2	4.6	3.5	6.2	8.5	5.8	8.3	10.5	7.4	100.0
28-Jul	1.8	1.4	0.8	0.4	0.4	0.8	2.4	2.7	3.8	3.9	4.7	4.0	4.7	10.1	9.8	7.4	4.4	5.0	5.5	3.1	4.6	7.4	6.2	4.6	100.0
29-Jul	5.9	3.0	1.9	0.7	0.6	2.0	4.1	2.5	2.9	4.1	4.1	5.9	5.5	7.0	7.1	6.9	6.7	4.8	4.3	4.3	5.2	3.9	1.3	5.4	100.0
30-Jul	7.1	2.9	1.5	0.6	0.7	1.3	1.2	2.4	3.1	2.4	3.7	5.6	3.6	3.7	4.7	5.2	8.2	8.4	6.4	6.0	5.9	2.5	6.9	5.9	100.0

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FN 03KE2HP XLS

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
31-Jul	3.9	1.0	0.9	0.7	0.6	1.1	1.9	1.9	3.5	3.6	3.9	4.0	4.2	4.6	3.8	6.4	6.4	10.0	7.6	4.5	5.9	7.8	7.4	4.2	100.0
1-Aug	4.6	2.5	2.1	2.1	1.7	1.6	2.6	3.6	6.4	4.7	4.4	4.9	6.4	6.4	5.4	6.6	7.3	7.2	4.5	2.9	3.2	3.1	3.3	2.7	100.0
2-Aug	1.8	1.3	1.1	0.7	0.7	1.0	1.3	1.9	3.1	2.3	3.5	3.1	4.3	3.7	4.5	3.2	8.8	10.1	11.2	6.7	6.6	7.6	7.5	4.1	100.0
3-Aug	4.6	2.5	2.8	1.1	0.8	1.5	2.2	2.7	4.3	4.2	2.5	4.1	4.8	7.2	6.2	4.0	3.3	7.1	8.5	7.8	5.3	4.6	4.1	3.7	100.0
4-Aug	4.6	4.4	1.6	1.2	1.2	2.0	4.0	3.9	4.7	4.9	4.2	6.1	9.3	5.5	4.6	5.7	4.3	3.8	3.7	5.1	3.8	3.6	4.6	3.2	100.0
5-Aug	2.8	2.1	1.0	1.0	0.7	1.0	1.5	3.7	3.3	2.8	4.0	3.2	4.2	3.5	3.7	5.1	4.9	4.0	4.4	6.9	7.0	9.0	10.5	9.6	100.0
6-Aug	2.9	2.0	1.4	1.4	0.9	1.3	2.5	3.7	4.1	4.2	3.9	4.0	5.6	6.6	4.7	6.8	4.2	4.0	5.2	5.2	6.1	7.9	6.8	4.4	100.0
7-Aug	4.2	2.9	2.4	1.7	2.3	1.3	4.0	4.4	4.0	3.6	3.8	4.1	4.7	4.4	7.0	6.0	5.0	5.0	4.0	5.6	5.2	5.2	4.8	4.2	100.0
8-Aug	8.2	5.0	2.6	4.3	2.1	5.1	5.4	4.9	5.0	3.3	4.6	3.9	4.4	2.9	3.5	3.2	4.6	4.3	2.5	3.3	3.2	4.2	5.5	4.0	100.0
9-Aug	3.5	1.6	1.5	1.9	2.0	2.2	1.3	1.4	2.9	3.8	4.8	5.0	7.5	8.6	7.1	5.3	3.0	3.2	4.3	5.0	5.6	5.2	5.4	7.9	100.0
10-Aug	7.6	6.7	4.9	3.4	1.9	2.3	4.5	5.4	4.3	5.4	7.8	9.1	7.7	5.5	3.6	2.1	2.7	2.1	2.2	2.5	1.7	2.2	1.4	2.9	100.0
Total	3.5	2.1	1.3	1.0	1.0	1.5	3.0	3.7	3.7	3.8	3.9	4.6	5.6	6.2	5.9	5.1	5.6	5.6	5.3	5.5	5.6	5.8	5.7	5.1	100.0

Appendix A.7. Kenai River north bank sonar counts by sector. 1 July through 10 August 2003.

Date	Counts by Sector												Daily Total	Cum Total
	1	2	3	4	5	6	7	8	9	10	11	12		
1-Jul	5	6	27	63	233	286	713	751	775	529	514	579	4,481	4,481
2-Jul	0	2	13	33	86	106	301	217	342	431	393	757	2,681	7,162
3-Jul	1	15	57	110	330	540	246	492	456	466	675	461	3,849	11,011
4-Jul	3	51	376	421	489	246	295	808	531	516	533	506	4,775	15,786
5-Jul	6	206	614	521	270	155	283	477	353	323	206	142	3,556	19,342
6-Jul	2	15	81	114	81	71	287	380	330	330	259	179	2,129	21,471
7-Jul	3	10	72	108	54	49	121	128	431	356	299	97	1,728	23,199
8-Jul	3	47	153	129	40	27	165	418	326	404	368	293	2,373	25,572
9-Jul	458	492	243	197	155	247	278	442	507	255	256	262	3,792	29,364
10-Jul	1,021	840	442	441	967	1,123	685	554	212	139	93	58	6,575	35,939
11-Jul	454	4,602	2,265	789	670	1,758	787	972	667	419	327	166	13,876	49,815
12-Jul	493	7,044	15,244	4,156	1,809	820	445	698	611	436	380	221	32,357	82,172
13-Jul	525	2,350	9,547	4,940	1,924	302	739	1,031	908	823	873	506	24,468	106,640
14-Jul	414	791	2,687	1,877	1,390	435	837	1,261	1,038	782	619	402	12,533	119,173
15-Jul	946	2,887	1,923	1,031	1,827	1,180	1,484	1,144	745	896	416	236	14,715	133,888
16-Jul	2,829	15,298	13,508	3,083	647	657	414	1,319	824	910	313	202	40,004	173,892
17-Jul	1,479	7,426	14,041	8,456	3,802	1,443	505	413	233	287	67	69	38,221	212,113
18-Jul	1,579	5,237	12,663	10,397	5,564	1,019	431	136	44	28	65	46	37,209	249,322
19-Jul	3,056	4,101	10,030	7,868	2,898	1,263	497	425	820	765	562	368	32,653	281,975
20-Jul	724	966	3,476	4,296	4,037	2,061	509	333	599	537	308	405	18,251	300,226
21-Jul	780	514	1,921	4,507	3,962	1,758	484	285	158	141	228	211	14,949	315,175
22-Jul	3,175	4,348	12,011	11,891	4,675	1,109	179	70	36	27	48	89	37,658	352,833
23-Jul	1,491	2,540	7,236	9,194	6,305	2,445	642	330	144	148	172	277	30,922	383,755
24-Jul	1,265	2,341	3,751	7,227	6,233	3,116	776	364	120	256	383	349	26,181	409,936
25-Jul	284	381	1,017	2,849	4,502	4,262	1,224	758	209	147	53	77	15,763	425,699
26-Jul	426	615	1,533	3,527	4,680	3,356	819	308	123	96	34	96	15,613	441,312
27-Jul	813	604	933	1,629	2,306	2,421	861	374	230	135	70	302	10,678	451,990
28-Jul	588	476	787	2,991	6,525	5,808	2,196	697	286	182	92	196	20,824	472,814
29-Jul	405	643	1,899	3,776	4,282	2,339	633	247	105	120	43	186	14,678	487,492
30-Jul	318	650	1,583	2,648	2,414	960	342	151	137	134	50	263	9,650	497,142
31-Jul	312	626	1,171	2,026	2,531	1,259	543	209	137	112	42	171	8,939	506,081
1-Aug	384	1,391	2,139	1,851	1,311	784	491	524	304	450	351	636	10,616	516,697
2-Aug	396	728	1,685	1,895	1,456	758	608	670	504	423	459	641	10,223	526,920
3-Aug	302	585	1,402	2,146	1,790	1,029	815	425	417	334	346	476	10,167	537,087
4-Aug	432	452	543	1,253	1,169	933	798	636	571	724	444	765	8,720	545,807
5-Aug	181	295	552	518	341	266	171	215	181	238	350	667	3,975	549,782
6-Aug	51	246	603	926	650	733	535	761	529	488	670	506	6,698	556,480
7-Aug	87	316	529	481	521	588	444	582	364	404	668	667	5,651	562,131
8-Aug	61	193	492	371	309	480	247	342	247	209	564	704	4,219	566,350
9-Aug	58	283	334	201	219	231	109	134	126	276	500	732	3,203	569,553
10-Aug	80	283	696	370	315	388	231	310	187	557	445	670	4,532	574,085
Total	25,890	70,996	130,279	111,307	83,767	48,811	22,970	20,791	15,867	15,253	13,538	14,636	574,085	

FN 03KFTSC.XLS

Appendix A.8. Kenai River south bank sonar counts by sector, 1 July through 10 August, 2003.

Date	Counts by Sector												Daily Total	Cum Total
	1	2	3	4	5	6	7	8	9	10	11	12		
1-Jul	60	34	55	23	29	55	164	186	176	108	137	103	1,130	1,130
2-Jul	22	41	48	25	22	69	89	78	36	23	63	12	528	1,658
3-Jul	35	62	131	66	32	54	77	60	38	9	43	16	623	2,281
4-Jul	26	101	404	131	134	282	221	133	53	46	63	20	1,614	3,895
5-Jul	29	118	340	95	134	307	240	146	88	56	41	10	1,604	5,499
6-Jul	37	92	251	64	58	173	141	90	43	41	38	9	1,037	6,536
7-Jul	30	122	479	133	171	450	351	234	106	67	66	18	2,247	8,783
8-Jul	191	206	758	180	134	322	269	149	70	48	65	22	2,414	11,197
9-Jul	70	314	1,109	232	135	268	223	104	57	39	61	30	2,642	13,839
10-Jul	77	323	1,475	456	204	366	318	154	86	62	69	20	3,610	17,449
11-Jul	180	807	4,835	1,896	477	821	572	277	134	86	91	66	10,242	27,691
12-Jul	167	1,502	12,141	8,647	1,357	1,764	945	564	216	66	97	397	27,863	55,554
13-Jul	85	575	5,322	3,679	1,009	1,902	1,899	1,085	487	160	136	117	16,456	72,010
14-Jul	55	647	6,702	4,990	978	1,299	1,112	622	183	50	59	4	16,701	88,711
15-Jul	244	491	2,716	1,321	328	576	531	301	164	88	75	28	6,863	95,574
16-Jul	487	5,128	21,059	13,823	2,192	2,752	2,227	980	333	80	88	40	49,189	144,763
17-Jul	617	8,061	30,405	21,501	3,309	3,564	1,909	681	226	52	57	287	70,669	215,432
18-Jul	620	6,607	24,393	16,850	2,585	2,785	1,463	454	182	62	56	29	56,086	271,518
19-Jul	411	3,092	14,015	12,129	2,738	2,874	2,005	819	353	87	80	18	38,621	310,139
20-Jul	125	1,196	4,676	3,573	1,025	1,119	899	497	287	83	74	17	13,571	323,710
21-Jul	140	1,683	6,313	4,565	1,047	1,128	1,062	567	351	102	61	16	17,033	340,743
22-Jul	368	3,884	12,769	7,707	1,576	1,203	1,109	515	259	27	15	26	29,458	370,201
23-Jul	307	4,555	15,460	8,506	1,701	1,910	1,208	606	245	27	130	65	34,720	404,921
24-Jul	178	2,214	9,687	9,613	2,384	1,000	1,394	871	566	215	109	11	28,242	433,163
25-Jul	66	1,068	4,887	4,952	1,296	568	732	568	367	121	67	65	14,757	447,920
26-Jul	132	1,444	5,931	4,514	1,019	668	907	510	381	131	61	162	15,860	463,780
27-Jul	88	1,177	4,605	3,714	786	635	916	610	468	366	183	244	13,792	477,572
28-Jul	158	1,734	7,402	5,574	1,088	610	977	448	265	117	110	302	18,785	496,357
29-Jul	111	1,458	5,718	3,734	727	517	638	327	214	107	63	89	13,703	510,060
30-Jul	105	810	3,000	2,066	491	358	528	351	269	107	58	97	8,240	518,300
31-Jul	34	687	3,210	2,684	591	449	662	470	298	88	54	107	9,334	527,634
1-Aug	44	804	3,066	1,661	457	676	655	385	240	104	404	81	8,577	536,211
2-Aug	78	699	3,925	3,300	975	889	961	630	455	179	191	192	12,474	548,685
3-Aug	58	357	2,957	3,407	876	502	696	530	343	192	152	28	10,098	558,783
4-Aug	56	231	1,565	1,929	558	420	565	448	336	214	180	23	6,525	565,308
5-Aug	72	193	1,428	1,834	577	523	636	591	474	253	124	22	6,727	572,035
6-Aug	41	283	2,952	3,476	948	781	886	825	610	231	87	9	11,129	583,164
7-Aug	87	240	1,341	1,597	572	773	907	1,043	917	366	171	15	8,029	591,193
8-Aug	105	308	713	779	262	358	460	600	635	500	360	71	5,151	596,344
9-Aug	102	124	486	662	376	461	731	881	863	544	369	102	5,701	602,045
10-Aug	56	166	880	747	414	682	797	728	375	97	179	58	5,179	607,224
Total	5,954	53,638	229,609	166,853	35,772	36,913	33,082	20,118	12,249	5,401	4,587	3,048	607,224	

FN 03KENC.XLS

Appendix A.9. Kenai River north bank sonar counts by sector, 1 July through 10 August 2003. 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	0.1	0.1	0.6	1.4	5.2	6.4	15.9	16.8	17.3	11.8	11.5	12.9	100.0
2-Jul	0.0	0.1	0.5	1.2	3.2	4.0	11.2	8.1	12.8	16.1	14.7	28.2	100.0
3-Jul	0.0	0.4	1.5	2.9	8.6	14.0	6.4	12.8	11.8	12.1	17.5	12.0	100.0
4-Jul	0.1	1.1	7.9	8.8	10.2	5.2	6.2	16.9	11.1	10.8	11.2	10.6	100.0
5-Jul	0.2	5.8	17.3	14.7	7.6	4.4	8.0	13.4	9.9	9.1	5.8	4.0	100.0
6-Jul	0.1	0.7	3.8	5.4	3.8	3.3	13.5	17.8	15.5	15.5	12.2	8.4	100.0
7-Jul	0.2	0.6	4.2	6.2	3.1	2.8	7.0	7.4	24.9	20.6	17.3	5.6	100.0
8-Jul	0.1	2.0	6.4	5.4	1.7	1.1	7.0	17.6	13.7	17.0	15.5	12.3	100.0
9-Jul	12.1	13.0	6.4	5.2	4.1	6.5	7.3	11.7	13.4	6.7	6.8	6.9	100.0
10-Jul	15.5	12.8	6.7	6.7	14.7	17.1	10.4	8.4	3.2	2.1	1.4	0.9	100.0
11-Jul	3.3	33.2	16.3	5.7	4.8	12.7	5.7	7.0	4.8	3.0	2.4	1.2	100.0
12-Jul	1.5	21.8	47.1	12.8	5.6	2.5	1.4	2.2	1.9	1.3	1.2	0.7	100.0
13-Jul	2.1	9.6	39.0	20.2	7.9	1.2	3.0	4.2	3.7	3.4	3.6	2.1	100.0
14-Jul	3.3	6.3	21.4	15.0	11.1	3.5	6.7	10.1	8.3	6.2	4.9	3.2	100.0
15-Jul	6.4	19.6	13.1	7.0	12.4	8.0	10.1	7.8	5.1	6.1	2.8	1.6	100.0
16-Jul	7.1	38.2	33.8	7.7	1.6	1.6	1.0	3.3	2.1	2.3	0.8	0.5	100.0
17-Jul	3.9	19.4	36.7	22.1	9.9	3.8	1.3	1.1	0.6	0.8	0.2	0.2	100.0
18-Jul	4.2	14.1	34.0	27.9	15.0	2.7	1.2	0.4	0.1	0.1	0.2	0.1	100.0
19-Jul	9.4	12.6	30.7	24.1	8.9	3.9	1.5	1.3	2.5	2.3	1.7	1.1	100.0
20-Jul	4.0	5.3	19.0	23.5	22.1	11.3	2.8	1.8	3.3	2.9	1.7	2.2	100.0
21-Jul	5.2	3.4	12.9	30.1	26.5	11.8	3.2	1.9	1.1	0.9	1.5	1.4	100.0
22-Jul	8.4	11.5	31.9	31.6	12.4	2.9	0.5	0.2	0.1	0.1	0.1	0.2	100.0
23-Jul	4.8	8.2	23.4	29.7	20.4	7.9	2.1	1.1	0.5	0.5	0.6	0.9	100.0
24-Jul	4.8	8.9	14.3	27.6	23.8	11.9	3.0	1.4	0.5	1.0	1.5	1.3	100.0
25-Jul	1.8	2.4	6.5	18.1	28.6	27.0	7.8	4.8	1.3	0.9	0.3	0.5	100.0
26-Jul	2.7	3.9	9.8	22.6	30.0	21.5	5.2	2.0	0.8	0.6	0.2	0.6	100.0
27-Jul	7.6	5.7	8.7	15.3	21.6	22.7	8.1	3.5	2.2	1.3	0.7	2.8	100.0
28-Jul	2.8	2.3	3.8	14.4	31.3	27.9	10.5	3.3	1.4	0.9	0.4	0.9	100.0
29-Jul	2.8	4.4	12.9	25.7	29.2	15.9	4.3	1.7	0.7	0.8	0.3	1.3	100.0
30-Jul	3.3	6.7	16.4	27.4	25.0	9.9	3.5	1.6	1.4	1.4	0.5	2.7	100.0
31-Jul	3.5	7.0	13.1	22.7	28.3	14.1	3.8	2.3	1.5	1.3	0.5	1.9	100.0
1-Aug	3.6	13.1	20.1	17.4	12.3	7.4	4.6	4.9	2.9	4.2	3.3	6.0	100.0
2-Aug	3.9	7.1	16.5	18.5	14.2	7.4	5.9	6.6	4.9	4.1	4.5	6.3	100.0
3-Aug	3.0	6.7	13.8	21.1	17.6	10.1	8.0	4.2	4.1	3.3	3.4	4.7	100.0
4-Aug	5.0	5.2	6.2	14.4	13.4	10.7	9.2	7.3	6.5	8.3	5.1	8.8	100.0
5-Aug	4.6	7.4	13.9	13.0	8.6	6.7	4.3	5.4	4.6	6.0	8.8	16.8	100.0
6-Aug	0.8	3.7	9.0	13.8	9.7	10.9	8.0	11.4	7.9	7.3	10.0	7.6	100.0
7-Aug	1.5	5.6	9.4	8.5	9.2	10.4	7.9	10.3	6.4	7.1	11.8	11.8	100.0
8-Aug	1.4	4.6	11.7	8.8	7.3	11.4	5.9	8.1	5.9	5.0	13.4	16.7	100.0
9-Aug	1.8	8.8	10.4	6.3	6.8	7.2	3.4	4.2	3.9	8.6	15.6	22.9	100.0
10-Aug	1.8	6.2	15.4	8.2	7.0	8.6	5.1	6.8	4.1	12.3	9.8	14.8	100.0
Total	4.5	12.4	22.7	19.4	14.6	8.5	4.0	5.6	2.8	2.7	2.4	2.5	100.0

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Appendix A.10. Kenai River south bank sonar counts by sector, 1 July through 10 August 2003. 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	5.3	3.0	4.9	2.0	2.6	4.9	14.5	16.5	15.6	9.6	12.1	9.1	100.0
2-Jul	4.2	7.8	9.1	4.7	4.2	13.1	16.9	14.8	6.8	4.4	11.9	2.3	100.0
3-Jul	5.6	10.0	21.0	10.6	5.1	8.7	12.4	9.6	6.1	1.4	6.9	2.6	100.0
4-Jul	1.6	6.3	25.0	8.1	8.3	17.5	13.7	8.2	3.3	2.9	3.9	1.2	100.0
5-Jul	1.8	7.4	21.2	5.9	8.4	19.1	15.0	9.1	5.5	3.5	2.6	0.6	100.0
6-Jul	3.6	8.9	24.2	6.2	5.6	16.7	13.6	8.7	4.1	4.0	3.7	0.9	100.0
7-Jul	1.3	5.4	21.3	6.8	7.6	20.0	15.6	10.4	4.7	3.0	2.9	0.8	100.0
8-Jul	7.9	8.5	31.4	7.5	5.6	13.3	11.1	6.2	2.9	2.0	2.7	0.9	100.0
9-Jul	2.6	11.9	42.0	8.8	5.1	10.1	8.4	3.9	2.2	1.5	2.3	1.1	100.0
10-Jul	2.1	8.9	40.9	12.6	5.7	10.1	8.8	4.3	2.4	1.7	1.9	0.6	100.0
11-Jul	1.8	7.9	47.2	18.5	4.7	8.0	5.6	2.7	1.3	0.8	0.9	0.6	100.0
12-Jul	0.6	5.4	43.6	31.0	4.9	6.3	3.4	2.0	0.8	0.2	0.3	1.4	100.0
13-Jul	0.5	3.5	32.3	22.4	6.1	11.6	11.5	6.6	3.0	1.0	0.8	0.7	100.0
14-Jul	0.3	3.9	40.1	29.9	5.9	7.8	6.7	3.7	1.1	0.3	0.4	0.0	100.0
15-Jul	3.6	7.2	39.6	19.2	4.8	8.4	7.7	4.4	2.4	1.3	1.1	0.4	100.0
16-Jul	1.0	10.4	42.8	28.1	4.5	5.6	4.5	2.0	0.7	0.2	0.2	0.1	100.0
17-Jul	0.9	11.4	43.0	30.4	4.7	5.0	2.7	1.0	0.3	0.1	0.1	0.4	100.0
18-Jul	1.1	11.8	43.5	30.0	4.6	5.0	2.6	0.8	0.3	0.1	0.1	0.1	100.0
19-Jul	1.1	8.0	36.3	31.4	7.1	7.4	5.2	2.1	0.9	0.2	0.2	0.0	100.0
20-Jul	0.9	8.8	34.5	28.3	7.6	8.2	6.6	3.7	2.1	0.6	0.5	0.1	100.0
21-Jul	0.8	9.9	37.1	26.8	6.1	6.6	6.2	3.3	2.1	0.6	0.4	0.1	100.0
22-Jul	1.2	13.2	43.3	26.2	5.3	4.1	3.8	1.7	0.9	0.1	0.1	0.1	100.0
23-Jul	0.9	13.1	44.5	24.5	4.9	5.5	3.5	1.7	0.7	0.1	0.4	0.2	100.0
24-Jul	0.6	7.8	34.3	34.0	8.4	3.5	4.9	3.1	2.0	0.8	0.4	0.0	100.0
25-Jul	0.4	7.2	33.1	33.6	8.8	3.8	5.0	3.8	2.5	0.8	0.5	0.4	100.0
26-Jul	0.8	9.1	37.4	28.5	6.4	4.2	5.7	3.2	2.4	0.8	0.4	1.0	100.0
27-Jul	0.6	8.5	33.4	26.9	5.7	4.6	6.6	4.4	3.4	2.7	1.3	1.8	100.0
28-Jul	0.8	9.2	39.4	29.7	5.8	3.2	5.2	2.4	1.4	0.6	0.6	1.6	100.0
29-Jul	0.8	10.6	41.7	27.2	5.3	3.8	4.7	2.4	1.6	0.8	0.5	0.6	100.0
30-Jul	1.3	9.8	36.4	25.1	6.0	4.3	6.4	4.3	3.3	1.3	0.7	1.2	100.0
31-Jul	0.4	7.4	34.4	28.8	6.3	4.8	7.1	5.0	3.2	0.9	0.6	1.1	100.0
1-Aug	0.5	9.4	35.7	19.4	5.3	7.9	7.6	4.5	2.8	1.2	4.7	0.9	100.0
2-Aug	0.6	5.6	31.5	26.5	7.8	7.1	7.7	5.1	3.6	1.4	1.5	1.5	100.0
3-Aug	0.6	3.5	29.3	33.7	8.7	5.0	6.9	5.2	3.4	1.9	1.5	0.3	100.0
4-Aug	0.9	3.5	24.0	29.6	8.6	6.4	8.7	6.9	5.1	3.3	2.8	0.4	100.0
5-Aug	1.1	2.9	21.2	27.3	8.6	7.8	9.5	8.8	7.0	3.8	1.8	0.3	100.0
6-Aug	0.4	2.5	26.5	31.2	8.5	7.0	8.0	7.4	5.5	2.1	0.8	0.1	100.0
7-Aug	1.1	3.0	16.7	19.9	7.1	9.6	11.3	13.0	11.4	4.6	2.1	0.2	100.0
8-Aug	2.0	6.0	13.8	15.1	5.1	7.0	8.9	11.6	12.3	9.7	7.0	1.4	100.0
9-Aug	1.8	2.2	8.5	11.6	6.6	8.1	12.8	15.5	15.1	9.5	6.5	1.8	100.0
10-Aug	1.1	3.2	17.0	14.4	8.0	13.2	15.4	14.1	7.2	1.9	3.5	1.1	100.0
Total	1.0	8.8	37.8	27.5	5.9	6.1	5.4	3.3	2.0	0.9	0.8	0.5	100.0

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Appendix A11. Minimum and maximum daily counting ranges for both banks of the Kenai river and range from transducer where at least 80% of the migration occurred in 2005.

Date	North Bank			Range where > 80% of migration occurred (m)	Sectors where > 80% of migration occurred	South Bank			Range where > 80% of migration occurred (m)	Sectors where > 80% of migration occurred
	Counting Range (Sectors 1-12) (ft)	Average Sector Width (m)	Average Sector Width (m)			Counting Range (Sectors 1-12) (ft)	Average Sector Width (m)	Average Sector Width (m)		
1-Jul	70	21.5	1.8	19.6	1 - 11	16	4.9	0.4	4.5	1 - 11
1-Jul	85	25.9	2.2	23.7	1 - 11					
2-Jul	85	25.9	2.2	25.9	1 - 12	18	5.5	0.5	4.6	1 - 10
2-Jul						19	5.8	0.5	4.6	1 - 10
3-Jul	85	25.9	2.2	23.7	1 - 11	19	5.8	0.5	4.3	1 - 9
3-Jul	75	22.9	1.9	21.0	1 - 11					
4-Jul	80	24.4	2.0	22.4	1 - 11	19	5.8	0.5	3.9	1 - 8
5-Jul	80	24.4	2.0	18.3	1 - 9	19.5	5.9	0.5	4.0	1 - 8
6-Jul	80	24.4	2.0	22.4	1 - 11	20	6.1	0.5	4.1	1 - 8
7-Jul	80	24.4	2.0	22.4	1 - 11	20	6.1	0.5	4.1	1 - 8
8-Jul	80	24.4	2.0	22.4	1 - 11	20	6.1	0.5	4.1	1 - 8
8-Jul	75	22.9	1.9	21.0	1 - 11					
9-Jul	80	24.4	2.0	20.3	1 - 10	20	6.1	0.5	3.6	1 - 7
9-Jul	90	27.4	2.3	22.9	1 - 10					
10-Jul	90	27.4	2.3	16.0	1 - 7	20	6.1	0.5	3.6	1 - 7
10-Jul	75	22.9	1.9	13.3	1 - 7					
11-Jul	60	18.3	1.5	10.7	1 - 7	20	6.1	0.5	3.0	1 - 6
11-Jul	80	24.4	2.0	14.2	1 - 7					
12-Jul	58	17.7	1.5	5.9	1 - 4	20	6.1	0.5	2.0	1 - 4
12-Jul	70	21.3	1.8	7.1	1 - 4					
13-Jul	55	16.8	1.4	8.4	1 - 6	20	6.1	0.5	3.6	1 - 7
13-Jul	60	18.3	1.5	9.1	1 - 6	19	5.8	0.5	3.6	1 - 7
14-Jul	75	22.9	1.9	17.1	1 - 9	19	5.8	0.5	2.9	1 - 6
14-Jul	60	18.3	1.5	13.7	1 - 9	19.5	5.9	0.5	2.9	1 - 6
15-Jul	60	18.3	1.5	12.2	1 - 8	19.5	5.9	0.5	3.5	1 - 7
15-Jul	100	30.5	2.5	20.3	1 - 8	20	6.1	0.5	3.5	1 - 7
16-Jul	70	21.3	1.8	7.1	1 - 4	19	5.8	0.5	1.9	1 - 4
17-Jul	55	16.8	1.4	5.6	1 - 4	19	5.8	0.5	1.9	1 - 4
17-Jul	70	21.3	1.8	7.1	1 - 4					
18-Jul	60	18.3	1.5	6.1	1 - 4	19	5.8	0.5	1.9	1 - 4
18-Jul	70	21.3	1.8	7.1	1 - 4					
19-Jul	60	18.3	1.5	7.6	1 - 5	19	5.8	0.5	2.4	1 - 5
19-Jul	70	21.3	1.8	8.9	1 - 5					
20-Jul	50	15.2	1.3	7.6	1 - 6	19	5.8	0.5	2.9	1 - 6
20-Jul	60	18.3	1.5	9.1	1 - 6					
21-Jul	55	16.8	1.4	8.4	1 - 6	19	5.8	0.5	2.9	1 - 6
22-Jul	55	16.8	1.4	8.4	1 - 6	19	5.8	0.5	2.9	1 - 6
23-Jul	55	16.8	1.4	5.6	1 - 4	19	5.8	0.5	1.9	1 - 4
23-Jul	60	18.3	1.5	7.6	1 - 5					
24-Jul	60	18.3	1.5	9.1	1 - 6	19	5.8	0.5	2.4	1 - 5
25-Jul						19	5.8	0.5	2.4	1 - 5
25-Jul	60	18.3	1.5	9.1	1 - 6	17	5.2	0.4	2.4	1 - 5
26-Jul	60	18.3	1.5	9.1	1 - 6	17	5.2	0.4	2.2	1 - 5
26-Jul	55	16.8	1.4	8.4	1 - 6					
27-Jul	50	15.2	1.3	7.6	1 - 6	17	5.2	0.4	3.0	1 - 7
27-Jul	55	16.8	1.4	8.4	1 - 6					
28-Jul	55	16.8	1.4	8.4	1 - 6	17	5.2	0.4	2.2	1 - 5
29-Jul						17	5.2	0.4	2.2	1 - 5
29-Jul	55	16.8	1.4	8.4	1 - 6	18	5.5	0.5	2.2	1 - 5
30-Jul	53	16.2	1.3	8.1	1 - 6	17.5	5.3	0.4	2.7	1 - 6
30-Jul	55	16.8	1.4	8.4	1 - 6	18	5.5	0.5	2.7	1 - 6
31-Jul	53	16.2	1.3	8.1	1 - 6	18	5.5	0.5	2.7	1 - 6
1-Aug	47	14.3	1.2	7.2	1 - 8	18	5.5	0.5	3.2	1 - 7
1-Aug	53	16.2	1.3	8.1	1 - 8	19	5.8	0.5	3.4	1 - 7
2-Aug	47	14.3	1.2	7.2	1 - 8	19	5.8	0.5	3.4	1 - 7
2-Aug	58	17.7	1.5	8.8	1 - 8	17	5.2	0.4	3.0	1 - 7
3-Aug	55	16.8	1.4	8.4	1 - 7	17	5.2	0.4	2.6	1 - 6
3-Aug	58	17.7	1.5	8.8	1 - 7					
4-Aug	55	16.8	1.4	8.4	1 - 10	17	5.2	0.4	3.0	1 - 7
4-Aug	65	19.8	1.7	9.9	1 - 10					

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Date	North Bank			Range where > 80% of migration occurred (m)	Sectors where > 80% of migration occurred	South Bank			Range where > 80% of migration occurred (m)	Sectors where > 80% of migration occurred
	Counting Range (Sectors 1-12) (ft)	Average Sector Width (m)				Counting Range (Sectors 1-12) (ft)	Average Sector Width (m)			
5-Aug	58	17.7	1.5	8.8	1 - 11	17	5.2	0.4	3.5	1 - 8
5-Aug	60	18.3	1.5	9.1	1 - 11					
6-Aug	60	18.3	1.5	9.1	1 - 10	17	5.2	0.4	3.0	1 - 7
6-Aug	70	21.3	1.8	10.7	1 - 10					
7-Aug	60	18.3	1.5	9.1	1 - 11	17	5.2	0.4	3.5	1 - 8
7-Aug	68	20.7	1.7	10.4	1 - 11					
8-Aug	60	18.3	1.5	9.1	1 - 11	17	5.2	0.4	4.3	1 - 10
8-Aug	61	18.6	1.5	9.5	1 - 11					
9-Aug	55	16.8	1.4	8.4	1 - 12	17	5.2	0.4	3.9	1 - 9
9-Aug	70	21.3	1.8	10.7	1 - 12					
10-Aug	60	18.3	1.5	9.1	1 - 11	17	5.2	0.4	3.5	1 - 8
10-Aug	65	19.8	1.7	9.9	1 - 11	19	5.8	0.5	3.9	1 - 8
Average		~20 m.				Average		~6 m.		

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Appendix A.12. Estimated salmon escapement adjacent to the north bank of the Kaslof River. 15 June through 10. August 2003.

Date	Sockeye		Pink		Cono		King	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
15-Jun	216	216	0	0	0	0	0	0
16-Jun	103	319	0	0	0	0	0	0
17-Jun	127	446	0	0	0	0	0	0
18-Jun	251	697	0	0	0	0	0	0
19-Jun	941	1,638	0	0	0	0	0	0
20-Jun	2,702	4,340	0	0	0	0	0	0
21-Jun	2,778	7,118	0	0	0	0	0	0
22-Jun	1,562	8,680	0	0	0	0	0	0
23-Jun	4,644	13,324	0	0	0	0	0	0
24-Jun	2,542	15,866	0	0	0	0	0	0
25-Jun	1,800	17,666	0	0	0	0	0	0
26-Jun	3,113	20,779	0	0	0	0	0	0
27-Jun	400	21,179	0	0	0	0	0	0
28-Jun	254	21,433	0	0	0	0	0	0
29-Jun	1,130	22,563	0	0	0	0	0	0
30-Jun	3,653	26,216	0	0	0	0	0	0
1-Jul	1,713	27,929	0	0	0	0	0	0
2-Jul	3,326	31,255	0	0	0	0	0	0
3-Jul	8,069	39,324	0	0	0	0	0	0
4-Jul	2,537	41,861	0	0	0	0	0	0
5-Jul	880	42,741	0	0	0	0	0	0
6-Jul	4,181	46,922	0	0	0	0	0	0
7-Jul	7,070	53,992	0	0	0	0	0	0
8-Jul	1,694	55,686	0	0	0	0	0	0
9-Jul	3,249	58,935	0	0	0	0	0	0
10-Jul	4,368	63,303	0	0	0	0	0	0
11-Jul	8,969	72,272	0	0	0	0	0	0
12-Jul	14,904	87,176	0	0	0	0	0	0
13-Jul	2,950	90,126	0	0	0	0	0	0
14-Jul	4,846	94,972	0	0	0	0	0	0
15-Jul	4,154	99,126	0	0	0	0	0	0
16-Jul	19,032	118,158	0	0	0	0	0	0
17-Jul	16,246	134,404	0	0	0	0	0	0
18-Jul	7,917	142,321	0	0	0	0	0	0
19-Jul	2,812	145,133	0	0	0	0	0	0
20-Jul	549	145,682	0	0	0	0	0	0
21-Jul	3,742	149,424	0	0	0	0	0	0
22-Jul	5,542	154,966	0	0	0	0	0	0
23-Jul	4,837	159,803	0	0	0	0	0	0
24-Jul	1,869	161,672	0	0	0	0	0	0
25-Jul	2,301	163,973	0	0	0	0	0	0
26-Jul	1,191	165,164	0	0	0	0	0	0
27-Jul	2,723	167,887	0	0	0	0	0	0
28-Jul	2,353	170,240	0	0	0	0	0	0
29-Jul	1,855	172,095	0	0	0	0	0	0
30-Jul	1,181	173,276	0	0	0	0	0	0
31-Jul	1,004	174,280	0	0	0	0	0	0
1-Aug	966	175,246	0	0	0	0	0	0
2-Aug	778	176,024	0	0	0	0	0	0
3-Aug	826	176,850	0	0	0	0	0	0
4-Aug	586	177,436	0	0	0	0	0	0
5-Aug	595	178,031	0	0	0	0	0	0
6-Aug	725	178,756	0	0	0	0	0	0
7-Aug	649	179,405	0	0	0	0	0	0
8-Aug	581	179,986	0	0	0	0	0	0
9-Aug	555	180,541	0	0	0	0	0	0
10-Aug	663	181,204	0	0	0	0	0	0

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Appendix A.13. Estimated salmon escapement adjacent to the south bank of the Kasloof River. 15 June through 10 August 2003.

Date	Sockeye		Pink		Coho		King	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
15-Jun	1,300	1,300	0	0	0	0	0	0
16-Jun	861	2,161	0	0	0	0	0	0
17-Jun	570	2,731	0	0	0	0	0	0
18-Jun	700	3,431	0	0	0	0	0	0
19-Jun	1,089	4,520	0	0	0	0	0	0
20-Jun	2,770	7,290	0	0	0	0	0	0
21-Jun	4,799	12,089	0	0	0	0	0	0
22-Jun	2,477	14,566	0	0	0	0	0	0
23-Jun	5,269	19,835	0	0	0	0	0	0
24-Jun	5,066	24,901	0	0	0	0	0	0
25-Jun	3,577	28,478	0	0	0	0	0	0
26-Jun	5,571	34,049	0	0	0	0	0	0
27-Jun	559	34,608	0	0	0	0	0	0
28-Jun	203	34,811	0	0	0	0	0	0
29-Jun	2,110	36,921	0	0	0	0	0	0
30-Jun	4,570	41,491	0	0	0	0	0	0
1-Jul	1,497	42,988	0	0	0	0	0	0
2-Jul	2,664	45,652	0	0	0	0	0	0
3-Jul	4,356	50,008	0	0	0	0	0	0
4-Jul	2,902	52,910	0	0	0	0	0	0
5-Jul	873	53,783	0	0	0	0	0	0
6-Jul	1,494	55,277	0	0	0	0	0	0
7-Jul	3,773	59,050	0	0	0	0	0	0
8-Jul	3,748	62,798	0	0	0	0	0	0
9-Jul	4,585	67,383	0	0	0	0	0	0
10-Jul	5,707	73,090	0	0	0	0	0	0
11-Jul	1,944	75,034	0	0	0	0	0	0
12-Jul	4,477	79,511	0	0	0	0	0	0
13-Jul	2,838	82,349	0	0	0	0	0	0
14-Jul	4,112	86,461	0	0	0	0	0	0
15-Jul	2,382	88,843	0	0	0	0	0	0
16-Jul	9,724	98,567	0	0	0	0	0	0
17-Jul	9,664	108,231	0	0	0	0	0	0
18-Jul	3,500	111,731	0	0	0	0	0	0
19-Jul	2,674	114,405	0	0	0	0	0	0
20-Jul	3,941	118,346	0	0	0	0	0	0
21-Jul	4,552	122,898	0	0	0	0	0	0
22-Jul	5,319	128,217	0	0	0	0	0	0
23-Jul	6,745	134,962	0	0	0	0	0	0
24-Jul	3,324	138,286	0	0	0	0	0	0
25-Jul	4,246	142,532	0	0	0	0	0	0
26-Jul	2,876	145,408	0	0	0	0	0	0
27-Jul	3,924	149,332	0	0	0	0	0	0
28-Jul	4,416	153,748	0	0	0	0	0	0
29-Jul	3,928	157,676	0	0	0	0	0	0
30-Jul	3,020	160,696	0	0	0	0	0	0
31-Jul	2,617	163,313	0	0	0	0	0	0
1-Aug	2,176	165,489	0	0	0	0	0	0
2-Aug	2,260	167,749	0	0	0	0	0	0
3-Aug	1,856	169,605	0	0	0	0	0	0
4-Aug	883	170,488	0	0	0	0	0	0
5-Aug	1,429	171,917	0	0	0	0	0	0
6-Aug	1,386	173,303	0	0	0	0	0	0
7-Aug	1,504	174,807	0	0	0	0	0	0
8-Aug	1,113	175,920	0	0	0	0	0	0
9-Aug	1,164	177,084	0	0	0	0	0	0
10-Aug	1,345	178,429	0	0	0	0	0	0

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Appendix A.14. Kasilof River, north bank sonar counts by hour, 15 June through 10 August, 2003.

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Date	Counts by Hour																								Daily Total	Cum 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	18	20	9	16	7	7	4	1	15	20	12	4	0	8	14	8	0	8	1	4	10	5	17	8	216	216
16-Jun	3	10	9	7	4	4	4	6	2	2	0	4	0	3	6	5	23	1	1	1	1	1	3	3	103	319
17-Jun	2	12	19	2	3	3	3	2	2	0	3	1	3	1	26	2	1	3	5	4	4	1	11	14	127	446
18-Jun	26	31	20	9	10	5	15	5	2	5	5	4	28	5	5	4	10	4	5	6	3	10	29	251	697	
19-Jun	39	39	39	39	39	39	39	4	25	4	7	6	3	2	10	10	6	11	20	70	103	113	136	138	941	1,638
20-Jun	91	122	84	48	160	159	85	72	69	77	84	88	58	98	133	233	178	122	51	72	93	134	188	203	2,702	4,340
21-Jun	77	72	80	101	90	78	27	56	32	98	122	203	153	141	101	270	217	170	113	100	84	104	164	125	2,778	7,118
22-Jun	70	60	79	54	48	70	64	48	49	54	45	23	57	89	38	57	110	74	69	59	75	61	95	111	1,562	8,680
23-Jun	95	105	145	158	95	170	94	46	52	52	62	86	166	212	608	553	296	394	432	314	188	143	103	75	4,644	13,324
24-Jun	127	87	92	193	252	126	114	113	85	41	58	56	46	53	111	234	219	105	75	124	64	55	41	71	2,542	15,866
25-Jun	59	71	59	109	113	69	52	67	74	77	87	44	102	59	35	130	128	94	52	56	74	59	43	87	1,800	17,666
26-Jun	116	196	265	143	159	199	248	97	49	94	53	75	47	52	65	53	226	264	107	142	162	157	77	67	3,113	20,779
27-Jun	16	9	35	23	15	11	18	11	33	12	15	4	5	17	33	34	11	13	11	20	26	17	8	3	400	21,179
28-Jun	2	7	7	19	14	12	8	8	4	5	4	3	10	1	6	1	5	3	12	12	9	18	27	57	254	21,433
29-Jun	37	13	30	19	70	81	54	30	37	16	18	46	23	26	28	11	48	30	99	52	48	87	159	68	1,130	22,563
30-Jun	51	93	119	121	181	220	170	61	96	164	223	157	81	87	63	93	91	105	273	451	208	126	236	183	3,653	26,216
1-Jul	104	70	53	58	59	99	97	25	12	47	62	54	62	39	51	67	45	38	44	110	124	65	166	162	1,713	27,929
2-Jul	137	71	64	48	51	62	245	247	260	69	87	88	86	142	119	103	61	135	99	159	363	253	227	150	3,326	31,255
3-Jul	331	418	68	236	149	123	121	51	279	297	217	535	471	460	325	339	380	517	292	305	633	743	350	429	8,069	39,324
4-Jul	112	115	195	141	123	153	142	105	114	193	129	100	65	111	74	63	41	108	52	95	73	51	92	90	2,537	41,861
5-Jul	53	68	45	47	22	18	32	22	42	26	44	58	25	28	18	23	26	25	68	81	23	46	21	19	880	42,741
6-Jul	19	32	36	34	40	42	85	67	81	140	247	329	261	187	150	52	105	107	138	177	292	401	431	728	4,181	46,922
7-Jul	381	205	253	364	441	357	217	262	281	198	389	819	445	700	337	276	344	149	192	138	126	65	67	64	7,070	53,992
8-Jul	63	67	51	59	15	26	24	52	61	21	23	25	22	93	158	84	102	94	119	80	84	90	144	137	1,694	55,686
9-Jul	252	291	187	166	177	105	104	89	75	98	116	63	69	68	232	458	182	114	96	52	66	32	103	54	3,249	58,935
10-Jul	44	203	143	52	68	59	234	48	43	64	110	127	155	194	185	379	565	139	143	262	304	338	243	266	4,368	63,303
11-Jul	200	170	289	342	231	130	173	191	163	152	128	132	191	258	290	513	638	273	355	808	1,001	929	727	685	8,969	72,272
12-Jul	503	724	676	1,437	1,935	930	531	580	406	568	511	470	380	314	449	436	818	866	532	119	269	598	427	395	14,904	87,176
13-Jul	240	129	72	71	111	193	106	59	60	95	58	75	23	44	18	93	31	70	149	114	48	284	444	363	2,950	90,126
14-Jul	164	102	116	177	238	861	292	125	89	160	225	232	177	92	100	52	88	75	156	414	192	209	249	261	4,846	94,972
15-Jul	129	63	58	49	105	159	181	153	71	109	176	184	155	86	81	74	54	81	68	169	210	378	524	837	4,154	99,126
16-Jul	376	252	187	282	327	307	694	1,733	854	469	834	1,372	1,157	903	475	291	528	391	730	1,723	1,686	824	1,291	1,343	19,032	118,158
17-Jul	752	439	217	207	482	725	531	940	1,615	687	593	807	1,365	1,085	867	684	744	557	558	465	755	614	305	252	16,246	134,404
18-Jul	227	140	116	122	87	117	145	221	488	806	354	116	555	499	478	216	416	347	372	392	375	609	512	207	7,917	142,321
19-Jul	68	39	28	50	39	71	47	24	25	21	157	187	214	199	195	180	205	132	123	136	108	119	201	241	2,812	145,133
20-Jul	94	23	11	16	51	10	23	4	5	3	5	3	7	3	6	6	23	23	23	69	16	35	37	53	519	145,682
21-Jul	63	26	27	43	55	75	95	58	56	84	114	169	359	245	259	286	370	172	156	164	152	336	128	250	3,742	149,424
22-Jul	137	94	64	90	122	195	251	169	113	107	131	188	224	260	358	437	476	453	432	303	232	263	215	228	5,542	154,966
23-Jul	142	85	113	140	210	378	280	236	187	194	218	125	324	205	205	323	318	285	172	127	147	169	91	163	4,837	159,803
24-Jul	90	112	82	73	104	92	91	85	106	44	50	51	75	92	44	72	72	103	76	86	54	81	67	67	1,869	161,672

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Date	Counts by Hour																								Daily Total	Cum 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		
25-Jul	20	9	58	15	43	52	123	71	45	49	36	48	120	83	59	105	142	264	316	217	196	120	62	48	2,301	163,973
26-Jul	18	38	3	19	30	64	59	27	47	18	25	43	39	32	36	54	42	52	81	133	92	101	76	62	1,191	165,164
27-Jul	28	40	22	14	38	46	83	49	74	92	119	131	125	98	134	232	175	146	157	242	214	220	165	79	2,723	167,887
28-Jul	39	33	25	8	21	62	106	204	89	102	52	200	144	136	106	73	124	132	133	215	120	75	79	75	2,353	170,240
29-Jul	52	26	16	20	33	90	100	135	78	78	84	69	130	73	62	73	68	87	106	131	167	62	52	63	1,855	172,095
30-Jul	53	33	41	20	35	32	54	54	50	49	32	49	59	51	54	55	40	23	38	61	91	61	85	61	1,181	173,276
31-Jul	19	31	29	17	14	21	45	27	64	53	36	58	37	40	34	34	44	30	64	38	86	87	61	35	1,004	174,280
1-Aug	26	34	24	18	11	29	78	45	56	41	56	42	39	26	40	52	67	49	34	35	53	36	33	42	966	175,246
2-Aug	25	32	16	25	15	44	39	29	34	39	57	57	46	20	35	20	25	27	39	27	35	37	43	12	778	176,024
3-Aug	19	11	25	24	18	35	48	29	22	20	54	49	57	54	80	49	35	51	11	23	34	25	23	30	826	176,850
4-Aug	7	10	2	5	6	26	21	38	12	21	16	20	17	20	22	21	54	32	51	40	27	72	34	12	586	177,436
5-Aug	17	19	15	17	10	26	24	29	30	23	16	15	14	20	42	36	41	17	27	29	28	27	35	38	595	178,031
6-Aug	41	28	29	22	16	29	35	35	32	19	16	27	20	20	29	41	41	39	55	55	22	33	29	12	725	178,756
7-Aug	19	19	20	36	15	22	20	26	41	40	27	21	41	25	31	22	35	23	29	20	43	22	32	20	649	179,405
8-Aug	33	17	7	14	12	27	28	25	35	22	29	12	22	19	30	25	11	24	32	48	31	23	37	18	581	179,986
9-Aug	40	25	11	19	16	22	29	34	21	27	30	27	21	24	12	12	19	21	11	25	12	22	40	35	555	180,541
10-Aug	36	38	33	28	32	26	25	33	21	32	18	21	22	23	16	17	35	22	32	30	24	25	29	45	663	181,204
Total	6,002	5,328	4,618	5,686	6,837	7,193	6,657	7,063	6,863	6,098	6,479	8,033	8,578	7,948	7,578	8,130	9,193	7,700	7,686	9,433	9,763	9,667	9,298	9,373	181,204	

Appendix A.15. Kasilof River, south bank sonar counts by hour, 15 June through 10 August, 2003.

Date	Counts by Hour																								Daily Total	Cum 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	53	86	89	56	47	64	72	54	78	79	85	63	38	64	36	28	26	24	17	22	35	62	69	53	1,300	1,300
16-Jun	42	8	43	62	54	31	60	73	56	32	43	50	33	28	18	11	21	42	23	21	33	31	28	18	861	2,161
17-Jun	23	56	68	51	35	17	19	30	44	26	22	26	8	12	12	3	4	8	11	12	8	28	16	31	570	2,731
18-Jun	41	90	46	29	35	7	16	17	35	34	32	24	34	13	11	15	8	20	17	12	23	23	50	68	700	3,431
19-Jun	100	63	75	64	43	16	26	9	15	31	42	19	12	15	28	37	23	14	39	26	7	26	166	193	1,089	4,520
20-Jun	121	145	224	152	93	33	55	44	70	54	75	104	85	49	204	121	75	47	32	47	68	113	246	513	2,770	7,290
21-Jun	249	153	190	223	262	76	71	40	47	89	181	415	488	294	293	346	325	202	134	105	111	68	129	308	4,799	12,089
22-Jun	247	174	150	105	98	88	85	47	54	32	36	99	154	133	114	104	69	78	55	43	58	88	117	249	2,477	14,566
23-Jun	404	317	369	266	281	222	119	48	50	38	22	28	111	218	539	366	452	388	316	141	135	154	118	167	5,269	19,835
24-Jun	248	396	434	207	218	248	188	118	105	66	74	95	249	179	293	380	300	268	231	215	110	143	122	179	5,066	24,901
25-Jun	188	264	335	183	162	196	164	136	95	48	47	88	76	73	79	154	326	192	95	92	112	93	131	248	3,577	28,478
26-Jun	201	224	512	640	622	344	183	217	224	130	100	76	100	58	79	109	340	521	227	177	240	100	81	66	5,571	34,049
27-Jun	53	85	82	83	53	16	19	5	14	10	8	7	14	4	11	24	8	6	3	9	11	17	5	12	559	34,608
28-Jun	9	8	9	15	15	13	10	16	9	2	3	0	17	9	3	9	2	2	10	20	7	13	2	0	203	34,811
29-Jun	89	89	89	89	89	89	89	89	89	93	35	23	9	30	41	36	36	26	176	161	141	137	199	166	2,110	36,921
30-Jun	129	182	220	302	208	272	412	135	62	140	236	116	89	121	112	118	199	359	241	179	243	120	191	184	4,570	41,491
1-Jul	81	144	80	83	100	101	93	59	21	63	142	60	76	45	38	6	4	11	17	20	17	16	95	125	1,497	42,988
2-Jul	81	79	66	61	49	86	324	347	137	105	94	180	91	74	64	44	84	86	75	115	114	110	110	88	2,664	45,652
3-Jul	68	47	34	36	101	109	83	112	374	97	77	57	180	131	111	97	107	98	103	53	422	796	638	425	4,356	50,008
4-Jul	452	295	149	188	265	247	193	176	116	124	84	57	47	59	40	43	19	51	71	30	35	38	52	71	2,902	52,910
5-Jul	55	56	65	71	56	35	24	27	25	30	35	23	22	38	32	28	36	45	38	34	18	29	12	39	873	53,783
6-Jul	12	17	39	38	44	44	52	27	32	24	80	129	70	66	56	58	49	27	50	34	33	77	120	316	1,494	55,277
7-Jul	130	130	254	253	229	160	131	139	127	134	124	190	297	216	107	82	161	212	133	134	58	77	148	147	3,773	59,050
8-Jul	182	201	172	133	192	274	183	129	98	159	46	95	120	164	247	156	194	246	70	85	114	110	243	135	3,748	62,798
9-Jul	310	363	327	278	348	305	194	151	90	99	88	74	86	74	247	372	304	182	177	104	94	101	65	152	4,585	67,383
10-Jul	96	233	248	294	199	354	334	69	70	85	233	202	198	321	296	512	618	160	125	389	254	185	136	96	5,707	73,090
11-Jul	31	39	105	127	104	98	158	100	69	57	39	59	60	81	68	59	213	48	41	62	97	99	76	54	1,944	75,034
12-Jul	68	79	79	223	200	70	191	191	191	191	150	150	173	85	89	164	229	405	288	116	324	424	284	113	4,477	79,511
13-Jul	89	124	137	202	342	561	349	143	96	78	106	56	16	13	17	41	43	44	23	32	44	71	125	86	2,838	82,349
14-Jul	71	152	124	215	307	723	637	143	87	155	126	68	26	35	145	145	56	38	49	179	178	123	162	168	4,112	86,461
15-Jul	96	133	82	38	101	35	82	122	87	70	66	82	57	26	22	56	17	11	20	189	314	195	215	266	2,382	88,843
16-Jul	140	121	92	75	178	540	1,418	2,488	547	123	172	369	374	628	564	255	256	116	120	275	338	143	225	167	9,724	98,567
17-Jul	296	270	240	165	296	509	607	651	1,530	777	179	303	594	532	380	282	275	136	138	227	421	479	270	107	9,664	108,231
18-Jul	154	120	133	101	139	165	255	141	311	323	199	154	189	157	134	145	66	94	116	113	107	52	57	75	3,500	111,731
19-Jul	82	80	53	113	133	218	191	179	176	117	286	99	123	126	70	85	127	57	56	52	62	88	53	48	2,674	114,405
20-Jul	47	29	25	31	48	115	153	124	117	198	268	284	432	521	393	240	142	113	127	110	148	98	76	102	3,941	118,346
21-Jul	113	80	119	101	185	129	158	209	142	175	237	384	322	389	369	353	129	234	93	99	126	113	124	169	4,552	122,898
22-Jul	211	268	225	149	171	193	102	122	118	128	185	136	143	268	498	484	298	209	213	155	220	236	276	311	5,319	128,217
23-Jul	278	410	385	381	492	472	358	438	373	350	184	172	102	148	149	338	340	300	273	259	197	128	155	63	6,745	134,962
24-Jul	46	75	99	118	221	170	153	175	113	172	158	144	83	140	133	83	194	176	222	186	165	107	107	84	3,324	138,286

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Date	Counts by Hour																								Daily Total	Cum 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		
25 Jul	117	81	52	102	164	227	136	216	172	96	205	135	83	171	164	103	149	317	412	411	243	167	181	133	4,246	112,532
26 Jul	162	61	46	54	73	148	146	184	132	131	142	164	91	124	93	101	102	94	204	188	125	132	150	89	2,876	145,408
27 Jul	64	58	58	79	121	167	235	322	390	173	172	190	211	233	65	91	117	156	130	276	183	107	177	119	3,924	149,332
28 Jul	73	60	65	45	62	63	253	204	192	283	234	227	259	178	328	198	180	166	237	264	313	199	167	166	4,416	153,748
29-Jul	110	121	106	109	77	150	266	347	229	195	209	105	158	183	125	173	178	181	151	167	208	123	110	117	3,928	157,676
30 Jul	105	86	60	50	53	144	185	194	208	166	228	91	159	109	105	104	74	99	106	136	214	162	82	100	3,020	160,696
31 Jul	52	64	44	35	11	61	40	80	130	127	103	139	177	206	133	83	173	118	125	124	121	195	150	96	2,617	163,313
1-Aug	56	59	63	90	122	105	121	134	175	123	140	118	91	72	87	76	25	88	70	47	76	91	99	48	2,176	165,489
2-Aug	61	48	51	47	37	90	79	121	99	174	227	185	88	138	85	87	115	105	57	53	81	59	110	60	2,260	167,749
3-Aug	23	26	37	31	11	80	145	72	54	82	170	146	140	107	119	127	46	48	57	75	45	59	55	71	1,856	169,605
4 Aug	26	41	15	45	32	55	55	32	60	14	22	38	40	105	30	26	27	22	57	21	32	21	23	44	883	170,488
5 Aug	20	6	8	19	18	58	55	132	58	43	50	25	49	98	142	79	67	74	68	88	114	57	72	29	1,429	171,917
6 Aug	24	39	12	20	12	20	56	68	160	57	71	46	81	60	95	54	69	83	67	102	65	57	55	13	1,386	173,303
7-Aug	23	15	33	23	78	73	56	72	74	79	47	76	34	106	60	77	118	129	86	89	55	93	13	45	1,504	174,807
8 Aug	11	18	15	12	11	28	43	38	49	44	17	35	57	31	21	77	74	77	86	114	81	88	61	19	1,113	175,920
9 Aug	11	31	8	19	11	51	71	96	10	38	18	13	27	32	57	36	30	44	80	106	98	73	71	43	1,164	177,084
10-Aug	40	14	23	28	41	82	105	108	44	76	40	40	20	58	17	56	51	44	99	91	79	83	74	29	1,315	178,399
Total	6,310	6,716	6,963	6,809	7,762	9,047	10,058	9,960	8,360	6,639	6,524	6,563	7,163	7,618	7,868	7,537	7,800	7,141	6,357	6,689	7,378	6,877	7,117	7,083	178,429	

Appendix A.16. Kasilof River north bank sonar counts by hour, 15 June through 10 August 2003. 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	8.3	9.3	4.2	7.4	3.2	3.2	1.9	0.5	6.9	9.3	5.6	1.9	0.0	3.7	6.5	3.7	0.0	3.7	0.5	1.9	4.6	2.3	7.9	3.7	100.0
16-Jun	2.9	9.7	8.7	6.8	3.9	3.9	3.9	5.8	1.9	1.9	0.0	3.9	0.0	2.9	5.8	4.9	22.3	1.0	1.0	1.0	1.0	1.0	2.9	2.9	100.0
17-Jun	1.6	9.4	15.0	1.6	2.4	2.4	2.1	1.6	1.6	0.0	2.4	0.8	2.4	0.8	20.5	1.6	0.8	2.4	3.9	3.1	3.1	0.8	8.7	11.0	100.0
18-Jun	10.4	12.4	8.0	3.6	4.0	2.0	6.0	2.0	0.8	2.0	2.0	2.0	1.6	11.2	2.0	2.0	1.6	4.0	1.6	2.0	2.4	1.2	4.0	11.6	100.0
19-Jun	4.1	4.1	4.1	4.1	4.1	4.1	4.1	0.4	2.7	0.4	0.7	0.6	0.3	0.2	1.1	1.1	0.6	1.2	2.1	7.4	10.9	12.0	14.5	14.7	100.0
20-Jun	3.1	4.5	3.1	1.8	5.9	5.9	3.1	2.7	2.6	2.8	3.1	3.3	2.1	3.6	4.9	8.6	6.6	4.5	1.9	2.7	3.4	5.0	7.0	7.5	100.0
21-Jun	2.8	2.6	2.9	3.6	3.2	2.8	1.0	2.0	1.2	3.5	4.4	7.3	5.5	5.1	3.6	9.7	7.8	6.1	4.1	3.6	3.0	3.7	5.9	4.5	100.0
22-Jun	4.5	3.8	5.1	3.5	3.1	4.5	4.1	3.1	3.1	3.5	2.9	1.5	3.6	5.7	2.4	3.6	7.0	4.7	4.4	3.8	4.8	4.1	6.1	7.1	100.0
23-Jun	2.0	2.3	3.1	3.4	2.0	3.7	2.0	1.0	1.1	1.1	1.3	1.9	3.6	4.6	13.1	11.9	6.4	8.5	9.3	6.8	4.0	3.1	2.2	1.6	100.0
24-Jun	5.0	3.4	3.6	7.6	9.9	5.0	4.5	4.4	3.3	1.6	2.3	2.2	1.8	2.1	4.4	9.2	8.6	4.1	3.0	4.9	2.5	2.2	1.6	2.8	100.0
25-Jun	3.3	3.9	3.3	6.1	6.3	3.8	2.9	3.7	4.1	4.3	4.8	2.4	5.7	3.3	1.9	7.2	7.1	5.2	2.9	3.1	4.1	3.3	2.4	4.8	100.0
26-Jun	3.7	6.3	8.5	4.6	5.1	6.4	8.0	3.1	1.6	3.0	1.7	2.4	1.5	1.7	2.1	1.7	7.3	8.5	3.4	4.6	5.2	5.0	2.5	2.2	100.0
27-Jun	4.0	2.2	8.8	5.8	3.8	2.8	4.5	2.8	8.2	3.0	3.8	1.0	1.2	4.2	8.2	8.5	2.8	3.2	2.8	5.0	6.5	4.2	2.0	0.8	100.0
28-Jun	0.8	2.8	2.8	7.5	5.5	4.7	3.1	3.1	1.6	2.0	1.6	1.2	3.9	0.4	2.4	0.4	2.0	1.2	4.7	4.7	3.5	7.1	10.6	22.4	100.0
29-Jun	3.3	1.2	2.7	1.7	6.2	7.2	4.8	2.7	3.3	1.4	1.6	4.1	2.0	2.3	2.5	1.0	4.2	2.7	8.8	4.6	4.2	7.7	14.1	6.0	100.0
30-Jun	1.4	2.5	3.3	3.3	5.0	6.0	4.7	1.7	2.6	4.5	6.1	4.3	2.2	2.4	1.7	2.5	2.5	2.9	7.5	12.3	5.7	3.4	6.5	5.0	100.0
1-Jul	6.1	4.1	3.1	3.4	3.4	5.8	5.7	1.5	0.7	2.7	3.6	3.2	3.6	2.3	3.0	3.9	2.6	2.2	2.6	6.4	7.2	3.8	9.7	9.5	100.0
2-Jul	4.1	2.1	1.9	1.4	1.5	1.9	7.4	7.4	7.8	2.1	2.6	2.6	2.6	4.3	3.6	3.1	1.8	4.1	3.0	4.8	10.9	7.6	6.8	4.5	100.0
3-Jul	4.1	5.2	0.8	2.9	1.8	1.5	1.5	0.6	3.5	3.7	2.7	6.6	5.8	5.7	4.0	4.2	4.7	6.4	3.6	3.8	7.8	9.2	4.3	5.3	100.0
4-Jul	4.4	4.5	7.7	5.6	4.8	6.0	5.6	4.1	4.5	7.6	5.1	3.9	2.6	4.4	2.9	2.5	1.6	4.3	2.0	3.7	2.9	2.0	3.6	3.5	100.0
5-Jul	6.0	7.7	5.1	5.3	2.5	2.0	3.6	2.5	4.8	3.0	5.0	6.6	2.8	3.2	2.0	2.6	3.0	2.8	7.7	9.2	2.6	5.2	2.4	2.2	100.0
6-Jul	0.5	0.8	0.9	0.8	1.0	1.0	2.0	1.6	1.9	3.3	5.9	7.9	6.2	4.5	3.6	1.2	2.5	2.6	3.3	4.2	7.0	9.6	10.3	17.4	100.0
7-Jul	5.4	2.9	3.6	5.1	5.8	5.0	3.1	3.7	4.0	2.8	5.5	12.0	6.3	9.9	4.8	3.9	4.9	2.1	2.7	2.0	1.8	0.9	0.9	0.9	100.0
8-Jul	3.7	4.0	3.0	3.5	0.9	1.5	1.4	3.1	3.6	1.2	1.4	1.5	1.3	5.5	9.3	5.0	6.0	5.5	7.0	4.7	5.0	5.3	8.5	8.1	100.0
9-Jul	7.8	9.0	5.8	5.1	5.4	3.2	3.2	2.7	2.3	3.0	3.6	1.9	2.1	2.1	7.1	14.1	5.6	3.5	3.0	1.6	2.0	4.0	3.2	1.7	100.0
10-Jul	1.0	4.6	3.3	1.2	1.6	1.4	5.4	1.1	1.0	1.5	2.5	2.9	3.5	4.4	4.2	8.7	12.9	3.2	3.3	6.0	7.0	7.7	5.6	6.1	100.0
11-Jul	2.2	1.9	3.2	3.8	2.6	1.4	1.9	2.1	1.8	1.7	1.1	1.5	2.1	2.9	3.2	5.7	7.1	3.0	4.0	9.0	11.2	10.4	8.1	7.6	100.0
12-Jul	3.4	4.9	4.5	9.6	13.0	6.2	3.6	3.9	2.7	3.8	3.4	3.2	2.5	2.1	3.0	2.9	5.5	5.8	3.6	1.0	1.8	4.0	2.9	2.7	100.0
13-Jul	8.1	4.4	2.4	2.4	3.8	6.5	3.6	2.0	2.0	3.2	2.0	2.5	0.8	1.5	0.6	3.2	1.1	2.4	5.1	3.9	1.6	9.6	15.1	12.3	100.0
14-Jul	3.4	2.1	2.4	3.7	4.9	17.8	6.0	2.6	1.8	3.3	4.6	4.8	3.7	1.9	2.1	1.1	1.8	1.5	3.2	8.5	4.0	4.3	5.1	5.4	100.0
15-Jul	3.1	1.5	1.4	1.2	2.5	3.8	4.4	3.7	1.7	2.6	4.2	4.4	3.7	2.1	1.9	1.8	1.3	1.9	1.6	4.1	5.1	9.1	12.6	20.1	100.0
16-Jul	2.0	1.3	1.0	1.5	1.7	1.6	3.6	9.1	4.5	2.5	4.4	7.2	6.1	4.7	2.5	1.5	2.8	2.1	3.8	9.1	8.9	4.3	6.8	7.1	100.0
17-Jul	4.6	2.7	1.3	1.3	3.0	4.5	3.3	5.8	9.9	4.2	3.7	5.0	8.4	6.7	5.3	4.2	4.6	3.4	3.4	2.9	4.6	3.8	1.9	1.6	100.0
18-Jul	2.9	1.8	1.5	1.5	1.1	1.5	1.8	2.8	6.2	10.2	4.5	1.5	7.0	6.3	6.0	2.7	5.3	4.4	4.7	5.0	4.7	7.7	6.5	2.6	100.0
19-Jul	2.4	1.4	1.0	1.8	1.4	2.5	1.7	0.9	0.9	0.7	5.6	6.7	7.6	7.1	6.9	6.4	7.3	4.7	4.4	4.8	3.8	4.2	7.3	8.6	100.0

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1900KAMP03

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	
20-Jul	17.1	4.2	2.0	2.9	9.3	1.8	4.2	0.7	0.9	0.5	0.9	0.5	1.3	0.5	1.1	1.1	4.2	4.2	4.2	12.6	2.9	6.4	6.7	9.7	100.0
21-Jul	1.7	0.7	0.7	1.1	1.5	2.0	2.5	1.5	1.5	2.2	3.0	4.5	9.6	6.5	6.9	7.6	9.9	4.6	4.2	4.4	4.1	9.0	3.4	6.7	100.0
22-Jul	2.5	1.7	1.2	1.6	2.2	3.5	4.5	3.0	2.0	1.9	2.4	3.4	4.0	4.7	6.5	7.9	8.6	8.2	7.8	5.5	4.2	4.7	3.9	4.1	100.0
23-Jul	2.9	1.8	2.3	2.9	4.3	7.8	5.8	4.9	3.9	4.0	4.5	2.6	6.7	4.2	4.2	6.7	6.6	5.9	3.6	2.6	3.0	3.5	1.9	3.4	100.0
24-Jul	4.8	6.0	4.4	3.9	5.6	4.9	4.9	4.5	5.7	2.4	2.7	2.7	4.0	4.9	2.4	3.9	3.9	5.5	4.1	4.6	2.9	4.3	3.6	3.6	100.0
25-Jul	0.9	0.4	2.5	0.7	1.9	2.3	5.3	3.1	2.0	2.1	1.6	2.1	5.2	3.6	2.6	4.6	6.2	11.5	13.7	9.4	8.5	5.2	2.7	2.1	100.0
26-Jul	1.5	3.2	0.3	1.6	2.5	5.4	5.0	2.3	3.9	1.5	2.1	3.6	3.3	2.7	3.0	4.5	3.5	4.4	6.8	11.2	7.7	8.5	6.1	5.2	100.0
27-Jul	1.0	1.5	0.8	0.5	1.4	1.7	3.0	1.8	2.7	3.4	4.4	4.8	4.6	3.6	4.9	8.5	6.4	5.4	5.8	8.9	7.9	8.1	6.1	2.9	100.0
28-Jul	1.7	1.4	1.1	0.3	0.9	2.6	4.5	8.7	3.8	4.3	2.2	8.5	6.1	5.8	4.5	3.1	5.3	5.6	5.7	9.1	5.1	3.2	3.4	3.2	100.0
29-Jul	2.8	1.4	0.9	1.1	1.8	4.9	5.4	7.3	4.2	4.2	4.5	3.7	7.0	3.9	3.3	3.9	3.7	4.7	5.7	7.1	9.0	3.3	2.8	3.4	100.0
30-Jul	4.5	2.8	3.5	1.7	3.0	2.7	4.6	4.6	4.2	4.1	2.7	4.1	5.0	4.3	4.6	4.7	3.4	1.9	3.2	5.2	7.7	5.2	7.2	5.2	100.0
31-Jul	1.9	3.1	2.9	1.7	1.4	2.1	4.5	2.7	6.4	5.3	3.6	5.8	3.7	4.0	3.4	3.4	4.4	3.0	6.4	3.8	8.6	8.7	6.1	3.5	100.0
1-Aug	2.7	3.5	2.5	1.9	1.1	3.0	8.1	4.7	5.8	4.2	5.8	4.3	4.0	2.7	4.1	5.4	6.9	5.1	3.5	3.6	5.5	3.7	3.4	4.3	100.0
2-Aug	3.2	4.1	2.1	3.2	1.9	5.7	5.0	3.7	4.4	5.0	7.3	7.3	5.9	2.6	4.5	2.6	3.2	3.5	5.0	3.5	4.5	4.8	5.5	1.5	100.0
3-Aug	2.3	1.3	3.0	2.9	2.2	4.2	5.8	3.5	2.7	2.4	6.5	5.9	6.9	6.5	9.7	5.9	4.2	6.2	1.3	2.8	4.1	3.0	2.8	3.6	100.0
4-Aug	1.2	1.7	0.3	0.9	1.0	4.4	3.6	6.5	2.0	3.6	2.7	3.4	2.9	3.4	3.8	3.6	9.2	5.5	8.7	6.8	4.6	12.3	5.8	2.0	100.0
5-Aug	2.9	3.2	2.5	2.9	1.7	4.4	4.0	4.9	5.0	3.9	2.7	2.5	2.4	3.4	7.1	6.1	6.9	2.9	4.5	4.9	4.7	4.5	5.9	6.4	100.0
6-Aug	5.7	3.9	4.0	3.0	2.2	4.0	4.8	4.8	4.4	2.6	2.2	3.7	2.8	2.8	4.0	5.7	5.7	5.4	7.6	7.6	3.0	4.6	4.0	1.7	100.0
7-Aug	2.9	2.9	3.1	5.5	2.3	3.4	3.1	4.0	6.3	6.2	4.2	3.2	6.3	3.9	4.8	3.4	5.4	3.5	4.5	3.1	6.6	3.4	4.9	3.1	100.0
8-Aug	5.7	2.9	1.2	2.4	2.1	4.6	4.8	4.3	6.0	3.8	5.0	2.1	3.8	3.3	5.2	4.3	1.9	4.1	5.5	8.3	5.3	4.0	6.4	3.1	100.0
9-Aug	7.2	4.5	2.0	3.4	2.9	4.0	5.2	6.1	3.8	4.9	5.4	4.9	3.8	4.3	2.2	2.2	3.4	3.8	2.0	4.5	2.2	4.0	7.2	6.3	100.0
10-Aug	5.4	5.7	5.0	4.2	4.8	3.9	3.8	5.0	3.2	4.8	2.7	3.2	3.3	3.5	2.4	2.6	5.3	3.3	4.8	4.5	3.6	3.8	4.4	6.8	100.0
Total	3.3	2.9	2.5	3.1	3.8	4.0	3.7	3.9	3.8	3.4	3.6	4.4	4.7	4.4	4.2	4.5	5.1	4.2	4.2	5.2	5.4	5.3	5.1	5.2	100.0

Appendix A.17. Kasilof River south bank sonar counts by hour, 15 June through 10 August 2003. 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	4.1	6.6	6.8	4.3	3.6	4.9	5.5	4.2	6.0	6.1	6.5	4.8	2.9	4.9	2.8	2.2	2.0	1.8	1.3	1.7	2.7	4.8	5.3	4.1	100.0
16-Jun	4.9	0.9	5.0	7.2	6.3	3.6	7.0	8.5	6.5	3.7	5.0	5.8	3.8	3.3	2.1	1.3	2.4	4.9	2.7	2.4	3.8	3.6	3.3	2.1	100.0
17-Jun	4.0	9.8	11.9	8.9	6.1	3.0	3.3	5.3	7.7	4.6	3.9	4.6	1.4	2.1	2.1	0.5	0.7	1.4	1.9	2.1	1.4	4.9	2.8	5.4	100.0
18-Jun	5.9	12.9	6.6	4.1	5.0	1.0	2.3	2.4	5.0	4.9	4.6	3.4	4.9	1.9	1.6	2.1	1.1	2.9	2.4	1.7	3.3	3.3	7.1	9.7	100.0
19-Jun	9.2	5.8	6.9	5.9	3.9	1.5	2.4	0.8	1.4	2.8	3.9	1.7	1.1	1.4	2.6	3.4	2.1	1.3	3.6	2.4	0.6	2.4	15.2	17.7	100.0
20-Jun	4.4	5.2	8.1	5.5	3.4	1.2	2.0	1.6	2.5	1.9	2.7	3.8	3.1	1.8	7.4	4.4	2.7	1.7	1.2	1.7	2.5	4.1	8.9	18.5	100.0
21-Jun	5.2	3.2	4.0	4.6	5.5	1.6	1.5	0.8	1.0	1.9	3.8	8.6	10.2	6.1	6.1	7.2	6.8	4.2	2.8	2.2	2.3	1.4	2.7	6.4	100.0
22-Jun	10.0	7.0	6.1	4.2	4.0	3.6	3.4	1.9	2.2	1.3	1.5	4.0	6.2	5.4	4.6	4.2	2.8	3.1	2.2	1.7	2.3	3.6	4.7	10.1	100.0
23-Jun	7.7	6.0	7.0	5.0	5.3	4.2	2.3	0.9	0.9	0.7	0.4	0.5	2.1	4.1	10.2	6.9	8.6	7.4	6.0	2.7	2.6	2.9	2.2	3.2	100.0
24-Jun	4.9	7.8	8.6	4.1	4.3	4.9	3.7	2.3	2.1	1.3	1.5	1.9	4.9	3.5	5.8	7.5	5.9	5.3	4.6	4.2	2.2	2.8	2.4	3.5	100.0
25-Jun	5.3	7.4	9.4	5.1	4.5	5.5	4.6	3.8	2.7	1.3	1.3	2.5	2.1	2.0	2.2	4.3	9.1	5.4	2.7	2.6	3.1	2.6	3.7	6.9	100.0
26-Jun	3.6	4.0	9.2	11.5	11.2	6.2	3.3	3.9	4.0	2.3	1.8	1.4	1.8	1.0	1.4	2.0	6.1	9.4	4.1	3.2	4.3	1.8	1.5	1.2	100.0
27-Jun	9.5	15.2	14.7	14.8	9.5	2.9	3.4	0.9	2.5	1.8	1.4	1.3	2.5	0.7	2.0	4.3	1.4	1.1	0.5	1.6	2.0	3.0	0.9	2.1	100.0
28-Jun	4.4	3.9	4.4	7.4	7.4	6.4	4.9	7.9	4.4	1.0	1.5	0.0	8.4	4.4	1.5	4.4	1.0	1.0	4.9	9.9	3.4	6.4	1.0	0.0	100.0
29-Jun	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.4	1.7	1.1	0.4	1.4	1.9	1.7	1.7	1.2	8.3	7.6	6.7	6.5	9.4	7.9	100.0
30-Jun	2.8	4.0	4.8	6.6	4.6	6.0	9.0	3.0	1.4	3.1	5.2	2.5	1.9	2.6	2.5	2.6	4.4	7.9	5.3	3.9	5.3	2.6	4.2	4.0	100.0
1-Jul	5.4	9.6	5.3	5.5	6.7	6.7	6.2	3.9	1.4	4.2	9.5	4.0	5.1	3.0	2.5	0.4	0.3	0.7	1.1	1.3	1.1	1.1	6.3	8.4	100.0
2-Jul	3.0	3.0	2.5	2.3	1.8	3.2	12.2	13.0	5.1	3.9	3.5	6.8	3.4	2.8	2.4	1.7	3.2	3.2	2.8	4.3	4.3	4.1	4.1	3.3	100.0
3-Jul	1.6	1.1	0.8	0.8	2.3	2.5	1.9	2.6	8.6	2.2	1.8	1.3	4.1	3.0	2.5	2.2	2.5	2.2	2.4	1.2	9.7	18.3	14.6	9.8	100.0
4-Jul	15.6	10.2	5.1	6.5	9.1	8.5	6.7	6.1	4.0	4.3	2.9	2.0	1.6	2.0	1.4	1.5	0.7	1.8	2.4	1.0	1.2	1.3	1.8	2.4	100.0
5-Jul	6.3	6.4	7.4	8.1	6.4	4.0	2.7	3.1	2.9	3.4	4.0	2.6	2.5	4.4	3.7	3.2	4.1	5.2	4.4	3.9	2.1	3.3	1.4	4.5	100.0
6-Jul	0.8	1.1	2.6	2.5	2.9	2.9	3.5	1.8	2.1	1.6	5.4	8.6	4.7	4.4	3.7	3.9	3.3	1.8	3.3	2.3	2.2	5.2	8.0	21.2	100.0
7-Jul	3.4	3.4	6.7	6.7	6.1	4.2	3.5	3.7	3.4	3.6	3.3	5.0	7.9	5.7	2.8	2.2	4.3	5.6	3.5	3.6	1.5	2.0	3.9	3.9	100.0
8-Jul	4.9	5.4	4.6	3.5	5.1	7.3	4.9	3.4	2.6	4.2	1.2	2.5	3.2	4.4	6.6	4.2	5.2	6.6	1.9	2.3	3.0	2.9	6.5	3.6	100.0
9-Jul	6.8	7.9	7.1	6.1	7.6	6.7	4.2	3.3	2.0	2.2	1.9	1.6	1.9	1.6	5.4	8.1	6.6	4.0	3.9	2.3	2.1	2.2	1.4	3.3	100.0
10-Jul	1.7	4.1	4.3	5.2	3.5	6.2	5.9	1.2	1.2	1.5	4.1	3.5	3.5	5.6	5.2	9.0	10.8	2.8	2.2	6.8	4.5	3.2	2.4	1.7	100.0
11-Jul	1.6	2.0	5.4	6.5	5.3	5.0	8.1	5.1	3.5	2.9	2.0	3.0	3.1	4.2	3.5	3.0	11.0	2.5	2.1	3.2	5.0	5.1	3.9	2.8	100.0
12-Jul	1.5	1.8	1.8	5.0	4.5	1.6	4.3	4.3	4.3	4.3	3.4	3.4	3.9	1.9	2.0	3.7	5.1	9.0	6.4	2.6	7.2	9.5	6.3	2.5	100.0
13-Jul	3.1	4.4	4.8	7.1	12.1	19.8	12.3	5.0	3.4	2.7	3.7	2.0	0.6	0.5	0.6	1.4	1.5	1.6	0.8	1.1	1.6	2.5	4.4	3.0	100.0
14-Jul	1.7	3.7	3.0	5.2	7.5	17.6	15.5	3.5	2.1	3.8	3.1	1.7	0.6	0.9	3.5	3.5	1.4	0.9	1.2	4.4	4.3	3.0	3.9	4.1	100.0

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FN 01KA2HP.xls

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	4.0	5.6	3.4	1.6	4.2	1.5	3.4	5.1	3.7	2.9	2.8	3.4	2.4	1.1	0.9	2.4	0.7	0.5	0.8	7.9	13.2	8.2	9.0	11.2	100.0
16-Jul	1.4	1.2	0.9	0.8	1.8	5.6	14.6	25.6	5.6	1.3	1.8	3.8	3.8	6.5	5.8	2.6	2.6	1.2	1.2	2.8	3.5	1.5	2.3	1.7	100.0
17-Jul	3.1	2.8	2.5	1.7	3.1	5.3	6.3	6.7	15.8	8.0	1.9	3.1	6.1	5.5	3.9	2.9	2.8	1.4	1.4	2.3	4.4	5.0	2.8	1.1	100.0
18-Jul	4.4	3.4	3.8	2.9	4.0	4.7	7.3	4.0	8.9	9.2	5.7	4.4	5.4	4.5	3.8	4.1	1.9	2.7	3.3	3.2	3.1	1.5	1.6	2.1	100.0
19-Jul	3.1	3.0	2.0	4.2	5.0	8.2	7.1	6.7	6.6	4.4	10.7	3.7	4.6	4.7	2.6	3.2	4.7	2.1	2.1	1.9	2.3	3.3	2.0	1.8	100.0
20-Jul	1.2	0.7	0.6	0.8	1.2	2.9	3.9	3.1	3.0	5.0	6.8	7.2	11.0	13.2	10.0	6.1	3.6	2.9	3.2	2.8	3.8	2.5	1.9	2.6	100.0
21-Jul	2.5	1.8	2.6	2.2	4.1	2.8	3.5	4.6	3.1	3.8	5.2	8.4	7.1	8.5	8.1	7.8	2.8	5.1	2.0	2.2	2.8	2.5	2.7	3.7	100.0
22-Jul	4.0	5.0	4.2	2.8	3.2	3.6	1.9	2.3	2.2	2.4	3.5	2.6	2.7	5.0	9.4	9.1	5.6	3.9	4.0	2.9	4.1	4.4	5.2	5.8	100.0
23-Jul	4.1	6.1	5.7	5.6	7.3	7.0	5.3	6.5	5.5	5.2	2.7	2.6	1.5	2.2	2.2	5.0	5.0	4.4	4.0	3.8	2.9	1.9	2.3	0.9	100.0
24-Jul	1.4	2.3	3.0	3.5	6.6	5.1	4.6	5.3	3.4	5.2	4.8	4.3	2.5	4.2	4.0	2.5	5.8	5.3	6.7	5.6	5.0	3.2	3.2	2.5	100.0
25-Jul	2.8	2.0	1.2	2.4	3.9	5.3	3.2	5.1	4.1	2.3	4.8	3.2	2.0	4.0	3.9	2.4	3.5	7.5	9.7	9.8	5.7	3.9	4.3	3.1	100.0
26-Jul	3.5	2.1	1.6	1.9	2.5	5.1	5.1	6.4	4.6	4.6	4.9	5.7	3.2	4.3	3.2	3.5	3.5	3.3	7.1	6.5	4.3	4.6	5.2	3.1	100.0
27-Jul	1.6	1.5	1.5	2.0	3.1	4.3	6.0	8.2	9.9	4.4	4.4	4.8	5.4	5.9	1.7	2.3	3.7	4.0	3.3	7.0	4.7	2.7	4.5	3.0	100.0
28-Jul	1.7	1.4	1.5	1.0	1.4	1.4	5.7	4.6	4.3	6.4	5.3	5.1	5.9	4.0	7.4	4.5	4.1	3.8	5.4	6.0	7.1	4.5	3.8	3.8	100.0
29-Jul	3.6	3.1	2.7	2.8	2.0	3.8	6.8	8.8	5.8	5.0	5.3	2.7	4.0	4.7	3.2	4.4	4.5	4.6	3.8	4.3	5.3	3.1	2.8	3.0	100.0
30-Jul	3.5	2.8	2.0	1.7	1.8	4.8	6.1	6.4	6.9	5.5	7.5	3.0	5.3	3.6	3.5	3.4	2.5	3.3	3.5	4.5	7.1	5.4	2.7	3.3	100.0
31-Jul	2.0	2.4	1.7	1.3	1.6	2.3	1.5	3.1	5.0	4.9	3.9	5.3	6.8	7.9	5.1	3.2	6.6	4.5	4.8	4.7	4.6	7.5	5.7	3.7	100.0
1-Aug	2.6	2.7	2.9	4.1	5.6	4.8	5.6	6.2	8.0	5.7	6.4	5.4	4.2	3.3	4.0	3.5	1.1	4.0	3.2	2.2	3.5	4.2	4.5	2.2	100.0
2-Aug	2.8	2.1	2.3	2.1	1.6	4.0	3.5	5.4	4.4	7.7	10.0	8.2	3.9	6.1	3.8	3.8	5.1	4.6	2.5	2.3	3.6	2.6	4.9	2.7	100.0
3-Aug	1.2	1.4	2.0	1.7	2.2	4.3	7.8	3.9	2.9	4.4	9.2	7.9	7.5	5.8	6.4	6.8	2.5	2.6	3.1	4.0	2.4	3.2	3.0	3.8	100.0
4-Aug	2.9	4.6	1.7	5.1	3.6	6.2	6.2	3.6	6.8	1.6	2.5	4.3	4.5	11.9	3.4	2.9	3.1	2.5	6.5	2.4	3.6	2.4	2.6	5.0	100.0
5-Aug	1.4	0.4	0.6	1.3	1.3	4.1	3.8	9.2	4.1	3.0	3.5	1.7	3.4	6.9	9.9	5.5	4.7	5.2	4.8	6.2	8.0	4.0	5.0	2.0	100.0
6-Aug	1.7	2.8	0.9	1.4	0.9	1.4	4.0	4.9	11.5	4.1	5.1	3.3	5.8	4.3	6.9	3.9	5.0	6.0	4.8	7.4	4.7	4.1	4.0	0.9	100.0
7-Aug	1.5	1.0	2.2	1.5	1.9	4.9	3.7	4.8	4.9	5.3	3.1	5.1	2.3	7.0	4.0	5.1	7.8	8.6	5.7	5.9	3.7	6.2	0.9	3.0	100.0
8-Aug	1.3	1.6	1.3	1.1	1.0	2.5	3.9	3.4	4.4	4.0	1.5	3.1	5.1	2.8	1.9	6.9	6.6	6.9	7.7	10.2	7.5	7.9	5.5	1.7	100.0
9-Aug	0.9	2.7	0.7	1.6	0.9	4.4	6.1	8.2	3.4	3.3	4.1	3.7	2.3	2.7	4.9	3.1	2.6	3.8	6.9	9.1	8.4	6.3	6.1	3.7	100.0
10-Aug	3.0	1.0	1.7	2.1	3.3	6.1	7.8	8.0	3.3	5.7	3.0	3.0	1.5	4.3	1.3	4.2	3.8	3.3	7.4	6.8	5.9	6.2	5.5	2.2	100.0
Total	3.6	3.8	3.9	3.8	4.4	5.1	5.6	5.6	4.7	3.7	3.7	3.7	4.0	4.3	4.4	4.2	4.4	4.0	3.6	3.7	4.1	3.9	4.0	4.0	100.0

Appendix A.18. Kasilof River north bank sonar counts by sector. 15 June through 10 August, 2003.

Counts by Sector														Daily Total	Cum Total
Date	1	2	3	4	5	6	7	8	9	10	11	12			
15-Jun	8	7	13	26	32	17	41	51	7	0	2	12	216	216	
16-Jun	6	3	6	11	13	25	17	8	0	0	0	14	103	319	
17-Jun	8	5	15	13	9	13	15	20	3	0	7	19	127	446	
18-Jun	16	7	29	36	28	32	36	35	6	0	1	25	251	697	
19-Jun	26	41	80	108	103	170	163	129	54	15	16	36	941	1,638	
20-Jun	26	155	476	564	181	352	334	379	43	54	101	37	2,702	4,340	
21-Jun	11	205	693	684	137	347	188	84	15	179	231	4	2,778	7,118	
22-Jun	36	105	322	357	92	203	135	47	8	102	143	12	1,562	8,680	
23-Jun	490	1,105	1,301	617	283	315	130	78	69	145	66	45	4,644	13,324	
24-Jun	51	502	636	653	249	79	94	108	31	36	6	97	2,542	15,866	
25-Jun	27	258	379	504	212	71	107	88	31	17	3	103	1,800	17,666	
26-Jun	173	801	901	650	189	102	102	110	20	17	0	48	3,113	20,779	
27-Jun	31	71	66	74	33	22	23	18	12	5	5	40	400	21,179	
28-Jun	13	41	22	48	25	10	27	17	12	11	2	26	254	21,433	
	24	248	209	265	87	38	109	86	21	28	2	13	1,130	22,563	
29-Jun															
30-Jun	29	714	631	959	405	188	274	268	81	72	10	22	3,653	26,216	
1-Jul	55	500	297	374	137	59	115	118	27	18	4	9	1,713	27,929	
2-Jul	271	616	701	667	413	122	232	167	85	34	9	9	3,326	31,255	
3-Jul	229	1,500	1,236	1,277	1,179	382	497	947	656	114	28	24	8,069	39,324	
4-Jul	125	703	367	403	323	73	164	235	93	23	8	20	2,537	41,861	
5-Jul	27	177	75	117	116	43	96	93	86	18	4	28	880	42,741	
6-Jul	98	1,647	855	381	339	102	170	361	104	42	25	57	4,181	46,922	
7-Jul	665	1,754	1,481	862	958	152	484	541	140	24	2	7	7,070	53,992	
8-Jul	40	409	375	276	207	72	123	93	56	23	10	10	1,694	55,686	
9-Jul	165	1,025	820	411	305	61	124	162	112	44	6	14	3,249	58,935	
10-Jul	153	1,363	1,319	323	431	274	147	134	102	78	14	30	4,368	63,303	
11-Jul	297	4,376	2,462	371	598	355	85	52	50	33	25	65	8,969	72,272	
12-Jul	705	6,907	4,599	891	804	487	150	107	72	89	40	53	14,904	87,176	
13-Jul	77	909	879	287	324	187	58	69	86	41	16	17	2,950	90,126	
14-Jul	103	2,681	1,201	349	182	68	55	42	39	85	22	19	4,846	94,972	
15-Jul	76	2,002	1,033	385	183	91	40	20	10	62	143	109	4,154	99,126	
16-Jul	162	10,936	6,151	1,156	307	112	66	15	3	34	51	39	19,032	118,158	
17-Jul	168	10,886	4,327	508	148	74	44	21	1	25	16	28	16,246	134,404	
18-Jul	145	5,497	1,735	223	100	49	20	16	4	51	53	24	7,917	142,321	
19-Jul	143	1,872	619	76	29	24	6	11	0	2	18	12	2,812	145,133	
20-Jul	68	230	117	50	26	14	4	7	4	11	8	10	549	145,682	
21-Jul	229	934	1,161	523	304	207	111	94	96	34	33	22	3,742	149,424	
22-Jul	438	1,177	1,795	864	376	287	144	139	131	55	123	13	5,542	154,966	
23-Jul	981	1,283	1,084	636	268	188	56	90	148	38	56	9	4,837	159,803	
24-Jul	1,043	311	207	131	45	52	21	15	9	20	7	8	1,869	161,672	
25-Jul	1,027	510	349	179	85	69	31	20	8	8	6	9	2,301	163,973	
26-Jul	378	270	202	116	56	98	44	6	6	10	4	1	1,191	165,164	
27-Jul	572	938	617	252	100	150	54	16	8	6	9	1	2,723	167,887	
28-Jul	491	778	522	223	100	107	44	18	47	17	4	2	2,353	170,240	
29-Jul	340	501	563	216	88	81	38	12	13	3	0	0	1,855	172,095	

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Counts by Sector														Daily Total	Cum Total
Date	1	2	3	4	5	6	7	8	9	10	11	12			
30-Jul	193	263	336	125	74	108	44	12	18	5	2	1	1,181	173,276	
31-Jul	211	240	227	92	50	88	60	12	19	3	2	0	1,004	174,280	
1-Aug	355	140	154	76	52	84	58	18	15	11	2	1	966	175,246	
2-Aug	292	102	89	63	55	95	46	7	17	4	6	2	778	176,024	
3-Aug	479	112	73	76	47	27	5	6	0	1	0	0	826	176,850	
4-Aug	354	76	41	35	24	25	14	6	5	2	1	3	586	177,436	
5-Aug	425	47	30	25	25	25	12	4	0	2	0	0	595	178,031	
6-Aug	541	64	29	26	24	17	19	2	1	2	0	0	725	178,756	
7-Aug	421	75	43	41	31	13	14	7	2	1	1	0	649	179,405	
8-Aug	402	62	35	24	26	20	5	5	0	2	0	0	581	179,986	
9-Aug	387	75	31	23	18	12	9	0	0	0	0	0	555	180,541	
10-Aug	494	71	22	34	26	11	3	2	0	0	0	0	663	181,204	
Total	14,800	68,487	44,038	18,736	11,061	6,549	5,307	5,228	2,680	1,756	1,353	1,209	181,204		

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Appendix A.19. Kasilof River south bank sonar counts by sector. 15 June through 10 August. 2005.

Counts by Sector														
Date	1	2	3	4	5	6	7	8	9	10	11	12	Daily Total	Cum Total
15-Jun	8	13	4	20	164	18	215	150	89	318	162	139	1,300	1,300
16-Jun	30	6	10	12	65	19	197	128	35	161	103	95	861	2,161
17-Jun	12	1	4	15	46	28	109	82	33	117	48	75	570	2,731
18-Jun	2	5	6	12	95	44	139	112	43	104	88	50	700	3,431
19-Jun	20	7	11	76	204	76	197	115	56	129	92	106	1,089	4,520
20-Jun	11	38	223	378	367	184	429	240	139	365	194	202	2,770	7,290
21-Jun	27	125	320	631	536	432	925	526	335	458	264	220	4,799	12,089
22-Jun	26	70	164	260	230	181	523	289	125	341	124	144	2,477	14,566
23-Jun	121	363	470	838	823	503	595	399	110	516	209	322	5,269	19,835
24-Jun	106	554	597	928	853	351	621	330	82	349	123	172	5,066	24,901
25-Jun	158	528	538	501	482	392	378	221	75	135	64	105	3,577	28,478
26-Jun	785	1,419	1,365	435	336	384	369	252	103	113	4	6	5,571	34,049
27-Jun	71	83	71	37	45	37	83	65	40	17	8	2	559	34,608
28-Jun	3	8	16	16	17	29	17	40	22	18	15	2	203	34,811
29-Jun	138	506	638	366	187	78	29	26	53	68	12	9	2,110	36,921
30-Jun	356	987	955	742	606	124	205	193	217	177	2	6	4,570	41,491
1-Jul	96	259	145	139	175	133	66	142	70	121	75	76	1,497	42,988
2-Jul	90	253	178	343	166	184	202	296	232	244	260	216	2,664	45,652
3-Jul	444	859	382	355	313	305	294	352	147	301	403	201	4,356	50,008
4-Jul	304	559	322	305	291	254	98	210	78	158	198	125	2,902	52,910
5-Jul	34	163	71	154	37	68	117	30	49	26	38	86	873	53,783
6-Jul	70	290	120	206	117	125	105	105	72	66	64	154	1,494	55,277
7-Jul	326	681	272	530	331	329	276	209	200	174	209	236	3,773	59,050
8-Jul	599	1,083	786	375	417	212	74	85	53	13	7	44	3,748	62,798
9-Jul	1,309	1,819	538	243	338	100	47	60	53	28	8	42	4,585	67,383
10-Jul	1,818	2,263	534	450	230	158	77	62	39	28	16	32	5,707	73,090
11-Jul	354	983	134	107	48	70	19	43	30	64	53	39	1,944	75,034
12-Jul	576	1,095	1,360	508	319	214	96	110	43	45	41	70	4,477	79,511
13-Jul	138	617	1,289	247	214	63	41	170	37	7	4	11	2,838	82,349
14-Jul	356	1,165	1,706	366	352	64	20	26	10	3	7	37	4,112	86,461
15-Jul	54	286	889	610	273	54	16	4	3	37	35	121	2,382	88,843
16-Jul	594	2,295	4,153	1,970	592	75	7	1	0	1	3	33	9,724	98,567
17-Jul	674	2,254	3,681	2,468	493	84	6	0	0	0	1	3	9,664	108,231
18-Jul	168	752	1,360	1,022	164	24	1	0	0	0	0	9	3,500	111,731
19-Jul	315	863	829	477	170	6	3	2	0	0	2	7	2,674	114,405
20-Jul	833	938	1,436	512	147	37	11	8	1	0	8	10	3,941	118,346
21-Jul	606	907	1,736	893	337	48	14	4	3	1	2	1	4,552	122,898
22-Jul	1,846	993	806	1,013	376	193	39	44	2	3	1	3	5,319	128,217
23-Jul	1,617	604	744	2,031	1,025	495	133	90	1	3	2	0	6,745	134,962
24-Jul	954	331	250	996	435	210	80	62	2	4	0	0	3,324	138,286
25-Jul	1,260	430	472	1,251	459	223	94	49	2	4	1	1	4,246	142,532
26-Jul	645	329	466	742	506	123	36	22	7	0	0	0	2,876	145,408
27-Jul	1,163	439	659	852	525	152	64	59	8	2	0	1	3,924	149,332
28-Jul	1,820	589	583	598	520	131	80	30	2	15	41	7	4,416	153,748
29-Jul	1,394	422	159	749	767	208	133	33	16	17	28	2	3,928	157,676

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Counts by Sector														
Date	1	2	3	4	5	6	7	8	9	10	11	12	Daily Total	Cum Total
30-Jul	1,050	392	109	472	588	197	113	29	18	24	18	10	3,020	160,696
31-Jul	287	287	322	422	561	314	176	114	68	36	13	17	2,617	163,313
1-Aug	214	202	281	415	432	223	130	148	81	22	20	8	2,176	165,489
2-Aug	216	487	473	507	417	75	21	37	20	7	0	0	2,260	167,749
3-Aug	157	410	348	410	317	92	44	41	33	2	2	0	1,856	169,605
4-Aug	43	116	113	284	212	47	12	45	11	0	0	0	883	170,488
5-Aug	130	326	270	377	190	47	18	42	29	0	0	0	1,429	171,917
6-Aug	58	153	272	211	220	223	165	35	22	9	4	14	1,386	173,303
7-Aug	122	296	294	333	205	179	34	15	1	9	7	9	1,504	174,807
8-Aug	93	142	189	120	155	244	71	20	33	18	19	9	1,113	175,920
9-Aug	97	150	171	150	202	189	82	32	9	22	24	36	1,164	177,084
10-Aug	78	159	225	183	304	250	44	18	25	21	33	5	1,345	178,429
Total	24,876	32,354	34,519	29,663	18,996	9,302	8,190	6,052	3,067	4,921	3,159	3,330	178,429	

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Appendix A.20. Kasilof River north bank sonar counts by sector. 15 June through
10 August, 2003. Counts expressed as percentage of daily total.

Counts by Sector													Daily Total
Date	1	2	3	4	5	6	7	8	9	10	11	12	
15-Jun	3.7	3.2	6.0	12.0	14.8	7.9	19.0	23.6	3.2	0.0	0.9	5.6	100.0
16-Jun	5.8	2.9	5.8	10.7	12.6	24.3	16.5	7.8	0.0	0.0	0.0	13.6	100.0
17-Jun	6.3	3.9	11.8	10.2	7.1	10.2	11.8	15.7	2.4	0.0	5.5	15.0	100.0
18-Jun	6.4	2.8	11.6	14.3	11.2	12.7	14.3	13.9	2.4	0.0	0.4	10.0	100.0
19-Jun	2.8	4.4	8.5	11.5	10.9	18.1	17.3	13.7	5.7	1.6	1.7	3.8	100.0
20-Jun	1.0	5.7	17.6	20.9	6.7	13.0	12.4	14.0	1.6	2.0	3.7	1.4	100.0
21-Jun	0.4	7.4	24.9	24.6	4.9	12.5	6.8	3.0	0.5	6.4	8.3	0.1	100.0
22-Jun	2.3	6.7	20.6	22.9	5.9	13.0	8.6	3.0	0.5	6.5	9.2	0.8	100.0
23-Jun	10.6	23.8	28.0	13.3	6.1	6.8	2.8	1.7	1.5	3.1	1.4	1.0	100.0
24-Jun	2.0	19.7	25.0	25.7	9.8	3.1	3.7	4.2	1.2	1.4	0.2	3.8	100.0
25-Jun	1.5	14.3	21.1	28.0	11.8	3.9	5.9	4.9	1.7	0.9	0.2	5.7	100.0
26-Jun	5.6	25.7	28.9	20.9	6.1	3.3	3.3	3.5	0.6	0.5	0.0	1.5	100.0
27-Jun	7.8	17.8	16.5	18.5	8.2	5.5	5.8	4.5	3.0	1.2	1.2	10.0	100.0
28-Jun	5.1	16.1	8.7	18.9	9.8	3.9	10.6	6.7	4.7	4.3	0.8	10.2	100.0
29-Jun	2.1	21.9	18.5	23.5	7.7	3.4	9.6	7.6	1.9	2.5	0.2	1.2	100.0
30-Jun	0.8	19.5	17.3	26.3	11.1	5.1	7.5	7.3	2.2	2.0	0.3	0.6	100.0
1-Jul	3.2	29.2	17.3	21.8	8.0	3.4	6.7	6.9	1.6	1.1	0.2	0.5	100.0
2-Jul	8.1	18.5	21.1	20.1	12.4	3.7	7.0	5.0	2.6	1.0	0.3	0.3	100.0
3-Jul	2.8	18.6	15.3	15.8	14.6	4.7	6.2	11.7	8.1	1.4	0.3	0.3	100.0
4-Jul	4.9	27.7	14.5	15.9	12.7	2.9	6.5	9.3	3.7	0.9	0.3	0.8	100.0
5-Jul	3.1	20.1	8.5	13.3	13.2	4.9	10.9	10.6	9.8	2.0	0.5	3.2	100.0
6-Jul	2.3	39.4	20.4	9.1	8.1	2.4	4.1	8.6	2.5	1.0	0.6	1.4	100.0
7-Jul	9.4	24.8	20.9	12.2	13.6	2.1	6.8	7.7	2.0	0.3	0.0	0.1	100.0
8-Jul	2.4	24.1	22.1	16.3	12.2	4.3	7.3	5.5	3.3	1.4	0.6	0.6	100.0
9-Jul	5.1	31.5	25.2	12.7	9.4	1.9	3.8	5.0	3.4	1.4	0.2	0.4	100.0
10-Jul	3.5	31.2	30.2	7.4	9.9	6.3	3.4	3.1	2.3	1.8	0.3	0.7	100.0
11-Jul	3.3	51.0	27.5	4.1	6.7	4.0	0.9	0.6	0.6	0.4	0.3	0.7	100.0
12-Jul	4.7	46.3	30.9	6.0	5.4	3.3	1.0	0.7	0.5	0.6	0.3	0.4	100.0
13-Jul	2.6	30.8	29.8	9.7	11.0	6.3	2.0	2.3	2.9	1.4	0.5	0.6	100.0
14-Jul	2.1	55.3	24.8	7.2	3.8	1.4	1.1	0.9	0.8	1.8	0.5	0.4	100.0
15-Jul	1.8	48.2	24.9	9.3	4.4	2.2	1.0	0.5	0.2	1.5	3.4	2.6	100.0
16-Jul	0.9	57.5	32.3	6.1	1.6	0.6	0.3	0.1	0.0	0.2	0.3	0.2	100.0
17-Jul	1.0	67.0	26.6	3.1	0.9	0.5	0.3	0.1	0.0	0.2	0.1	0.2	100.0
18-Jul	1.8	69.4	21.9	2.8	1.3	0.6	0.3	0.2	0.1	0.6	0.7	0.3	100.0
19-Jul	5.1	66.6	22.0	2.7	1.0	0.9	0.2	0.4	0.0	0.1	0.6	0.4	100.0
20-Jul	12.4	41.9	21.3	9.1	4.7	2.6	0.7	1.3	0.7	2.0	1.5	1.8	100.0
21-Jul	6.1	25.0	31.0	14.0	8.1	5.5	3.0	2.5	2.4	0.9	0.9	0.6	100.0
22-Jul	7.9	21.2	32.4	15.6	6.8	5.2	2.6	2.5	2.4	1.0	2.2	0.2	100.0
23-Jul	20.3	26.5	22.4	13.1	5.5	3.9	1.2	1.9	3.1	0.8	1.2	0.2	100.0
24-Jul	55.8	16.6	11.1	7.0	2.4	2.8	1.1	0.8	0.5	1.1	0.4	0.4	100.0

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Counts by Sector													
Date	1	2	3	4	5	6	7	8	9	10	11	12	Daily Total
25-Jul	44.6	22.2	15.2	7.8	3.7	3.0	1.3	0.9	0.3	0.3	0.3	0.4	100.0
26-Jul	31.7	22.7	17.0	9.7	4.7	8.2	3.7	0.5	0.5	0.8	0.3	0.1	100.0
27-Jul	21.0	34.4	22.7	9.3	3.7	5.5	2.0	0.6	0.3	0.2	0.3	0.0	100.0
28-Jul	20.9	33.1	22.2	9.5	4.2	4.5	1.9	0.8	2.0	0.7	0.2	0.1	100.0
29-Jul	18.3	27.0	30.4	11.6	4.7	4.4	2.0	0.6	0.7	0.2	0.0	0.0	100.0
30-Jul	16.3	22.3	28.5	10.6	6.3	9.1	3.7	1.0	1.5	0.4	0.2	0.1	100.0
31-Jul	21.0	23.9	22.6	9.2	5.0	8.8	6.0	1.2	1.9	0.3	0.2	0.0	100.0
1-Aug	36.7	14.5	15.9	7.9	5.4	8.7	6.0	1.9	1.6	1.1	0.2	0.1	100.0
2-Aug	37.5	13.1	11.4	8.1	7.1	12.2	5.9	0.9	2.2	0.5	0.8	0.3	100.0
3-Aug	58.0	13.6	8.8	9.2	5.7	3.3	0.6	0.7	0.0	0.1	0.0	0.0	100.0
4-Aug	60.4	13.0	7.0	6.0	4.1	4.3	2.4	1.0	0.9	0.3	0.2	0.5	100.0
5-Aug	71.4	7.9	5.0	4.2	4.2	4.2	2.0	0.7	0.0	0.3	0.0	0.0	100.0
6-Aug	74.6	8.8	4.0	3.6	3.3	2.3	2.6	0.3	0.1	0.3	0.0	0.0	100.0
7-Aug	64.9	11.6	6.6	6.3	4.8	2.0	2.2	1.1	0.3	0.2	0.2	0.0	100.0
8-Aug	69.2	10.7	6.0	4.1	4.5	3.4	0.9	0.9	0.0	0.3	0.0	0.0	100.0
9-Aug	69.7	13.5	5.6	4.1	3.2	2.2	1.6	0.0	0.0	0.0	0.0	0.0	100.0
10-Aug	74.5	10.7	3.3	5.1	3.9	1.7	0.5	0.3	0.0	0.0	0.0	0.0	100.0
Total	8.2	37.8	24.3	10.3	6.1	3.6	2.9	2.9	1.5	1.0	0.7	0.7	100.0

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Appendix A.21. Kasilof River south bank sonar counts by sector, 15 June through 10 August, 2003. 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	0.6	1.0	0.5	1.5	12.6	1.4	16.5	11.5	6.8	24.5	12.5	10.7	100.0
16-Jun	3.5	0.7	1.2	1.4	7.5	2.2	22.9	14.9	4.1	18.7	12.0	11.0	100.0
17-Jun	2.1	0.2	0.7	2.6	8.1	4.9	19.1	14.4	5.8	20.5	8.4	13.2	100.0
18-Jun	0.3	0.7	0.9	1.7	13.6	6.3	19.9	16.0	6.1	14.9	12.6	7.1	100.0
19-Jun	1.8	0.6	1.0	7.0	18.7	7.0	18.1	10.6	5.1	11.8	8.4	9.7	100.0
20-Jun	0.4	1.4	8.1	13.6	13.2	6.6	15.5	8.7	5.0	13.2	7.0	7.3	100.0
21-Jun	0.6	2.6	6.7	13.1	11.2	9.0	19.3	11.0	7.0	9.5	5.5	4.6	100.0
22-Jun	1.0	2.8	6.6	10.5	9.3	7.3	21.1	11.7	5.0	13.8	5.0	5.8	100.0
23-Jun	2.3	6.9	8.9	15.9	15.6	9.5	11.3	7.6	2.1	9.8	4.0	6.1	100.0
24-Jun	2.1	10.9	11.8	18.3	16.8	6.9	12.3	6.5	1.6	6.9	2.4	3.4	100.0
25-Jun	4.4	14.8	15.0	14.0	13.5	11.0	10.6	6.2	2.1	3.8	1.8	2.9	100.0
26-Jun	14.1	25.5	24.5	7.8	6.0	6.9	6.6	4.5	1.8	2.0	0.1	0.1	100.0
27-Jun	12.7	14.8	12.7	6.6	8.1	6.6	14.8	11.6	7.2	3.0	1.4	0.4	100.0
28-Jun	1.5	3.9	7.9	7.9	8.4	14.3	8.4	19.7	10.8	8.9	7.4	1.0	100.0
29-Jun	6.5	24.0	30.2	17.3	8.9	3.7	1.4	1.2	2.5	3.2	0.6	0.4	100.0
30-Jun	7.8	21.6	20.9	16.2	13.3	2.7	4.5	4.2	4.7	3.9	0.0	0.1	100.0
1-Jul	6.4	17.3	9.7	9.3	11.7	8.9	4.4	9.5	4.7	8.1	5.0	5.1	100.0
2-Jul	3.4	9.5	6.7	12.9	6.2	6.9	7.6	11.1	8.7	9.2	9.8	8.1	100.0
3-Jul	10.2	19.7	8.8	8.1	7.2	7.0	6.7	8.1	3.4	6.9	9.3	4.6	100.0
4-Jul	10.5	19.3	11.1	10.5	10.0	8.8	3.4	7.2	2.7	5.4	6.8	4.3	100.0
5-Jul	3.9	18.7	8.1	17.6	4.2	7.8	13.4	3.4	5.6	3.0	4.4	9.9	100.0
6-Jul	4.7	19.4	8.0	13.8	7.8	8.4	7.0	7.0	4.8	4.4	4.3	10.3	100.0
7-Jul	8.6	18.0	7.2	14.0	8.8	8.7	7.3	5.5	5.3	4.6	5.5	6.3	100.0
8-Jul	16.0	28.9	21.0	10.0	11.1	5.7	2.0	2.3	1.4	0.3	0.2	1.2	100.0
9-Jul	28.5	39.7	11.7	5.3	7.4	2.2	1.0	1.3	1.2	0.6	0.2	0.9	100.0
10-Jul	31.9	39.7	9.4	7.9	4.0	2.8	1.3	1.1	0.7	0.5	0.3	0.6	100.0
11-Jul	18.2	50.6	6.9	5.5	2.5	3.6	1.0	2.2	1.5	3.3	2.7	2.0	100.0
12-Jul	12.9	24.5	30.4	11.3	7.1	4.8	2.1	2.5	1.0	1.0	0.9	1.6	100.0
13-Jul	4.9	21.7	45.4	8.7	7.5	2.2	1.4	6.0	1.3	0.2	0.1	0.4	100.0
14-Jul	8.7	28.3	41.5	8.9	8.6	1.6	0.5	0.6	0.2	0.1	0.2	0.9	100.0
15-Jul	2.3	12.0	37.3	25.6	11.5	2.3	0.7	0.2	0.1	1.6	1.5	5.1	100.0
16-Jul	6.1	23.6	42.7	20.3	6.1	0.8	0.1	0.0	0.0	0.0	0.0	0.3	100.0
17-Jul	7.0	23.3	38.1	25.5	5.1	0.9	0.1	0.0	0.0	0.0	0.0	0.0	100.0
18-Jul	4.8	21.5	38.9	29.2	4.7	0.7	0.0	0.0	0.0	0.0	0.0	0.3	100.0
19-Jul	11.8	32.3	31.0	17.8	6.4	0.2	0.1	0.1	0.0	0.0	0.1	0.3	100.0
20-Jul	21.1	23.8	36.4	13.0	3.7	0.9	0.3	0.2	0.0	0.0	0.2	0.3	100.0
21-Jul	13.3	19.9	38.1	19.6	7.4	1.1	0.3	0.1	0.1	0.0	0.0	0.0	100.0
22-Jul	34.7	18.7	15.2	19.0	7.1	3.6	0.7	0.8	0.0	0.1	0.0	0.1	100.0
23-Jul	24.0	9.0	11.0	30.1	15.2	7.3	2.0	1.3	0.0	0.0	0.0	0.0	100.0
24-Jul	28.7	10.0	7.5	30.0	13.1	6.3	2.4	1.9	0.1	0.1	0.0	0.0	100.0

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Counts by Sector													Daily Total
Date	1	2	3	4	5	6	7	8	9	10	11	12	
25-Jul	29.7	10.1	11.1	29.5	10.8	5.3	2.2	1.2	0.0	0.1	0.0	0.0	100.0
26-Jul	22.4	11.4	16.2	25.8	17.6	4.3	1.3	0.8	0.2	0.0	0.0	0.0	100.0
27-Jul	29.6	11.2	16.8	21.7	13.4	3.9	1.6	1.5	0.2	0.1	0.0	0.0	100.0
28-Jul	41.2	13.3	13.2	13.5	11.8	3.0	1.8	0.7	0.0	0.3	0.9	0.2	100.0
29-Jul	35.5	10.7	4.0	19.1	19.5	5.3	3.4	0.8	0.4	0.4	0.7	0.1	100.0
30-Jul	34.8	13.0	3.6	15.6	19.5	6.5	3.7	1.0	0.6	0.8	0.6	0.3	100.0
31-Jul	11.0	11.0	12.3	16.1	21.4	12.0	6.7	4.4	2.6	1.4	0.5	0.6	100.0
1-Aug	9.8	9.3	12.9	19.1	19.9	10.2	6.0	6.8	3.7	1.0	0.9	0.4	100.0
2-Aug	9.6	21.5	20.9	22.4	18.5	3.3	0.9	1.6	0.9	0.3	0.0	0.0	100.0
3-Aug	8.5	22.1	18.8	22.1	17.1	5.0	2.4	2.2	1.8	0.1	0.1	0.0	100.0
4-Aug	4.9	13.1	12.8	32.2	24.0	5.3	1.4	5.1	1.2	0.0	0.0	0.0	100.0
5-Aug	9.1	22.8	18.9	26.4	13.3	3.3	1.3	2.9	2.0	0.0	0.0	0.0	100.0
6-Aug	4.2	11.0	19.6	15.2	15.9	16.1	11.9	2.5	1.6	0.6	0.3	1.0	100.0
7-Aug	8.1	19.7	19.5	22.1	13.6	11.9	2.3	1.0	0.1	0.6	0.5	0.6	100.0
8-Aug	8.4	12.8	17.0	10.8	13.9	21.9	6.4	1.8	3.0	1.6	1.7	0.8	100.0
9-Aug	8.3	12.9	14.7	12.9	17.4	16.2	7.0	2.7	0.8	1.9	2.1	3.1	100.0
10-Aug	5.8	11.8	16.7	13.6	22.6	18.6	3.3	1.3	1.9	1.6	2.5	0.4	100.0
Total	13.9	18.1	19.3	16.6	10.6	5.2	4.6	3.4	1.7	2.8	1.8	1.9	100.0

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Appendix A. 22. Minimum and maximum daily counting ranges for both banks of the Kaslof river and range from transducer where a minimum of 80% of the migration occurred in 2003.

Date	North Bank			Range where > 80% of migration occurred (m)	Sectors where > 80% of migration occurred	South Bank			Range where > 80% of migration occurred (m)	Sectors where > 80% of migration occurred
	Counting Range (Sectors 1-12) (ft)	Average Sector Width (m)	Average Sector Width (m)			Counting Range (All Sectors) (ft)	Average Sector Width (m)	Average Sector Width (m)		
15-Jun	45	13.7	1.1	12.6	1 - 11	50	15.2	1.3	14.0	1 - 11
16-Jun	45	13.7	1.1	12.6	1 - 11	50	15.2	1.3	14.0	1 - 11
16-Jun	47	14.3	1.2	13.1	1 - 11					
17-Jun	47	14.3	1.2	13.1	1 - 11	50	15.2	1.3	14.0	1 - 11
18-Jun	47	14.3	1.2	11.9	1 - 10	50	15.2	1.3	12.7	1 - 10
19-Jun	45	13.7	1.1	11.4	1 - 10	50	15.2	1.3	12.7	1 - 10
19-Jun	55	16.8	1.4	14.0	1 - 10					
20-Jun	50	15.2	1.3	12.7	1 - 10	50	15.2	1.3	12.7	1 - 10
20-Jun	61	18.6	1.5	15.5	1 - 10	54	16.5	1.4	13.7	1 - 10
21-Jun	61	18.6	1.5	13.9	1 - 9	54	16.5	1.4	12.3	1 - 9
22-Jun	61	18.6	1.5	15.5	1 - 10	54	16.5	1.4	13.7	1 - 10
23-Jun	61	18.6	1.5	13.9	1 - 9	55	16.8	1.4	12.6	1 - 9
23-Jun	70	21.3	1.8	16.0	1 - 9					
24-Jun	49	14.9	1.2	10.0	1 - 8	53	16.2	1.3	10.8	1 - 8
24-Jun	50	15.2	1.3	10.2	1 - 8					
25-Jun						53	16.2	1.3	9.4	1 - 7
25-Jun	50	15.2	1.3	8.9	1 - 7	60	18.3	1.5	10.7	1 - 7
26-Jun	50	15.2	1.3	7.6	1 - 6	57	17.4	1.4	8.7	1 - 6
27-Jun	50	15.2	1.3	10.2	1 - 8	57	17.4	1.4	11.6	1 - 8
28-Jun	48	14.6	1.2	11.0	1 - 9	57	17.4	1.4	13.0	1 - 9
28-Jun	50	15.2	1.3	11.4	1 - 9	60	18.3	1.5	13.7	1 - 9
29-Jun	50	15.2	1.3	6.4	1 - 5	60	18.3	1.5	7.6	1 - 5
29-Jun	48	14.6	1.2	6.1	1 - 5					
30-Jun	48	14.6	1.2	7.3	1 - 6	60	18.3	1.5	9.1	1 - 6
1-Jul	48	14.6	1.2	11.0	1 - 9	60	18.3	1.5	13.7	1 - 9
1-Jul						40	12.2	1.0	9.1	1 - 9
2-Jul	48	14.6	1.2	12.2	1 - 10	40	12.2	1.0	10.2	1 - 10
2-Jul						65	19.8	1.7	16.5	1 - 10
3-Jul	48	14.6	1.2	12.2	1 - 10	45	13.7	1.1	11.4	1 - 10
3-Jul						53	16.2	1.3	15.5	1 - 10
4-Jul	48	14.6	1.2	9.8	1 - 8	50	15.2	1.3	10.2	1 - 8
4-Jul						45	13.7	1.1	9.1	1 - 8
5-Jul	48	14.6	1.2	11.0	1 - 9	45	13.7	1.1	10.3	1 - 9
6-Jul	48	14.6	1.2	11.0	1 - 9	45	13.7	1.1	10.3	1 - 9
7-Jul	48	14.6	1.2	11.0	1 - 9	45	13.7	1.1	10.3	1 - 9
7-Jul						61	18.6	1.5	13.9	1 - 9
8-Jul	48	14.6	1.2	6.1	1 - 5	61	18.6	1.5	7.7	1 - 5
9-Jul	48	14.6	1.2	4.9	1 - 4	61	18.6	1.5	6.2	1 - 4
10-Jul	40	12.2	1.0	3.0	1 - 3	61	18.6	1.5	4.6	1 - 3
10-Jul	48	14.6	1.2	3.7	1 - 3	50	15.2	1.3	3.8	1 - 3
11-Jul	40	12.2	1.0	4.1	1 - 4	50	15.2	1.3	5.1	1 - 4
11-Jul	48	14.6	1.2	4.9	1 - 4	40	12.2	1.0	4.1	1 - 4
12-Jul	40	12.2	1.0	5.1	1 - 5	40	12.2	1.0	5.1	1 - 5
12-Jul	48	14.6	1.2	6.1	1 - 5	34	10.4	0.9	4.3	1 - 5
13-Jul	40	12.2	1.0	4.1	1 - 4	34	10.4	0.9	3.5	1 - 4
13-Jul	47	14.3	1.2	4.8	1 - 4					
14-Jul	47	14.3	1.2	4.8	1 - 4	34	10.4	0.9	3.5	1 - 4
14-Jul						43	13.1	1.1	4.4	1 - 4
15-Jul	34	10.4	0.9	4.3	1 - 5	43	13.1	1.1	5.5	1 - 5
15-Jul	47	14.3	1.2	6.0	1 - 5					
16-Jul	34	10.4	0.9	3.5	1 - 4	43	13.1	1.1	4.4	1 - 4
16-Jul						40	12.2	1.0	4.1	1 - 4
17-Jul	34	10.4	0.9	3.5	1 - 4	40	12.2	1.0	4.1	1 - 4
18-Jul	34	10.4	0.9	3.5	1 - 4	40	12.2	1.0	4.1	1 - 4
18-Jul						42	12.8	1.1	4.3	1 - 4
19-Jul	34	10.4	0.9	3.5	1 - 4	42	12.8	1.1	4.3	1 - 4
20-Jul	34	10.4	0.9	2.6	1 - 3	42	12.8	1.1	3.2	1 - 3
20-Jul						34	10.4	0.9	2.6	1 - 3
21-Jul	19	5.8	0.5	1.9	1 - 4	34	10.4	0.9	3.5	1 - 4
21-Jul	34	10.4	0.9	3.5	1 - 4					

-continued-

FN 03ClpRge.xls

Date	North Bank			Range where > 80% of migration occurred (m)	Sectors where > 80% of migration occurred	South Bank			Range where > 80% of migration occurred (m)	Sectors where > 80% of migration occurred
	Counting Range (Sectors 1-12) (ft)	Average Sector Width (m)	Average Sector Width (m)			Counting Range (Sectors 1-12) (ft)	Average Sector Width (m)	Average Sector Width (m)		
22-Jul	30	9.1	0.8	3.0	1 - 4	34	10.4	0.9	3.5	1 - 4
22-Jul						25	7.6	0.6	2.5	1 - 4
23-Jul	30	9.1	0.8	3.8	1 - 5	25	7.6	0.6	3.2	1 - 5
24-Jul	20	6.1	0.5	2.5	1 - 5	25	7.6	0.6	3.2	1 - 5
24-Jul	30	9.1	0.8	3.8	1 - 5					
25-Jul	17	5.2	0.4	1.7	1 - 4	25	7.6	0.6	2.5	1 - 4
25-Jul	20	6.1	0.5	2.0	1 - 4					
26-Jul	17	5.2	0.4	2.2	1 - 5	25	7.6	0.6	3.2	1 - 5
27-Jul	17	5.2	0.4	2.2	1 - 5	25	7.6	0.6	3.2	1 - 5
28-Jul	17	5.2	0.4	1.7	1 - 4	25	7.6	0.6	2.5	1 - 4
28-Jul						17	5.2	0.4	1.7	1 - 4
29-Jul	17	5.2	0.4	2.2	1 - 5	17	5.2	0.4	2.2	1 - 5
30-Jul	17	5.2	0.4	2.2	1 - 5	17	5.2	0.4	2.2	1 - 5
31-Jul	17	5.2	0.4	2.6	1 - 6	15	4.6	0.4	2.3	1 - 6
31-Jul						20	6.1	0.5	3.0	1 - 6
1-Aug	17	5.2	0.4	2.6	1 - 6	13	4.0	0.3	2.0	1 - 6
1-Aug						20	6.1	0.5	3.0	1 - 6
2-Aug	17	5.2	0.4	2.2	1 - 5	20	6.1	0.5	2.5	1 - 5
2-Aug						20	6.1	0.5	2.5	1 - 5
3-Aug	17	5.2	0.4	2.2	1 - 5	13	4.0	0.3	1.7	1 - 5
3-Aug						20	6.1	0.5	2.5	1 - 5
4-Aug	17	5.2	0.4	2.2	1 - 5	20	6.1	0.5	2.5	1 - 5
4-Aug	20	6.1	0.5	2.5	1 - 5					
5-Aug	20	6.1	0.5	2.5	1 - 5	20	6.1	0.5	2.5	1 - 5
6-Aug	20	6.1	0.5	3.0	1 - 6	20	6.1	0.5	3.0	1 - 6
6-Aug						13	4.0	0.3	2.0	1 - 6
7-Aug	20	6.1	0.5	2.5	1 - 5	20	6.1	0.5	2.5	1 - 5
7-Aug						13	4.0	0.3	1.7	1 - 5
8-Aug	20	6.1	0.5	3.0	1 - 6	14	4.3	0.4	2.1	1 - 6
9-Aug	20	6.1	0.5	3.0	1 - 6	14	4.3	0.4	2.1	1 - 6
9-Aug						17	5.2	0.4	2.6	1 - 6
10-Aug	20	6.1	0.5	3.0	1 - 6	17	5.2	0.4	2.6	1 - 6
10-Aug						14	4.3	0.4	2.1	1 - 6

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Average -12 m.

Average - 12 m.

Appendix A.23. Daily substrateless (top) and substrate (bottom) sonar counts by sector on the north bank of the Kasilof River 23 July through 10 August, 2003.

Substrateless													
	Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
23-Jul	428	384	162	111	23	30	11	2	0	0	2	1	1,154
24-Jul	1,043	311	207	131	45	52	21	15	9	20	7	8	1,869
25-Jul	1,027	510	349	179	85	69	31	20	8	8	6	9	2,301
26-Jul	378	270	202	116	56	98	44	6	6	10	4	1	1,191
27-Jul	572	938	617	252	100	150	54	16	8	6	9	1	2,723
28-Jul	491	778	522	223	100	107	44	18	47	17	4	2	2,353
29-Jul	340	501	563	216	88	81	38	12	13	3	0	0	1,855
30-Jul	193	263	336	125	74	108	44	12	18	5	2	1	1,181
31-Jul	211	240	227	92	50	88	60	12	19	3	2	0	1,004
1-Aug	355	140	154	76	52	84	58	18	15	11	2	1	966
2-Aug	292	102	89	63	55	95	46	7	17	4	6	2	778
3-Aug	479	112	73	76	47	27	5	6	0	1	0	0	826
4-Aug	354	76	41	35	24	25	14	6	5	2	1	3	586
5-Aug	425	47	30	25	25	25	12	4	0	2	0	0	595
6-Aug	541	64	29	26	24	17	19	2	1	2	0	0	725
7-Aug	421	75	43	41	31	13	14	7	2	1	1	0	649
8-Aug	402	62	35	24	26	20	5	5	0	2	0	0	581
9-Aug	387	75	31	23	18	12	9	0	0	0	0	0	555
10-Aug	494	71	22	34	26	11	3	2	0	0	0	0	663
Total	8,833	5,019	3,732	1,868	949	1,112	532	170	168	97	46	29	22,555
Cum. %	39%	61%	78%	86%	90%	95%	98%	98%	99%	100%	100%	100%	
Total Sectors 1-6	21,513		95%		Total Sectors 7-12				1,042		5%		

Substrate													
	Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
23-Jul	628	883	255	19	2	1	7	1	1	3	0	2	1,802
24-Jul	846	894	314	64	11	4	16	13	8	8	0	2	2,180
25-Jul	446	1,642	303	38	5	6	16	6	11	0	0	0	2,473
26-Jul	296	693	253	31	45	69	50	16	48	5	1	2	1,509
27-Jul	240	1,161	1,024	111	23	10	9	8	3	1	0	1	2,591
28-Jul	178	888	956	150	23	1	9	11	1	0	2	4	2,223
29-Jul	110	787	818	107	13	1	8	5	3	0	0	6	1,858
30-Jul	71	520	450	61	6	1	7	8	2	0	2	7	1,135
31-Jul	84	421	511	77	12	2	6	9	5	1	2	4	1,134
1-Aug	36	45	702	62	13	1	11	10	7	9	5	2	903
2-Aug	74	72	712	67	6	4	7	10	13	23	11	5	1,004
3-Aug	93	69	514	58	9	7	8	10	10	7	4	1	790
4-Aug	109	211	186	36	7	4	13	12	4	5	3	7	597
5-Aug	100	405	167	38	6	7	10	4	3	5	3	0	748
6-Aug	88	507	221	29	7	2	13	9	7	11	7	1	902
7-Aug	87	406	161	26	11	4	9	7	3	8	5	4	731
8-Aug	77	284	156	22	5	2	13	11	7	10	2	3	592
9-Aug	79	244	179	26	11	6	20	12	5	16	6	3	607
10-Aug	54	281	177	30	6	3	11	16	4	8	1	2	593
Total	3,696	10,413	8,059	1,052	221	135	243	178	145	120	54	56	24,372
Cum. %	15%	58%	91%	95%	96%	97%	98%	98%	99%	100%	100%	100%	
Total Sectors 1-6	23,576		97%		Total Sectors 7-12				796		3%		

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Appendix A. 24. Minimum and maximum counting range for the substrate counter (top),
and substrateless counter (bottom) north bank of the Kasilof River, 2003.

Substrate counter					
Date	Counting Range (All Sectors) (ft)	(m)	Average Sector Width (m)	Range where >80% of migration occurred (m)	Sectors where > 80% of migration occurred
23-Jul	37	11.3	0.9	1.9	1 - 2
24-Jul	30	9.1	0.8	1.5	1 - 2
25-Jul	30	9.1	0.8	1.5	1 - 2
26-Jul	30	9.1	0.8	2.3	1 - 3
27-Jul	30	9.1	0.8	2.3	1 - 3
28-Jul	20	6.1	0.5	1.5	1 - 3
29-Jul	20	6.1	0.5	1.5	1 - 3
30-Jul	20	6.1	0.5	1.5	1 - 3
31-Jul	20	6.1	0.5	1.5	1 - 3
1-Aug	20	6.1	0.5	1.5	1 - 3
2-Aug	20	6.1	0.5	1.5	1 - 3
3-Aug	20	6.1	0.5	1.5	1 - 3
4-Aug	20	6.1	0.5	1.5	1 - 3
5-Aug	20	6.1	0.5	1.5	1 - 3
6-Aug	20	6.1	0.5	1.5	1 - 3
7-Aug	20	6.1	0.5	1.5	1 - 3
8-Aug	20	6.1	0.5	1.5	1 - 3
9-Aug	17	5.2	0.4	1.3	1 - 3
10-Aug	17	5.2	0.4	1.3	1 - 3
10-Aug	20	6.1	0.5	1.5	1 - 3
Average	~23 ft.	~7 m.		~2 m.	1 - 3

Substrateless counter					
23-Jul	30	9.1	0.8	3.8	1 - 5
24-Jul	20	6.1	0.5	2.5	1 - 5
24-Jul	30	9.1	0.8	3.8	1 - 5
25-Jul	17	5.2	0.4	1.7	1 - 4
25-Jul	20	6.1	0.5	2.0	1 - 4
26-Jul	17	5.2	0.4	2.2	1 - 5
27-Jul	17	5.2	0.4	2.2	1 - 5
28-Jul	17	5.2	0.4	1.7	1 - 4
29-Jul	17	5.2	0.4	2.2	1 - 5
30-Jul	17	5.2	0.4	2.2	1 - 5
31-Jul	17	5.2	0.4	2.6	1 - 6
1-Aug	17	5.2	0.4	2.6	1 - 6
2-Aug	17	5.2	0.4	2.2	1 - 5
3-Aug	17	5.2	0.4	2.2	1 - 5
4-Aug	17	5.2	0.4	2.2	1 - 5
4-Aug	20	6.1	0.5	2.5	1 - 5
5-Aug	20	6.1	0.5	2.5	1 - 5
6-Aug	20	6.1	0.5	3.0	1 - 6
7-Aug	20	6.1	0.5	2.5	1 - 5
8-Aug	20	6.1	0.5	3.0	1 - 6
9-Aug	20	6.1	0.5	3.0	1 - 6
10-Aug	20	6.1	0.5	3.0	1 - 6
Average	~19 ft	~6 m.		~2.5 m.	1 - 5

03countingRges.xls

Appendix A. 25. Hourly substrateless sonar counts conducted on the north bank of the Kasilof River, 23 July through 10 August, 2003.

Substrateless counts																					
Hour	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul	31-Jul	1-Aug	2-Aug	3-Aug	4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	9-Aug	10-Aug	Total	% Hourly
1		90	20	18	28	39	52	53	19	26	25	19	7	17	41	19	33	40	36	582	2.6%
2		112	9	38	40	33	26	33	31	34	32	11	10	19	28	19	17	25	38	555	2.5%
3		82	58	3	22	25	16	41	29	24	16	25	2	15	29	20	7	11	33	458	2.0%
4		73	15	19	14	8	20	20	17	18	25	24	5	17	22	36	14	19	28	394	1.7%
5		104	43	30	38	21	33	35	14	11	15	18	6	10	16	15	12	16	32	469	2.1%
6		92	52	64	46	62	90	32	21	29	44	35	26	26	29	22	27	22	26	745	3.3%
7		91	123	59	83	106	100	54	45	78	39	48	21	24	35	20	28	29	25	1,008	4.5%
8		85	71	27	49	204	135	54	27	45	29	29	38	29	35	26	25	34	33	975	4.3%
9		106	45	47	74	89	78	50	64	56	34	22	12	30	32	41	35	21	21	857	3.8%
10		44	49	18	92	102	78	49	53	41	39	20	21	23	19	40	22	27	32	769	3.4%
11		50	36	25	119	52	84	32	36	56	57	54	16	16	16	27	29	30	18	753	3.3%
12		51	48	43	131	200	69	49	58	42	57	49	20	15	27	21	12	27	21	940	4.2%
13		75	120	39	125	144	130	59	37	39	46	57	17	14	20	41	22	21	22	1,028	4.6%
14		92	83	32	98	136	73	51	40	26	20	54	20	20	20	25	19	24	23	856	3.8%
15		44	59	36	134	106	62	54	34	40	35	80	22	42	29	31	40	12	16	866	3.8%
16		72	105	54	232	73	73	55	34	52	20	49	21	36	41	22	25	12	17	993	4.4%
17		72	142	42	175	124	68	40	44	67	25	35	54	41	41	35	11	19	35	1,070	4.7%
18	285	103	264	52	146	132	87	23	30	49	27	51	32	17	39	23	24	21	22	1,427	6.3%
19	172	76	316	81	157	133	106	38	64	34	39	11	51	27	55	29	32	11	32	1,464	6.5%
20	127	86	217	133	242	215	131	61	38	35	27	23	40	29	55	20	48	25	30	1,582	7.0%
21	147	54	196	92	214	120	167	91	86	53	35	34	27	28	22	43	31	12	24	1,476	6.5%
22	169	81	120	101	220	75	62	61	87	36	37	25	72	27	33	22	23	22	25	1,298	5.8%
23	91	67	62	76	165	79	52	85	61	33	43	23	34	35	29	32	37	40	29	1,073	4.8%
24	163	67	48	62	79	75	63	61	35	42	12	30	12	38	12	20	18	35	45	917	4.1%
Total	1154	1869	2301	1191	2723	2353	1855	1181	1004	966	778	826	586	595	725	649	581	555	663	22,555	100.0%

continued

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Appendix A. 26. Hourly substrate sonar counts conducted on the north bank of the Kaslof River, 23 July through 10 August, 2003.

Substrate counts																					
Hour	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul	31-Jul	1-Aug	2-Aug	3-Aug	4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	9-Aug	10-Aug	Total	% Hourly
1		128	44	41	94	38	67	40	33	18	28	19	10	26	34	18	17	22	16	693	2.8%
2		120	18	43	52	33	31	41	15	17	19	16	12	18	27	18	7	9	27	523	2.1%
3		90	58	26	43	15	25	27	17	10	18	25	5	23	31	17	8	14	15	467	1.9%
4		77	90	44	51	15	28	22	20	28	17	19	16	10	11	25	14	13	12	512	2.1%
5		107	65	46	48	24	35	33	23	18	29	16	8	8	18	26	17	20	15	556	2.3%
6		118	88	51	100	31	82	11	16	18	25	31	7	26	28	38	26	29	27	752	3.1%
7		128	184	50	99	80	97	34	43	37	43	27	19	21	29	29	20	25	40	1,005	4.1%
8		129	99	44	89	130	161	59	31	34	37	29	17	28	33	41	24	22	32	1,039	4.3%
9		102	91	91	103	112	102	65	85	61	33	25	15	43	36	37	35	35	33	1,104	4.5%
10		50	109	22	86	101	65	64	64	53	53	23	17	23	27	50	21	21	15	864	3.5%
11		79	61	56	92	38	105	30	48	36	68	50	14	26	25	38	27	27	18	838	3.4%
12		88	69	79	111	212	80	53	61	57	56	53	17	23	26	37	14	30	19	1,085	4.5%
13		46	130	59	104	130	88	74	60	50	39	45	39	25	40	27	20	21	18	1,015	4.2%
14		54	108	49	88	130	82	53	60	35	80	56	23	28	33	34	19	24	22	978	4.0%
15		67	44	53	124	135	55	42	48	41	64	54	29	26	46	46	26	20	23	943	3.9%
16		68	79	92	192	123	67	45	50	54	42	47	34	37	86	23	24	22	31	1,116	4.6%
17		111	143	89	110	148	79	56	38	46	43	34	51	74	81	38	32	30	37	1,240	5.1%
18	490	124	226	77	138	185	88	24	39	60	39	53	26	34	65	30	42	23	26	1,789	7.3%
19	324	125	237	111	158	166	118	43	85	34	50	26	41	49	54	33	30	37	27	1,748	7.2%
20	276	93	173	73	178	79	127	79	45	33	45	33	38	40	47	35	39	32	26	1,491	6.1%
21	231	79	150	81	128	112	140	91	103	37	61	29	23	42	30	42	39	26	35	1,479	6.1%
22	201	66	87	59	195	64	52	44	87	56	64	27	53	45	37	22	33	28	22	1,242	5.1%
23	142	80	54	57	148	67	27	67	44	36	31	32	50	38	43	13	36	50	31	1,046	4.3%
24	138	51	66	116	60	55	57	38	19	34	20	21	33	35	15	14	22	27	26	847	3.5%
Total	1,802	2,180	2,473	1,509	2,591	2,223	1,858	1,135	1,134	903	1,004	790	597	748	902	731	592	607	593	24,372	100.0%

Appendix A.27. Estimated salmon escapement adjacent to the north bank of the Crescent River, 27 June through 3 August, 2003.

Date	Sockeye		Pink		Chum		Coho		King		Dolly Varden	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
27-Jun	3,710	3,710	0	0	0	0	0	0	0	0	0	0
28-Jun	3,396	7,106	0	0	0	0	0	0	0	0	0	0
29-Jun	3,664	10,770	0	0	0	0	0	0	0	0	0	0
30-Jun	3,372	14,142	0	0	0	0	0	0	0	0	0	0
1-Jul	2,005	16,147	251	251	0	0	0	0	259	259	0	0
2-Jul	1,099	17,246	0	251	0	0	0	0	0	259	0	0
3-Jul	653	17,899	0	251	0	0	0	0	0	259	27	27
4-Jul	1,335	19,234	0	251	0	0	0	0	33	292	33	59
5-Jul	1,038	20,272	0	251	0	0	0	0	0	292	0	59
6-Jul	1,078	21,350	13	264	0	0	0	0	0	292	27	86
7-Jul	3,972	25,322	107	371	0	0	0	0	0	292	107	194
8-Jul	928	26,250	33	404	0	0	0	0	17	308	0	194
9-Jul	790	27,040	23	427	0	0	0	0	23	331	23	217
10-Jul	789	27,829	39	466	0	0	0	0	26	358	26	243
11-Jul	300	28,129	0	466	0	0	0	0	0	358	0	243
12-Jul	1,147	29,276	0	466	0	0	0	0	0	358	51	294
13-Jul	9,272	38,548	0	466	0	0	0	0	0	358	242	536
14-Jul	1,677	40,225	48	514	0	0	0	0	0	358	48	585
15-Jul	1,480	41,705	48	562	0	0	0	0	0	358	24	609
16-Jul	1,063	42,768	11	573	0	0	0	0	0	358	22	631
17-Jul	3,093	45,861	32	605	32	32	0	0	0	358	516	1,147
18-Jul	5,184	51,045	106	711	106	138	0	0	0	358	846	1,993
19-Jul	3,925	54,970	0	711	78	217	0	0	0	358	471	2,464
20-Jul	1,884	56,854	0	711	0	217	0	0	0	358	141	2,605
21-Jul	2,368	59,222	88	799	132	348	0	0	88	445	175	2,780
22-Jul	1,674	60,896	0	799	234	582	0	0	33	478	167	2,948
23-Jul	1,705	62,601	80	879	27	609	0	0	80	558	107	3,055
24-Jul	1,440	64,041	28	907	55	664	0	0	28	586	222	3,276
25-Jul	2,507	66,548	188	1,095	94	758	0	0	31	617	376	3,652
26-Jul	2,295	68,843	199	1,294	271	1,029	0	0	54	672	398	4,050
27-Jul	1,614	70,457	88	1,382	133	1,162	0	0	22	694	88	4,138
28-Jul	976	71,433	43	1,425	86	1,248	29	29	57	751	43	4,181
29-Jul	1,342	72,775	87	1,512	152	1,400	0	29	22	773	108	4,290
30-Jul	1,290	74,065	21	1,533	430	1,830	0	29	0	773	0	4,290
31-Jul	1,882	75,947	0	1,533	309	2,138	0	29	0	773	0	4,290
1-Aug	876	76,823	65	1,598	681	2,819	32	61	16	789	0	4,290
2-Aug	948	77,771	18	1,616	820	3,639	0	61	0	789	0	4,290
3-Aug	1,381	79,152	90	1,706	789	4,428	0	61	18	807	0	4,290

Appendix A.28. Estimated salmon escapement adjacent to the south bank of the Crescent River, 27 June through 3 August, 2003.

Date	Sockeye		Pink		Chum		Coho		King		Dolly Varden	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
27-Jun	764	764	0	0	0	0	0	0	0	0	0	0
28-Jun	813	1,577	0	0	0	0	0	0	0	0	0	0
29-Jun	893	2,470	0	0	0	0	0	0	0	0	0	0
30-Jun	447	2,917	0	0	0	0	0	0	0	0	0	0
1-Jul	380	3,297	48	48	0	0	0	0	0	0	0	0
2-Jul	520	3,817	0	48	0	0	0	0	0	0	0	0
3-Jul	618	4,435	0	48	0	0	0	0	0	0	25	25
4-Jul	1,481	5,916	0	48	0	0	0	0	36	36	36	61
5-Jul	1,317	7,233	0	48	0	0	0	0	0	36	0	61
6-Jul	1,486	8,719	19	67	0	0	0	0	0	36	37	98
7-Jul	3,496	12,215	94	161	0	0	0	0	0	36	94	192
8-Jul	1,129	13,344	40	201	0	0	0	0	20	56	0	192
9-Jul	906	14,250	27	228	0	0	0	0	27	83	27	219
10-Jul	928	15,178	46	274	0	0	0	0	31	114	31	250
11-Jul	316	15,494	0	274	0	0	0	0	0	114	0	250
12-Jul	1,275	16,769	0	274	0	0	0	0	0	114	56	306
13-Jul	4,952	21,721	0	274	0	0	0	0	0	114	129	435
14-Jul	2,425	24,146	70	344	0	0	0	0	0	114	70	505
15-Jul	1,992	26,138	64	408	0	0	0	0	0	114	32	537
16-Jul	2,926	29,064	31	439	0	0	0	0	0	114	62	599
17-Jul	1,528	30,592	16	455	16	16	0	0	0	114	255	854
18-Jul	2,543	33,135	52	507	52	68	0	0	0	114	415	1,269
19-Jul	1,172	34,307	0	507	23	91	0	0	0	114	141	1,409
20-Jul	1,180	35,487	0	507	0	91	0	0	0	114	88	1,497
21-Jul	1,367	36,854	51	558	76	167	0	0	51	164	101	1,598
22-Jul	891	37,745	0	558	125	292	0	0	18	182	89	1,688
23-Jul	804	38,549	38	596	13	305	0	0	38	220	50	1,738
24-Jul	466	39,015	9	605	18	322	0	0	9	229	72	1,809
25-Jul	259	39,274	19	624	10	332	0	0	3	232	39	1,848
26-Jul	642	39,916	56	680	76	408	0	0	15	247	111	1,959
27-Jul	616	40,532	34	714	51	459	0	0	8	255	34	1,993
28-Jul	356	40,888	16	730	31	490	11	11	21	276	16	2,008
29-Jul	520	41,408	34	764	59	549	0	11	8	284	42	2,050
30-Jul	461	41,869	8	772	154	702	0	11	0	284	0	2,050
31-Jul	796	42,665	0	772	131	833	0	11	0	284	0	2,050
1-Aug	240	42,905	18	790	186	1,019	9	20	4	288	0	2,050
2-Aug	213	43,118	4	794	184	1,203	0	20	0	288	0	2,050
3-Aug	187	43,305	12	806	107	1,311	0	20	2	290	0	2,050

Appendix A.29. Crescent River north bank sonar counts by hour, 27 June through 3 August, 2003.

Date	Counts by Hour																								Daily Total	Cum 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		
27-Jun	8	9	50	23	9	63	2	69	54	4	80	171	109	73	58	85	77	406	413	629	854	311	68	85	3,710	3710
28-Jun	20	72	38	7	6	15	4	24	0	15	7	10	92	91	123	50	126	141	724	512	289	418	470	142	3,396	7,106
29-Jun	90	69	96	37	4	0	1	168	5	39	17	186	283	198	233	117	47	101	688	428	414	188	172	53	3,664	10,770
30-Jun	43	98	52	1	49	105	3	103	57	234	240	52	118	318	76	87	86	91	167	671	348	299	188	145	3,631	14,401
01-Jul	85	39	86	5	76	10	84	91	104	96	52	122	189	139	142	84	20	1	34	203	284	171	92	47	2,256	16,657
02-Jul	33	13	10	38	41	43	43	16	48	21	40	221	34	31	25	105	117	71	78	53	7	2	6	3	1,099	17,756
03-Jul	4	0	0	2	32	25	28	31	31	0	1	7	8	13	19	81	95	64	62	27	16	23	77	34	680	18,436
04-Jul	63	49	52	50	59	67	67	6	87	75	82	118	89	72	29	68	58	57	67	61	45	15	55	9	1,400	19,836
05-Jul	2	1	1	0	42	8	43	3	6	22	8	42	49	49	48	281	32	106	21	8	10	95	95	66	1,038	20,874
06-Jul	6	1	12	4	31	45	45	48	68	67	72	48	49	93	47	88	44	11	150	13	39	43	47	47	1,118	21,992
07-Jul	57	38	0	14	25	168	122	232	169	177	200	357	473	348	437	347	296	236	160	141	120	51	12	7	4,187	26,179
08-Jul	4	18	47	39	12	36	37	29	36	50	36	97	65	40	96	24	29	45	71	62	40	22	39	4	978	27,157
09-Jul	2	4	36	36	37	37	15	19	1	7	14	73	29	162	105	38	25	58	35	28	61	27	6	5	860	28,017
10-Jul	41	33	34	33	34	33	34	34	33	5	2	5	8	17	29	117	90	67	117	44	27	11	14	19	881	28,898
11-Jul	22	11	8	13	10	9	14	2	0	2	1	9	2	17	6	10	22	47	12	12	36	11	23	1	300	29,198
12-Jul	0	10	50	50	6	12	2	5	47	59	50	48	136	100	92	56	50	51	92	64	51	32	86	49	1,198	30,396
13-Jul	148	314	326	315	316	331	373	67	226	30	125	284	654	671	813	567	1,064	626	740	577	672	214	25	36	9,514	39,910
14-Jul	74	74	77	76	83	81	99	79	81	74	74	74	100	116	106	120	120	89	46	44	19	33	25	10	1,774	41,684
15-Jul	17	6	4	0	66	38	28	55	31	49	93	61	108	134	169	183	129	88	56	44	68	57	31	37	1,552	43,236
16-Jul	12	2	46	13	1	1	27	51	8	36	110	81	74	56	55	174	79	29	51	44	42	55	26	24	1,097	44,333
17-Jul	16	5	0	9	0	59	120	31	57	57	165	300	506	462	321	311	361	318	179	111	53	61	135	36	3,673	48,006
18-Jul	18	3	6	32	0	14	69	73	109	169	630	591	1,107	1,012	738	365	309	233	71	249	201	68	107	68	6,242	54,248
19-Jul	9	14	9	12	1	46	22	26	84	81	268	278	698	589	612	595	365	195	106	147	88	137	56	36	4,474	58,722
20-Jul	14	54	59	7	7	10	13	36	65	70	96	165	169	207	266	154	167	105	80	95	59	48	52	27	2,025	60,747
21-Jul	7	1	29	12	4	18	70	60	67	70	148	232	312	307	356	363	271	198	129	71	43	46	30	6	2,850	63,597
22-Jul	10	3	4	7	24	0	6	2	8	31	24	38	66	173	179	329	401	239	213	119	94	87	42	10	2,109	65,706
23-Jul	8	5	10	12	6	16	28	43	48	81	102	139	108	138	169	187	328	177	172	86	56	50	27	2	1,998	67,704
24-Jul	7	3	9	2	20	24	10	36	84	87	66	83	102	173	167	74	124	165	145	164	133	63	29	2	1,772	69,476
25-Jul	8	8	4	3	14	36	44	17	40	53	74	106	108	209	276	420	253	347	290	233	300	123	200	30	3,196	72,672
26-Jul	16	4	4	5	5	10	36	108	129	142	171	158	156	263	176	79	280	340	209	390	225	180	97	34	3,217	75,889
27-Jul	31	62	54	2	9	61	135	64	30	63	88	13	39	75	120	119	97	75	106	76	114	164	275	74	1,946	77,835
28-Jul	30	47	29	10	29	56	24	58	88	53	40	89	69	36	56	56	87	19	70	52	113	37	67	19	1,234	79,069
29-Jul	37	12	2	9	3	12	60	59	69	95	70	41	121	120	193	187	134	102	100	61	69	52	87	15	1,710	80,779
30-Jul	16	4	8	6	29	21	73	14	41	140	106	148	188	219	96	88	55	42	52	75	63	128	79	50	1,741	82,520
31-Jul	22	23	0	15	13	11	17	8	116	366	222	70	69	59	27	101	127	42	25	129	130	298	161	140	2,191	84,711
1-Aug	35	43	34	38	28	48	38	38	119	40	122	60	72	84	85	130	78	113	100	82	89	61	68	62	1,670	86,381
2-Aug	42	30	21	27	42	37	56	106	123	54	97	52	75	129	133	111	130	87	65	67	104	54	82	62	1,786	88,167
3-Aug	57	16	37	49	30	22	111	56	44	42	27	78	94	146	163	144	139	140	127	184	150	115	148	158	2,277	90,444
Total	1,114	1,198	1,344	1,013	1,203	1,628	2,003	1,967	2,413	2,756	3,820	4,707	6,726	7,095	6,887	6,454	6,356	5,355	5,881	6,193	5,530	3,849	3,295	1,654	90,444	

Appendix A.30. Crescent River south bank sonar counts by hour, 27 June through 3 August, 2003.

Date	Counts by Hour																								Daily Total	Cum 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		
27-Jun	33	1	2	0	30	0	0	5	0	2	15	21	41	27	30	58	11	32	42	315	32	32	32	3	764	764
28-Jun	4	0	1	0	0	0	0	0	0	34	0	0	38	134	85	119	71	60	67	86	29	25	31	26	813	1,577
29-Jun	4	25	32	33	0	0	0	0	31	0	9	42	74	96	35	34	52	21	268	42	38	46	10	1	893	2,470
30-Jun	0	1	41	0	0	0	1	1	12	21	33	26	23	19	44	19	60	39	5	83	4	11	3	1	447	2,917
01-Jul	0	4	0	0	0	0	2	1	4	10	35	39	19	17	17	17	38	5	11	103	17	17	21	51	428	3,345
02-Jul	22	45	16	1	1	23	0	41	24	34	15	82	38	22	24	20	21	21	14	7	9	7	23	10	520	3,865
03-Jul	10	4	0	10	0	0	0	0	4	0	9	15	30	14	69	47	136	99	30	41	40	28	25	32	643	4,508
04-Jul	10	17	19	64	5	53	67	38	79	92	66	79	65	47	80	156	213	64	66	75	101	32	58	7	1,553	6,061
05-Jul	9	1	4	27	52	51	10	51	17	54	18	91	105	132	157	104	81	60	114	59	51	8	7	54	1,317	7,378
06-Jul	6	3	7	54	22	7	17	64	17	14	21	149	108	149	179	142	76	146	140	79	17	13	47	65	1,542	8,920
07-Jul	155	154	154	154	4	152	151	108	121	268	200	210	258	524	400	225	268	89	34	25	11	5	14	1	3,685	12,605
08-Jul	10	1	4	3	34	2	4	6	28	85	63	70	142	61	162	93	51	107	59	37	111	34	9	13	1,189	13,794
09-Jul	39	25	3	9	5	6	2	2	14	35	22	30	47	86	101	102	98	119	100	57	18	13	44	9	986	14,780
10-Jul	7	12	1	20	13	3	44	4	6	19	16	28	57	40	187	125	90	111	140	61	21	6	13	12	1,036	15,816
11-Jul	11	7	20	6	2	4	10	10	17	7	19	16	12	15	45	30	21	14	19	7	9	4	8	3	316	16,132
12-Jul	11	56	1	10	2	6	18	15	31	38	29	39	48	87	72	76	88	172	131	130	100	72	83	16	1,331	17,463
13-Jul	28	34	46	31	34	42	156	68	96	159	180	412	328	613	621	511	524	368	230	199	190	67	110	14	5,081	22,544
14-Jul	67	66	41	4	90	15	16	97	41	86	129	214	154	276	298	258	151	147	70	66	81	81	84	33	2,565	25,109
15-Jul	3	13	1	63	1	28	95	86	37	58	99	128	155	173	274	115	179	157	89	61	74	58	57	84	2,088	27,197
16-Jul	39	14	37	68	19	50	42	121	134	131	195	199	321	315	129	171	297	275	61	40	45	28	144	143	3,018	30,215
17-Jul	15	11	77	25	74	74	40	24	88	55	44	74	148	156	76	166	175	141	77	139	44	66	13	13	1,815	32,030
18-Jul	11	127	53	34	11	9	129	125	144	311	226	274	279	353	296	209	163	78	61	90	35	16	20	8	3,062	35,092
19-Jul	15	51	32	24	29	25	10	48	50	59	54	57	74	126	61	126	71	150	52	55	90	43	18	16	1,336	36,428
20-Jul	4	15	54	16	2	34	56	52	50	51	56	49	61	217	105	68	156	50	34	19	53	21	31	14	1,268	37,696
21-Jul	53	1	18	50	19	13	143	139	4	180	20	113	55	67	180	105	142	149	64	55	40	28	5	3	1,646	39,342
22-Jul	4	6	1	0	0	10	77	138	33	5	45	92	5	57	90	90	146	108	66	38	61	28	7	16	1,123	40,465
23-Jul	2	2	15	0	2	24	195	4	7	44	6	56	91	124	32	39	22	65	13	15	13	13	128	30	942	41,407
24-Jul	5	1	5	8	15	10	0	5	0	2	0	6	11	21	12	11	6	99	22	23	257	11	8	35	573	41,980
25-Jul	3	6	12	9	8	5	6	24	7	10	32	20	17	31	13	3	71	12	11	8	6	12	4	0	330	42,310
26-Jul	2	6	2	4	6	2	2	6	1	2	2	2	3	39	111	142	220	55	37	48	77	72	37	22	900	43,210
27-Jul	17	3	4	31	7	16	2	5	8	19	12	7	13	54	77	103	16	45	31	58	122	31	31	31	743	43,953
28-Jul	4	3	14	4	19	19	19	19	4	2	19	9	10	23	45	11	14	25	22	109	24	13	15	4	450	44,403
29-Jul	3	3	2	3	3	4	3	4	6	5	13	4	13	27	95	28	32	109	13	27	14	11	97	144	663	45,066
30-Jul	5	26	1	0	0	3	44	13	67	16	6	26	18	27	82	27	81	65	26	15	24	15	9	26	622	45,688
31-Jul	24	7	1	2	0	4	30	57	6	48	15	57	91	24	34	148	44	86	18	10	74	70	70	7	927	46,615
1-Aug	0	33	65	0	0	18	11	2	11	4	4	2	44	43	22	31	44	11	12	29	9	22	19	21	457	47,072
2-Aug	3	3	6	16	2	10	28	3	11	8	8	16	26	72	19	22	27	23	29	9	8	16	13	23	401	47,473
3-Aug	0	21	25	2	5	5	18	0	11	0	3	6	8	7	26	29	20	13	15	8	19	23	30	15	309	47,782
Total	638	808	817	785	516	727	1,448	1,386	1,221	1,968	1,738	2,760	3,030	4,335	4,385	3,780	3,976	3,390	2,293	2,328	1,968	1,098	1,381	1,006	47,782	

Appendix A.31. Crescent River north bank sonar counts by hour, 27 June through 3 August, 2003. 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	
27-Jun	0.2	0.2	1.3	0.6	0.2	1.7	0.1	1.9	1.5	0.1	2.2	4.6	2.9	2.0	1.6	2.3	2.1	10.9	11.1	17.0	23.0	8.4	1.8	2.3	100.0
28-Jun	0.6	2.1	1.1	0.2	0.2	0.4	0.1	0.7	0.0	0.4	0.2	0.3	2.7	2.7	3.6	1.5	3.7	4.2	21.3	15.1	8.5	12.3	13.8	4.2	100.0
29-Jun	2.5	1.9	2.6	1.0	0.1	0.0	0.0	4.6	0.1	1.1	0.5	5.1	7.7	5.4	6.4	3.2	1.3	2.8	18.8	11.7	12.1	5.1	4.7	1.4	100.0
30-Jun	1.2	2.7	1.4	0.0	1.3	2.9	0.1	2.8	1.6	6.4	6.6	1.4	3.2	8.8	2.1	2.4	2.4	2.5	4.6	18.5	9.6	8.2	5.2	4.0	100.0
1-Jul	3.8	1.7	3.8	0.2	3.4	0.4	3.7	4.0	4.6	4.3	2.3	5.4	8.4	6.2	6.3	3.7	0.9	0.0	1.5	9.0	12.6	7.6	4.1	2.1	100.0
2-Jul	3.0	1.2	0.9	3.5	3.7	3.9	3.9	1.5	4.4	1.9	3.6	20.1	3.1	2.8	2.3	9.6	10.6	6.5	7.1	4.8	0.6	0.2	0.5	0.3	100.0
3-Jul	0.6	0.0	0.0	0.3	4.7	3.7	4.1	4.6	4.6	0.0	0.1	1.0	1.2	1.9	2.8	11.9	14.0	9.4	9.1	4.0	2.4	3.4	11.3	5.0	100.0
4-Jul	4.5	3.5	3.7	3.6	4.2	4.8	4.8	0.4	6.2	5.4	5.9	8.4	6.4	5.1	2.1	4.9	4.1	4.1	4.8	4.4	3.2	1.1	3.9	0.6	100.0
5-Jul	0.2	0.1	0.1	0.0	4.0	0.8	4.1	0.3	0.6	2.1	0.8	4.0	4.7	4.7	4.6	27.1	3.1	10.2	2.0	0.8	1.0	9.2	9.2	6.4	100.0
6-Jul	0.5	0.1	1.1	0.4	2.8	4.0	4.0	4.3	6.1	6.0	6.4	4.3	4.2	4.4	8.3	4.2	7.9	3.9	1.0	13.4	1.2	3.5	3.8	4.2	100.0
7-Jul	1.4	0.9	0.0	0.3	0.6	4.0	2.9	5.5	4.0	4.2	4.8	8.5	11.3	8.3	10.4	8.3	7.1	5.6	3.8	3.4	2.9	1.2	0.3	0.2	100.0
8-Jul	0.4	1.8	4.8	4.0	1.2	3.7	3.8	3.0	3.7	5.1	3.7	9.9	6.6	4.1	9.8	2.5	3.0	4.6	7.3	6.3	4.1	2.2	4.0	0.4	100.0
9-Jul	0.2	0.5	4.2	4.2	4.3	4.3	1.7	2.2	0.1	0.8	1.6	8.5	3.4	18.8	12.2	4.4	2.9	6.7	4.1	3.3	7.1	3.1	0.7	0.6	100.0
10-Jul	4.7	3.7	3.9	3.7	3.9	3.7	3.9	3.9	3.7	0.6	0.2	0.6	0.9	1.9	3.3	13.3	10.2	7.6	13.3	5.0	3.1	1.2	1.6	2.2	100.0
11-Jul	7.3	3.7	2.7	4.3	3.3	3.0	4.7	0.7	0.0	0.7	0.3	3.0	0.7	5.7	2.0	3.3	7.3	15.7	4.0	4.0	12.0	3.7	7.7	0.3	100.0
12-Jul	0.0	0.8	4.2	4.2	0.5	1.0	0.2	0.4	3.9	4.9	4.2	4.0	11.4	8.3	7.7	4.7	4.2	4.3	7.7	5.3	4.3	2.7	7.2	4.1	100.0
13-Jul	1.6	3.3	3.4	3.3	3.3	3.5	3.9	0.7	2.4	0.3	1.3	3.0	6.9	7.1	8.5	6.0	11.2	6.6	7.8	6.1	7.1	2.2	0.3	0.4	100.0
14-Jul	4.2	4.2	4.3	4.3	4.7	4.6	5.6	4.5	4.6	4.2	4.2	4.2	5.6	6.5	6.0	6.8	6.8	5.0	2.6	2.5	1.1	1.9	1.4	0.6	100.0
15-Jul	1.1	0.4	0.3	0.0	4.3	2.4	1.8	3.5	2.0	3.2	6.0	3.9	7.0	8.6	10.9	11.8	8.3	5.7	3.6	2.8	4.4	3.7	2.0	2.4	100.0
16-Jul	1.1	0.2	4.2	1.2	0.1	0.1	2.5	4.6	0.7	3.3	10.0	7.4	6.7	5.1	5.0	15.9	7.2	2.6	4.6	4.0	3.8	5.0	2.4	2.2	100.0
17-Jul	0.4	0.1	0.0	0.2	0.0	1.6	3.3	0.8	1.6	1.6	4.5	8.2	13.8	12.6	8.7	8.5	9.8	8.7	4.9	3.0	1.4	1.7	3.7	1.0	100.0
18-Jul	0.3	0.0	0.1	0.5	0.0	0.2	1.1	1.2	1.7	2.7	10.1	9.5	17.7	16.2	11.8	5.8	5.0	3.7	1.1	4.0	3.2	1.1	1.7	1.1	100.0
19-Jul	0.2	0.3	0.2	0.3	0.0	1.0	0.5	0.6	1.9	1.8	6.0	6.2	15.6	13.2	13.7	13.3	8.2	4.4	2.4	3.3	2.0	3.1	1.3	0.8	100.0
20-Jul	0.7	2.7	2.9	0.3	0.3	0.5	0.6	1.8	3.2	3.5	4.7	8.1	8.3	10.2	13.1	7.6	8.2	5.2	4.0	4.7	2.9	2.4	2.6	1.3	100.0
21-Jul	0.2	0.0	1.0	0.4	0.1	0.6	2.5	2.1	2.4	2.5	5.2	8.1	10.9	10.8	12.5	12.7	9.5	6.9	4.5	2.5	1.5	1.6	1.1	0.2	100.0
22-Jul	0.5	0.1	0.2	0.3	1.1	0.0	0.3	0.1	0.4	1.5	1.1	1.8	3.1	8.2	8.5	15.6	19.0	11.3	10.1	5.6	4.5	4.1	2.0	0.5	100.0
23-Jul	0.4	0.3	0.5	0.6	0.3	0.8	1.4	2.2	2.4	4.1	5.1	7.0	5.4	6.9	8.5	9.4	16.4	8.9	8.6	4.3	2.8	2.5	1.4	0.1	100.0
24-Jul	0.4	0.2	0.5	0.1	1.1	1.4	0.6	2.0	4.7	4.9	3.7	4.7	5.8	9.8	9.4	4.2	7.0	9.3	8.2	9.3	7.5	3.6	1.6	0.1	100.0
25-Jul	0.3	0.3	0.1	0.1	0.4	1.1	1.4	0.5	1.3	1.7	2.3	3.3	3.4	6.5	8.6	13.1	7.9	10.9	9.1	7.3	9.4	3.8	6.3	0.9	100.0
26-Jul	0.5	0.1	0.1	0.2	0.2	0.3	1.1	3.4	4.0	4.4	5.3	4.9	4.8	8.2	5.5	2.5	8.7	10.6	6.5	12.1	7.0	5.6	3.0	1.1	100.0
27-Jul	1.6	3.2	2.8	0.1	0.5	3.1	6.9	3.3	1.5	3.2	4.5	0.7	2.0	3.9	6.2	6.1	5.0	3.9	5.4	3.9	5.9	8.1	14.1	3.8	100.0
28-Jul	2.4	3.8	2.4	0.8	2.4	4.5	1.9	4.7	7.1	4.3	3.2	7.2	5.6	2.9	4.5	4.5	7.1	1.5	5.7	4.2	9.2	3.0	5.4	1.5	100.0
29-Jul	2.2	0.7	0.1	0.5	0.2	0.7	3.5	3.5	4.0	5.6	4.1	2.4	7.1	7.0	11.3	10.9	7.8	6.0	5.8	3.6	4.0	3.0	5.1	0.9	100.0
30-Jul	0.9	0.2	0.5	0.3	1.7	1.2	4.2	0.8	2.4	8.0	6.1	8.5	10.8	12.6	5.5	5.1	3.2	2.4	3.0	4.3	3.6	7.4	4.5	2.9	100.0
31-Jul	1.0	1.0	0.0	0.7	0.6	0.5	0.8	0.4	5.3	16.7	10.1	3.2	3.1	2.7	1.2	4.6	5.8	1.9	1.1	5.9	5.9	13.6	7.3	6.4	100.0
1-Aug	2.1	2.6	2.0	2.3	1.7	2.9	2.3	2.3	7.1	2.4	7.3	3.6	4.3	5.0	5.1	7.8	4.7	6.8	6.0	4.9	5.3	3.8	4.1	3.7	100.0
2-Aug	2.4	1.7	1.2	1.5	2.4	2.1	3.1	5.9	6.9	3.0	5.4	2.9	4.2	7.2	7.4	6.2	7.3	4.9	3.6	3.8	5.8	3.0	4.6	3.5	100.0
3-Aug	2.5	0.7	1.6	2.2	1.3	1.0	4.9	2.5	1.9	1.8	1.2	3.4	4.1	6.4	7.2	6.3	6.1	6.1	5.6	8.1	6.6	5.1	6.5	6.9	100.0
Total	1.2	1.3	1.5	1.1	1.3	1.8	2.2	2.2	2.7	3.0	4.2	5.2	7.4	7.8	7.6	7.1	7.0	5.9	6.5	6.8	6.1	4.3	3.6	1.8	100.0

Appendix A.32. Crescent River south bank sonar counts by hour, 27 June through 3 August, 2003. 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	
27-Jun	4.3	0.1	0.3	0.0	3.9	0.0	0.0	0.7	0.0	0.3	2.0	2.7	5.1	3.5	3.9	7.6	1.4	4.2	5.5	41.2	4.2	4.2	4.2	0.4	100.0
28-Jun	0.5	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	4.7	16.5	10.5	14.6	8.7	7.4	8.2	10.6	3.6	3.1	4.2	3.2	100.0
29-Jun	0.4	2.8	3.6	3.7	0.0	0.0	0.0	0.0	3.5	0.0	1.0	4.7	8.3	10.8	3.9	3.8	5.8	2.4	30.0	4.7	4.3	5.2	1.1	0.1	100.0
30-Jun	0.0	0.2	9.2	0.0	0.0	0.0	0.2	0.2	2.7	4.7	7.4	5.8	5.1	4.3	9.8	4.3	13.4	8.7	1.1	18.6	0.9	2.5	0.7	0.2	100.0
1-Jul	0.0	0.9	0.0	0.0	0.0	0.0	0.5	0.2	0.9	2.3	8.2	9.1	4.4	4.0	4.0	4.0	8.9	1.2	2.6	24.1	4.0	4.0	4.9	11.9	100.0
2-Jul	4.2	8.7	3.1	0.2	0.2	4.4	0.0	7.9	4.6	6.5	2.9	15.8	7.3	4.2	4.6	3.8	4.0	4.0	2.7	1.3	1.7	1.3	4.4	1.9	100.0
3-Jul	1.6	0.6	0.0	1.6	0.0	0.0	0.0	0.0	0.6	0.0	1.4	2.3	4.7	2.2	10.7	7.3	21.2	15.4	4.7	6.4	6.2	4.4	3.9	5.0	100.0
4-Jul	0.6	1.1	1.2	4.1	0.3	3.4	4.3	2.4	5.1	5.9	4.2	5.1	4.2	3.0	5.2	10.0	13.7	4.1	4.2	4.8	6.5	2.1	3.7	0.5	100.0
5-Jul	0.7	0.1	0.3	2.1	3.9	3.9	0.8	3.9	1.3	4.1	1.4	6.9	8.0	10.0	11.9	7.9	6.2	4.6	8.7	4.5	3.9	0.6	0.5	4.1	100.0
6-Jul	0.4	0.2	0.5	3.5	1.4	0.5	1.1	4.2	1.1	0.9	1.4	9.7	7.0	9.7	11.6	9.2	4.9	9.5	9.1	5.1	1.1	0.8	3.0	4.2	100.0
7-Jul	4.2	4.2	4.2	4.2	0.1	4.1	4.1	2.9	3.3	7.3	5.4	5.7	7.0	14.2	10.9	6.1	7.3	2.4	0.9	0.7	0.3	0.1	0.4	0.0	100.0
8-Jul	0.8	0.1	0.3	0.3	2.9	0.2	0.3	0.5	2.4	7.1	5.3	5.9	11.9	5.1	13.6	7.8	4.3	9.0	5.0	3.1	9.3	2.9	0.8	1.1	100.0
9-Jul	4.0	2.5	0.3	0.9	0.5	0.6	0.2	0.2	1.4	3.5	2.2	3.0	4.8	8.7	10.2	10.3	9.9	12.1	10.1	5.8	1.8	1.3	4.5	0.9	100.0
10-Jul	0.7	1.2	0.1	1.9	1.3	0.3	4.2	0.4	0.6	1.8	1.5	2.7	5.5	3.9	18.1	12.1	8.7	10.7	13.5	5.9	2.0	0.6	1.3	1.2	100.0
11-Jul	3.5	2.2	6.3	1.9	0.6	1.3	3.2	3.2	5.4	2.2	6.0	5.1	3.8	4.7	14.2	9.5	6.6	4.4	6.0	2.2	2.8	1.3	2.5	0.9	100.0
12-Jul	0.8	4.2	0.1	0.8	0.2	0.5	1.4	1.1	2.3	2.9	2.2	2.9	3.6	6.5	5.4	5.7	6.6	12.9	9.8	9.8	7.5	5.4	6.2	1.2	100.0
13-Jul	0.6	0.7	0.9	0.6	0.7	0.8	3.1	1.3	1.9	3.1	3.5	8.1	6.5	12.5	12.2	10.1	10.3	7.2	4.5	3.9	3.7	1.3	2.2	0.3	100.0
14-Jul	2.6	2.6	1.6	0.2	3.5	0.6	0.6	3.8	1.6	3.4	5.0	8.3	6.0	10.8	11.6	10.1	5.9	5.7	2.7	2.6	3.2	3.3	1.3	1.3	100.0
15-Jul	0.1	0.6	0.0	3.0	0.0	1.3	4.5	4.1	1.8	2.8	4.7	6.1	7.4	8.3	13.1	5.5	8.6	7.5	4.3	2.9	3.5	2.8	2.7	4.0	100.0
16-Jul	1.3	0.5	1.2	2.3	0.6	1.7	1.4	4.0	4.4	4.3	6.5	6.6	10.6	10.4	4.3	5.7	9.8	9.1	2.0	1.3	1.5	0.9	4.8	4.7	100.0
17-Jul	0.8	0.6	4.2	1.4	4.1	4.1	2.2	1.3	4.8	3.0	2.4	4.1	8.2	8.6	4.2	9.1	9.6	7.8	4.2	7.7	2.4	3.6	0.7	0.7	100.0
18-Jul	0.4	4.1	1.7	1.1	0.4	0.3	4.2	4.1	4.7	10.2	7.4	8.9	9.1	11.5	9.7	6.8	5.3	2.5	2.0	2.9	1.1	0.5	0.7	0.3	100.0
19-Jul	1.1	3.8	2.4	1.8	2.2	1.9	0.7	3.6	3.7	4.4	4.0	4.3	5.5	9.4	4.6	9.4	5.3	11.2	3.9	4.1	6.7	3.2	1.3	1.2	100.0
20-Jul	0.3	1.2	4.3	1.3	0.2	2.7	4.4	4.1	3.9	4.0	4.4	3.9	4.8	17.1	8.3	5.4	12.3	3.9	2.7	1.5	4.2	1.7	2.4	1.1	100.0
21-Jul	3.2	0.1	1.1	3.0	1.2	0.8	8.7	8.4	0.2	10.9	1.2	6.9	3.3	4.1	10.9	6.4	8.6	9.1	3.9	3.3	2.4	1.7	0.3	0.2	100.0
22-Jul	0.4	0.5	0.1	0.0	0.0	0.9	6.9	12.3	2.9	0.4	4.0	8.2	0.4	5.1	8.0	8.0	13.0	9.6	5.9	3.4	5.4	2.5	0.6	1.4	100.0
23-Jul	0.2	0.2	1.6	0.0	0.2	2.5	20.7	0.4	0.7	4.7	0.6	5.9	9.7	13.2	3.4	4.1	2.3	6.9	1.4	1.6	1.4	1.4	13.6	3.2	100.0
24-Jul	0.9	0.2	0.9	1.4	2.6	1.7	0.0	0.9	0.0	0.3	0.0	1.0	1.9	3.7	2.1	1.9	1.0	17.3	3.8	4.0	44.9	1.9	1.4	6.1	100.0
25-Jul	0.9	1.8	3.6	2.7	2.4	1.5	1.8	7.3	2.1	3.0	9.7	6.1	5.2	9.4	3.9	0.9	21.5	3.6	3.3	2.4	1.8	3.6	1.2	0.0	100.0
26-Jul	0.2	0.7	0.2	0.4	0.7	0.2	0.2	0.7	0.1	0.2	0.2	0.2	0.3	4.3	12.3	15.8	24.4	6.1	4.1	5.3	8.6	8.0	4.1	2.4	100.0
27-Jul	2.3	0.4	0.5	4.2	0.9	2.2	0.3	0.7	1.1	2.6	1.6	0.9	1.7	7.3	10.4	13.9	2.2	6.1	4.2	7.8	16.4	4.2	4.2	4.2	100.0
28-Jul	0.9	0.7	3.1	0.9	4.2	4.2	4.2	4.2	0.9	0.4	4.2	2.0	2.2	5.1	10.0	2.4	3.1	5.6	4.9	24.2	5.3	2.9	3.3	0.9	100.0
29-Jul	0.5	0.5	0.3	0.5	0.5	0.6	0.5	0.6	0.9	0.8	2.0	0.6	2.0	4.1	14.3	4.2	4.8	16.4	2.0	4.1	2.1	1.7	14.6	21.7	100.0
30-Jul	0.8	4.2	0.2	0.0	0.0	0.5	7.1	2.1	10.8	2.6	1.0	4.2	2.9	4.3	13.2	4.3	13.0	10.5	4.2	2.4	3.9	2.4	1.4	4.2	100.0
31-Jul	2.6	0.8	0.1	0.2	0.0	0.4	3.2	6.1	0.6	5.2	1.6	6.1	9.8	2.6	3.7	16.0	4.7	9.3	1.9	1.1	8.0	7.6	7.6	0.8	100.0
1-Aug	0.0	7.2	14.2	0.0	0.0	3.9	2.4	0.4	2.4	0.9	0.9	0.4	9.6	9.4	4.8	6.8	9.6	2.4	2.6	6.3	2.0	4.8	4.2	4.6	100.0
2-Aug	0.7	0.7	1.5	4.0	0.5	2.5	7.0	0.7	2.7	2.0	2.0	4.0	6.5	18.0	4.7	5.5	6.7	5.7	7.2	2.2	2.0	4.0	3.2	5.7	100.0
3-Aug	0.0	6.8	8.1	0.6	1.6	1.6	5.8	0.0	3.6	0.0	1.0	1.9	2.6	2.3	8.4	9.4	6.5	4.2	4.9	2.6	6.1	7.4	9.7	4.9	100.0
Total	1.3	1.7	1.7	1.6	1.1	1.5	3.0	2.9	2.6	4.1	3.6	5.8	6.3	9.1	9.2	7.9	8.3	7.1	4.8	4.9	4.1	2.3	2.9	2.1	100.0

Appendix A.33. Crescent River north bank sonar counts by sector, 27 June through 3 August, 2003.

Counts by Sector														
Date	1	2	3	4	5	6	7	8	9	10	11	12	Daily Total	Cum Total
27-Jun	458	1,057	1,257	620	267	49	1	0	0	1	0	0	3,710	3,710
28-Jun	220	525	1,238	739	478	131	40	8	4	4	3	6	3,396	7,106
29-Jun	285	604	1,326	779	460	104	48	27	17	6	4	4	3,664	10,770
30-Jun	958	1,287	822	341	142	37	14	11	4	6	4	5	3,631	14,401
1-Jul	1,613	388	182	44	21	5	2	1	0	0	0	0	2,256	16,657
2-Jul	846	128	99	22	2	2	0	0	0	0	0	0	1,099	17,756
3-Jul	439	146	62	18	7	1	0	0	0	1	4	2	680	18,436
4-Jul	1,051	293	50	4	0	0	0	0	1	0	0	1	1,400	19,836
5-Jul	989	40	5	4	0	0	0	0	0	0	0	0	1,038	20,874
6-Jul	1,087	25	6	0	0	0	0	0	0	0	0	0	1,118	21,992
7-Jul	3,977	205	5	0	0	0	0	0	0	0	0	0	4,187	26,179
8-Jul	835	135	8	0	0	0	0	0	0	0	0	0	978	27,157
9-Jul	813	45	2	0	0	0	0	0	0	0	0	0	860	28,017
10-Jul	793	71	8	1	0	0	0	0	0	1	3	4	881	28,898
11-Jul	221	64	8	0	0	0	0	7	0	0	0	0	300	29,198
12-Jul	1,128	63	7	0	0	0	0	0	0	0	0	0	1,198	30,396
13-Jul	7,276	2,028	177	33	0	0	0	0	0	0	0	0	9,514	39,910
14-Jul	1,346	263	116	38	4	1	1	1	1	1	1	1	1,774	41,684
15-Jul	1,014	442	78	17	1	0	0	0	0	0	0	0	1,552	43,236
16-Jul	743	287	58	8	1	0	0	0	0	0	0	0	1,097	44,333
17-Jul	3,095	517	50	10	1	0	0	0	0	0	0	0	3,673	48,006
18-Jul	4,698	1,365	153	16	8	2	0	0	0	0	0	0	6,242	54,248
19-Jul	3,932	476	51	13	2	0	0	0	0	0	0	0	4,474	58,722
20-Jul	1,885	100	27	5	1	1	0	0	0	0	0	6	2,025	60,747
21-Jul	2,558	250	37	2	0	2	1	0	0	0	0	0	2,850	63,597
22-Jul	1,952	121	27	1	1	3	3	1	0	0	0	0	2,109	65,706
23-Jul	1,834	141	14	4	2	2	1	0	0	0	0	0	1,998	67,704
24-Jul	1,642	116	14	0	0	0	0	0	0	0	0	0	1,772	69,476
25-Jul	2,737	391	56	8	2	0	0	2	0	0	0	0	3,196	72,672
26-Jul	2,441	699	66	8	2	0	0	1	0	0	0	0	3,217	75,889
27-Jul	1,242	625	73	5	0	0	1	0	0	0	0	0	1,946	77,835
28-Jul	735	449	43	5	2	0	0	0	0	0	0	0	1,234	79,069
29-Jul	1,196	450	53	2	0	0	8	1	0	0	0	0	1,710	80,779
30-Jul	500	951	254	25	5	3	1	0	2	0	0	0	1,741	82,520
31-Jul	399	938	432	130	63	63	28	38	19	15	29	37	2,191	84,711
1-Aug	242	186	332	200	126	140	81	85	50	53	76	99	1,670	86,381
2-Aug	46	193	245	163	141	257	132	160	75	88	95	191	1,786	88,167
3-Aug	3	2	74	97	254	695	328	312	161	114	108	129	2,277	90,444
Total	57,229	16,066	7,515	3,362	1,993	1,498	690	655	334	290	327	485	90,444	

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Appendix A.34. Crescent River south bank sonar counts by sector. 27 June through 3 August, 2003.

Date	Counts by Sector												Daily Total	Cum Total
	1	2	3	4	5	6	7	8	9	10	11	12		
27-Jun	717	20	25	2	0	0	0	0	0	0	0	0	764	764
28-Jun	764	31	13	4	0	0	0	0	0	0	0	1	813	1,577
29-Jun	744	67	20	7	6	8	9	11	17	2	1	1	893	2,470
30-Jun	430	8	9	0	0	0	0	0	0	0	0	0	447	2,917
1-Jul	415	5	0	0	0	0	0	1	0	0	1	0	428	3,345
2-Jul	462	37	3	0	0	0	0	0	0	3	2	13	520	3,865
3-Jul	584	50	2	0	0	0	0	0	0	0	0	7	643	4,508
4-Jul	1,530	18	1	0	0	1	0	0	0	0	0	3	1,553	6,061
5-Jul	1,222	82	9	0	0	0	0	0	0	0	0	4	1,317	7,378
6-Jul	1,525	17	0	0	0	0	0	0	0	0	0	0	1,542	8,920
7-Jul	3,617	64	4	0	0	0	0	0	0	0	0	0	3,685	12,605
8-Jul	1,154	35	0	0	0	0	0	0	0	0	0	0	1,189	13,794
9-Jul	959	26	1	0	0	0	0	0	0	0	0	0	986	14,780
10-Jul	1,027	8	1	0	0	0	0	0	0	0	0	0	1,036	15,816
11-Jul	313	3	0	0	0	0	0	0	0	0	0	0	316	16,132
12-Jul	1,315	16	0	0	0	0	0	0	0	0	0	0	1,331	17,463
13-Jul	4,784	229	58	10	0	0	0	0	0	0	0	0	5,081	22,544
14-Jul	2,290	234	40	1	0	0	0	0	0	0	0	0	2,565	25,109
15-Jul	1,916	154	18	0	0	0	0	0	0	0	0	0	2,088	27,197
16-Jul	2,870	73	29	6	37	0	0	1	0	0	0	0	3,018	30,215
17-Jul	1,767	37	8	3	0	0	0	0	0	0	0	0	1,815	32,030
18-Jul	2,764	231	37	20	8	2	0	0	0	0	0	0	3,062	35,092
19-Jul	1,206	87	23	13	7	0	0	0	0	0	0	0	1,336	36,428
20-Jul	1,098	94	47	16	5	6	0	1	1	0	0	0	1,268	37,696
21-Jul	1,361	140	50	43	22	13	1	0	2	0	14	0	1,646	39,342
22-Jul	911	49	45	65	40	12	0	0	0	0	1	0	1,123	40,465
23-Jul	814	38	21	28	19	18	0	4	0	0	0	0	942	41,407
24-Jul	524	10	16	1	0	0	5	0	0	11	2	4	573	41,980
25-Jul	305	9	2	3	8	0	0	0	0	0	2	1	330	42,310
26-Jul	891	4	0	3	2	0	0	0	0	0	0	0	900	43,210
27-Jul	743	0	0	0	0	0	0	0	0	0	0	0	743	43,953
28-Jul	450	0	0	0	0	0	0	0	0	0	0	0	450	44,403
29-Jul	662	1	0	0	0	0	0	0	0	0	0	0	663	45,066
30-Jul	620	2	0	0	0	0	0	0	0	0	0	0	622	45,688
31-Jul	924	3	0	0	0	0	0	0	0	0	0	0	927	46,615
1-Aug	456	1	0	0	0	0	0	0	0	0	0	0	457	47,072
2-Aug	399	2	0	0	0	0	0	0	0	0	0	0	401	47,473
3-Aug	307	1	0	0	0	0	0	0	0	0	0	1	309	47,782
Total	44,840	1,888	482	225	154	60	15	18	20	16	23	41	47,782	

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Appendix A.35. Crescent River north bank sonar counts by sector, 27 June through 3 August, 2003.
 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	12.3	28.5	33.9	16.7	7.2	1.3	0.0	0.0	0.0	0.0	0.0	0.0	100.0
28-Jun	6.5	15.5	36.5	21.8	14.1	3.9	1.2	0.2	0.1	0.1	0.1	0.2	100.0
29-Jun	7.8	16.5	36.2	21.3	12.6	2.8	1.3	0.7	0.5	0.2	0.1	0.1	100.0
30-Jun	26.4	35.4	22.6	9.4	3.9	1.0	0.4	0.3	0.1	0.2	0.1	0.1	100.0
1-Jul	71.5	17.2	8.1	2.0	0.9	0.2	0.1	0.0	0.0	0.0	0.0	0.0	100.0
2-Jul	77.0	11.6	9.0	2.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	100.0
3-Jul	64.6	21.5	9.1	2.6	1.0	0.1	0.0	0.0	0.0	0.1	0.6	0.3	100.0
4-Jul	75.1	20.9	3.6	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	100.0
5-Jul	95.3	3.9	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
6-Jul	97.2	2.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
7-Jul	95.0	4.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
8-Jul	85.4	13.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
9-Jul	94.5	5.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
10-Jul	90.0	8.1	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	100.0
11-Jul	73.7	21.3	2.7	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	100.0
12-Jul	94.2	5.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
13-Jul	76.5	21.3	1.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
14-Jul	75.9	14.8	6.5	2.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100.0
15-Jul	65.3	28.5	5.0	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
16-Jul	67.7	26.2	5.3	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
17-Jul	84.3	14.1	1.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
18-Jul	75.3	21.9	2.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
19-Jul	87.9	10.6	1.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
20-Jul	93.1	4.9	1.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	100.0
21-Jul	89.8	8.8	1.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
22-Jul	92.6	5.7	1.3	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	100.0
23-Jul	91.8	7.1	0.7	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	100.0
24-Jul	92.7	6.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
25-Jul	85.6	12.2	1.8	0.3	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	100.0
26-Jul	75.9	21.7	2.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
27-Jul	63.8	32.1	3.8	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	100.0
28-Jul	59.6	36.4	3.5	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
29-Jul	69.9	26.3	3.1	0.1	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.0	100.0
30-Jul	28.7	54.6	14.6	1.4	0.3	0.2	0.1	0.0	0.1	0.0	0.0	0.0	100.0
31-Jul	18.2	42.8	19.7	5.9	2.9	2.9	1.3	1.7	0.9	0.7	1.3	1.7	100.0
1-Aug	14.5	11.1	19.9	12.0	7.5	8.4	4.9	5.1	3.0	3.2	4.6	5.9	100.0
2-Aug	2.6	10.8	13.7	9.1	7.9	14.4	7.4	9.0	4.2	4.9	5.3	10.7	100.0
3-Aug	0.1	0.1	3.2	4.3	11.2	30.5	14.4	13.7	7.1	5.0	4.7	5.7	100.0
Total	63.3	17.8	8.3	3.7	2.2	1.7	0.8	0.7	0.4	0.3	0.4	0.5	100.0

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Appendix A.36. Crescent River south bank sonar counts by sector, 27 June through 3 August, 2003.
 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	93.8	2.6	3.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
28-Jun	94.0	3.8	1.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	100.0
29-Jun	83.3	7.5	2.2	0.8	0.7	0.9	1.0	1.2	1.9	0.2	0.1	0.1	100.0
30-Jun	96.2	1.8	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
1-Jul	97.0	1.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	1.4	100.0
2-Jul	88.8	7.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.4	2.5	100.0
3-Jul	90.8	7.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	100.0
4-Jul	98.5	1.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	100.0
5-Jul	92.8	6.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	100.0
6-Jul	98.9	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
7-Jul	98.2	1.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
8-Jul	97.1	2.9	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	2.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
10-Jul	99.1	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
11-Jul	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
12-Jul	98.8	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
13-Jul	94.2	4.5	1.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
14-Jul	89.3	9.1	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
15-Jul	91.8	7.4	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
16-Jul	95.1	2.5	1.0	0.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
17-Jul	97.4	2.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
18-Jul	90.3	7.5	1.2	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
19-Jul	90.3	6.5	1.7	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
20-Jul	86.6	7.4	3.7	1.3	0.4	0.5	0.0	0.1	0.1	0.0	0.0	0.0	100.0
21-Jul	82.7	8.5	3.0	2.6	1.3	0.8	0.1	0.0	0.1	0.0	0.9	0.0	100.0
22-Jul	81.1	4.4	4.0	5.8	3.6	1.1	0.0	0.0	0.0	0.0	0.1	0.0	100.0
23-Jul	86.4	4.0	2.2	3.0	2.0	1.9	0.0	0.4	0.0	0.0	0.0	0.0	100.0
24-Jul	91.4	1.7	2.8	0.2	0.0	0.0	0.9	0.0	0.0	1.9	0.3	0.7	100.0
25-Jul	92.4	2.7	0.6	0.9	2.4	0.0	0.0	0.0	0.0	0.0	0.6	0.3	100.0
26-Jul	99.0	0.4	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
27-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
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	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
30-Jul	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
31-Jul	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
1-Aug	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
2-Aug	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
3-Aug	99.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	100.0
Total	95.8	4.0	1.0	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	100.0

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Appendix A. 37. Minimum and maximum daily counting ranges for both banks of the Crescent river and range from transducer where a minimum of 80% of the migration occurred in 2003.

Date	North Bank			Range where > 80% of migration occurred (m)	Sectors where > 80% of migration occurred	South Bank			Range where > 80% of migration occurred (m)	Sectors where > 80% of migration occurred
	Counting Range (Sectors 1-12) (ft)	Average Sector Width (m)	Average Sector Width (m)			Counting Range (All Sectors) (ft)	Average Sector Width (m)	Average Sector Width (m)		
27-Jun	11	3.4	0.3	1.1	1 - 4	50	15.2	1.3	1.3	1 - 1
28-Jun	11	3.4	0.3	1.1	1 - 4	50	15.2	1.3	1.3	1 - 1
29-Jun	11	3.4	0.3	1.1	1 - 4	50	15.2	1.3	1.3	1 - 1
30-Jun	11	3.4	0.3	0.8	1 - 3	50	15.2	1.3	1.3	1 - 1
1-Jul	11	3.4	0.3	0.6	1 - 2	50	15.2	1.3	1.3	1 - 1
2-Jul	11	3.4	0.3	0.6	1 - 2	50	15.2	1.3	1.3	1 - 1
3-Jul	11	3.4	0.3	0.6	1 - 2	50	15.2	1.3	1.3	1 - 1
4-Jul	11	3.4	0.3	0.6	1 - 2	50	15.2	1.3	1.3	1 - 1
5-Jul	11	3.4	0.3	0.3	1 - 1	50	15.2	1.3	1.3	1 - 1
5-Jul	14	4.3	0.4	0.4	1 - 1					
6-Jul	17	5.2	0.4	0.4	1 - 1	40	12.2	1.0	1.0	1 - 1
7-Jul	17	5.2	0.4	0.4	1 - 1	40	12.2	1.0	1.0	1 - 1
8-Jul	17	5.2	0.4	0.4	1 - 1	40	12.2	1.0	1.0	1 - 1
9-Jul	16	4.9	0.4	0.4	1 - 1	40	12.2	1.0	1.0	1 - 1
10-Jul	12	3.7	0.3	0.3	1 - 1	40	12.2	1.0	1.0	1 - 1
11-Jul	10	3.0	0.3	0.5	1 - 2	40	12.2	1.0	1.0	1 - 1
11-Jul	15	4.6	0.4	0.8	1 - 2					1 - 1
12-Jul	20	6.1	0.5	0.5	1 - 1	40	12.2	1.0	1.0	1 - 1
13-Jul	12	3.7	0.3	0.6	1 - 2	40	12.2	1.0	1.0	1 - 1
14-Jul	12	3.7	0.3	0.6	1 - 2	40	12.2	1.0	1.0	1 - 1
15-Jul	12	3.7	0.3	0.6	1 - 2	40	12.2	1.0	1.0	1 - 1
16-Jul	12	3.7	0.3	0.6	1 - 2	40	12.2	1.0	1.0	1 - 1
17-Jul	12	3.7	0.3	0.3	1 - 1	35	10.7	0.9	0.9	1 - 1
17-Jul	14	4.3	0.4	0.4	1 - 1					
18-Jul	12	3.7	0.3	0.6	1 - 2	35	10.7	0.9	0.9	1 - 1
18-Jul	15	4.6	0.4	0.8	1 - 2	34	10.4	0.9	0.9	1 - 1
19-Jul	15	4.6	0.4	0.4	1 - 1	34	10.4	0.9	0.9	1 - 1
20-Jul	15	4.6	0.4	0.4	1 - 1	34	10.4	0.9	0.9	1 - 1
21-Jul	15	4.6	0.4	0.4	1 - 1	34	10.4	0.9	0.9	1 - 1
22-Jul	15	4.6	0.4	0.4	1 - 1	34	10.4	0.9	0.9	1 - 1
22-Jul						35	10.7	0.9	0.9	1 - 1
23-Jul	15	4.6	0.4	0.4	1 - 1	35	10.7	0.9	0.9	1 - 1
24-Jul	15	4.6	0.4	0.4	1 - 1	35	10.7	0.9	0.9	1 - 1
25-Jul	15	4.6	0.4	0.4	1 - 1	33	10.1	0.8	0.8	1 - 1
26-Jul	15	4.6	0.4	0.8	1 - 2	33	10.1	0.8	0.8	1 - 1
26-Jul						35	10.7	0.9	0.9	1 - 1
27-Jul	15	4.6	0.4	0.8	1 - 2	35	10.7	0.9	0.9	1 - 1
28-Jul	15	4.6	0.4	0.8	1 - 2	35	10.7	0.9	0.9	1 - 1
29-Jul	15	4.6	0.4	0.8	1 - 2	35	10.7	0.9	0.9	1 - 1
30-Jul	15	4.6	0.4	0.8	1 - 2	35	10.7	0.9	0.9	1 - 1
31-Jul	15	4.6	0.4	1.1	1 - 3	35	10.7	0.9	0.9	1 - 1
1-Aug	15	4.6	0.4	3.0	1 - 8	36	11.0	0.9	0.9	1 - 1
2-Aug	15	4.6	0.4	3.8	1 - 10	36	11.0	0.9	0.9	1 - 1
3-Aug	15	4.6	0.4	3.4	1 - 9	36	11.0	0.9	0.9	1 - 1
Average		~4 m.				Average	~12 m.			FN: 03C 1gRge.xls

Appendix A.38. Estimated salmon escapement adjacent to the north bank of the Yentna River, 7 July through 6 August, 2003.

Date	Sockeye		Pink		Chum		Coho		Chinook		Other*	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7-Jul	233	233	213	213	42	42	0	0	0	0	0	0
8-Jul	196	429	178	391	36	78	0	0	0	0	0	0
9-Jul	212	641	75	466	15	93	91	91	45	45	15	15
10-Jul	76	717	189	656	0	93	38	129	0	45	38	53
11-Jul	37	754	54	710	55	148	18	147	37	82	0	53
12-Jul	80	834	197	907	55	203	12	159	0	82	6	59
13-Jul	1,273	2,106	704	1,611	136	339	114	273	0	82	0	59
14-Jul	6,222	8,328	2,735	4,346	451	790	451	724	0	82	30	89
15-Jul	4,774	13,102	3,011	7,357	370	1,160	341	1,065	0	82	85	174
16-Jul	2,900	16,002	3,074	10,431	435	1,595	87	1,152	0	82	29	203
17-Jul	953	16,955	1,163	11,594	57	1,652	57	1,209	0	82	0	203
18-Jul	1,595	18,551	1,273	12,867	145	1,797	65	1,274	0	82	32	235
19-Jul	3,622	22,172	1,207	14,074	251	2,049	251	1,525	0	82	50	285
20-Jul	7,899	30,072	2,728	16,803	508	2,557	666	2,192	32	113	0	285
21-Jul	6,491	36,563	4,457	21,260	822	3,379	519	2,711	0	113	0	285
22-Jul	2,737	39,300	4,770	26,030	684	4,063	684	3,395	20	133	0	285
23-Jul	1,188	40,487	4,727	30,757	466	4,529	419	3,814	0	133	23	308
24-Jul	1,052	41,539	2,701	33,459	192	4,721	143	3,957	12	145	0	308
25-Jul	1,778	43,317	1,915	35,374	562	5,283	264	4,221	0	145	0	308
26-Jul	2,665	45,982	2,968	38,341	560	5,843	379	4,600	0	145	0	308
27-Jul	558	46,540	2,616	40,957	385	6,229	264	4,863	10	155	0	308
28-Jul	404	46,943	817	41,774	59	6,288	39	4,903	0	155	0	308
29-Jul	489	47,432	989	42,763	72	6,359	48	4,950	0	155	0	308
30-Jul	750	48,183	980	43,744	280	6,639	240	5,190	0	155	0	308
31-Jul	764	48,947	2,048	45,792	275	6,914	408	5,598	0	155	0	308
1-Aug	1,116	50,063	3,333	49,125	807	7,722	670	6,268	0	155	17	325
2-Aug	517	50,610	2,900	52,025	592	8,313	370	6,638	0	155	30	355
3-Aug	650	51,260	3,472	55,496	589	8,902	528	7,166	0	155	41	396
4-Aug	176	51,436	2,149	57,646	782	9,684	449	7,616	20	175	59	454
5-Aug	730	52,166	2,591	60,237	1,132	10,816	377	7,993	0	175	126	580
6-Aug	645	52,811	2,882	63,118	688	11,504	387	8,380	43	218	215	795

*Other includes whitefish, rainbow trout and/or longnose sucker.

Appendix A.39. Estimated salmon escapement adjacent to the south bank of the Yentna River, 7 July through 6 August, 2003.

Date	Sockeye		Pink		Chum		Coho		Chinook		Other*	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
7-Jul	454	454	69	69	0	0	39	39	10	10	0	0
8-Jul	343	797	79	148	13	13	46	85	0	10	0	0
9-Jul	309	1,106	58	206	26	39	6	92	7	17	0	0
10-Jul	644	1,750	239	445	27	66	10	102	18	35	0	0
11-Jul	771	2,521	533	978	94	160	42	144	0	35	0	0
12-Jul	786	3,307	733	1,711	138	298	53	197	11	46	0	0
13-Jul	3,798	7,105	1,032	2,743	129	427	258	455	14	61	14	14
14-Jul	7,284	14,389	1,771	4,514	506	933	615	1,069	18	79	0	14
15-Jul	7,234	21,623	3,044	7,558	491	1,424	687	1,757	33	112	16	31
16-Jul	5,499	27,122	3,377	10,935	441	1,865	424	2,181	0	112	0	31
17-Jul	3,062	30,184	2,420	13,355	227	2,092	178	2,359	0	112	0	31
18-Jul	8,323	38,507	2,208	15,563	456	2,548	1,320	3,678	0	112	0	31
19-Jul	6,521	45,028	1,462	17,025	395	2,943	711	4,389	0	112	0	31
20-Jul	13,328	58,356	3,467	20,492	578	3,521	1,348	5,738	0	112	0	31
21-Jul	15,508	73,864	8,637	29,129	1,130	4,651	2,503	8,241	0	112	0	31
22-Jul	9,418	83,282	9,069	38,198	641	5,292	1,779	10,019	29	141	0	31
23-Jul	3,805	87,088	7,779	45,976	690	5,982	1,716	11,735	19	160	0	31
24-Jul	6,385	93,473	6,778	52,754	785	6,767	1,570	13,305	26	186	0	31
25-Jul	4,714	98,187	2,940	55,694	362	7,129	1,133	14,439	0	186	0	31
26-Jul	2,914	101,101	1,639	57,333	236	7,365	471	14,910	0	186	0	31
27-Jul	4,882	105,983	6,439	63,772	1,197	8,562	2,982	17,893	19	205	0	31
28-Jul	3,433	109,416	2,969	66,741	278	8,840	1,021	18,913	0	205	0	31
29-Jul	2,361	111,777	751	67,492	88	8,928	419	19,332	0	205	0	31
30-Jul	1,294	113,071	1,697	69,190	253	9,181	835	20,167	0	205	0	31
31-Jul	2,254	115,325	4,570	73,760	317	9,498	905	21,072	0	205	0	31
1-Aug	4,720	120,045	6,551	80,311	1,628	11,126	3,214	24,286	0	205	0	31
2-Aug	3,437	123,482	8,988	89,299	1,409	12,534	3,015	27,300	0	205	0	31
3-Aug	1,825	125,307	6,793	96,091	1,825	14,360	4,099	31,399	30	235	120	151
4-Aug	987	126,294	4,547	100,638	2,093	16,453	2,791	34,191	0	235	24	175
5-Aug	606	126,900	2,072	102,710	1,268	17,721	1,268	35,459	14	249	14	189
6-Aug	1,102	128,002	1,556	104,266	1,124	18,845	1,383	36,842	0	249	0	189

*Other includes white fish, rainbow trout and/or longnose sucker.

Appendix A.40. Yentna River north bank sonar counts by hour, 7 July through 6 August 2003.

Date	Counts by Hour																								Daily Total	Cum 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	17	25	29	16	62	33	40	18	28	7	28	14	40	7	6	8	8	13	14	20	14	8	8	25	488	488
8-Jul	14	31	28	22	6	11	20	10	7	16	21	17	17	10	14	8	19	28	17	24	5	20	29	16	410	898
9-Jul	9	30	21	21	11	23	8	15	6	11	19	27	10	30	19	14	10	33	16	14	16	47	20	24	454	1,352
10-Jul	17	17	10	7	17	6	14	4	0	17	36	20	10	19	10	15	31	21	4	14	11	14	7	20	341	1,693
11-Jul	21	23	16	9	9	3	5	1	1	9	8	8	8	3	7	12	12	8	9	9	4	3	6	7	201	1,894
12-Jul	6	12	12	12	12	10	18	4	13	12	6	7	17	6	7	7	19	15	24	18	24	28	30	32	351	2,245
13-Jul	50	30	70	49	25	56	57	29	55	57	61	128	87	63	59	54	150	129	58	133	129	121	268	309	2,227	4,472
14-Jul	408	413	333	346	368	326	242	119	137	563	556	577	553	617	274	226	511	723	508	396	301	346	564	482	9,889	14,361
15-Jul	554	514	404	371	289	323	218	241	191	177	229	337	546	263	160	362	399	575	251	208	367	598	606	398	8,581	22,942
16-Jul	409	356	453	344	327	259	210	199	186	258	287	266	365	280	300	222	370	362	241	160	142	193	185	151	6,525	29,467
17-Jul	160	124	143	122	93	93	140	57	78	37	106	92	70	81	111	59	73	114	156	53	64	69	85	50	2,230	31,697
18-Jul	95	66	77	91	97	124	74	94	102	138	150	203	148	125	133	113	172	198	180	136	218	80	126	170	3,110	34,807
19-Jul	254	281	205	164	167	163	121	222	269	237	55	220	150	178	60	82	381	224	116	93	193	512	544	494	5,382	40,189
20-Jul	432	573	366	466	494	675	484	138	166	355	483	702	840	331	419	368	297	594	386	311	763	892	602	696	11,833	52,022
21-Jul	548	751	627	480	387	352	166	59	226	431	421	917	740	767	148	273	435	479	164	210	1,050	1,377	884	398	12,290	64,312
22-Jul	316	285	251	256	221	229	174	139	215	378	391	500	627	395	221	555	644	652	786	344	185	265	474	393	8,896	73,208
23-Jul	326	286	245	199	205	222	196	105	141	394	357	347	392	283	158	130	303	371	341	159	357	611	431	264	6,823	80,031
24-Jul	329	262	277	212	242	196	209	117	126	201	177	158	234	102	90	69	206	188	166	66	58	127	156	132	4,100	84,131
25-Jul	242	81	151	128	98	104	141	83	71	142	261	166	164	95	133	186	305	502	222	205	290	247	249	253	4,519	88,650
26-Jul	237	269	200	224	250	206	200	130	192	320	317	372	242	183	380	450	394	318	129	102	308	417	329	402	6,571	95,221
27-Jul	391	405	296	244	171	118	121	76	96	109	149	173	105	112	85	132	214	190	112	88	68	197	103	78	3,833	99,054
28-Jul	99	87	86	97	103	85	66	59	42	32	58	36	37	55	40	21	38	36	46	39	25	57	33	42	1,319	100,373
29-Jul	40	29	45	25	16	26	47	82	66	58	78	59	74	102	138	71	52	112	73	95	74	113	78	44	1,597	101,970
30-Jul	76	67	44	53	31	34	41	53	45	85	99	117	102	154	142	159	114	136	98	101	128	101	186	85	2,251	104,221
31-Jul	95	90	116	140	94	92	94	63	51	152	138	210	181	70	94	70	168	171	88	143	168	353	259	395	3,495	107,716
1-Aug	482	419	344	264	323	268	271	193	148	286	269	259	150	137	217	238	196	197	146	246	120	120	316	334	5,943	113,659
2-Aug	237	275	210	250	225	217	230	184	74	75	166	240	192	90	137	192	138	203	190	204	166	168	165	210	4,438	118,097
3-Aug	163	213	318	314	291	200	194	80	127	167	230	174	123	65	218	371	237	365	364	95	146	151	321	352	5,279	123,376
4-Aug	224	238	284	234	168	132	136	68	48	112	92	141	130	99	78	89	73	163	106	101	55	259	288	319	3,634	127,010
5-Aug	316	350	303	263	245	229	158	132	128	164	176	213	194	175	138	116	240	221	364	144	67	118	329	173	4,956	131,966
6-Aug	175	297	225	208	171	231	135	63	64	36	151	111	106	102	118	212	294	329	413	285	213	375	319	227	4,860	136,826
Total	6,742	6,899	6,189	5,628	5,218	5,046	4,230	2,837	3,099	5,036	5,575	6,811	6,654	4,999	4,114	4,884	6,503	7,670	5,788	4,216	5,729	7,987	7,997	6,975	136,826	

Appendix A.41. Yentna River south bank sonar counts by hour, 7 July through 6 August 2003.

Date	Counts by Hour																								Daily Total	Cum 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	27	27	19	17	22	30	17	22	15	25	24	41	34	16	36	22	24	16	25	16	40	23	16	18	572	572
8-Jul	25	15	18	23	16	20	11	9	16	17	28	21	38	53	40	12	7	21	18	12	8	8	15	30	481	1,053
9-Jul	21	13	9	10	12	12	16	18	8	6	7	12	16	10	15	14	30	29	28	21	17	22	29	30	405	1,458
10-Jul	29	30	19	38	26	36	36	29	28	42	71	47	62	34	19	32	35	59	78	49	27	18	30	65	939	2,397
11-Jul	44	52	41	52	65	46	54	24	50	75	94	91	99	50	43	90	48	86	60	36	44	58	81	57	1,440	3,837
12-Jul	61	63	55	64	57	54	54	49	75	85	63	84	77	71	69	78	78	79	89	65	77	117	69	88	1,721	5,558
13-Jul	99	83	130	109	123	167	123	90	108	102	84	213	182	162	178	334	418	395	263	180	341	455	468	439	5,246	10,804
14-Jul	459	488	427	329	358	371	255	254	232	414	414	683	609	409	312	638	551	586	325	222	608	373	464	413	10,194	20,998
15-Jul	356	291	192	265	258	330	359	217	210	260	351	489	606	571	564	474	663	871	571	672	897	907	681	450	11,505	32,503
16-Jul	595	394	486	359	377	345	300	214	359	316	407	376	411	618	689	432	771	481	363	408	313	345	202	180	9,741	42,244
17-Jul	227	210	173	179	172	122	205	99	206	253	251	192	261	188	204	223	298	329	242	323	537	427	297	268	5,886	48,130
18-Jul	450	206	186	302	236	237	291	340	578	519	615	681	821	626	609	749	977	915	614	454	362	553	454	532	12,307	60,437
19-Jul	512	484	418	403	362	424	346	234	182	281	382	342	308	364	402	227	294	370	580	638	285	368	453	431	9,090	69,527
20-Jul	373	356	490	517	512	439	540	468	389	712	507	1,045	1,046	939	804	708	1,517	1,105	532	887	1,098	1,288	1,121	1,328	18,721	88,248
21-Jul	1,245	1,164	940	986	817	813	812	746	1,153	1,228	1,395	1,634	1,649	1,682	847	1,303	1,472	1,394	722	1,384	956	1,229	1,116	1,090	27,777	116,025
22-Jul	1,125	1,003	866	750	792	741	642	493	588	854	1,085	1,108	994	813	867	1,049	1,100	651	1,016	752	911	1,182	853	701	20,936	136,961
23-Jul	668	638	561	512	514	360	424	312	496	565	783	729	794	800	666	468	600	665	583	566	397	687	646	575	14,009	150,970
24-Jul	686	566	499	458	497	538	541	441	612	608	865	812	802	572	844	865	1,022	800	738	422	681	547	574	554	15,544	166,514
25-Jul	586	503	379	268	242	440	300	258	333	302	377	459	373	407	377	561	660	604	462	327	318	164	203	246	9,149	175,663
26-Jul	194	201	117	156	72	68	89	38	79	161	198	148	168	199	293	248	283	298	275	268	306	384	466	552	5,261	180,924
27-Jul	724	766	692	523	462	496	709	448	486	515	659	611	652	601	568	821	933	734	728	698	666	727	664	636	15,519	196,443
28-Jul	509	611	400	399	440	417	331	288	342	247	321	256	322	317	292	297	246	297	244	278	266	200	220	161	7,701	204,144
29-Jul	154	119	135	56	77	89	142	152	141	119	137	140	101	128	196	180	186	203	224	165	174	193	185	223	3,619	207,763
30-Jul	156	134	114	102	109	51	162	180	131	136	137	140	212	191	230	205	211	291	165	245	236	200	182	159	4,079	211,842
31-Jul	170	179	148	136	127	130	164	165	93	134	285	366	311	249	324	237	247	770	792	592	593	594	818	422	8,016	219,858
1-Aug	680	728	590	700	609	708	630	565	683	608	488	636	269	613	491	823	780	806	563	434	918	858	927	976	16,113	236,001
2-Aug	871	829	880	861	935	847	842	802	526	539	576	835	756	674	442	646	674	670	533	465	701	676	661	607	16,848	252,849
3-Aug	660	786	724	759	679	711	513	458	614	444	731	533	438	424	431	585	611	419	402	806	690	710	847	721	14,693	267,542
4-Aug	803	821	716	659	525	529	463	362	343	371	510	391	315	365	406	559	466	342	287	263	247	240	213	10,443	277,985	
5-Aug	174	238	231	162	132	198	211	143	293	269	305	220	204	212	214	323	332	293	310	177	171	146	147	138	5,243	283,228
6-Aug	102	136	127	154	171	151	173	147	241	235	282	232	178	118	195	317	271	315	410	279	279	300	180	172	5,165	288,393
Total	12,785	12,134	10,782	10,308	9,796	9,920	9,755	8,065	9,610	10,439	12,432	13,567	13,108	12,506	11,667	13,520	15,805	14,894	12,242	12,104	13,164	14,006	13,309	12,475	288,393	

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Appendix A.42. Yentna River north bank sonar counts by hour, 7 July through 6 August, 2003. 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	5.1	5.9	3.3	12.7	6.8	8.2	3.7	5.7	1.4	5.7	2.9	8.2	1.4	1.2	1.6	1.6	2.7	2.9	4.1	2.9	1.6	1.6	5.1	100.0
8-Jul	3.4	7.6	6.8	5.4	1.5	2.7	4.9	2.4	1.7	3.9	5.1	4.1	4.1	2.4	3.4	2.0	4.6	6.8	4.1	5.9	1.2	4.9	7.1	3.9	100.0
9-Jul	2.0	6.6	4.6	4.6	2.4	5.1	1.8	3.3	1.3	2.4	4.2	5.9	2.2	6.6	4.2	3.1	2.2	7.3	3.5	3.1	3.5	10.1	4.4	5.3	100.0
10-Jul	5.0	5.0	2.9	2.1	5.0	1.8	4.1	1.2	0.0	5.0	10.6	5.9	2.9	5.6	2.9	4.4	9.1	6.2	1.2	4.1	3.2	4.1	2.1	5.9	100.0
11-Jul	10.4	11.4	8.0	4.5	4.5	1.5	2.5	0.5	0.5	4.5	4.0	4.0	4.0	1.5	3.5	6.0	6.0	4.0	4.5	4.5	2.0	1.5	3.0	3.5	100.0
11-Jul	1.7	3.4	3.4	3.4	3.4	2.8	5.1	1.1	3.7	3.4	1.7	2.0	4.8	1.7	2.0	2.0	5.4	4.3	6.8	5.1	6.8	8.0	8.5	9.1	100.0
12-Jul	2.2	1.3	3.1	2.2	1.1	2.5	2.6	1.3	2.5	2.6	2.7	5.7	3.9	2.8	2.6	2.4	6.7	5.8	2.6	6.0	5.8	5.4	12.0	13.9	100.0
13-Jul	4.1	4.2	3.4	3.5	3.7	3.3	2.4	1.2	1.4	5.7	5.6	5.8	5.6	6.2	2.8	2.3	5.2	7.3	5.1	4.0	3.0	3.5	5.7	4.9	100.0
14-Jul	6.5	6.0	4.7	4.3	3.4	3.8	2.5	2.8	2.2	2.1	2.7	3.9	6.4	3.1	1.9	4.2	4.6	6.7	2.9	2.4	4.3	7.0	7.1	4.6	100.0
15-Jul	6.3	5.5	6.9	5.3	5.0	4.0	3.2	3.0	2.9	4.0	4.4	4.1	5.6	4.3	4.6	3.4	5.7	5.5	3.7	2.5	2.2	3.0	2.8	2.3	100.0
17-Jul	7.2	5.6	6.4	5.5	4.2	4.2	6.3	2.6	3.5	1.7	4.8	4.1	3.1	3.6	5.0	2.6	3.3	5.1	7.0	2.4	2.9	3.1	3.8	2.2	100.0
18-Jul	3.1	2.1	2.5	2.9	3.1	4.0	2.4	3.0	3.3	4.4	4.8	6.5	4.8	4.0	4.3	3.6	5.5	6.4	5.8	4.4	7.0	2.6	4.1	5.5	100.0
19-Jul	4.7	5.2	3.8	3.0	3.1	3.0	2.2	4.1	5.0	4.4	1.0	4.1	2.8	3.3	1.1	1.5	7.1	4.2	2.2	1.7	3.6	9.5	10.1	9.2	100.0
20-Jul	3.7	4.8	3.1	3.9	4.2	5.7	4.1	1.2	1.4	3.0	4.1	5.9	7.1	2.8	3.5	3.1	2.5	5.0	3.3	2.6	6.4	7.5	5.1	5.9	100.0
21-Jul	4.5	6.1	5.1	3.9	3.1	2.9	1.4	0.5	1.8	3.5	3.4	7.5	6.0	6.2	1.2	2.2	3.5	3.9	1.3	1.7	8.5	11.2	7.2	3.2	100.0
22-Jul	3.6	3.2	2.8	2.9	2.5	2.6	2.0	1.6	2.4	4.2	4.4	5.6	7.0	4.4	2.5	6.2	7.2	7.3	8.8	3.9	2.1	3.0	5.3	4.4	100.0
23-Jul	4.8	4.2	3.6	2.9	3.0	3.3	2.9	1.5	2.1	5.8	5.2	5.1	5.7	4.1	2.3	1.9	4.4	5.4	5.0	2.3	5.2	9.0	6.3	3.9	100.0
24-Jul	8.0	6.4	6.8	5.2	5.9	4.8	5.1	2.9	3.1	4.9	4.3	3.9	5.7	2.5	2.2	1.7	5.0	4.6	4.0	1.6	1.4	3.1	3.8	3.2	100.0
25-Jul	5.4	1.8	3.3	2.8	2.2	2.3	3.1	1.8	1.6	3.1	5.8	3.7	3.6	2.1	2.9	4.1	6.7	11.1	4.9	4.5	6.4	5.5	5.5	5.6	100.0
26-Jul	3.6	4.1	3.0	3.4	3.8	3.1	3.0	2.0	2.9	4.9	4.8	5.7	3.7	2.8	5.8	6.8	6.0	4.8	2.0	1.6	4.7	6.3	5.0	6.1	100.0
27-Jul	10.2	10.6	7.7	6.4	4.5	3.1	3.2	2.0	2.5	2.8	3.9	4.5	2.7	2.9	2.2	3.4	5.6	5.0	2.9	2.3	1.8	5.1	2.7	2.0	100.0
28-Jul	7.5	6.6	6.5	7.1	7.8	6.4	5.0	4.5	3.2	2.4	4.4	2.7	2.8	4.2	3.0	1.6	2.9	2.7	3.5	3.0	1.9	4.3	2.5	3.2	100.0
29-Jul	2.5	1.8	2.8	1.6	1.0	1.6	2.9	5.1	4.1	3.6	4.9	3.7	4.6	6.4	8.6	4.4	3.3	7.0	4.6	5.9	4.6	7.1	4.9	2.8	100.0
30-Jul	3.4	3.0	2.0	2.4	1.4	1.5	1.8	2.4	2.0	3.8	4.4	5.2	4.5	6.8	6.3	7.1	5.1	6.0	4.4	4.5	5.7	4.5	8.3	3.8	100.0
31-Jul	2.7	2.6	3.3	4.0	2.7	2.6	2.7	1.8	1.5	4.3	3.9	6.0	5.2	2.0	2.7	2.0	4.8	4.9	2.5	4.1	4.8	10.1	7.4	11.3	100.0
1-Aug	8.1	7.1	5.8	4.4	5.4	4.5	4.6	3.2	2.5	4.8	4.5	4.4	2.5	2.3	3.7	4.0	3.3	3.3	2.5	4.1	2.0	2.0	5.3	5.6	100.0
2-Aug	5.3	6.2	4.7	5.6	5.1	4.9	5.2	4.1	1.7	1.7	3.7	5.4	4.3	2.0	3.1	4.3	3.1	4.6	4.3	4.6	3.7	3.8	3.7	4.7	100.0
3-Aug	3.1	4.0	6.0	5.9	5.5	3.8	3.7	1.5	2.4	3.2	4.4	3.3	2.3	1.2	4.1	7.0	4.5	6.9	6.9	1.8	2.8	2.9	6.1	6.7	100.0
4-Aug	6.2	6.5	7.8	6.4	4.6	3.6	3.7	1.9	1.3	3.1	2.5	3.9	3.6	2.7	2.1	2.4	2.0	4.5	2.9	2.8	1.5	7.1	7.9	8.8	100.0
5-Aug	6.4	7.1	6.1	5.3	4.9	4.6	3.2	2.7	2.6	3.3	3.6	4.3	3.9	3.5	2.8	2.3	4.8	4.5	7.3	2.9	1.4	2.4	6.6	3.5	100.0
6-Aug	3.6	6.1	4.6	4.3	3.5	4.8	2.8	1.3	1.3	0.7	3.1	2.3	2.2	2.1	2.4	4.4	6.0	6.8	8.5	5.9	4.4	7.7	6.6	4.7	100.0
Total	4.9	5.0	4.5	4.1	3.8	3.7	3.1	2.1	2.3	3.7	4.1	5.0	4.9	3.7	3.0	3.6	4.8	5.6	4.2	3.1	4.2	5.8	5.8	5.1	100.0

Appendix A.43. Yentna River south bank sonar counts by hour, 7 July through 6 August, 2003. 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	4.7	4.7	3.3	3.0	3.8	5.2	3.0	3.8	2.6	4.4	4.2	7.2	5.9	2.8	6.3	3.8	4.2	2.8	4.4	2.8	7.0	4.0	2.8	3.1	100.0
8-Jul	5.2	3.1	3.7	4.8	3.3	4.2	2.3	1.9	3.3	3.5	5.8	4.4	7.9	11.0	8.3	2.5	1.5	4.4	3.7	2.5	1.7	1.7	3.1	6.2	100.0
9-Jul	5.2	3.2	2.2	2.5	3.0	3.0	4.0	4.4	2.0	1.5	1.7	3.0	4.0	2.5	3.7	3.5	7.4	7.2	6.9	5.2	4.2	5.4	7.2	7.4	100.0
10-Jul	3.1	3.2	2.0	4.0	2.8	3.8	3.8	3.1	3.0	4.5	7.6	5.0	6.6	3.6	2.0	3.4	3.7	6.3	8.3	5.2	2.9	1.9	3.2	6.9	100.0
11-Jul	3.1	3.6	2.8	3.6	4.5	3.2	3.8	1.7	3.5	5.2	6.5	6.3	6.9	3.5	3.0	6.2	3.3	6.0	4.2	2.5	3.1	4.0	5.6	4.0	100.0
12-Jul	3.5	3.7	3.2	3.7	3.3	3.1	3.1	2.8	4.4	4.9	3.7	4.9	4.5	4.1	4.0	4.5	4.5	4.6	5.2	3.8	4.5	6.8	4.0	5.1	100.0
13-Jul	1.9	1.6	2.5	2.1	2.3	3.2	2.3	1.7	2.1	1.9	1.6	4.1	3.5	3.1	3.4	6.4	8.0	7.5	5.0	3.4	6.5	8.7	8.9	8.4	100.0
14-Jul	4.5	4.8	4.2	3.2	3.5	3.6	2.5	2.5	2.3	4.1	4.1	6.7	6.0	4.0	3.1	6.3	5.4	5.7	3.2	2.2	6.0	3.7	4.6	4.1	100.0
15-Jul	3.1	2.5	1.7	2.3	2.2	2.9	3.1	1.9	1.8	2.3	3.1	4.3	5.3	5.0	4.9	4.1	5.8	7.6	5.0	5.8	7.8	7.9	5.9	3.9	100.0
16-Jul	6.1	4.0	5.0	3.7	3.9	3.5	3.1	2.2	3.7	3.2	4.2	3.9	4.2	6.3	7.1	4.4	7.9	4.9	3.7	4.2	3.2	3.5	2.1	1.8	100.0
17-Jul	3.9	3.6	2.9	3.0	2.9	2.1	3.5	1.7	3.5	4.3	4.3	3.3	4.4	3.2	3.5	3.8	5.1	5.6	4.1	5.5	9.1	7.3	5.0	4.6	100.0
18-Jul	3.7	1.7	1.5	2.5	1.9	1.9	2.4	2.8	4.7	4.2	5.0	5.5	6.7	5.1	4.9	6.1	7.9	7.4	5.0	3.7	2.9	4.5	3.7	4.3	100.0
19-Jul	5.6	5.3	4.6	4.4	4.0	4.7	3.8	2.6	2.0	3.1	4.2	3.8	3.4	4.0	4.4	2.5	3.2	4.1	6.1	7.0	3.1	4.0	5.0	4.7	100.0
20-Jul	2.0	1.9	2.6	2.8	2.7	2.3	2.9	2.5	2.1	3.8	2.7	5.6	5.6	5.0	4.3	3.8	8.1	5.9	2.8	4.7	5.9	6.9	6.0	7.1	100.0
21-Jul	4.5	4.2	3.4	3.5	2.9	2.9	2.9	2.7	4.2	4.4	5.0	5.9	5.9	6.1	3.0	4.7	5.3	5.0	2.6	5.0	3.4	4.4	4.0	3.9	100.0
22-Jul	5.4	4.8	4.1	3.6	3.8	3.5	3.1	2.4	2.8	4.1	5.2	5.3	4.7	3.9	4.1	5.0	5.3	3.1	4.9	3.6	4.4	5.6	4.1	3.3	100.0
23-Jul	4.8	4.6	4.0	3.7	3.7	2.6	3.0	2.2	3.5	4.0	5.6	5.2	5.7	5.7	4.8	3.3	4.3	4.7	4.2	4.0	2.8	4.9	4.6	4.1	100.0
24-Jul	4.4	3.6	3.2	2.9	3.2	3.5	3.5	2.8	3.9	3.9	5.6	5.2	5.2	3.7	5.4	5.6	6.6	5.1	4.7	2.7	4.4	3.5	3.7	3.6	100.0
25-Jul	6.4	5.5	4.1	2.9	2.6	4.8	3.3	2.8	3.6	3.3	4.1	5.0	4.1	4.4	4.1	6.1	7.2	6.6	5.0	3.6	3.5	1.8	2.2	2.7	100.0
26-Jul	3.7	3.8	2.2	3.0	1.4	1.3	1.7	0.7	1.5	3.1	3.8	2.8	3.2	3.8	5.6	4.7	5.4	5.7	5.2	5.1	5.8	7.3	8.9	10.5	100.0
27-Jul	4.7	4.9	4.5	3.4	3.0	3.2	4.6	2.9	3.1	3.3	4.2	3.9	4.2	3.9	3.7	5.3	6.0	4.7	4.7	4.5	4.3	4.7	4.3	4.1	100.0
28-Jul	6.6	7.9	5.2	5.2	5.7	5.4	4.3	3.7	4.4	3.2	4.2	3.3	4.2	4.1	3.8	3.9	3.2	3.9	3.2	3.6	3.5	2.6	2.9	2.1	100.0
29-Jul	4.3	3.3	3.7	1.5	2.1	2.5	3.9	4.2	3.9	3.3	3.8	3.9	2.8	3.5	5.4	5.0	5.1	5.6	6.2	4.6	4.8	5.3	5.1	6.2	100.0
30-Jul	3.8	3.3	2.8	2.5	2.7	1.3	4.0	4.4	3.2	3.3	3.4	3.4	5.2	4.7	5.6	5.0	5.2	7.1	4.0	6.0	5.8	4.9	4.5	3.9	100.0
31-Jul	2.1	2.2	1.8	1.7	1.6	1.6	2.0	2.1	1.2	1.7	3.5	4.5	3.9	3.1	4.0	2.9	3.1	9.6	9.8	7.4	7.4	7.4	10.2	5.2	100.0
1-Aug	4.2	4.5	3.7	4.3	3.8	4.4	3.9	3.5	4.2	3.8	3.0	3.9	1.7	4.0	3.0	5.1	4.8	5.0	3.5	2.7	5.7	5.3	5.8	6.1	100.0
2-Aug	5.2	4.9	5.2	5.1	5.5	5.0	5.0	4.8	3.1	3.2	3.4	5.0	4.5	4.0	2.6	3.8	4.0	4.0	3.2	2.8	4.2	4.0	3.9	3.6	100.0
3-Aug	4.5	5.3	4.9	5.2	4.6	4.8	3.5	3.1	4.2	3.0	5.0	3.6	3.0	2.9	2.9	4.0	4.2	2.9	2.7	5.5	4.7	4.8	5.8	4.9	100.0
4-Aug	7.7	7.9	6.9	6.3	5.0	5.1	4.4	3.5	3.3	3.6	4.9	3.7	3.0	3.5	3.9	5.4	4.5	3.3	2.7	2.5	2.4	2.4	2.3	2.0	100.0
5-Aug	3.3	4.5	4.4	3.1	2.5	3.8	4.0	2.7	5.6	5.1	5.8	4.2	3.9	4.0	4.1	6.2	6.3	5.6	5.9	3.4	3.3	2.8	2.8	2.6	100.0
6-Aug	2.0	2.6	2.5	3.0	3.3	2.9	3.3	2.8	4.7	4.5	5.5	4.5	3.4	2.3	3.8	6.1	5.2	6.1	7.9	5.4	5.4	5.8	3.5	3.3	100.0
Total	4.4	4.2	3.7	3.6	3.4	3.4	3.4	2.8	3.3	3.6	4.3	4.7	4.5	4.3	4.0	4.7	5.5	5.2	4.2	4.2	4.6	4.9	4.6	4.3	100.0

Appendix A.44. Yentna River north bank sonar counts by sector. 7 July through 6 August, 2003.

Counts by Sector														
Date	1	2	3	4	5	6	7	8	9	10	11	12	Daily Total	Cum Total
7-Jul	84	239	128	28	4	4	1	0	0	0	0	0	488	488
8-Jul	38	239	109	4	4	4	2	1	1	2	2	4	410	898
9-Jul	23	215	159	34	11	8	1	1	1	1	0	0	454	1,352
10-Jul	29	135	136	22	9	5	0	1	0	1	2	1	341	1,693
11-Jul	44	82	52	12	1	0	0	1	0	0	4	5	201	1,894
12-Jul	88	101	80	35	22	15	4	0	1	0	2	3	351	2,245
13-Jul	429	608	530	293	198	89	24	16	12	10	10	8	2,227	4,472
14-Jul	1,703	3,341	2,752	1,396	473	129	33	24	6	12	17	3	9,889	14,361
15-Jul	1,229	2,934	2,635	1,240	457	51	21	6	3	1	0	4	8,581	22,942
16-Jul	973	2,543	1,897	810	222	40	17	7	5	6	4	1	6,525	29,467
17-Jul	364	979	629	230	21	2	4	0	0	0	0	1	2,230	31,697
18-Jul	427	1,065	996	378	90	48	36	19	10	19	6	16	3,110	34,807
19-Jul	459	2,299	1,527	494	177	83	81	58	67	57	47	33	5,382	40,189
20-Jul	757	6,405	3,193	974	281	98	39	9	14	21	18	24	11,833	52,022
21-Jul	848	6,565	3,507	932	311	78	16	8	5	8	6	6	12,290	64,312
22-Jul	685	4,811	2,468	670	171	53	10	4	2	8	3	11	8,896	73,208
23-Jul	618	3,464	1,768	610	193	65	39	42	5	12	4	3	6,823	80,031
24-Jul	278	1,947	1,202	357	150	41	39	49	10	4	7	16	4,100	84,131
25-Jul	927	2,018	1,258	246	53	8	5	1	0	3	0	0	4,519	88,650
26-Jul	1,712	2,591	1,663	397	82	29	12	31	21	28	4	1	6,571	95,221
27-Jul	725	1,161	1,022	518	188	80	36	24	16	25	24	14	3,833	99,054
28-Jul	242	424	327	206	70	23	14	9	1	0	1	2	1,319	100,373
29-Jul	340	609	404	148	65	16	7	4	3	0	0	1	1,597	101,970
30-Jul	372	1,021	404	218	135	54	21	8	3	6	7	2	2,251	104,221
31-Jul	804	1,728	540	187	100	66	20	9	5	22	8	6	3,495	107,716
1-Aug	1,332	2,825	1,009	292	119	82	66	42	30	76	28	42	5,943	113,659
2-Aug	914	1,985	795	227	123	103	65	41	54	56	32	43	4,438	118,097
3-Aug	820	2,297	1,194	352	212	105	58	71	33	47	50	40	5,279	123,376
4-Aug	434	1,671	790	329	137	87	47	55	26	14	25	19	3,634	127,010
5-Aug	337	2,101	1,161	741	229	142	69	62	28	29	38	19	4,956	131,966
6-Aug	302	2,144	1,203	627	232	106	71	75	26	25	37	12	4,860	136,826
Total	18,337	60,547	35,538	13,007	4,540	1,714	858	678	388	493	386	340	136,826	

IN REVISIONS

Appendix A.45. Yenma River south bank sonar counts by sector, 7 July through 6 August, 2003.

Counts by Sector														
Date	1	2	3	4	5	6	7	8	9	10	11	12	Daily Total	Cum Total
7-Jul	36	41	152	108	109	55	35	25	7	4	0	0	572	572
8-Jul	19	23	147	89	89	45	39	15	9	5	0	1	481	1,053
9-Jul	42	21	102	80	58	44	37	10	9	2	0	0	405	1,458
10-Jul	220	49	180	144	170	75	57	20	16	7	1	0	939	2,397
11-Jul	150	70	318	234	251	212	110	48	29	17	1	0	1,440	3,837
12-Jul	68	23	405	364	348	260	143	43	42	17	0	8	1,721	5,558
13-Jul	34	83	1,550	1,160	1,102	682	357	128	98	42	5	5	5,246	10,804
14-Jul	20	199	3,822	2,319	1,896	1,056	546	162	105	60	7	2	10,194	20,998
15-Jul	44	184	4,618	2,643	2,137	968	635	160	72	40	3	1	11,505	32,503
16-Jul	71	112	2,993	2,199	2,023	1,146	725	252	152	59	2	7	9,741	42,244
17-Jul	93	62	1,968	1,280	1,140	695	352	168	87	35	6	0	5,886	48,130
18-Jul	56	60	2,465	2,117	2,559	2,383	1,439	582	453	161	28	4	12,307	60,437
19-Jul	82	219	1,591	2,274	2,111	1,546	658	319	149	82	30	29	9,090	69,527
20-Jul	42	1,310	3,637	4,829	4,564	2,724	896	399	235	55	16	14	18,721	88,248
21-Jul	67	3,310	7,247	6,882	5,801	2,882	859	379	230	78	26	16	27,777	116,025
22-Jul	160	3,197	6,571	5,224	3,517	1,561	388	172	84	35	5	22	20,936	136,961
23-Jul	107	1,831	3,789	3,507	2,731	1,332	388	162	109	31	16	6	14,009	150,970
24-Jul	53	1,214	3,531	3,453	3,532	2,213	772	371	226	141	26	12	15,544	166,514
25-Jul	167	1,055	2,785	2,211	1,602	867	255	83	88	26	6	4	9,149	175,663
26-Jul	186	885	1,671	1,247	708	358	113	50	35	6	1	1	5,261	180,924
27-Jul	144	2,099	3,575	3,479	3,141	1,727	612	310	272	91	32	37	15,519	196,443
28-Jul	100	1,140	2,172	1,920	1,268	690	195	99	73	23	13	8	7,701	204,144
29-Jul	135	421	1,371	960	419	212	52	26	9	9	3	2	3,619	207,763
30-Jul	58	455	1,215	1,264	597	238	127	48	44	25	4	4	4,079	211,842
31-Jul	167	1,206	1,812	1,657	1,541	833	315	194	149	85	33	54	8,046	219,888
1-Aug	202	2,299	3,713	3,851	2,897	1,646	577	446	224	143	51	64	16,113	236,001
2-Aug	96	1,310	4,447	4,625	3,296	1,539	615	474	243	141	45	17	16,848	252,849
3-Aug	96	2,149	3,701	3,576	2,613	1,350	478	441	135	104	33	17	14,693	267,542
4-Aug	79	2,379	2,588	2,250	1,482	866	340	211	116	81	28	23	10,443	277,985
5-Aug	55	1,950	1,467	783	390	270	135	67	46	22	35	23	5,243	283,228
6-Aug	48	1,627	1,426	892	551	322	149	62	49	16	11	12	5,165	288,393
Total	2,897	30,983	77,029	67,621	54,643	30,797	12,399	5,926	3,595	1,643	467	393	288,393	

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Appendix A.46. Yenma River north bank sonar counts by sector, 7 July through 6 Augus, 2003. 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	17.2	49.0	26.2	5.7	0.8	0.8	0.2	0.0	0.0	0.0	0.0	0.0	100.0
8-Jul	9.3	58.3	26.6	1.0	1.0	1.0	0.5	0.2	0.2	0.5	0.5	1.0	100.0
9-Jul	5.1	47.4	35.0	7.5	2.4	1.8	0.2	0.2	0.2	0.2	0.0	0.0	100.0
10-Jul	8.5	39.6	39.9	6.5	2.6	1.5	0.0	0.3	0.0	0.3	0.6	0.3	100.0
11-Jul	21.9	40.8	25.9	6.0	0.5	0.0	0.0	0.5	0.0	0.0	2.0	2.5	100.0
12-Jul	25.1	28.8	22.8	10.0	6.3	4.3	1.1	0.0	0.3	0.0	0.6	0.9	100.0
13-Jul	19.3	27.3	23.8	13.2	8.9	4.0	1.1	0.7	0.5	0.4	0.4	0.4	100.0
14-Jul	17.2	33.8	27.8	14.1	4.8	1.3	0.3	0.2	0.1	0.1	0.2	0.0	100.0
15-Jul	14.3	34.2	30.7	14.5	5.3	0.6	0.2	0.1	0.0	0.0	0.0	0.0	100.0
16-Jul	14.9	39.0	29.1	12.4	3.4	0.6	0.3	0.1	0.1	0.1	0.1	0.0	100.0
17-Jul	16.3	43.9	28.2	10.3	0.9	0.1	0.2	0.0	0.0	0.0	0.0	0.0	100.0
18-Jul	13.7	34.2	32.0	12.2	2.9	1.5	1.2	0.6	0.3	0.6	0.2	0.5	100.0
19-Jul	8.5	42.7	28.4	9.2	3.3	1.5	1.5	1.1	1.2	1.1	0.9	0.6	100.0
20-Jul	6.4	54.1	27.0	8.2	2.4	0.8	0.3	0.1	0.1	0.2	0.2	0.2	100.0
21-Jul	6.9	53.4	28.5	7.6	2.5	0.6	0.1	0.1	0.0	0.1	0.0	0.0	100.0
22-Jul	7.7	54.1	27.7	7.5	1.9	0.6	0.1	0.0	0.0	0.1	0.0	0.1	100.0
23-Jul	9.1	50.8	25.9	8.9	2.8	1.0	0.6	0.6	0.1	0.2	0.1	0.0	100.0
24-Jul	6.8	47.5	29.3	8.7	3.7	1.0	1.0	1.2	0.2	0.1	0.2	0.4	100.0
25-Jul	20.5	44.7	27.8	5.4	1.2	0.2	0.1	0.0	0.0	0.1	0.0	0.0	100.0
26-Jul	26.1	39.4	25.3	6.0	1.2	0.4	0.2	0.5	0.3	0.4	0.1	0.0	100.0
27-Jul	18.9	30.3	26.7	13.5	4.9	2.1	0.9	0.6	0.4	0.7	0.6	0.4	100.0
28-Jul	18.3	32.1	24.8	15.6	5.3	1.7	1.1	0.7	0.1	0.0	0.1	0.2	100.0
29-Jul	21.3	38.1	25.3	9.3	4.1	1.0	0.4	0.3	0.2	0.0	0.0	0.1	100.0
30-Jul	16.5	45.4	17.9	9.7	6.0	2.4	0.9	0.4	0.1	0.3	0.3	0.1	100.0
31-Jul	23.0	49.4	15.5	5.4	2.9	1.9	0.6	0.3	0.1	0.6	0.2	0.2	100.0
1-Aug	22.4	47.5	17.0	4.9	2.0	1.4	1.1	0.7	0.5	1.3	0.5	0.7	100.0
2-Aug	20.6	44.7	17.9	5.1	2.8	2.3	1.5	0.9	1.2	1.3	0.7	1.0	100.0
3-Aug	15.5	43.5	22.6	6.7	4.0	2.0	1.1	1.3	0.6	0.9	0.9	0.8	100.0
4-Aug	11.9	46.0	21.7	9.1	3.8	2.4	1.3	1.5	0.7	0.4	0.7	0.5	100.0
5-Aug	6.8	42.4	23.4	15.0	4.6	2.9	1.4	1.3	0.6	0.6	0.8	0.4	100.0
6-Aug	6.2	44.1	24.8	12.9	4.8	2.2	1.5	1.5	0.5	0.5	0.8	0.2	100.0
Total	13.4	44.3	26.0	9.5	3.3	1.3	0.6	0.5	0.3	0.4	0.3	0.2	100.0

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Appendix A.47. Yentna River south bank sonar counts by sector, 7 July through 6 August, 2003. Counts expressed as percentage of daily total.

Counts by Sector													Daily Total
Date	1	2	3	4	5	6	7	8	9	10	11	12	
7-Jul	6.3	7.2	26.6	18.9	19.1	9.6	6.1	4.4	1.2	0.7	0.0	0.0	100.0
8-Jul	4.0	4.8	30.6	18.5	18.5	9.4	8.1	3.1	1.9	1.0	0.0	0.2	100.0
9-Jul	10.4	5.2	25.2	19.8	14.3	10.9	9.1	2.5	2.2	0.5	0.0	0.0	100.0
10-Jul	23.4	5.2	19.2	15.3	18.1	8.0	6.1	2.1	1.7	0.7	0.1	0.0	100.0
11-Jul	10.4	4.9	22.1	16.2	17.4	14.7	7.6	3.3	2.0	1.2	0.1	0.0	100.0
12-Jul	4.0	1.3	23.5	21.2	20.2	15.1	8.3	2.5	2.4	1.0	0.0	0.5	100.0
13-Jul	0.6	1.6	29.5	22.1	21.0	13.0	6.8	2.4	1.9	0.8	0.1	0.1	100.0
14-Jul	0.2	2.0	37.5	22.7	18.6	10.4	5.4	1.6	1.0	0.6	0.1	0.0	100.0
15-Jul	0.4	1.6	40.1	23.0	18.6	8.4	5.5	1.4	0.6	0.3	0.0	0.0	100.0
16-Jul	0.7	1.1	30.7	22.6	20.8	11.8	7.4	2.6	1.6	0.6	0.0	0.1	100.0
17-Jul	1.6	1.1	33.4	21.7	19.4	11.8	6.0	2.9	1.5	0.6	0.1	0.0	100.0
18-Jul	0.5	0.5	20.0	17.2	20.8	19.4	11.7	4.7	3.7	1.3	0.2	0.0	100.0
19-Jul	0.9	2.4	17.5	25.0	23.2	17.0	7.2	3.5	1.6	0.9	0.3	0.3	100.0
20-Jul	0.2	7.0	19.4	25.8	24.4	14.6	4.8	2.1	1.3	0.3	0.1	0.1	100.0
21-Jul	0.2	11.9	26.1	24.8	20.9	10.4	3.1	1.4	0.8	0.3	0.1	0.1	100.0
22-Jul	0.8	15.3	31.4	25.0	16.8	7.5	1.9	0.8	0.4	0.2	0.0	0.1	100.0
23-Jul	0.8	13.1	27.0	25.0	19.5	9.5	2.8	1.2	0.8	0.2	0.1	0.0	100.0
24-Jul	0.3	7.8	22.7	22.2	22.7	14.2	5.0	2.4	1.5	0.9	0.2	0.1	100.0
25-Jul	1.8	11.5	30.4	24.2	17.5	9.5	2.8	0.9	1.0	0.3	0.1	0.0	100.0
26-Jul	3.5	16.8	31.8	23.7	13.5	6.8	2.1	1.0	0.7	0.1	0.0	0.0	100.0
27-Jul	0.9	13.5	23.0	22.4	20.2	11.1	3.9	2.0	1.8	0.6	0.2	0.2	100.0
28-Jul	1.3	14.8	28.2	24.9	16.5	9.0	2.5	1.3	0.9	0.3	0.2	0.1	100.0
29-Jul	3.7	11.6	37.9	26.5	11.6	5.9	1.4	0.7	0.2	0.2	0.1	0.1	100.0
30-Jul	1.4	11.2	29.8	31.0	14.6	5.8	3.1	1.2	1.1	0.6	0.1	0.1	100.0
31-Jul	2.1	15.0	22.5	20.6	19.2	10.4	3.9	2.4	1.9	1.1	0.4	0.7	100.0
1-Aug	1.3	14.3	23.0	23.9	18.0	10.2	3.6	2.8	1.4	0.9	0.3	0.4	100.0
2-Aug	0.6	7.8	26.4	27.5	19.6	9.1	3.7	2.8	1.4	0.8	0.3	0.1	100.0
3-Aug	0.7	14.6	25.2	24.3	17.8	9.2	3.3	3.0	0.9	0.7	0.2	0.1	100.0
4-Aug	0.8	22.8	24.8	21.5	14.2	8.3	3.3	2.0	1.1	0.8	0.3	0.2	100.0
5-Aug	1.0	37.2	28.0	14.9	7.4	5.1	2.6	1.3	0.9	0.4	0.7	0.4	100.0
6-Aug	0.9	31.5	27.6	17.3	10.7	6.2	2.9	1.2	0.9	0.3	0.2	0.2	100.0
Total	1.0	10.7	26.7	23.4	18.9	10.7	4.3	2.1	1.2	0.6	0.2	0.1	100.0

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Appendix A.48. Minimum and maximum daily counting ranges for both banks of the Yentna river and range from transducer where a minimum of 80% of the migration occurred in 2005.

Date	North Bank			Range where > 80% of migration occurred (m)	Sectors where > 80% of migration occurred	South Bank			Range where > 80% of migration occurred (m)	Sectors where > 80% of migration occurred
	Counting Range (Sectors 1-12) (ft)	Average Sector (m)	Width (m)			Counting Range (Sectors 1-12) (ft)	Average Sector (m)	Width (m)		
7-Jul	37	11.3	0.9	2.8	1 - 3	30	9.1	0.8	4.6	1 - 6
8-Jul	38	11.6	1.0	2.9	1 - 3	30	9.1	0.8	4.6	1 - 6
9-Jul	39	11.9	1.0	3.0	1 - 3	30	9.1	0.8	4.6	1 - 6
9-Jul						28	8.4	0.7	4.2	1 - 6
10-Jul	40	12.2	1.0	3.0	1 - 3	30	9.1	0.8	3.8	1 - 5
10-Jul	37	11.1	0.9	2.8	1 - 3					
11-Jul	34	10.4	0.9	2.6	1 - 3					
11-Jul	40	12.2	1.0	3.0	1 - 3	30	9.1	0.8	4.6	1 - 6
12-Jul	40	12.2	1.0	4.1	1 - 4					
12-Jul	29	8.7	0.7	2.9	1 - 4	30	9.1	0.8	4.6	1 - 6
13-Jul	29	8.7	0.7	2.9	1 - 4					
13-Jul	30	9.1	0.8	3.0	1 - 4	30	9.1	0.8	4.6	1 - 6
14-Jul	30	9.1	0.8	3.0	1 - 4	29	8.8	0.7	4.4	1 - 6
15-Jul	30	9.1	0.8	3.0	1 - 4	29	8.8	0.7	3.7	1 - 5
15-Jul						30	9.1	0.8	3.8	1 - 5
16-Jul	30	9.1	0.8	2.3	1 - 3	29	8.8	0.7	3.7	1 - 5
16-Jul	34	10.4	0.9	2.6	1 - 3	30	9.1	0.8	4.6	1 - 6
17-Jul	35	10.7	0.9	2.7	1 - 3					
18-Jul						30	9.1	0.8	4.6	1 - 6
18-Jul	35	10.7	0.9	3.6	1 - 4	30	9.0	0.7	4.5	1 - 6
18-Jul	30	9.1	0.8	3.0	1 - 4	30	9.0	0.7	5.2	1 - 7
19-Jul	34	10.4	0.9	3.5	1 - 4					
19-Jul						30	9.0	0.7	4.5	1 - 6
20-Jul	34	10.4	0.9	2.6	1 - 3	27	8.2	0.7	4.1	1 - 6
20-Jul						30	9.0	0.7	4.5	1 - 6
20-Jul						27	8.2	0.7	4.1	1 - 6
21-Jul	34	10.4	0.9	2.6	1 - 3	27	8.2	0.7	3.4	1 - 5
21-Jul						29	8.8	0.7	3.7	1 - 5
22-Jul	34	10.4	0.9	2.6	1 - 3	29	8.8	0.7	3.7	1 - 5
22-Jul						27	8.2	0.7	3.4	1 - 5
23-Jul	34	10.4	0.9	2.6	1 - 3	27	8.2	0.7	3.4	1 - 5
23-Jul	36	11.0	0.9	2.7	1 - 3					
24-Jul	36	11.0	0.9	2.7	1 - 3					
24-Jul						27	8.2	0.7	4.1	1 - 6
25-Jul	36	11.0	0.9	2.7	1 - 3	27	8.1	0.7	4.0	1 - 6
25-Jul	40	12.2	1.0	3.0	1 - 3	27	8.2	0.7	3.4	1 - 5
26-Jul	40	12.2	1.0	3.0	1 - 3					
26-Jul	31	9.4	0.8	2.4	1 - 3	27	8.2	0.7	3.4	1 - 5
27-Jul	31	9.4	0.8	3.1	1 - 4					
27-Jul	30	9.0	0.7	3.0	1 - 4	27	8.2	0.7	3.4	1 - 5
28-Jul	30	9.0	0.7	3.0	1 - 4	28	8.4	0.7	3.5	1 - 5
28-Jul	30	9.1	0.8	3.0	1 - 4	28	8.4	0.7	3.5	1 - 5
29-Jul	30	9.1	0.8	2.3	1 - 3					
29-Jul						27	8.2	0.7	3.4	1 - 5
30-Jul	30	9.1	0.8	3.0	1 - 4	28	8.4	0.7	3.5	1 - 5
30-Jul	29	8.7	0.7	2.9	1 - 4	27	8.2	0.7	3.4	1 - 5
31-Jul	29	8.7	0.7	2.2	1 - 3					
31-Jul	30	9.1	0.8	2.3	1 - 3	27	8.2	0.7	4.1	1 - 6
1-Aug	29	8.8	0.7	2.2	1 - 3				0.0	1 - 6
1-Aug	34	10.2	0.9	2.6	1 - 3	27	8.2	0.7	3.4	1 - 5
2-Aug	33	10.1	0.8	2.5	1 - 3					
3-Aug	33	10.1	0.8	2.5	1 - 3	27	8.2	0.7	3.4	1 - 5
3-Aug	29	8.8	0.7	2.2	1 - 3	21	6.4	0.5	2.7	1 - 5
4-Aug	29	8.8	0.7	2.9	1 - 4	21	6.4	0.5	2.7	1 - 5
4-Aug	31	9.4	0.8	3.1	1 - 4					
5-Aug	29	8.8	0.7	2.9	1 - 4	21	6.4	0.5	2.1	1 - 4
6-Aug	29	8.8	0.7	2.9	1 - 4	21	6.4	0.5	2.7	1 - 5

Average - 10 m.

Average - 8 m.

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