# KOGRUKLUK RIVER WEIR SALMON STUDIES, 2003

By

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## ABSTRACT

The Holitna River is a major tributary of the Kuskokwim River and is one of the largest salmon-producing tributaries in the drainage. In 1976, the Alaska Department of Fish and Game established a weir on the Kogrukluk River, the main branch of the upper Holitna River, approximately 750 km from the mouth of the Kuskokwim River. In 2003, the weir was operational from 20 June to 21 September. The estimated total annual chinook salmon escapement of 11,771 fish was above the sustainable escapement goal (SEG) of 10,000 fish. Total annual chum salmon escapement was 23,413, below the SEG of 30,000 fish. Total annual sockeye salmon escapement was 9,164, below the recent 10-year average of about 12,000 fish. The total annual coho salmon escapement of 74,604 exceeded all previous years' escapements and was well above the SEG of 25,000 fish. The age, sex, and length (ASL) composition of total annual chinook, chum, and coho salmon escapements were estimated. Carcass washout rate and timing by species was monitored, and variability in stream hydrological and climatic conditions was recorded. The crew collected information in association with three salmon tagging projects, one operated on the lower Holitna River and two projects conducted on the mainstem Kuskokwim River.



KEY WORDS: Kuskokwim River, Holitna River, Kogrukluk River, escapement, chinook salmon (*Oncorhynchus tshawytscha),* chum salmon (*O. keta*), coho salmon (*O. kisutch*), sockeye salmon (*O. nerka*), mark-recapture, radio telemetry.

# INTRODUCTION

The Kuskokwim River is the second largest river in Alaska, draining an area approximately 130,000 $km^2$ (Figure 1; Brown 1983). Each year mature Pacific salmon *Oncorhynchus spp* return to the river and its tributaries to spawn, supporting important subsistence and commercial fisheries throughout the drainage. Subsistence harvests remain a fundamental component of local culture, and the subsistence salmon fishery in the Kuskokwim Area is one of the largest and most important in the state (Coffing 1991, 1997a, 1997b; Coffing et al. 2000; Ward et al. 2003). The commercial salmon fishery, though modest in value compared to other areas of Alaska, has been an important component of the market economy of lower Kuskokwim River communities (Buklis 1999, Burkey et al. 2002).

The Holitna River is one of the largest salmon-producing tributaries of the Kuskokwim River drainage. Salmon escapements in the Holitna River basin have been documented since 1961, when the first aerial survey was flown (Schneiderhan 1983, Burkey 1994). The importance of the Holitna River as a salmon producer and the necessity to closely monitor salmon escapement motivated the Alaska Department of Fish and Game (ADF&G) to establish a weir on the Kogrukluk River, a tributary of the Holitna River, in 1976 (Figure 1; Baxter *undated* a). Kogrukluk River salmon escapements are a relatively small percentage of overall salmon escapements in the Kuskokwim River drainage; however, this tributary appears to support an above average number of spawning chinook *O. tshawytscha*, chum *O. keta*, sockeye *O. nerka*, and coho *O. kisutch* salmon when compared to other Kuskokwim River tributaries of similar size (Burkey et al. 1999).

Managing for sustainable salmon fisheries in the Kuskokwim River is challenging due in part to the lack of abundance and run timing information. Historically, few salmon spawning streams within the Kuskokwim River basin have received attention for rigorous salmon escapement monitoring, which limits the ability of managers to assess the adequacy of escapements and the effects of management decisions. The need for long term escapement monitoring projects such as the Kogrukluk River weir became more evident in September 2000, when the Alaska Board of Fisheries (BOF) classified both Kuskokwim River chinook and chum salmon as "stocks of concern" due to the chronic inability of managers to maintain expected harvest levels (5 AAC 39.222; Burkey et al. 2000a, 2000b; Ward et al. 2003).

In the early 1980s, fisheries management began to shift from a strategy emphasizing guideline-harvest-levels to a strategy emphasizing abundance. ADF&G established species-specific escapement goals for streams such as the Kogrukluk River that had sufficient historical baseline information (Buklis 1993). These escapement goals were later termed biological escapement goals (BEGs) and more recently sustainable escapement goals (SEGs). In 1983, escapement goals for Kogrukluk River weir were established for chinook (10,000), chum (20,000), sockeye (2,000), and coho salmon (20,000). In 1984, escapement goals were increased to 30,000 for chum and 25,000 for coho salmon. The sockeye salmon goal was discontinued approximately 1995, but the change was not well documented (Burkey et al. 1997). These goals represent simple averages, or medians, of historical information, with the underlying principle of ensuring escapements that would provide for sustained yield consistent with historical levels.

In 2003, the Kogrukluk River weir was one of two ground-based projects with formal escapement goals (Ward et al. 2003). The other project was Aniak River sonar, which has an escapement goal associated with sonar counts of unapportioned fish passage used to index chum salmon escapement. All other escapement goals in the Kuskokwim River drainage were based on peak aerial surveys counts, and most of these focus on chinook salmon. The Kogrukluk River weir was the only location in the Kuskokwim Area with a formal escapement goal for coho salmon.

All salmon escapement goals for the Kuskokwim Area were revised in January 2004 (ADF&G 2004). The new goals, which are described as ranges, will be in effect beginning with the 2004 season. The new SEGs for Kogrukluk River weir are 5,300 to 14,000 chinook salmon, 15,000 to 49,000 chum salmon, and 13,000 to 28,000 coho salmon. The weir will continue to be the only location in the Kuskokwim River with a coho salmon escapement goal, and it will also be the only ground-based project with a chinook salmon goal, and one of two ground-based projects with a chum salmon escapement goal.

### *Objectives*

1. Determine the daily and total annual escapement of chinook, chum, sockeye and coho salmon to the Kogrukluk River.

2. Estimate the age, sex, and length (ASL) composition of the total annual chinook, chum and coho salmon escapements such that simultaneous 95% interval estimates of the age composition will have a maximum width of 0.20.

3. Recover tag numbers and associated information from chum, sockeye,and coho salmon passing the Kogrukluk River weir in support of the mark-recapture study conducted on the mainstem Kuskokwim River.

4. Serve as a monitoring site for chinook salmon equipped with radio transmitters deployed as part of radiotelemetry studies conducted on the lower Holitna River and mainstem Kuskokwim Rivers.

5. Monitor the carcass washout rate and timing by species.

6. Monitor variability in hydrological and climatic conditions to provide information relating to potential environmental effects on salmon production and timing.

## *Background*

The Kogrukluk River is the middle of three tributaries (Chukowan River, Kogrukluk River, and Shotgun Creek) that form the headwaters of the Holitna River, an important salmon producing tributary of the Kuskokwim River. In the dialect of the upper Kuskokwim River Yup'ik People, Kogrukluk means "middle-fork" (Evan Ignatti, Kashegelok elder, personal communication). In the early 1800's, the Holitna River was an important inland Russian fur-trading route from Bristol Bay to the Kuskokwim River (Oswalt 1990). Twice yearly, Russian explorers and traders traveled north and south along the Holitna and Nushagak Rivers, using a five day portage to travel between Shotgun Creek and the Chichitnok River to complete the passage (Brown 1983, Oswalt 1990). Until 1845, this served as the primary supply route to the first Russian station on the Kuskokwim River at the mouth of the Holitna River. A number of communities developed to service this trade route and existed from the confluence of the Kogrukluk and Chukowan Rivers to the confluence of the Holitna and Hoholitna Rivers (Brown 1983). Among these were the villages of Kashegelok, Nogamut, and Itulilik. From then until recent times, residents of Holitna River communities made their living from subsistence hunting and fishing, relying heavily on the abundant Holitna River salmon runs and supplementing their livelihoods through the fur trade (Brown 1983, Oswalt 1990; E. Ignatti, Kashegelok elder, personal communication). In the 1930's the Red Devil mercury mine opened, creating jobs and luring Holitna villagers to the communities of Red Devil and Sleetmute. As the fur trade waned and other opportunities arose, the Holitna River villages were slowly abandoned. The last two residents (Evan Ignatti and Ignatti Ignatti) of the village of Kashegelok relocated to Red Devil in 2003. The other Holitna River sites have been abandoned for many years and little remains. Today, there are a number of lodges and homesteads, mostly on the lower river; however only one inhabitant, Elder Nastacia Nick, remains year round. Despite this, the Holitna River remains an important area for subsistence and sport hunting and fishing.

The importance of the Holitna River and its tributaries as a key salmon spawning system in the Kuskokwim River drainage has been acknowledged since 1961 (Schneiderhan 1983). In 1969, a salmon counting tower project was initiated on the Kogrukluk River upstream of the confluence of Shotgun Creek (Yanagawa 1972). Due to shifting river channels, the tower was relocated twice between 1970 and 1978, but always remained upstream of the mouth of Shotgun Creek. In order to more accurately assess salmon escapements, installation of a counting weir was attempted in 1971 near the counting tower site, but the weir was destroyed by high water early in the season (Yanagawa 1973). Both tower and weir operations in this section of the Kogrukluk River were hindered by log jams and shifting channels. Inadequacies of the existing tower sites and the absence of more suitable tower sites resulted in a transition from a counting tower to a weir between 1976 and 1978 (Baxter 1979). Because the weir was located below the confluence of Shotgun Creek, both tower and weir projects were operated concurrently from 1976 to 1978 to compare escapement estimates between projects. Beginning in 1981, weir operational periods were extended to include coho salmon (Baxter 1982). The Kogrukluk River weir (also known as the Ignatti weir or Holitna River weir) has been monitoring salmon escapements in the upper

Holitna River drainage since 1976, and has the longest operational history of any ground-based escapement monitoring project in the Kuskokwim Area.

## METHODS

### *Study Area*

The Kogrukluk River is formed by surface runoff from the north side of a low plateau dividing the Tikchik Lakes and Nushagak River basins, from the Holitna and Kuskokwim River basins. From its headwaters about 8 km north of Nishlik Lake, the Kogrukluk River flows northerly for approximately 80 km. The Kogrukluk River together with the Chukowan River and Shotgun Creek form the headwaters of the Holitna River near the abandoned village site of Kashegelok (Figure 2).

The Kogrukluk River descends approximately 250 m with an average drop of 3.2 m per km across a 1-5 km wide, flood plane (Figure 3; Collazzi 1989). The flood plane is composed of soft sediments that erode easily allowing the river to change coarse quickly and often forming oxbows and sloughs favored by sockeye salmon as spawning habitat (Baxter *undated b*). Sometime between 1940 and 1960, the Holitna River below the confluence of the Kogrukluk and the Chukowan Rivers shifted to the east, effectively destroying the village of Kashegelok (E. Ignatti, Kashegelok elder, personal communication). During the spring flood of 2003, the Chukowan River cut a second mouth at its confluence with the Holitna River, building a gravel bar across the channel in an area traditionally favored as a floatplane-landing site. At normal flow, the Kogrukluk River has a nominal load of suspended materials, but the water is clear except at periods of high flow when it may be stained due to organic leaching.

The flood plain is poorly drained. Low-lying mixed spruce and cottonwood forest are interspersed with wet tundra. Large logjams are common, creating ideal rearing habitats for juvenile chinook and coho salmon (Healy 1991). Riparian areas consist of mixed spruce and cottonwood forest, and colonial willows and alders on banks and gravel bars. Uplands are typically rolling spruce-hardwood forest, with alpine tundra above 200 m. White spruce, birch, and aspen are common on moderate south-facing slopes and black spruce are common on north-facing slopes, poorly drained areas, and pockets of permafrost. The understory consists of spongy moss and low brush on cool moist slopes, grasses on dry slopes, and willow and alder near timberline.

## *Weir Design and Operation*

### Installation Site

Located approximately 120 km by river from the village of Sleetmute and 212 km by air from Bethel, the Kogrukluk River weir is the most remote ground based escapement project in the Kuskokwim Area. The Holitna River is a highly productive system for salmon, but most of the lower river is unsuitable for escapement projects due to excessive depth, width, or braided channels. Personnel and supplies are transported to and from the weir by floatplane. River landings are necessary due to the lack of nearby lakes. Weather and water level often interfere with scheduled flights.

Kogrukluk River weir is located approximately 750 river kilometers (rkm) from the mouth of the Kuskokwim River, about 1 rkm upstream from the confluence with the Chukowan River and 3 rkm below the confluence of Shotgun Creek (Figure 2; Clark and Molyneaux 2003). The weir has been at this location since 1976 (Baxter *undated* a).

At the weir site, the Kogrukluk River is approximately 67 m wide and 4 m deep from bank level to the bottom of the channel. During normal summer operations, river depth is about 1.3 m in the deepest section. The weir sits in the center of a 2 km stretch of relatively straight channel. Banks are soft sediments and bottom material is primarily composed of gravel and cobbles. The weir site is located at the base of a southwest-facing hillside.

### Weir Design

The basic design and materials used in the Kogrukluk River weir in 2003 were the same as those described by Baxter (1981), and included an improved fish trap incorporated into the design in 2001 modeled after the trap used at the George River weir (Linderman et al. 2002). The fixed-picket weir spanned a 70-m channel, with a fish trap located 30 m from the east bank.

### Boat Passage

The need to pass boats through the weir is rare; still, four aluminum panels have been used to form a "boat gate". Boats and rafts wishing to pass the weir were stopped, and then the boat gate was opened to allow passage. Fish that passed upstream during this process were counted. If fish passage was high, it was not possible to count all fish passing under the boat. There is currently no convenient way to pass boats through the weir.

### Weir Maintenance

Daily cleaning was typically accomplished by removing small debris and passing it downstream of the weir using rakes and gaffs. Small debris included sticks, leaves, fibrous root mats, algae, and fish carcasses. Large debris such as logs and large root clumps were removed using chainsaws, axes, ropes, and sometimes required partial dismantling of the weir.

The daily cleaning routine included a visual inspection of the weir for signs of substrate scouring, damaged pickets, or other conditions that could compromise operations. Periodically, the crew conducted a more thorough inspection by snorkeling along the leading edge of the weir. Problems were addressed immediately. Areas showing signs of substrate scouring were addressed with sandbags or comparable means.

## *Fish Passage*

### Upstream Fish Passage

Salmon passing upstream through the weir were counted and recorded by species and sex, with the exception of fish that were small enough to pass freely between weir pickets. Fish were enumerated 4 to 8 times a day between 07:30 and 24:00 hours, though frequency and duration of counting periods varied depending on fish behavior and abundance. Most often, counting was conducted through the fish trap to facilitate recapture of tagged fish. An observer positioned on the trap viewed fish entering from the downstream side through a plexiglass "fish window". In addition to identifying fish by species and sex, this allowed observers to anticipate and effectively trap tagged fish to recover tag data. As an alternative method, a few pickets were removed allowing fish passing through the weir to be counted by an observer positioned above. A "flash-panel" composed of light colored material, such as an aluminum weir panel or a painted board, was used to increase contrast and visibility. This method sometimes allowed salmon already upstream of the weir to move back downstream. These were subtracted from daily counts unless the fish was obviously spawned out. The daily passage count was tallied by species and sex and recorded in the logbook.

Visual determination of sex is possible due to the level of sexual dimorphism apparent in salmon reaching the weir. After traveling 750 km in fresh water, key differences are readily observable. For example females become obviously swollen and round behind the pectoral fins, have blunt, bullet shaped heads, and swim with steady, wide strokes. Males exhibit an exaggerated elongation of the kype, are streamline and muscular in appearance, and swim with short, powerful strokes. Though some variation exists, these differences are applicable to all salmon species observed. The above mention "fish window" greatly improves identification, although the presence of a flash-panel on the river bottom is sufficient for making these determinations.

## Estimating Missed Salmon Passage

Total annual escapement was determined by combining total observed passage with any passage estimates made for inoperable periods. The passage estimate for a single day was calculated as the average of the observed passage 2 days before and 2 days after the inoperable period. Daily passage estimates for inoperable periods lasting 2 or more days were calculated by a linear extrapolation of the average observed passage 2 days before and after the inoperable period using the following formula:

$$\hat{n}_{d_i} = \alpha + \beta \cdot i \tag{1}$$

$$\alpha = \frac{n_{d_1-1} + n_{d_1-2}}{2}$$

$$\beta = \frac{\left(n_{d_I+1} + n_{d_I+2}\right) - \left(n_{d_1-1} + n_{d_1-2}\right)}{2(I+1)}$$

for $(1, 2, \ldots, i, \ldots I)$

where

$\hat{n}_{d_i} =$ passage estimate for the $i^{th}$ day $(1, 2, \ldots, i, \ldots I)$ of a multiple day breach event;

$n_{d_I+1} =$ observed passage the first day after the inoperable period ($d_I$);

$n_{d_I+2} =$ observed passage the second day after the inoperable period ($d_I$);

$n_{d_1-1} =$ observed passage one day before the inoperable period;

$n_{d_1-2} =$ observed passage 2 days before the inoperable period;

$I =$ number of days the inoperable period lasted.

This method was a change from estimate methods used in previous years. Clark and Salomone (2002) described details about past practices for estimating missed daily passages.

## Carcass Counts

Spent and dead salmon, hereafter referred to as carcasses, that accumulated on the weir were counted by species before being passed downstream. The daily carcass count was tallied by species and recorded in the logbook.

## *Salmon Age-Sex-Length Composition*

Age-sex-length (ASL) composition of the total annual chinook, chum, and coho salmon escapements were estimated by sampling a fraction of the fish passage and applying the ASL composition of those samples to the total escapement as described by DuBois and Molyneaux (2000).

### Age-Sex-Length Sampling

The crew at the Kogrukluk River weir employed standard sampling techniques as described by DuBois and Molyneaux (2000). A pulse sampling design was used, in which intensive sampling was conducted for 1 to 3 days followed by a few days without sampling. The goal of each pulse was to collect samples from 210 chinook, 200 chum, and 70 coho salmon. These sample sizes were selected so that the simultaneous 95% confidence interval estimates of age and sex composition proportions would be no wider than 0.20 (Bromaghin 1993) per pulse for chinook with 10 age/sex categories and chum salmon with 8 age/sex categories, and for the entire season for coho salmon with 10 age/sex categories. Samples sizes were increased by 10% from that recommended by Bromaghin (1993) to account for scales that cannot be aged. The minimum acceptable number of pulse samples was three per species, one pulse sample from each third of the run, to account for temporal dynamics in the ASL composition. In 2003, this minimum was achieved for chum and coho salmon.

Salmon were sampled from a fish trap installed in the weir. The trap included an entrance gate, holding box, and exit gate. The entrance gate was opened while the exit gate remained closed, allowing fish to accumulate inside the 1.5 by 2.5 m holding box. The holding box was allowed to fill with fish and sampling was done during scheduled counting periods.

Crewmembers used a dip-net to remove fish from the holding pen. Fish were removed from the dip-net and placed into a partially submerged fish cradle. Three scales were taken from the preferred area as described in standard procedures (DuBois and Molyneaux 2000). These scales were used at a later date to determine the age of the fish. Sex was determined through visual examination of the external morphology, keying on the development of the kype, roundness of the belly, and the presence or absence of an ovipositor. Length was measured to the nearest millimeter from mid eye to fork-of-tail using a straight edged meter stick. After sampling, each fish was released upstream of the weir. Scales were placed on gum cards and sampling information was recorded. This information was later transferred to computer mark-sense forms. The procedure was repeated until the holding pen was emptied. Completed gum cards and data forms were sent to the Bethel or Anchorage ADF&G office for processing.

Additional samples were collected for chinook salmon through active sampling. Active sampling required a crewmember to be positioned above the downstream end of the trap to observe fish entering the holding pen. When a chinook entered the holding pen, the

crewmember would immediately close both the entrance and exit gates, thereby actively trapping the chinook salmon inside the holding box for sampling.

### Estimating ASL Composition of Escapement

ADF&G staff in Bethel and Anchorage aged scales collected at the Kogrukluk River weir, processed the ASL data, and generated data summaries. DuBois and Molyneaux (2000) describe details of the processing and summarizing procedures. These procedures generated two types of summary tables for each species; one described the age and sex composition and the other described length statistics. These summaries account for changes in the ASL composition throughout the season by first partitioning the season into temporal strata based on pulse sample dates, then applying the ASL composition of individual pulse samples to the corresponding temporal strata, and finally summing the strata to generate the estimated ASL composition for the season. This procedure ensured that the ASL composition of the total annual escapement was weighted by the abundance of fish in the escapement rather than the abundance of fish in the samples. For example, if samples of chum salmon were collected in six pulses, then the season would be partitioned into six temporal strata with one pulse sample occurring in each stratum. A sample of 168 chum salmon collected from 7 to 8 July would be used to estimate the ASL composition of the 4,305 chum salmon that passed the weir during the temporal strata that extended from 6 to 13 July. This procedure would be repeated for each stratum, and the estimated age and sex composition for the total annual escapement would be calculated as the sum of chum salmon in each stratum. In similar fashion, the estimated mean length composition for the total annual escapement would be calculated by weighting the mean lengths in each stratum by the escapement of chum salmon that passed the weir during that stratum.

Ages are reported using European notation, which is composed of two numerals separated by a decimal. The first numeral indicates the number of winters the juvenile has spent in fresh water and the second numeral indicates the number of winters spent in the ocean (Groot and Margolis 1991). Total age of a fish is equal to the sum of these two numerals, plus 1 year to account for the winter when the egg was incubating in gravel. For example, a chinook salmon described as an age-1.4 fish is actually 6 years of age.

## *Salmon Tag Recovery*

Three tagging studies were conducted in the mainstem Kuskokwim River and in the mainstem Holitna River in 2003. The Kogrukluk River weir and other weir projects in the Kuskokwim River drainage were integrated into these studies as tag recovery sites.

**Kuskokwim River Chinook Radiotelemetry Tagging**

The Kogrukluk River weir was part of a radiotelemetry project intended to estimate the total abundance of chinook salmon in the Kuskokwim River (Stuby *in preparation*). Radio transmitters were inserted into chinook salmon caught near Kalskag/Aniak, and receiver stations monitored the movement of tagged chinook. Three radio receiver stations were placed in the Holitna River drainage: the lower Holitna River, the lower Hoholitna River, and just upstream of the Kogrukluk River weir. Each chinook captured at the Kalskag/Aniak site was fitted with a highly visible monofilament tag that allowed the weir crew to observe and recapture radio-tagged fish in the fish trap. For each recaptured fish, the crew recorded date of recapture, tag number, tag color, and the general condition of the fish. The known chinook salmon passage at the weir, coupled with data collected from receiver stations, was used with similar data collected at other weir projects to develop estimates of the total chinook salmon abundance upstream from the tagging site.

**Holitna River Chinook, and ChumRadiotelemetry Tagging**

The Kogrukluk River weir was also part of a radiotelemetry project intended to estimate the total abundance of chinook and chum salmon in the Holitna River drainage (Stroka and Brase *in preparation*). Radio transmitters were inserted into salmon caught near the mouth of the Holitna River, and receiver stations monitored the movement of tagged chinook. The project utilized the same receiver stations described in the previous section. Each salmon captured at the lower Holitna River tagging site was fitted with a highly visible monofilament tag that allowed the weir crew to observe and recapture tagged fish in the fish trap. For each recaptured fish, the crew recorded date of recapture, tag number, tag color, and the general condition of the fish. The known chinook and chum salmon passage at the weir, coupled with data collected from receiver stations, was used to develop estimates of the total chinook and chum salmon abundance in the Holitna River drainage.

**Chum, Coho, and Sockeye Mark-Recapture Tagging**

Chum, coho, and sockeye salmon were captured near Kalskag/Aniak tagging site and fitted with spaghetti tags as part of a mark-recapture study to estimate the total abundance of these species in the Kuskokwim River (Kerkvliet et al. *in press*). The Kogrukluk River weir served as one of several tag recovery locations.

The weir crew recaptured tagged fish in the fish trap and recorded the date of recapture, species, tag number, and tag color. The tagged fish were recaptured in the same manner as the active sampling technique described for the ASL sampling of chinook salmon. Visibility was enhanced through the use of clear-bottom viewing boxes that reduced glare and water turbulence. Tagged fish were released upstream of the weir after the tag number was recorded. The crew summarized the number of tagged and untagged fish daily, so that tagged fish not recaptured were recorded by tag color and added to the daily tallies. The crew also examined ASL-sampled

salmon for a hole-punched adipose fin that served as a secondary mark to determine incidence of tag loss.

### *Climatological and Hydrological Monitoring*

Water and air temperatures were measured each day at the Kogrukluk River weir at approximately 07:30 hours. Water temperature was determined by submerging a calibrated thermometer below the water surface until the temperature reading stabilized. Air temperature was obtained from a thermometer attached to an outside wall of the cabin in a shaded location. Temperature readings were recorded in the logbook, along with notations about wind direction, estimated wind speed, cloud cover, and precipitation. Daily precipitation was measured using a rain gauge.

Daily operations included monitoring river depth with a standardized staff gauge. The staff gauge consisted of a metal rod driven into the stream channel with a meter stick attached. The height of the water surface, as measured from the meter stick, represented the "stage" of the river above an established datum plane. The staff gauge was calibrated to the datum plane by a semi-permanent benchmark to provide for consistent stage measurements between years. The benchmark consisted of a nail driven into the second step of a wooden staircase leading from the riverbank to the utility shed, which represents a measurement of 5,000 mm above baseline and corresponds to the highest water level observed at the Kogrukluk River weir. Water stage was measured at approximately 07:30 and 17:00 hours.

## RESULTS

### *Weir Operations*

Installation at the Kogrukluk River weir began on 19 June. The weir was operational from 12:30 hours on 21 June, until 20:00 on 20 September. The weir was rendered inoperable three times during the season. The first inoperable period occurred between 29 and 30 July, when high water levels increased debris loads and necessitated a partial dismantling of the weir. On 4 August, crewmembers discovered a hole in the weir that was believed to have been present for less than 24 hours. A second high water event from 27 to 29 August again necessitated partial removal of the weir in order to decrease debris loads. Passage was estimated during these inoperable periods. Late in August, the boat gate section began to show substantial scouring, possibly due to the activities of fish spawning immediately upstream of the weir. The boat gate was thereafter abandoned and the crew removed pickets to allow for boat passage. This was more time-consuming and fish counts were probably underestimated at these times. Only a few incidents of this type occurred, primarily late in September, due to the remoteness of the area and low boat traffic on the Kogrukluk River in 2003. There is currently no convenient way to pass boats through the weir.

## *Fish Passage*

### Chinook Salmon

Total annual chinook salmon escapement past the Kogrukluk River weir in 2003 was 11,771 fish, including 186 chinook salmon (1.6% of the total run) estimated to have passed during inoperable periods (Table 1). The 2003 total annual chinook salmon escapement exceeded the minimum SEG of 10,000 fish. Chinook salmon were observed passing upstream of the weir from 21 June to 12 September. Peak daily passage of 858 chinook salmon occurred on 9 July, with a median passage date of 14 July. The central 50% of the observed passage occurred between 8 and 20 July (Appendix A.1).

### Chum Salmon

Total annual chum salmon escapement in 2003 was 23,413 fish, including an estimated 899 chum salmon (3.8% of the total run) that passed during inoperable periods (Table 1). The 2003 total annual chum salmon escapement did not achieve the minimum SEG of 30,000 fish. Chum salmon were observed passing upstream of the weir from 21 June to 19 September. Peak daily passage of 1,583 chum salmon occurred on 21 July. The median passage date for the season was 18 July. The central 50% of the passage occurred between 12 July and 23 July (Appendix A.2).

### Coho Salmon

The total annual coho salmon escapement for 2003 was 74,604 fish, including an estimated 5,873 coho salmon (7.9% of the total run) that passed when the weir was inoperable (Table 1). The 2003 total annual coho salmon escapement greatly exceeded the minimum SEG of 25,000 fish. Coho salmon were observed passing upstream of the weir from 20 July to 20 September when the weir was dismantled. Peak daily passage of 4,661 coho salmon occurred on 5 September, and the median passage date was 31 August. The central 50% of passage occurred between 26 August and 5 September (Appendix A.3).

### Sockeye Salmon

Total annual sockeye salmon escapement past the weir in 2003 was 9,164 fish, including an estimated 178 sockeye (1.9% of the total run) that passed when the weir was inoperable (Table 1). Sockeye salmon were observed passing upstream of the weir from 21 June to 8 September. Peak daily passage of 758 fish occurred on 14 July. The median passage date was 16 July, and the central 50% passage occurred between 12 and 20 July (Appendix A.4).

### Other Species

Pink salmon are uncommon in the Kogrukluk River; however, pink salmon were observed passing upstream of the weir in 2003. Complete enumeration is not possible because pink salmon can pass upstream through the spacing between weir pickets. In 2003, three pink salmon were observed passing upstream through the weir, but four carcasses were recovered on the weir.

Other species observed at the Kogrukluk River weir include Arctic grayling *Thymallus arcticus*, char *Salvenlinus sp.*, and occasionally northern pike *Esox luciu*, whitefish *Coregonus sp.*, and burbot *Lota lota*. For a complete listing of fish species in the area, see Baxter (*undated* c).

### Carcass Counts

Carcasses recovered at the Kogrukluk River in 2003 included 1,352 chinook, 8,111 chum, 4 coho, 934 sockeye, and 4 pink salmon weir (Table 2). Chinook carcasses were recovered between 6 July and 5 September, with 50% cumulative recovery on 7 August. Chum carcasses were recovered between 4 July and 5 September, with 50% cumulative recovery on 28 July. Coho carcasses were first recovered 28 July. Sockeye carcasses were recovered between 13 July and 5 September, with 50% cumulative recovery on 13 August. Pink salmon carcasses were recovered between 22 and 27 July.

## *Age-Sex-Length Data*

### Chinook Salmon

Age, sex, and length were determined for 373 chinook salmon, or 3.2% of the total annual chinook escapement in 2003 (Tables 3, 4). The samples were collected in four pulses that ranged in size from 59 to 158 aged fish per pulse, and the run was partitioned into four temporal strata based on the temporal distribution of the sampling effort. As applied to the total chinook escapement, age-1.3 was the most abundant age class (42.6%), followed by age-1.4 (36.0%), age-1.2 (18.7%), and age-1.5 (2.8%) fish. The proportion of older-aged fish, particularly age-1.4 fish, tended to increase as the run progressed. Female chinook comprised 31.3% of the total annual escapement based on weighted ASL samples, and 36.3% of the run based on visual sex determination by crewmembers during daily enumeration routine (Tables 1, 3). The length of female chinook salmon ranged from 600 to 987 mm, and males ranged from 465 to 970 mm (Table 4). Average lengths for female age-1.3, -1.4, and -1.5 fish were 770, 855, and 872 mm, respectively. Average lengths for male age-1.2, -1.3, and -1.4 fish were 544, 703, and 809 mm, respectively.

### Chum Salmon

Age, sex, and length were determined for 1,014 chum salmon, or 4.3% of the total annual chum salmon escapement in 2003 (Tables 5, 6). The samples were collected in six pulses that ranged in size from 127 to 190 aged fish per pulse, and the run was partitioned into six temporal strata based on the temporal distribution of the sampling effort. As applied to the total chum escapement, age-0.3 was the most abundant age class (65.9%), followed by age-0.4 (31.7%), age-0.2 (1.8%), and age-0.5 (0.6%) fish. The proportion of older (age-0.4 and -0.5) fish decreased as the run progressed. Based on weighted ASL samples, sex composition of the total chum salmon escapement was estimated to include 2,076 females, or 8.9% of the total escapement, while visual sex identification by the crew during daily enumeration routine indicated that females comprised 13% of the total chum run (Tables 1, 5). The length of female chum salmon ranged from 489 to 612 mm, and males ranged from 502 to 641 mm (Table 6). Average lengths for female age-0.2, -0.3, and -0.4 fish were 524, 550, and 564 mm, respectively. Average lengths for male age-0.2, -0.3, -0.4, and -0.5 fish were 534, 567, 593, and 613 mm, respectively.

### Coho Salmon

Age, sex, and length were determined for 161 coho salmon, or 0.2% of the total annual coho salmon escapement in 2003 (Tables 7, 8). The samples were collected in three pulses with sample sizes of 58, 62, and 41 aged fish. The coho run was partitioned into three temporal strata based on sampling dates. Age-2.1 fish accounted for 81.5% of the total annual escapement, and age-3.1 and -1.1 fish accounted for 16.8% and 1.6% of the escapement. Based on weighted ASL samples, female coho salmon comprised 40.2% of the total annual escapement, while visual sex identification by crew during daily enumeration found 42.5% females (Tables 1, 7). Average length for female age-2.1 and -3.1 fish were 568 and 579 mm, respectively (Table 8). Average length for male age-2.1 and -3.1 fish were 563 and 568 mm. A single male age-1.1 fish was 580 mm, and a single female age-1.1 fish was 516 mm.

## *Salmon Tag Recovery*

### Kuskokwim River Chinook Radiotelemetry Tag Recovery

Of 32 radio-tagged chinook salmon observed passing upstream of the Kogrukluk River weir in 2003, 21 were tagged near Kalskag/Aniak on the mainstem Kuskokwim River (Appendix B). Tag numbers were recovered from 18 of these chinook salmon. Radiotelemetry from both the stationary receiver and aerial surveys upstream of the weir recorded a total of 49 chinook salmon tagged at Kalskag/Aniak (Stuby *in preparation*).

### Holitna River Chinook and Chum Radiotelemetry Tag Recovery

Of 30 radio-tagged chinook salmon observed passing upstream of the Kogrukluk River weir in 2003, tag numbers were recovered from 11 chinook with radio transmitters deployed at the lower Holitna River site (Appendix B). Tag numbers were recovered at the weir from seven of these fish. Radiotelemetry from both the stationary receiver and aerial surveys upstream of the weir recorded a total of 15 chinook salmon tagged at the lower Holitna River site (Stroka and Brase *in preparation*).

Five chum salmon radio-tagged in the lower Holitna River were observed passing upstream of the Kogrukluk River weir in 2003 (Appendix B). Tag numbers were recovered from all of these fish. Radiotelemetry from both the stationary receiver and aerial surveys upstream of the weir recorded a total of 13 chum salmon tagged in the Holitna River (Stroka and Brase *in preparation*).

### Chum, Coho, and Sockeye Mark-Recapture Tag Recovery

Eighty-four spaghetti-tagged chum salmon (0.4% of the total observed passage) were seen passing the Kogrukluk River weir, and tag information was recovered from 64 of the fish (Appendix B). Of 1,014 fish examined for secondary marks (4.5% of the observed passage), no untagged chum salmon had a secondary mark that would have indicated spaghetti tag loss.

A total of 1,026 spaghetti-tagged coho salmon (1.5% of the total observed passage) were seen passing the weir in 2003, and tag information was recovered from 750 of these fish (Appendix A). Of 161 fish examined for secondary marks (2.6% of the total passage), no untagged coho salmon had a secondary mark.

Seventy-three spaghetti-tagged sockeye salmon (0.8% of the total observed passage) were seen passing the weir in 2003 (Appendix B). Tag information was recovered from 65 of these fish. No sockeye salmon were examined for a secondary mark, because sockeye were not ASL sampled.

## *Climatological and Hydrological Conditions*

Water temperature at the Kogrukluk River weir in 2003 ranged from 3° to 15°C, with an average water temperature of 10.4°C (Appendix C). River stages ranged from 2,595 to 3,125 mm, with an average of 2,873 mm for the overall operational period. Air temperature at the weir ranged from -4° to 28°C, with an average air temperature of 9.3°C for the operational period.

## DISCUSSION

### *Weir Operations*

Operations at Kogrukluk River weir were a success in 2003, largely due to favorable river conditions for installation, removal, and general operation. The weir was operational from 21 June to 20 September. Two brief periods of high water necessitated a partial removal of the weir to prevent damage and/or to allow normal fish passage during periods of poor water clarity. The inoperable periods occurred from 29 to 30 July and 27 to 29 August. In addition, a small hole was discovered and repaired on 4 August. Based on low observed passage numbers, the hole was determined to have occurred on the previous day, 3 August. Late in August, the boat gate section began to show substantial scouring, possibly due to the activities of fish spawning immediately upstream of the weir. The boat gate was thereafter abandoned and the crew removed pickets to allow for boat passage. This was more time-consuming and fish counts were probably underestimated at these times. Only a few incidents of this type occurred, primarily late in September, due to the remoteness of the area and low boat traffic on the Kogrukluk River in 2003. There is currently no convenient way to pass boats through the weir.

In most years, high water levels prevent weir installation at the Kogrukluk River until late June or early July. In 2003, early low water levels facilitated the second earliest operation date for Kogrukluk River weir on record (Figure 4, Appendix A). It is important to note that in most years the weir has become operational after the chinook, chum, and sockeye salmon have already begun to arrive. The early parts of the chinook, chum, and sockeye salmon runs have often been estimated from run timing averages generated using the 1976, 1978, and 1984 runs as a model (Appendix A; Schneiderhan 1989, Salomone 2000). Run timing averages have since been generated using data sets that are largely composed of estimates. The project end date was near average (Appendix A). Low water levels contributed to quick and uncomplicated weir removal.

The total inoperable time of 5 days was also well below that of most previous years. This is due to unusually favorable river conditions combined with proactive removal of weir pickets at very high water to prevent current and debris from damaging the weir. The early start date and low number of inoperable days allowed for reliable estimates of the 2003 salmon escapements to the Kogrukluk River, and will provide an important reference point from which to construct future estimates and models.

## *Fish Passage*

### Chinook Salmon

***Abundance.*** The early installation date of Kogrukluk River weir in 2003, and the limited number of inoperable days, provided a more complete picture of the total annual chinook salmon escapement than most previous years (Appendix A.1). Only one chinook salmon was observed during the first 4 days of operation and subsequent passage increased gradually, peaking in July, then tapering through early September when passage included at most one or two chinook salmon per day. Consequently, the reported escapement of 11,771 chinook salmon past the Kogrukluk River weir in 2003 is considered a reliable estimate of the total annual chinook escapement upstream of the weir (Table 1).

The 2003 escapement of 11,771 chinook salmon was above the minimum SEG of 10,000 fish for the second consecutive year (Figure 5, Appendix D). The escapement was also markedly higher than in 1999 and 2000, which were years that contributed to the BOF classifying Kuskokwim River chinook salmon as a stock of concern (Burkey et al. 2000a). Similarly in 2003, other chinook salmon escapement monitoring projects throughout the Kuskokwim River basin showed increases over numbers reported in 1999 and 2000. Escapement projects where improvement was observed included Kwethluk, George and Tatlawiksuk River weirs (Figure 6; Linderman et al. 2004 a, Linderman et al. 2004 b, Zabkar and Harper in preparation); and aerial surveys on the Salmon (Pitka Fork), Gagaryah, Cheeneetnuk, Oskawalik, Holokuk, Salmon (Aniak drainage), Kipchuk and mainstem Aniak Rivers (Table 9; Bergstrom and Whitmore 2004). The only monitored locations that did not show a marked increase in chinook salmon escapement in 2003 were Takotna and Tuluksak River weirs (Gilk and Molyneaux *in preparation*, and Roettiger et al. *in preparation*).

Chinook salmon escapements to the Kogrukluk River and other spawning tributaries might have been lower had it not been for conservation measures taken in response to the BOF stock of concern designation for Kuskokwim River chinook salmon (Burkey et al. 2000a). One of these measures was the closure of the Kuskokwim River commercial salmon fishery in June and July; consequently, total commercial harvest of chinook salmon was only 150 fish in 2003, compared to the 10-year average of 9,632 fish per year (Bergstrom and Whitmore 2004). Another conservation measure was the implementation of a subsistence fishing schedule throughout the Kuskokwim River drainage. This schedule was first invoked in 2001 and required that all Kuskokwim River subsistence fishers suspend fishing for three consecutive days each week in accordance with a prearranged schedule. In 2003, the schedule was discontinued after 6 July when most run assessment tools suggested the measure was no longer needed. Thereafter, subsistence fishing was allowed 7 days a week. The Kogrukluk River and other Kuskokwim River tributaries likely benefited from the schedule because June closures provided windows when fish could pass through the lower Kuskokwim River where the subsistence fishery is most intense. Evidence from a chinook radiotelemetry project suggests that fish bound for the Kogrukluk River pass through the lower river during the earlier part of the chinook run, which supports the idea that conservation measures, especially in June, may benefit Kogrukluk River

stocks (Figure 7; Stuby 2003).

***Run Timing.*** Chinook salmon run timing at the weir in 2003 was near the historical average as indicated by the median passage date of 14 July, which was 2 days later than average (Appendix A.1). Historically, the earliest median passage date occurred on 7 July (1981 and 1996), and the latest date occurred on 20 July (1999). The central 50% passage in 2003 occurred from 8 to 20 July, beginning 1 day later and ending 3 days later than the historical average.

***Carcasses.*** Approximately 12% of the 2003 Kogrukluk River chinook salmon escapement was later observed as carcasses at the weir (Figures 8 and 9), which was similar to the historical average of 11% (Appendix E). This does not account for carcasses washing past the weir during inoperable periods, though in 2003 the weir was only briefly inoperable early in the period when chinook carcasses were being observed. Based on historical aerial surveys and radiotelemetry tracking, chinook salmon occur along the entire 80 rkm stretch of the Kogrukluk River, which likely contributes to retention of carcasses upstream of the weir (Burkey and Salomone 1999, Stuby 2003; J. Linderman, ADF&G Anchorage, personal communication). Consequently, the nutrient value of the majority of spawned-out chinook salmon was likely retained within the Kogrukluk River where it can contribute to the productivity of the system through the introduction of marine derived nutrients (Cederholm et al. 1999).

## Chum Salmon

***Abundance.*** The earlier installation date of Kogrukluk River weir in 2003, and the limited number of inoperable days, provided a more complete picture of the total annual chum salmon escapement than most previous years (Appendix A.2). Daily chum salmon passage during the first few days of operation was in the single digits and passage increased gradually, peaking in July, and then tapering through mid-September when passage included at most two or three chum salmon per day. Consequently, the reported escapement of 23,413 chum salmon past the Kogrukluk River weir in 2003 is considered a reliable estimate of the total annual chum escapement upstream of the weir (Table 1).

The 2003 escapement of 23,413 chum salmon was below the minimum SEG of 30,000 fish, but markedly better than the low escapements of 1997, 1999 and 2000, which figured prominently in the BOF classifying Kuskokwim River chum salmon as a stock of concern (Figure 5; Appendix D; Burkey et al. 2000b). Similarly in 2003, other chinook salmon escapement monitoring projects throughout the Kuskokwim River basin showed increases over numbers reported in 1997, 1999, and 2000. Escapement projects where improvement was observed included Kwethluk, George, and Takotna River weirs and Aniak River sonar (Table 9, Figure 10; Roettiger et al. *in preparation,* Linderman et al. *2004* a, Gilk and Molyneaux *in preparation,* Bergstrom and Whitmore 2004).

Chum salmon escapements likely benefited from the conservation measures taken in response to the BOF stock of concern designation for Kuskokwim River chum salmon (Burkey et al. 2000b). Kuskokwim River commercial salmon fishery was closed in June and July, so the incidental commercial harvest in August was limited to 2,760 chum salmon, compared to the 10-year

average of 139,083 fish per year (Bergstrom and Whitmore 2004). Another conservation measure was the implementation of a subsistence fishing schedule, which was discontinued after 6 July in 2003. The degree to which increased chum salmon escapements are a consequence of conservation measures, rather than solely improved productivity, is not known. For the Kogrukluk River, however, evidence from recent tagging studies have demonstrated repeatedly that chum salmon bound for the Kogrukluk River pass through the lower Kuskokwim River at Kalskag-Aniak in the early part of the chum run (Kerkvliet et al. 2003, Kerkvliet et al. *in preparation*).

***Run Timing.*** Chum salmon run timing at the weir in 2003 was later than average as indicated by the median passage date of 18 July, which was 5 days later than the historical average (Appendix A.2). Historically, the earliest median passage date occurred on 9 July (1981, 1988, and 1996), while the latest date was on 19 July (1991 and 2001). The central 50% passage in 2003 occurred from 12 to 23 July, 4 days later than the historical average.

***Carcasses.*** Approximately 36% of the 2003 Kogrukluk River chum salmon escapement was later observed as carcasses at the weir (Figure 8 and 9), which was higher than the historical average of 21% (Appendix E). This does not account for carcasses washing past the weir during inoperable periods, and in 2003 an inoperable period occurred near the peak of when chum salmon carcasses were being seen, so a substantial number of carcasses may have passed downstream unobserved. Historical aerial surveys conducted on the Kogrukluk River document the largest concentrations of chum salmon spawning within the lower half of the Kogrukluk River Index Area, which likely contributes to the low retention of chum salmon upstream of the weir (Burkey and Salomone 1999, J. Linderman, ADF&G Anchorage, personal communication).

**Sockeye Salmon**

***Abundance.*** The earlier installation date of Kogrukluk River weir in 2003, and the limited number of inoperable days, provided a more complete picture of the total annual sockeye salmon escapement than most previous years (Appendix A.3). The first sockeye salmon was seen on 28 June, the seventh day of weir operation, and passage increased gradually thereafter, peaking in July, and then tapering 13 August when the last sockeye salmon was observed. Consequently, the reported escapement of 9,164 sockeye salmon past the Kogrukluk River weir is considered a reliable estimate of the total annual sockeye escapement upstream of the weir in 2003 (Table 1).

No escapement goal is associated with sockeye salmon in the Kogrukluk River. Escapement in 2003 was slightly above average for the 27 years that the weir has been operated, and it was the highest escapement since 1998 (Figure 11; Appendix D).

The Kogrukluk River weir is currently the only site in the Kuskokwim River drainage with a history of enumerating sockeye salmon. Large lakes, typical of sockeye salmon rearing habitat, are absent from the Kogrukluk River drainage, although sockeye salmon have been observed spawning in a number of backwater sloughs in the Holitna, Kogrukluk, Chuckowan, and Hoholitna Rivers, and in Shotgun Creek (Baxter *undated* b, Baxter 1979). Sockeye salmon have been documented in several other tributaries in the Kuskokwim River basin (Burkey and Salomone

1999), but little is known about these populations. Rearing ecology of these "river-type" sockeye salmon is not well known in the Kuskokwim River drainage, though river-spawning behavior among sockeye salmon is well documented in other areas of both Asia and North America (Burgner 1991). Wood et al. (1987) found river-type sockeye salmon contributed from 39% to 48% of total sockeye salmon returns to the Stikine River in 1984 and 1985. The contribution of these river-type sockeye salmon to the overall Kuskokwim River sockeye salmon production could be substantial.

Through 2003, Kuskokwim River sockeye salmon have not been the subject of a directed commercial fishery (Ward et al. 2003). They have not been identified as a stock of concern, although escapements have likely benefited from the conservation measures discussed above for chinook and chum salmon because of the concurrent run timing of these three species in June and early July. The incidental sockeye salmon harvest in 2003 was 279 fish, compared to 1991 through 2000 average of 50,792 fish.

Annual subsistence harvest of sockeye salmon in the Kuskokwim River averages about 39,000 fish, compared to 79,000 for chinook salmon and 63,000 for chum salmon (Ward et al. 2003). Consequently, the Kuskokwim Area's primary research funding agency, the Federal Office of Subsistence Management, dedicate fewer fiscal resources to projects focused on sockeye salmon.

***Run Timing.*** Sockeye salmon run timing at the weir in 2003 was similar to past years as indicated by the median passage date of 16 July, which was one day later than average (Appendix A.3). Historically, the earliest median passage date for Kogrukluk River sockeye salmon occurred on 9 July (1981), and the latest date was 22 July (1999). The central 50% passage in 2003 occurred from 12 to 20 July, similar to historic averages.

***Carcasses.*** Approximately 10% of the 2003 Kogrukluk River sockeye salmon escapement was later observed as carcasses at the weir (Figure 8 and 9), which was similar to the historical average of 10% (Appendix E). This does not account for carcasses washing past the weir during inoperable periods, though in 2003 inoperable periods did not occur at times of high sockeye carcass accumulation. The majority of sockeye salmon carcasses appear to be retained within the Kogrukluk River, upstream of the weir, thereby contributing to the productivity of the system through the introduction of marine derived nutrients (Cederholm et al. 1999).

## Coho Salmon

***Abundance.*** The limited number of inoperable days at Kogrukluk River weir in 2003, coupled with the later than usual end date of the project, provided a more complete picture of the total annual coho salmon escapement than most previous years (Appendix A.4). The first coho salmon was seen on 20 July, and passage increased gradually thereafter, peaked on 5 September with 4,661 fish for the day, and then tapered quickly to a few hundred fish per day through the end of operations on 20 September. The number of coho salmon that past upstream of the weir site after 20 September is unknown; however, the reported escapement of 74,604 coho salmon is considered a reliable estimate of the total annual coho escapement through that date in 2003 (Table 1).

The 2003 escapement of 74,604 coho salmon far exceeded the minimum SEG of 25,000 fish, and was the largest recorded escapement in the 27-year history of the project (Figure 11, Appendix D). The Kogrukluk River is the only tributary in the Kuskokwim basin with an established escapement goal for coho salmon, and it is the only tributary in the Kuskokwim Area with a long-term history of coho salmon escapement monitoring. Like the Kogrukluk River, monitored coho salmon escapements throughout the Kuskokwim River drainage were all at record high numbers, including the Kwethluk, Tuluksak, George, and Takotna Rivers (Table 9, Figure 12; Roettiger et al. *in preparation*, Zabkar and Harper *in preparation*, Linderman et al. 2004 a, and Gilk and Molyneaux *in preparation*).

Not withstanding the record escapements in 2003, since 1997 the annual coho salmon runs to the Kuskokwim River have been depressed, as evidenced by below average commercial harvests (Ward et al. 2003) concurrent with low escapements, the later assessment relying mostly on observations at Kogrukluk River weir (Appendix A.4). From 1987 through 1996 the average annual coho salmon commercial harvest in the Kuskokwim River was 572,524 fish, for the years since 1997 the average has decreased to 169,867 fish. The low harvests have been due in part to limited commercial market interest, but the concurrent low escapements suggest lower overall coho salmon productivity in recent years. Perhaps 2003 marks a change in this trend.

Kuskokwim River coho salmon have not been identified as a stock of concern. The coho salmon run in the mainstem Kuskokwim River occurs in late July and August, well after most of the chinook and chum salmon runs have passed, so coho salmon escapements likely received little benefit from the conservation measures taken in June and July for chinook and chum salmon (Burkey et al. 2000a and Burkey et al. 2000b).

Annual subsistence harvest of coho salmon in the Kuskokwim River averages about 32,000 fish, compared to 79,000 for chinook salmon, and 63,000 for chum salmon (Ward et al. 2003). Consequently, the Kuskokwim Area's primary research funding agency, the Federal Office of Subsistence Management, dedicate fewer fiscal resources to projects focused on coho salmon.

***Run Timing.*** Coho salmon run timing at the weir in 2003 was near average, as indicated by the median passage date of 31 August, which was one day earlier than average (Appendix A.4). Historically, the earliest median passage date occurred on 25 August (1996), and the latest date was on 10 September (1990). The central 50% of the 2003 passage occurred from 26 August to 5 September, within historic averages.

***Carcasses.*** Few coho salmon carcasses were observed at the weir (Table 2). Most post-spawning mortality likely occurs after the weir is removed for the season.

**Pink Salmon**

Similar to past years, the number of pink salmon observed passing the Kogrukluk River weir was low in 2003. Total annual escapement remains unknown because pink salmon are able to swim between the weir pickets. A total of three pink salmon were observed passing the weir in 2003,

two in mid July, and one in September; however, four pink salmon carcasses were recovered on the weir. Recovered pink salmon carcasses typically outnumber observed fish. Historically, spent female pink salmon have been observed among recovered carcasses, suggesting that pink salmon spawn upstream of the weir, but actual spawning has not been observed. The Kogrukluk River is approximately 750 km from the mouth of the Kuskokwim River, making the few pink salmon that pass the weir among the farthest-migrating pink salmon in the world (Morrow 1980, Heard 1991).

## *Age-Sex-Length Composition*

### Chinook Salmon

Despite active sampling efforts, the number of chinook ASL samples generally fell below the objective sample size for a "pulse sample" (Table 3). The need for achieving the target sample size for each ASL pulse sample was weighed against the need for collecting the samples over a brief period of time, the abundance of the species at the time the samples were collected, and the need to avoid undue delay to the salmon migration. The samples were, however, well distributed over the course of the run and were deemed adequate for preliminary analysis. However the statistical significance of any apparent patterns is questionable. In addition, the total number of samples for the season was adequate to achieve the desired precision and accuracy minimums; consequently, the samples were used to describe the chinook salmon age composition for the 2003 total annual escapement.

The 2003 chinook salmon escapement exceeded the minimum SEG in the Kogrukluk River, and the age composition of the escapement indicates a continued increase abundance is likely in 2004. Chinook salmon escapement in the Kogrukluk River is typically dominated by age-1.3 and -1.4 fish (DuBois and Molyneaux 2000), but the abundance of age-1.2 and -1.3 fish in one year can provide insight for the abundance of age-1.3 and -1.4 fish in the following year (Figure 13). The 2003 escapement showed the highest percentage of age-1.2 fish since 1997, so the abundance of age-1.3 fish in 2004 should also be greater than in recent years. Similarly, the strong showing of age-1.3 fish forecasts a strong return of age-1.4 chinook salmon in 2004. The unusually early start date in 2003 may actually confound this assessment because age-1.2 fish were most prominent early in the 2003 run (Figure 14), but historically ASL samples are often lacking from that portion of the run.

Based on weighted ASL samples, the percentage of female chinook salmon was comparable to that estimated by the field crew during daily fish passage (Table 1, Figure 15). These percentages are similar to those of past years for which sufficient data is available (DuBois and Molyneaux 2000). The low percentage is strongly influenced by the prevalence of age-1.2 and -1.3 fish, which are mostly males. The relative percentage of age-1.4 and older females increased as the run progressed and the younger males became less common (Figure 16).

Historical length composition data shows a general increase in length for all chinook age classes between the mid 1980s and early 1990s, and a general decline in length from then through recent

years (Figure 17). Between 2001 and 2003, age-1.3 males and females show a general increase in length though sample sizes for females of this age class are small. Age-1.4 males showed a decrease for this period and age-1.4 females did not change. For both male and female chinook salmon, length increased with age.

**Chum Salmon**

The ASL sample size objectives for chum salmon at Kogrukluk River weir were achieved in 2003 and applied towards describing the age composition for total annual escapement. Older-aged chum salmon, age-0.4 and -0.5, were prominent early in the run, but as the season progressed, age-0.3 became predominant, as is typical in the Kuskokwim Area (Table 5; DuBois and Molyneaux 2000). The percentage of age-0.3 chum salmon was above average in 2003, which is promising for an above average return of age-0.4 chum salmon in 2004; however, the sibling relationship for chum salmon is not as reliable as it is for chinook salmon at Kogrukluk River weir (Figure 13). In addition, the unknown numbers of Kogrukluk River chum salmon harvested each year and the difficulty of aging partially reabsorbed fish scales collected at the weir make the interpretation of sibling relationships challenging.

Based on the weighted ASL samples, the percentage of female chum salmon was comparable to that estimated by the field crew during daily fish passage (Figure 15). From 1993 until the 2003, visual estimates of sex during normal fish passage show an average of 5.7% more females than that reported from ASL sampling. The disparity may be due in part to differences in behavior between male and female chum salmon, with females having greater reluctance to enter the fish trap where the current is lower.

The proportion of male to female chum salmon is typically about even in most Kuskokwim Area data sets (DuBois and Molyneaux 2000); however, Kogrukluk River chum salmon have been an exception. The percentage of females has generally been low since 1990, with the record low of 4.1% in 1997 (Figure 15). The anomaly may be caused by differences in the spawning behavior between females and males, coupled with the weir being located upstream of the chum salmon spawning area in the mainstem Holitna River. Male salmon in spawning condition have been observed to continue migrating upstream a considerable distance, while females tend not to stray too far from their redds (Schroder 1982). This behavior, however, does not fully explain the situation at Kogrukluk River because prior to 1990 the incidence of females was 20 to 30 percent higher. In a radiotelemetry project conducted on the Holitna River, gillnet captures of chum salmon showed 18.7% females in 2003 (Stroka and Brase *in preparation*) and 23.3% in 2000 (Wuttig and Evenson 2001), which were higher than that observed at the weir but still lower than in most Kuskokwim River stocks. These findings could indicate that percentages of females are low for the entire Holitna, although gillnet selectivity is an issue with the radiotelemetry sex ratios since female chum salmon may tend to be smaller than males and less likely to tangle in gear as sexually mature males with a pronounced kype (DuBois and Molyneaux 2000).

For each age-sex category, the mean lengths of chum salmon were generally smaller in 2003 than the historic average (Table 6). Furthermore, average length appeared to decrease as the season progressed (Figure 18), which is typical in the Kuskokwim Area (DuBois and Molyneaux

2000). Another trend is that the average length in all age-sex categories has decreased since 1998 (Figure 17). Though the change has been small, about 15 to 20 millimeters, it may exacerbate the sex ratio anomaly described above, because very small females have on rare occasion been seen passing between weir pickets.

**Coho Salmon**

The ASL sample size objectives per pulse for coho salmon at Kogrukluk River weir were not achieved in 2003, but the polled sample was close to the objective. Sampling results were applied to describe the age composition for total annual escapement (Table 7). Similar to past years, the coho salmon run was dominated by age-2.1 fish, though the percentage was lower than the historic average of 89.6%. Dominance of age-2.1 coho salmon is typical of Kuskokwim Area coho runs (DuBois and Molyneaux 2000).

The percentage of female coho salmon, as determined through ASL sampling in 2003, was comparable to that observed by the crew during daily fish passage, and to the historic average (Table 7; Figure 15). Similar to past years, there was an increase in the percentage of female coho salmon as the 2003 run progressed (Figure 16).

Mean lengths for coho salmon in 2003 were similar to historic averages for both sexes and across age classes (Table 8). Average length of age-2.1 fish increased as the run progressed in 2003 (Figure 18), as is typical in the Kuskokwim River (DuBois and Molyneaux 2003).

## *Salmon Tag Recovery*

**Kuskokwim River Chinook Radiotelemetry Tag Recovery**

A total of 49 radio-tagged chinook salmon from the Kalskag/Aniak tagging site were detected upstream of the weir (Appendix B). Details about the 2003 Holitna River radiotelemetry project will be discussed by Stuby (*in preparation*). Overall, the run timing of discreet chinook salmon spawning aggregates past the Kalskag/Aniak tagging site was more compacted in 2003 than in 2002 (Figure 19). Furthermore, the pattern of upper river populations running past the tagging site earlier than lower river populations was less distinct in 2003 than in 2002.

**Holitna River Chinook and Chum Radiotelemetry Tag Recovery**

A total of 15 radio-tagged chinook salmon and 13 radio-tagged chum salmon from the lower Holitna River tagging site were detected upstream of the weir (Appendix B). Details about the 2003 Holitna River radiotelemetry project will be discussed by Stroka and Brase (*in preparation*).

**Chum, Coho, and Sockeye Mark-Recapture Tag Recovery**

Details about the 2003 mark-recapture tagging project will be discussed by Kerkvliet et al. (*in press)*, however some finding will be described below.

***Chum Salmon.*** Eighty-four spaghetti-tagged chum salmon were observed passing the Kogrukluk River weir in 2003 (Appendix B). Run timing of these tagged fish was similar to the overall Kogrukluk River chum run (Figure 20). The median passage for tagged fish occurred one day earlier than the median passage date for the overall Kogrukluk River chum salmon run.

Tag numbers were recovered from 65 chum salmon (Appendix B), and 89% of those were tagged during the first 25% of the chum salmon run past the Kalskag/Aniak tagging sites (Figure 21). Tag recoveries from other Kuskokwim River escapement projects suggest a difference in run timing between spawning populations as they pass the Kalskag/Aniak mark-recapture sites (Figure 22; Kerkvliet et al. *in preparation*). These findings are similar to those from 2002, and suggest that Kogrukluk River chum salmon migrate through the Kalskag-Aniak area during the early portion of the mainstem chum salmon run (Figure 22; Kerkvliet et al. 2003). Harvest of chum salmon in the lower Kuskokwim River during the earlier portion of the run may exploit a larger proportion of fish bound for the Kogrukluk River relative to those bound for other middle and lower Kuskokwim River tributaries. This emphasizes the importance of run timing information for sustainable management of Kuskokwim River chum salmon.

The percentage of tagged fish in the total annual chum salmon escapement past the Kogrukluk River weir was relatively small (0.37%) compared to the percentage observed at the George River weir and the Aniak River sonar project, though it was similar to that observed at the Takotna River weir (Kerkvliet et al. *in press*). The lower incidence of tagged chum indicates that Kogrukluk River chum had a lower probability of capture at the tagging site than did chum salmon bound for other tributaries. Reasons for this disparity are unknown.

Travel time between the Kalskag/Aniak tagging sites and the Kogrukluk River weir was 10 to 24 days with an average travel time of 14 days (Kerkvliet et al. *in press*). Migration speed ranged from 18 to 42 km per day with an average of 32 km per day.

***Coho Salmon.*** In 2003, 1,024 spaghetti-tagged coho salmon were observed passing the Kogrukluk River weir. Run timing of the tagged fish was about 6 days later than the run timing of the overall escapement (Figure 23), which may be associated with recovery time following handling at the Kalskag/Aniak tagging sites.

Tag numbers were recovered from 750 coho salmon (Appendix B). Kogrukluk River coho salmon tended to pass through the Kalskag/Aniak tagging site later than Takotna River fish, whose spawning stream was more distant, but earlier than George River fish, whose spawning stream was less distant (Figures 21 and 24). The upper river to lower river run timing continuum was more distinct in 2003 than in 2002. Though not as dramatic as was seen in chum salmon (Figure

22), consideration of the differences in stock specific run timing is an important element for sustainable management of Kuskokwim River coho salmon.

Travel time between the Kalskag/Aniak tagging sites and the weir ranged from 11 to 47 days, with an average travel time of 19 days (Kerkvliet et al. *in press*). The migration speed ranged from 10 to 41 km per day, with an average migration speed of 25 km per day.

***Sockeye Salmon.*** Seventy-three spaghetti-tagged sockeye salmon were observed passing the Kogrukluk River weir in 2003 (Appendix B). Run timing of these tagged salmon was about 2 days later than the timing of the overall escapement (Figure 25), which may be associated with recovery time following handling at the Kalskag/Aniak tagging sites.

Tag numbers were recovered from 65 sockeye salmon (Appendix B). Kogrukluk River sockeye salmon were evenly distributed within the group of the sockeye salmon caught at the Kalskag/Aniak tagging sites (Figure 21). Kogrukluk River weir is the only escapement project in the Kuskokwim River drainage were appreciable numbers of sockeye are observed; consequently, the Kogrukluk River recaptures constituted the majority of sockeye salmon recapture data in 2003 (Kerkvliet et al *in preparation*).

The transit time for tagged fish from the Kalskag/Aniak tagging sites to the weir ranged from 10 to 37 days with an average travel time of 19 days (Kerkvliet et al *in preparation*). The migration speed from the tagging sites to the Kogrukluk River weir ranged from 12 to 45 km per day with an average speed of 25 km per day.

### *Climatological and Hydrological Monitoring*

The Kogrukluk River is influenced by both coastal and interior weather systems, and the nearby Kilbuck Mountains, which results in a local climate that is often different from the rest of the Kuskokwim Basin. Heavy thundershowers, and occasional hailstorms, often occur between mid July and mid August. Heavy rain tends to wash out large quantities of debris and sediment, which causes Kogrukluk River water to become tannic and murky, though reduced water clarity, usually improves quickly.

Below average water level occurred throughout most of the 2003 season at the Kogrukluk River weir. Water level in the Kogrukluk River in 2003 appeared to affect the migration of chinook, chum, sockeye, and especially coho salmon. An increase in water level on 20 and 31 August was mirrored by an increase in coho salmon passage (Figure 26). This behavior in coho salmon has been observed in other stocks throughout their range (Sandercock 1991).

Water temperature records for the Kogrukluk River in 2003 ranged from 4°C to 17°C during project operations (Appendix B). The 2003 average water temperature of 10.5°C was lower than the historical average water temperature of 11.2°C In September 2003, low daily water temperatures did appear to affect coho salmon passage (Figure 27). Relatively minor increases and decreases in water temperature seemed to correspond with similar fluctuations in fish passage. These changes were concurrent with increases and decreases in water level.

## RECOMMENDATIONS

1. Variability in start and stop dates for the Kogrukluk River weir confound between-year comparisons of summary statistics such as the total annual escapement. Circumstances that dictate start and stop dates are often beyond the control of project leaders or crews, but comparability can be enhanced by adopting a standardized target operation period across all years. The span of dates selected for the target operational period would need to balance between what has been proven historically to be practical start and stop dates, while still providing a reasonable assessment of the total escapement estimate for each species. Project leaders would be required to estimate fish passage for inoperable periods that occurred within the target operational dates. Furthermore, counts made before or after the target operational period would be excluded from the reported cumulative passage and percent passage.

2. Kogrukluk River has the longest history of salmon escapement monitoring in the Kuskokwim Area, but inquiry into the rich history of data collected at this project is elusive because the limited historic perspective provided by the standard project report. Future project reports for the Kogrukluk River weir should continue to include historical perspectives such as the following:

    a. brood tables and three dimensional graphics that illustrate the number of fish by age class for the recent past,
    b. differences in sex composition as determined from weighted ASL samples and crew counts (both percent and total number),
    c. trends in the number and percent of females in the escapement,
    d. and trends in average length at age and sex.

3. Estimates of total annual escapement currently date to 1976, but extension of that timeline back to 1969 may be possible though the use of the counting tower data. Some paired data exist for years when both the tower and weir operated concurrently that may allow for estimates of total annual chinook and chum salmon escapement back to 1969.

4. A spawner-recruit analysis for Kogrukluk River salmon is another initiative with some merit. One of the caveats in undertaking this initiative in the past was accounting for the unknown fraction of Kogrukluk River fish harvested in the commercial and subsistence fisheries. Preliminary findings from the mark-recapture projects operated in 2002 and 2003 provide insight into the timing of Kogrukluk River salmon stocks in the lower Kuskokwim River, which may allow for some reasonable assumptions as to what temporal fraction of harvest is likely to contain fish bound for the Kogrukluk River. Isolating harvest during that time period, and applying an estimated spawning stock apportionment to account for Kogrukluk River fish, may provide the resolution required for identifying a reasonable spawner-recruit relationship.

5. Throughout most of the 1990s the percentage of female chum salmon in the Kogrukluk River escapements has been low, which contrasts with the approximately even split between females and male in nearly every other Kuskokwim Area data set. Low percentages raise concerns about how representative the Kogrukluk River chum salmon sex composition is to the Holitna River drainage in general. Operation of the Holitna River radio telemetry project provides some opportunity to resolve this question and comparison between the two projects should continue to be incorporated into future Kogrukluk River project reports.

6. Another ASL issue to be discussed is the variability in sex determination from the ASL samples compared to weir crew estimates derived from the daily counting routine. Counting crews report higher percentages of females than those provided by ASL data. It may be valuable to design a regime to test the accuracy of visual speciation and sex determination by field crews. If a level of error could be determined for visual differentiation, counts and sex ratios could be better compared to ASL data. This, along with documentation of observed salmon behavior with emphasis on patterns of migration through the weir, could lend insight into the discrepancies between ASL and visually-derived sex ratios. If consistent relationships are found, it may be possible to better evaluate sex ratios and improve estimates of productivity.

7. Install a remote logging station to record climatological data on the Kogrukluk River through the winter. Information could be correlated against future runs to help discern favorable or unfavorable brood conditions for Kogrukluk River salmon stocks. Comparable climatic data loggers should be developed at other weir projects as well.

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**Tables**

Table 1. Actual daily and estimated counts of chinook, sockeye, chum, coho, and pink salmon at the Kogrukluk River weir, 2003.

| Date | Chinook | | | | Chum | | | Sockeye | | | Coho | | | Pink |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Jacks[a] | Female | Totals | Male | Female | Totals | Male | Female | Totals | Male | Female | Totals | Totals |
| 6/21 | 0 | *0* | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/22 | 0 | *0* | 1 | 1 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/23 | 0 | *0* | 0 | 0 | 10 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/24 | 0 | *0* | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/25 | 4 | *0* | 3 | 7 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/26 | 3 | *0* | 2 | 5 | 6 | 1 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/27 | 12 | *2* | 12 | 24 | 33 | 1 | 34 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 6/28 | 22 | *4* | 18 | 40 | 34 | 14 | 48 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 6/29 | 29 | *3* | 21 | 50 | 21 | 7 | 28 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 6/30 | 60 | *15* | 14 | 74 | 63 | 18 | 81 | 5 | 6 | 11 | 0 | 0 | 0 | 0 |
| 7/1 | 16 | *4* | 1 | 17 | 62 | 5 | 67 | 3 | 1 | 4 | 0 | 0 | 0 | 0 |
| 7/2 | 207 | *21* | 65 | 272 | 242 | 30 | 272 | 9 | 11 | 20 | 0 | 0 | 0 | 0 |
| 7/3 | 263 | *34* | 81 | 344 | 351 | 40 | 391 | 15 | 34 | 49 | 0 | 0 | 0 | 0 |
| 7/4 | 178 | *28* | 51 | 229 | 324 | 41 | 365 | 19 | 18 | 37 | 0 | 0 | 0 | 0 |
| 7/5 | 304 | *48* | 106 | 410 | 621 | 91 | 712 | 24 | 25 | 49 | 0 | 0 | 0 | 0 |
| 7/6 | 363 | *69* | 91 | 454 | 623 | 66 | 689 | 139 | 132 | 271 | 0 | 0 | 0 | 0 |
| 7/7 | 365 | *63* | 114 | 479 | 568 | 58 | 626 | 108 | 65 | 173 | 0 | 0 | 0 | 1 |
| 7/8 | 417 | *87* | 175 | 592 | 521 | 59 | 580 | 276 | 190 | 466 | 0 | 0 | 0 | 0 |
| 7/9 | 576 | *137* | 282 | 858 | 603 | 55 | 658 | 457 | 205 | 662 | 0 | 0 | 0 | 0 |
| 7/10 | 400 | *77* | 162 | 562 | 531 | 36 | 567 | 156 | 64 | 220 | 0 | 0 | 0 | 1 |
| 7/11 | 54 | *11* | 17 | 71 | 146 | 6 | 152 | 59 | 30 | 89 | 0 | 0 | 0 | 0 |
| 7/12 | 424 | *51* | 178 | 602 | 509 | 35 | 544 | 302 | 118 | 420 | 0 | 0 | 0 | 0 |
| 7/13 | 230 | *38* | 127 | 357 | 440 | 49 | 489 | 314 | 135 | 449 | 0 | 0 | 0 | 0 |
| 7/14 | 454 | *76* | 307 | 761 | 985 | 152 | 1,137 | 520 | 238 | 758 | 0 | 0 | 0 | 0 |
| 7/15 | 294 | *22* | 260 | 554 | 915 | 155 | 1,070 | 504 | 201 | 705 | 0 | 0 | 0 | 0 |
| 7/16 | 402 | *77* | 244 | 646 | 845 | 212 | 1,057 | 334 | 168 | 502 | 0 | 0 | 0 | 0 |
| 7/17 | 316 | *36* | 143 | 459 | 776 | 179 | 955 | 313 | 153 | 466 | 0 | 0 | 0 | 0 |
| 7/18 | 265 | *47* | 135 | 400 | 923 | 144 | 1,067 | 299 | 170 | 469 | 0 | 0 | 0 | 0 |
| 7/19 | 261 | *48* | 180 | 441 | 1203 | 219 | 1,422 | 473 | 231 | 704 | 0 | 0 | 0 | 0 |
| 7/20 | 196 | *36* | 180 | 376 | 1115 | 242 | 1,357 | 366 | 172 | 538 | 3 | 3 | 6 | 0 |
| 7/21 | 268 | *61* | 274 | 542 | 1376 | 207 | 1,583 | 335 | 113 | 448 | 4 | 4 | 8 | 0 |
| 7/22 | 232 | *50* | 234 | 466 | 932 | 146 | 1,078 | 250 | 60 | 310 | 7 | 5 | 12 | 0 |
| 7/23 | 124 | *26* | 99 | 223 | 473 | 66 | 539 | 88 | 15 | 103 | 3 | 0 | 3 | 0 |
| 7/24 | 121 | *21* | 136 | 257 | 448 | 36 | 484 | 150 | 25 | 175 | 2 | 1 | 3 | 0 |
| 7/25 | 113 | *24* | 135 | 248 | 783 | 75 | 858 | 254 | 67 | 321 | 8 | 6 | 14 | 0 |
| 7/26 | 61 | *13* | 55 | 116 | 470 | 65 | 535 | 111 | 20 | 131 | 1 | 3 | 4 | 0 |
| 7/27 | 62 | *8* | 91 | 153 | 327 | 39 | 366 | 101 | 11 | 112 | 5 | 3 | 8 | 0 |
| 7/28 | 45 | *7* | 61 | 106 | 318 | 38 | 356 | 86 | 14 | 100 | 7 | 20 | 27 | 0 |
| 7/29[b] | | | | **85** | | | **354** | | | **75** | | | **27** | |
| 7/30[a] | 13 | *2* | 13 | **85** | 159 | 22 | **354** | 11 | 3 | **75** | 6 | 7 | **27** | 0 |
| 7/31 | 17 | *4* | 26 | 43 | 269 | 46 | 315 | 38 | 8 | 46 | 11 | 14 | 25 | 0 |
| 8/1 | 18 | *6* | 21 | 39 | 321 | 58 | 379 | 37 | 4 | 41 | 28 | 19 | 47 | 0 |
| 8/2 | 14 | *5* | 26 | 40 | 245 | 47 | 292 | 28 | 6 | 34 | 35 | 32 | 67 | 0 |
| 8/3[a] | 10 | *2* | 6 | **31** | 65 | 4 | **237** | 4 | 1 | **25** | 6 | 7 | **51** | 0 |
| 8/4[a] | 6 | *1* | 2 | **31** | 27 | 9 | **237** | 3 | 0 | **25** | 9 | 4 | **51** | 0 |
| 8/5 | 16 | *2* | 7 | 23 | 111 | 14 | 125 | 16 | 2 | 18 | 21 | 16 | 37 | 0 |
| 8/6 | 17 | *4* | 3 | 20 | 132 | 20 | 152 | 5 | 2 | 7 | 36 | 17 | 53 | 0 |
| 8/7 | 21 | *3* | 6 | 27 | 154 | 23 | 177 | 14 | 3 | 17 | 91 | 44 | 135 | 0 |
| 8/8 | 10 | *2* | 14 | 24 | 93 | 20 | 113 | 5 | 0 | 5 | 33 | 34 | 67 | 0 |
| 8/9 | 8 | *5* | 7 | 15 | 117 | 20 | 137 | 3 | 2 | 5 | 173 | 96 | 269 | 0 |
| 8/10 | 4 | *0* | 3 | 7 | 67 | 21 | 88 | 4 | 1 | 5 | 185 | 139 | 324 | 0 |
| 8/11 | 2 | *1* | 1 | 3 | 26 | 8 | 34 | 2 | 0 | 2 | 13 | 14 | 27 | 0 |
| 8/12 | 12 | *0* | 2 | 14 | 33 | 9 | 42 | 1 | 0 | 1 | 633 | 322 | 955 | 0 |

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Table 1. (page 2 of 2)

| Date | Chinook | | | | Chum | | | Sockeye | | | Coho | | | Pink |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Jacks | Female | Totals | Male | Female | Totals | Male | Female | Totals | Male | Female | Totals | Totals |
| 8/13 | 5 | *1* | 0 | 5 | 28 | 9 | 37 | 1 | 0 | 1 | 388 | 159 | 547 | 0 |
| 8/14 | 2 | *0* | 4 | 6 | 9 | 3 | 12 | 3 | 0 | 3 | 695 | 311 | 1,006 | 0 |
| 8/15 | 3 | *0* | 2 | 5 | 36 | 2 | 38 | 2 | 1 | 3 | 775 | 425 | 1,200 | 0 |
| 8/16 | 8 | *1* | 0 | 8 | 18 | 2 | 20 | 1 | 0 | 1 | 565 | 280 | 845 | 0 |
| 8/17 | 6 | *1* | 1 | 7 | 12 | 4 | 16 | 1 | 0 | 1 | 441 | 192 | 633 | 0 |
| 8/18 | 2 | *0* | 1 | 3 | 8 | 1 | 9 | 0 | 0 | 0 | 171 | 66 | 237 | 0 |
| 8/19 | 2 | *0* | 0 | 2 | 4 | 0 | 4 | 0 | 0 | 0 | 322 | 120 | 442 | 0 |
| 8/20 | 6 | *1* | 1 | 7 | 4 | 0 | 4 | 1 | 1 | 2 | 810 | 335 | 1,145 | 0 |
| 8/21 | 5 | *0* | 2 | 7 | 3 | 0 | 3 | 0 | 0 | 0 | 1,506 | 680 | 2,186 | 0 |
| 8/22 | 1 | *0* | 1 | 2 | 1 | 1 | 2 | 0 | 0 | 0 | 944 | 486 | 1,430 | 0 |
| 8/23 | 0 | *0* | 0 | 0 | 2 | 0 | 2 | 1 | 0 | 1 | 730 | 281 | 1,011 | 0 |
| 8/24 | 7 | *1* | 0 | 7 | 3 | 0 | 3 | 1 | 1 | 2 | 1,060 | 533 | 1,593 | 0 |
| 8/25 | 2 | *0* | 0 | 2 | 1 | 0 | 1 | 1 | 0 | 1 | 1,126 | 639 | 1,765 | 0 |
| 8/26 | 2 | *2* | 1 | 3 | 3 | 2 | 5 | 0 | 0 | 0 | 1,900 | 1,271 | 3,171 | 0 |
| 8/27[a] | 0 | *0* | 0 | **2** | 4 | 0 | **4** | 0 | 0 | **0** | 1,989 | 1,280 | **3,269** | 0 |
| 8/28[b] | | | | **2** | | | **2** | | | **0** | | | **3,551** | |
| 8/29[a] | 2 | *1* | 0 | **2** | 2 | 0 | **2** | 0 | 0 | **0** | 847 | 498 | **3,551** | 0 |
| 8/30 | 2 | *0* | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 2,500 | 1,600 | 4,100 | 0 |
| 8/31 | 1 | *0* | 0 | 1 | 2 | 0 | 2 | 0 | 0 | 0 | 2,069 | 1,593 | 3,662 | 0 |
| 9/1 | 3 | *0* | 0 | 3 | 2 | 0 | 2 | 1 | 0 | 1 | 2,035 | 1,666 | 3,701 | 0 |
| 9/2 | 1 | *0* | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1,575 | 1,215 | 2,790 | 0 |
| 9/3 | 2 | *1* | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 1,283 | 818 | 2,101 | 0 |
| 9/4 | 2 | *0* | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 2,554 | 1,947 | 4,501 | 0 |
| 9/5 | 1 | *0* | 0 | 1 | 3 | 0 | 3 | 0 | 0 | 0 | 2,520 | 2,141 | 4,661 | 0 |
| 9/6 | 1 | *0* | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1,476 | 1,397 | 2,873 | 0 |
| 9/7 | 1 | *0* | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 899 | 788 | 1,687 | 0 |
| 9/8 | 1 | *1* | 0 | 1 | 2 | 0 | 2 | 1 | 0 | 1 | 1,026 | 881 | 1,907 | 0 |
| 9/9 | 1 | *0* | 0 | 1 | 3 | 0 | 3 | 0 | 0 | 0 | 1,457 | 1,500 | 2,957 | 0 |
| 9/10 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 956 | 1,046 | 2,002 | 0 |
| 9/11 | 0 | *0* | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 617 | 692 | 1,309 | 0 |
| 9/12 | 2 | *1* | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 808 | 1,049 | 1,857 | 1 |
| 9/13 | 0 | *0* | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 720 | 1,000 | 1,720 | 0 |
| 9/14 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 336 | 351 | 687 | 0 |
| 9/15 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 225 | 276 | 501 | 0 |
| 9/16 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 148 | 208 | 356 | 0 |
| 9/17 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 151 | 182 | 333 | 0 |
| 9/18 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 260 | 292 | 552 | 0 |
| 9/19 | 0 | *0* | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 99 | 82 | 181 | 0 |
| 9/20 | 0 | *0* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 187 | 151 | 338 | 0 |
| Total Estimated Escapement | 7,380 | 1,292 | 4,205 | **11,771** | 19,580 | 2,934 | **23,413** | 6,259 | 2,727 | **9,164** | 39,490 | 29,241 | **74,604** | 3 |
| Obs. Escapement | | | | 11,585 | | | 22,514 | | | 8,986 | | | 68,731 | 3 |
| % Estimated | | | | 1.6% | | | 4.0% | | | 2.0% | | | 8.5% | 0.0% |

[a] Jack numbers are a subset of total males, daily and cumulative.

[b] estimated salmon passage (partial day)

[c] estimated salmon passage (full day)

Table 2. Daily mortality counts for chinook, sockeye, and chum salmon at the Kogrukluk River weir, 2003.

| Date | Chinook | Sockeye | Chum | Date | Chinook | Sockeye | Chum |
|---|---|---|---|---|---|---|---|
| 6/26 | 0 | 0 | 0 | 8/1 | 46 | 2 | 383 |
| 6/27 | 0 | 0 | 0 | 8/2 | 56 | 4 | 280 |
| 6/28 | 0 | 0 | 0 | 8/3 | 91 | 4 | 262 |
| 6/29 | 0 | 0 | 0 | 8/4 | 107 | 4 | 232 |
| 6/30 | 0 | 0 | 0 | 8/5 | 103 | 14 | 228 |
| 7/1 | 0 | 0 | 0 | 8/6 | 190 | 19 | 353 |
| 7/2 | 0 | 0 | 0 | 8/7 | 125 | 60 | 361 |
| 7/3 | 0 | 0 | 0 | 8/8 | 134 | 39 | 346 |
| 7/4 | 0 | 0 | 3 | 8/9 | 107 | 74 | 208 |
| 7/5 | 0 | 0 | 2 | 8/10 | 87 | 68 | 154 |
| 7/6 | 1 | 0 | 5 | 8/11 | 48 | 69 | 132 |
| 7/7 | 0 | 0 | 2 | 8/12 | 57 | 70 | 115 |
| 7/8 | 0 | 0 | 9 | 8/13 | 26 | 62 | 145 |
| 7/9 | 0 | 0 | 15 | 8/14 | 28 | 75 | 85 |
| 7/10 | 0 | 0 | 14 | 8/15 | NA | NA | NA |
| 7/11 | 0 | 0 | 24 | 8/16 | 10 | 53 | 62 |
| 7/12 | 1 | 0 | 39 | 8/17 | 5 | 38 | 28 |
| 7/13 | 0 | 2 | 90 | 8/18 | 0 | 0 | 0 |
| 7/14 | 0 | 0 | 96 | 8/19 | 9 | 88 | 58 |
| 7/15 | 0 | 0 | 107 | 8/20 | 0 | 0 | 0 |
| 7/16 | 0 | 0 | 217 | 8/21 | 5 | 61 | 37 |
| 7/17 | 0 | 2 | 210 | 8/22 | 29 | 29 | 5 |
| 7/18 | 0 | 1 | 134 | 8/23 | 0 | 0 | 0 |
| 7/19 | 0 | 0 | 250 | 8/24 | 37 | 37 | 3 |
| 7/20 | 0 | 3 | 420 | 8/25 | 1 | 9 | 8 |
| 7/21 | 2 | 2 | 220 | 8/26 | 0 | 0 | 0 |
| 7/22 | 3 | 0 | 265 | 8/27 | 2 | 23 | 22 |
| 7/23 | 2 | 0 | 287 | 8/28 | 0 | 0 | 0 |
| 7/24 | 2 | 2 | 225 | 8/29 | 1 | 1 | 3 |
| 7/25 | 0 | 4 | 171 | 8/30 | 0 | 0 | 0 |
| 7/26 | 4 | 3 | 568 | 8/31 | 0 | 0 | 0 |
| 7/27 | 4 | 3 | 502 | 9/1 | 0 | 0 | 0 |
| 7/28 | 24 | 7 | 673 | 9/2 | 0 | 0 | 0 |
| 7/29 | NA | NA | NA | 9/3 | 0 | 0 | 0 |
| 7/30 | NA | NA | NA | 9/4 | 0 | 0 | 0 |
| 7/31 | 4 | 0 | 50 | 9/5 | 1 | 2 | 3 |
| | | | | **Total** | 1,352 | 934 | 8,111 |

Table 3. Age and sex of chinook salmon at the Kogrukluk River weir based on escapement samples collected with a fish trap, 2003.

| Year | Sample Dates (Stratum Dates) | Sample Size | Sex | Age Class 0.2 Esc. | 0.2 % | 1.1 Esc. | 1.1 % | 1.2 Esc. | 1.2 % | 2.1 Esc. | 2.1 % | 1.3 Esc. | 1.3 % | 2.2 Esc. | 2.2 % | 1.4 Esc. | 1.4 % | 2.3 Esc. | 2.3 % | 1.5 Esc. | 1.5 % | 2.4 Esc. | 2.4 % | 1.6 Esc. | 1.6 % | 2.5 Esc. | 2.5 % | Total Esc. | Total % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2003 | 7/1 - 4 | 59 | M | 0 | 0.0 | 0 | 0.0 | 300 | 20.3 | 0 | 0.0 | 874 | 59.3 | 0 | 0.0 | 175 | 11.9 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1,348 | 91.5 |
| | (6/21 - 7/5) | | F | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 50 | 3.4 | 0 | 0.0 | 50 | 3.4 | 0 | 0.0 | 25 | 1.7 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 125 | 8.5 |
| | | | Subtotal[a] | 0 | 0.0 | 0 | 0.0 | 300 | 20.3 | 0 | 0.0 | 924 | 62.7 | 0 | 0.0 | 225 | 15.3 | 0 | 0.0 | 25 | 1.7 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1,473 | 100.0 |
| | 7/7 - 11 | 92 | M | 0 | 0.0 | 0 | 0.0 | 944 | 26.1 | 0 | 0.0 | 1,298 | 35.9 | 0 | 0.0 | 275 | 7.6 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2,517 | 69.6 |
| | (7/6 - 12) | | F | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 39 | 1.1 | 0 | 0.0 | 905 | 25.0 | 0 | 0.0 | 157 | 4.3 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1,101 | 30.4 |
| | | | Subtotal | 0 | 0.0 | 0 | 0.0 | 944 | 26.1 | 0 | 0.0 | 1,337 | 37.0 | 0 | 0.0 | 1,180 | 32.6 | 0 | 0.0 | 157 | 4.3 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 3,618 | 100.0 |
| | | | Subtotal[a] | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7/15 - 19 | 64 | M | 0 | 0.0 | 0 | 0.0 | 562 | 14.1 | 0 | 0.0 | 1,685 | 42.2 | 0 | 0.0 | 499 | 12.5 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2,746 | 68.8 |
| | (7/13 - 7/20) | | F | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 62 | 1.6 | 0 | 0.0 | 1,124 | 28.1 | 0 | 0.0 | 62 | 1.6 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1,248 | 31.2 |
| | | | Subtotal[a] | 0 | 0.0 | 0 | 0.0 | 562 | 14.1 | 0 | 0.0 | 1,747 | 43.8 | 0 | 0.0 | 1,623 | 40.6 | 0 | 0.0 | 62 | 1.6 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 3,994 | 100.0 |
| | 7/21 - 8/7 | 158 | M | 0 | 0.0 | 0 | 0.0 | 391 | 14.6 | 0 | 0.0 | 867 | 32.3 | 0 | 0.0 | 221 | 8.2 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1,479 | 55.1 |
| | (7/21 - 9/20) | | F | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 136 | 5.0 | 0 | 0.0 | 986 | 36.7 | 0 | 0.0 | 85 | 3.2 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1,207 | 44.9 |
| | | | Subtotal[a] | 0 | 0.0 | 0 | 0.0 | 391 | 14.6 | 0 | 0.0 | 1,003 | 37.3 | 0 | 0.0 | 1,207 | 44.9 | 0 | 0.0 | 85 | 3.2 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2,686 | 100.0 |
| | Season[b] | 373 | M | 0 | 0.0 | 0 | 0.0 | 2,196 | 18.7 | 0 | 0.0 | 4,723 | 40.1 | 0 | 0.0 | 1,170 | 10.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 8,090 | 68.7 |
| | | | F | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 288 | 2.5 | 0 | 0.0 | 3,064 | 26.0 | 0 | 0.0 | 330 | 2.8 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 3,681 | 31.3 |
| | | | Total | 0 | 0.0 | 0 | 0.0 | 2,196 | 18.7 | 0 | 0.0 | 5,011 | 42.6 | 0 | 0.0 | 4,234 | 36.0 | 0 | 0.0 | 330 | 2.8 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 11,771 | 100.0 |

[a] The number of fish in each stratum age and sex category are derived from the sample percentages; discrepancies in sums are attributed to rounding errors.

[b] The number of fish in "Season" summaries are the strata sums; "Season" percentages are derived from the sums.

Table 4. Mean length (mm) of chinook salmon at the Kogrukluk River weir based on escapement samples collected with a fish trap, 2003

| Year | Sample Dates (Stratum Dates) | Sex | | Age Class 0.2 | 1.1 | 1.2 | 2.1 | 1.3 | 2.2 | 1.4 | 2.3 | 1.5 | 2.4 | 1.6 | 2.5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2003 | 7/1 - 4 | M | Mean Length | | | 543 | | 667 | | 778 | | | | | |
| | (6/21 - 7/5) | | Std. Error | | | 10 | | 11 | | 19 | | | | | |
| | | | Range | | | 482- 594 | | 514- 769 | | 735- 882 | | | | | |
| | | | Sample Size | 0 | 0 | 12 | 0 | 35 | 0 | 7 | 0 | 0 | 0 | 0 | 0 |
| | | F | Mean Length | | | | | 828 | | 872 | | 800 | | | |
| | | | Std. Error | | | | | 1 | | 5 | | - | | | |
| | | | Range | | | | | 827- 829 | | 867- 877 | | 800- 800 | | | |
| | | | Sample Size | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| | 7/7, 9 - 11 | M | Mean Length | | | 551 | | 713 | | 840 | | | | | |
| | (7/6 - 12) | | Std. Error | | | 7 | | 11 | | 27 | | | | | |
| | | | Range | | | 480- 609 | | 592- 800 | | 768- 970 | | | | | |
| | | | Sample Size | 0 | 0 | 24 | 0 | 33 | 0 | 7 | 0 | 0 | 0 | 0 | 0 |
| | | F | Mean Length | | | | | 600 | | 867 | | 893 | | | |
| | | | Std. Error | | | | | - | | 12 | | 17 | | | |
| | | | Range | | | | | 600- 600 | | 700- 944 | | 851- 930 | | | |
| | | | Sample Size | 0 | 0 | 0 | 0 | 1 | 0 | 23 | 0 | 4 | 0 | 0 | 0 |
| | 7/15 - 19 | M | Mean Length | | | 526 | | 713 | | 791 | | | | | |
| | (7/13 - 20) | | Std. Error | | | 15 | | 12 | | 24 | | | | | |
| | | | Range | | | 465- 611 | | 600- 863 | | 666- 886 | | | | | |
| | | | Sample Size | 0 | 0 | 9 | 0 | 27 | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| | | F | Mean Length | | | | | 786 | | 852 | | 796 | | | |
| | | | Std. Error | | | | | - | | 12 | | - | | | |
| | | | Range | | | | | 786- 786 | | 783- 935 | | 796- 796 | | | |
| | | | Sample Size | 0 | 0 | 0 | 0 | 1 | 0 | 18 | 0 | 1 | 0 | 0 | 0 |
| | 7/21 - 8/7 | M | Mean Length | | | 552 | | 705 | | 838 | | | | | |
| | (7/21 - 9/20) | | Std. Error | | | 8 | | 9 | | 16 | | | | | |
| | | | Range | | | 487- 624 | | 562- 866 | | 762- 964 | | | | | |
| | | | Sample Size | 0 | 0 | 23 | 0 | 51 | 0 | 13 | 0 | 0 | 0 | 0 | 0 |
| | | F | Mean Length | | | | | 792 | | 848 | | 911 | | | |
| | | | Std. Error | | | | | 9 | | 7 | | 26 | | | |
| | | | Range | | | | | 762- 822 | | 758- 954 | | 824- 987 | | | |
| | | | Sample Size | 0 | 0 | 0 | 0 | 8 | 0 | 58 | 0 | 5 | 0 | 0 | 0 |
| 2003 | | | | | | | | | | | | | | | |
| | Season [a b] | M | Mean Length | | | 544 | | 703 | | 809 | | | | | |
| | | | Range | | | 465- 624 | | 514- 866 | | 666- 970 | | | | | |
| | | | Sample Size | 0 | 0 | 68 | 0 | 146 | 0 | 35 | 0 | 0 | 0 | 0 | 0 |
| | | F | Mean Length | | | | | 770 | | 855 | | 872 | | | |
| | | | Range | | | | | 600- 829 | | 700- 954 | | 796- 987 | | | |
| | | | Sample Size | 0 | 0 | 0 | 0 | 12 | 0 | 101 | 0 | 11 | 0 | 0 | 0 |

[a] "Season" mean lengths are weighted by the escapement passage in each stratum.

[b] "Season" mean lengths are simple averages of number of fish sampled.

Table 5. Age and sex of chum salmon at the Kogrukluk River weir based on escapement samples collected with a fish trap, 2003.

| Year | Sample Dates (Stratum Dates) | Sample Size | Sex | Age Class 0.2 Esc. | 0.2 % | 0.3 Esc. | 0.3 % | 0.4 Esc. | 0.4 % | 0.5 Esc. | 0.5 % | Total Esc. | Total % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2003 | 6/30 - 7/4 | 181 | M | 11 | 0.6 | 704 | 34.8 | 1,006 | 49.7 | 56 | 2.8 | 1,777 | 87.8 |
| | (6/21 - 7/5) | | F | 0 | 0.0 | 123 | 6.1 | 123 | 6.1 | 0 | 0.0 | 246 | 12.2 |
| | | | Subtotal[a] | 11 | 0.6 | 827 | 40.9 | 1,129 | 55.8 | 56 | 2.8 | 2,023 | 100.0 |
| | 7/7 - 8 | 168 | M | 77 | 1.8 | 2,024 | 47.0 | 1,691 | 39.3 | 0 | 0.0 | 3,793 | 88.1 |
| | (7/6 - 7/13) | | F | 0 | 0.0 | 308 | 7.2 | 205 | 4.7 | 0 | 0.0 | 512 | 11.9 |
| | | | Subtotal[a] | 77 | 1.8 | 2,332 | 54.2 | 1,896 | 44.0 | 0 | 0.0 | 4,305 | 100.0 |
| | 7/15 - 16 | 168 | M | 40 | 0.6 | 3,554 | 53.0 | 2,555 | 38.1 | 80 | 1.2 | 6,229 | 92.9 |
| | (7/14 - 7/19) | | F | 80 | 1.2 | 399 | 5.9 | 0 | 0.0 | 0 | 0.0 | 479 | 7.1 |
| | | | Subtotal[a] | 120 | 1.8 | 3,953 | 58.9 | 2,555 | 38.1 | 80 | 1.2 | 6,708 | 100.0 |
| | 7/21 - 25 | 180 | M | 159 | 2.2 | 5,248 | 73.3 | 1,272 | 17.8 | 0 | 0.0 | 6,679 | 93.3 |
| | (7/20 - 7/28) | | F | 0 | 0.0 | 397 | 5.6 | 80 | 1.1 | 0 | 0.0 | 477 | 6.7 |
| | | | Subtotal[a] | 159 | 2.2 | 5,645 | 78.9 | 1,352 | 18.9 | 0 | 0.0 | 7,156 | 100.0 |
| | 7/31 - 8/1 | 190 | M | 0 | 0.0 | 1,529 | 70.5 | 377 | 17.3 | 0 | 0.0 | 1,906 | 87.9 |
| | (7/29 - 8/4) | | F | 11 | 0.5 | 217 | 10.0 | 34 | 1.6 | 0 | 0.0 | 262 | 12.1 |
| | | | Subtotal[a] | 11 | 0.5 | 1,746 | 80.5 | 411 | 18.9 | 0 | 0.0 | 2,168 | 100.0 |
| | 8/2, 5 - 7 | 127 | M | 33 | 3.1 | 845 | 80.3 | 75 | 7.1 | 0 | 0.0 | 953 | 90.6 |
| | (8/5 - 9/20) | | F | 8 | 0.8 | 83 | 7.9 | 8 | 0.8 | 0 | 0.0 | 99 | 9.4 |
| | | | Subtotal[a] | 41 | 3.9 | 928 | 88.2 | 83 | 7.9 | 0 | 0.0 | 1,052 | 100.0 |
| | Season[b] | 1,014 | M | 320 | 1.4 | 13,904 | 59.4 | 6,976 | 29.8 | 136 | 0.6 | 21,336 | 91.1 |
| | | | F | 100 | 0.4 | 1,527 | 6.5 | 450 | 1.9 | 0 | 0.0 | 2,076 | 8.9 |
| | | | Total | 420 | 1.8 | 15,431 | 65.9 | 7,426 | 31.7 | 136 | 0.6 | 23,412 | 100.0 |

[a] The number of fish in each stratum age and sex category are derived from the sample percentages; discrepancies in sums are attributed to rounding errors.

[b] The number of fish in "Season" summaries are the strata sums; "Season" percentages are derived from the sums.

Table 6. Mean length (mm) of chum salmon at the Kogrukluk River weir based on escapement samples collected with a fish trap, 2003.

| Year | Sample Dates (Stratum Dates) | Sex | | Age Class 0.2 | 0.3 | 0.4 | 0.5 |
|---|---|---|---|---|---|---|---|
| 2003 | 6/30 - 7/4 (6/21 - 7/5) | M | Mean Length | 560 | 572 | 593 | 607 |
| | | | Std. Error | - | 3 | 2 | 11 |
| | | | Range | 560- 560 | 512- 663 | 534- 639 | 585- 641 |
| | | | Sample Size | 1 | 63 | 90 | 5 |
| | | F | Mean Length | | 561 | 568 | |
| | | | Std. Error | | 9 | 9 | |
| | | | Range | | 504- 606 | 515- 612 | |
| | | | Sample Size | 0 | 11 | 11 | 0 |
| | 7/7 - 8 (7/6 - 7/13) | M | Mean Length | 547 | 567 | 593 | |
| | | | Std. Error | 2 | 3 | 3 | |
| | | | Range | 545- 552 | 502- 639 | 530- 657 | |
| | | | Sample Size | 3 | 79 | 66 | 0 |
| | | F | Mean Length | | 562 | 560 | |
| | | | Std. Error | | 9 | 5 | |
| | | | Range | | 484- 590 | 545- 585 | |
| | | | Sample Size | 0 | 12 | 8 | 0 |
| | 7/15 - 16 (7/14 - 7/19) | M | Mean Length | 556 | 575 | 599 | 617 |
| | | | Std. Error | - | 3 | 4 | 6 |
| | | | Range | 556- 556 | 495- 670 | 520- 657 | 611- 622 |
| | | | Sample Size | 1 | 89 | 64 | 2 |
| | | F | Mean Length | 529 | 553 | | |
| | | | Std. Error | 3 | 9 | | |
| | | | Range | 526- 532 | 510- 600 | | |
| | | | Sample Size | 2 | 10 | 0 | 0 |
| | 7/21 - 25 (7/20 - 7/28) | M | Mean Length | 521 | 568 | 588 | |
| | | | Std. Error | 9 | 3 | 5 | |
| | | | Range | 502- 543 | 507- 685 | 526- 631 | |
| | | | Sample Size | 4 | 132 | 32 | 0 |
| | | F | Mean Length | | 544 | 579 | |
| | | | Std. Error | | 9 | 17 | |
| | | | Range | | 501- 587 | 562- 595 | |
| | | | Sample Size | 0 | 10 | 2 | 0 |
| | 7/31 - 8/1 (7/29 - 8/4) | M | Mean Length | | 555 | 576 | |
| | | | Std. Error | | 2 | 4 | |
| | | | Range | | 493- 617 | 525- 616 | |
| | | | Sample Size | 0 | 134 | 33 | 0 |
| | | F | Mean Length | 489 | 533 | 560 | |
| | | | Std. Error | - | 6 | 17 | |
| | | | Range | 489- 489 | 491- 591 | 534- 591 | |
| | | | Sample Size | 1 | 19 | 3 | 0 |

- continued -

Table 6. (Page 2 of 2)

| Year | Sample Dates (Stratum Dates) | Sex | | Age Class 0.2 | 0.3 | 0.4 | 0.5 |
|---|---|---|---|---|---|---|---|
| 2003 (Cont.) | 8/2, 5 - 7 (8/5 - 9/20) | M | Mean Length | 534 | 548 | 576 | |
| | | | Std. Error | 1 | 3 | 12 | |
| | | | Range | 531- 537 | 482- 626 | 536- 663 | |
| | | | Sample Size | 4 | 102 | 9 | 0 |
| | | F | Mean Length | 529 | 543 | 512 | |
| | | | Std. Error | - | 3 | - | |
| | | | Range | 529- 529 | 531- 558 | 512- 512 | |
| | | | Sample Size | 1 | 10 | 1 | 0 |
| | Season [a] | M | Mean Length | 534 | 567 | 593 | 613 |
| | | | Range | 502- 560 | 482- 685 | 520- 663 | 585- 641 |
| | | | Sample Size | 13 | 599 | 294 | 7 |
| | | F | Mean Length | 524 | 550 | 564 | |
| | | | Range | 489- 532 | 484- 606 | 512- 612 | |
| | | | Sample Size | 4 | 72 | 25 | 0 |

[a] "Season" mean lengths are weighted by the escapement passage in each stratum.

Table 7. Age and sex of coho salmon at the Kogrukluk River weir based on escapement samples collected with a fish trap, 2003

| Year | Sample Dates (Stratum Dates) | Sample Size | Sex | Age Class 1.1 Esc. | 1.1 % | 2.1 Esc. | 2.1 % | 2.2 Esc. | 2.2 % | 3.1 Esc. | 3.1 % | Total Esc. | Total % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2003 | 8/12 - 14 | 58 | M | 0 | 0.0 | 5,439 | 65.5 | 0 | 0.0 | 859 | 10.3 | 6,298 | 75.9 |
| | (7/20 - 8/20) | | F | 0 | 0.0 | 1,718 | 20.7 | 0 | 0.0 | 286 | 3.5 | 2,004 | 24.1 |
| | | | Subtotal[a] | 0 | 0.0 | 7,157 | 86.2 | 0 | 0.0 | 1,145 | 13.8 | 8,302 | 100.0 |
| | 8/27, 29 | 62 | M | 614 | 1.6 | 19,628 | 51.6 | 0 | 0.0 | 4,294 | 11.3 | 24,535 | 64.5 |
| | (8/21 - 9/3) | | F | 613 | 1.6 | 9,201 | 24.2 | 0 | 0.0 | 3,680 | 9.7 | 13,495 | 35.5 |
| | | | Subtotal[a] | 1,227 | 3.2 | 28,829 | 75.8 | 0 | 0.0 | 7,974 | 21.0 | 38,030 | 100.0 |
| | 9/17 - 18, 20 | 41 | M | 0 | 0.0 | 12,478 | 43.9 | 0 | 0.0 | 1,386 | 4.9 | 13,864 | 48.8 |
| | (9/4 - 20) | | F | 0 | 0.0 | 12,478 | 43.9 | 0 | 0.0 | 2,080 | 7.3 | 14,558 | 51.2 |
| | | | Subtotal[a] | 0 | 0.0 | 24,956 | 87.8 | 0 | 0.0 | 3,466 | 12.2 | 28,422 | 100.0 |
| | Season[b] | 161 | M | 614 | 0.8 | 37,546 | 50.2 | 0 | 0.0 | 6,539 | 8.7 | 44,698 | 59.8 |
| | | | F | 613 | 0.8 | 23,396 | 31.3 | 0 | 0.0 | 6,046 | 8.1 | 30,056 | 40.2 |
| | | | Total | 1,227 | 1.6 | 60,942 | 81.5 | 0 | 0.0 | 12,585 | 16.8 | 74,754 | 100.0 |

[a] The number of fish in each stratum age and sex category are derived from the sample percentages; discrepancies in sums are attributed to rounding errors.

[b] The number of fish in "Season" summaries are the strata sums; "Season" percentages are derived from the sums.

Table 8. Mean length (mm) of coho salmon at the Kogrukluk River weir based on escapement samples collected with a fish trap, 2003.

| Year | Sample Dates (Stratum Dates) | Sex | | Age Class 1.1 | 2.1 | 2.2 | 3.1 |
|---|---|---|---|---|---|---|---|
| 2003 | 8/12 - 14 (7/20 - 8/20) | M | Mean Length | | 543 | | 583 |
| | | | Std. Error | | 5 | | 7 |
| | | | Range | | 466- 595 | | 554- 598 |
| | | | Sample Size | 0 | 38 | 0 | 6 |
| | | F | Mean Length | | 560 | | 580 |
| | | | Std. Error | | 5 | | 2 |
| | | | Range | | 532- 595 | | 578- 582 |
| | | | Sample Size | 0 | 12 | 0 | 2 |
| 2003 (Cont.) | 8/27, 29 (8/21 - 9/3) | M | Mean Length | 580 | 562 | | 559 |
| | | | Std. Error | - | 6 | | 18 |
| | | | Range | 580- 580 | 480- 656 | | 474- 630 |
| | | | Sample Size | 1 | 32 | 0 | 7 |
| | | F | Mean Length | 516 | 562 | | 579 |
| | | | Std. Error | - | 8 | | 10 |
| | | | Range | 516- 516 | 502- 609 | | 535- 606 |
| | | | Sample Size | 1 | 15 | 0 | 6 |
| | 9/17 - 18, 20 (9/4 - 20) | M | Mean Length | | 573 | | 589 |
| | | | Std. Error | | 12 | | 24 |
| | | | Range | | 461- 684 | | 565- 613 |
| | | | Sample Size | 0 | 18 | 0 | 2 |
| | | F | Mean Length | | 574 | | 578 |
| | | | Std. Error | | 6 | | 15 |
| | | | Range | | 516- 642 | | 548- 595 |
| | | | Sample Size | 0 | 18 | 0 | 3 |
| | Season [a] | M | Mean Length | 580 | 563 | | 568 |
| | | | Range | 580- 580 | 461- 684 | | 474- 630 |
| | | | Sample Size | 1 | 88 | 0 | 15 |
| | | F | Mean Length | 516 | 568 | | 579 |
| | | | Range | 516- 516 | 502- 642 | | 535- 606 |
| | | | Sample Size | 1 | 45 | 0 | 11 |

[a] "Season" mean lengths are weighted by the escapement passage in each stratum.

Table 9. Historic salmon escapements for selected tributaries of the Kuskokwim River.

| Chinook Salmon | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Year | | | | | | | | |
| Escapement Project | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | |
| Weir: | | | | | | | | | |
| Takotna River | 401 | 1,176 | | | 345 | 723 | 316 | 378 | [a] |
| Tatlawiksuk River | | | 970 | 1,490 | 817 | 2,010 | 2,237 | 1,683 | [b] |
| Kogrukluk River | 14,199 | 13,286 | 12,107 | 5,570 | 3,310 | 9,298 | 10,104 | 11,771 | |
| George River | 7,716 | 7,834 | | 3,548 | 2,960 | 3,309 | 2,444 | 4,693 | [c] |
| Tuluksak River | | | | | | 997 | 1,346 | 1,064 | |
| Kwethluk River | | 10,395 | | | 3,547 | | 8,397 | 14,474 | |
| Aerial Survey: | | | | | | | | | |
| Salmon River (Pitka Fork) | | | | | 374 | 1,029 | 1,276 | 1,391 | |
| Gagaryah River | | | | 364 | | | 452 | 1,003 | |
| Cheeneetnuk River | | 345 | | | | | 730 | 810 | |
| Holitna River | | 2,093 | | 741 | 501 | 1,760 | 1,741 | 1,477 | |
| Oskawalik River | | 1,470 | | 98 | 62 | 181 | 235 | 844 | |
| Holokuk River | 85 | 165 | | 18 | 42 | 52 | 513 | 1,096 | |
| Salmon River (Aniak River) | 983 | 980 | | | 152 | 703 | 1,236 | 1,292 | |
| Kipchuk River (Aniak River) | | 855 | 443 | | 182 | | 1,615 | 1,493 | |
| Aniak River | 3,496 | 2,187 | 1,930 | | 714 | | 1,856 | 3,514 | |
| Kisaralik River | | 439 | 457 | | | | 2,285 | 688 | |

| Chum Salmon | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Year | | | | | | | | |
| Escapement Project | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | |
| Weir: | | | | | | | | | |
| Takotna River | 2,808 | 1,785 | | | 1,254 | 5,420 | 4,386 | 3,393 | |
| Tatlawiksuk River | | | 5,726 | 9,599 | 7,044 | 23,718 | 24,542 | 479 | [a] |
| Kogrukluk River | 48,495 | 7,958 | 36,442 | 13,820 | 11,491 | 30,570 | 51,570 | 23,413 | |
| George River | 21,670 | 5,907 | | 11,558 | 3,492 | 11,601 | 6,543 | 33,666 | |
| Tuluksak River | | | | | | 19,321 | 9,958 | 11,625 | |
| Kwethluk River | 26,049 | 10,659 | | | 11,691 | | 35,854 | 41,812 | |
| Sonar: | | | | | | | | | |
| Aniak River | 302,106 | 262,522 | 279,431 | 105,196 | 144,157 | 222,231 | 363,585 | 363,396 | |

| Coho Salmon | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Year | | | | | | | | |
| Escapement Project | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | |
| Weir: | | | | | | | | | |
| Takotna River | | | | | 3,957 | 2,606 | 3,984 | 7,171 | |
| Tatlawiksuk River | | | | 3,455 | 5,756 | 10,539 | 11,363 | 0 | [a] |
| Kogrukluk River | 50,555 | 12,237 | 24,348 | 12,609 | 12,237 | 33,135 | 14,516 | 74,604 | |
| George River | | 9,210 | | 8,930 | 11,262 | 14,415 | 6,759 | 33,280 | |
| Tuluksak River | | | | | | 23,768 | 11,487 | 39,627 | |
| Kwethluk River | | | | | 25,610 | 22,904 | 14,516 | 107,789 | |

[a] Estimates not made for inoperable period; numbers may not reflect true escapement.

[b] Estimates made for inoperable period represent 64% of annual escapement.

[c] Estimates made for inoperable period represent 79% of annual escapement.

**Figures**

Figure 1. Kuskokwim Area salmon management districts and escapement monitoring projects.

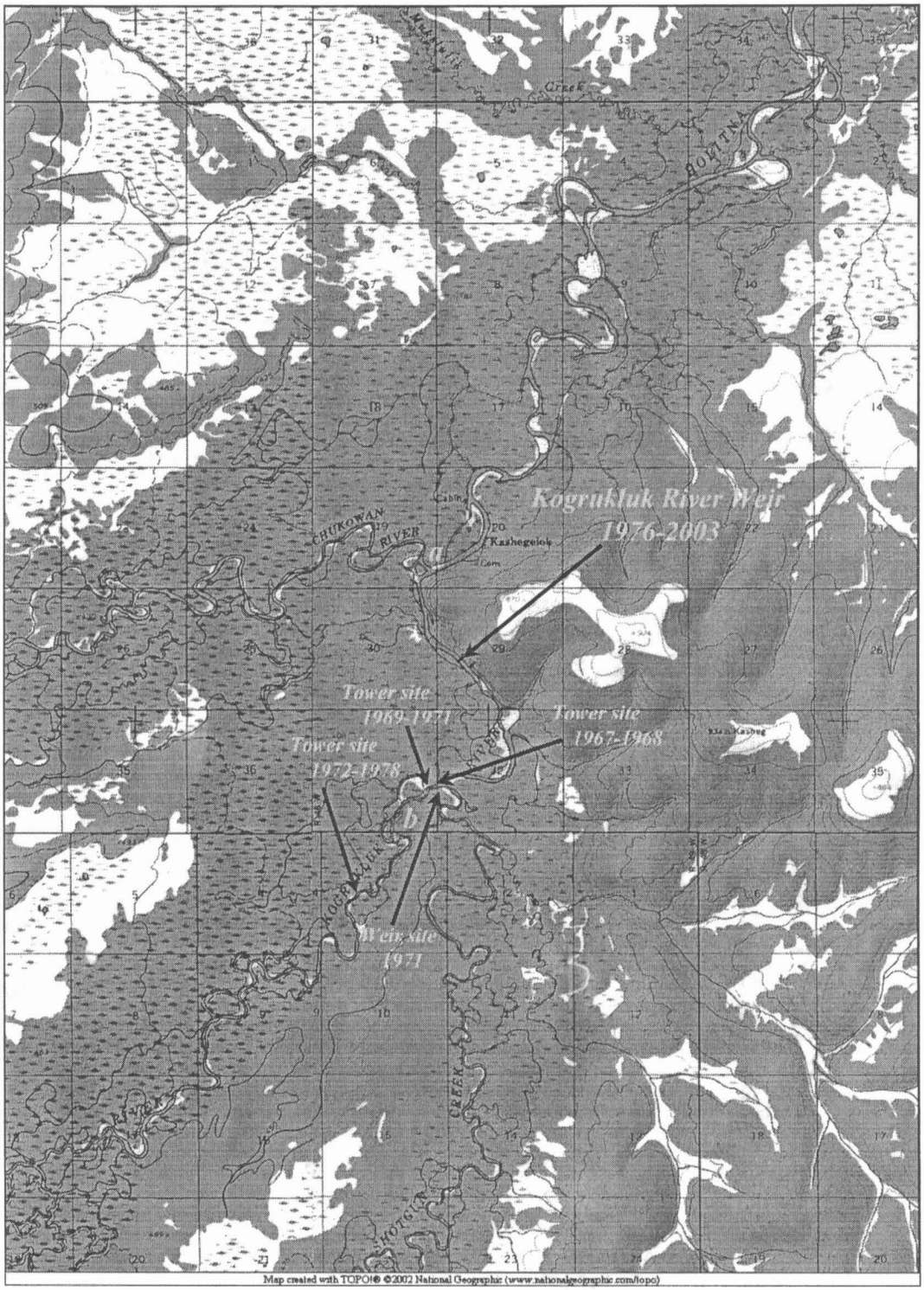


Figure 2. Kogrukluk River study area and positions of various escapement projects.

***a*** = map updated to show current river channel position as of the spring flood, 2003.
***b*** = map updated to show current river channel position. Year of channel movement unclear.

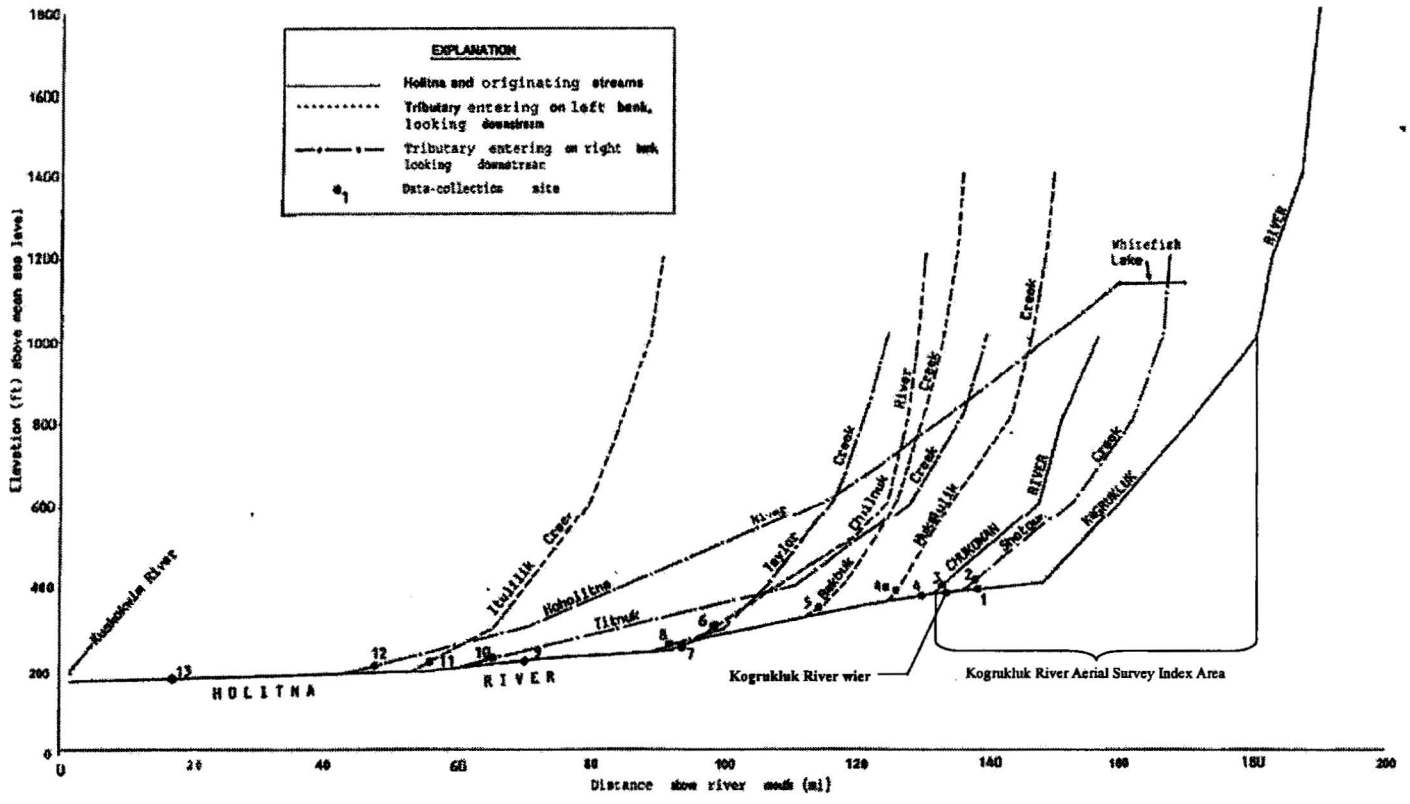


Figure 3. Profile of the Holitna River and major tributaries, Alaska (Collazzi 1989).

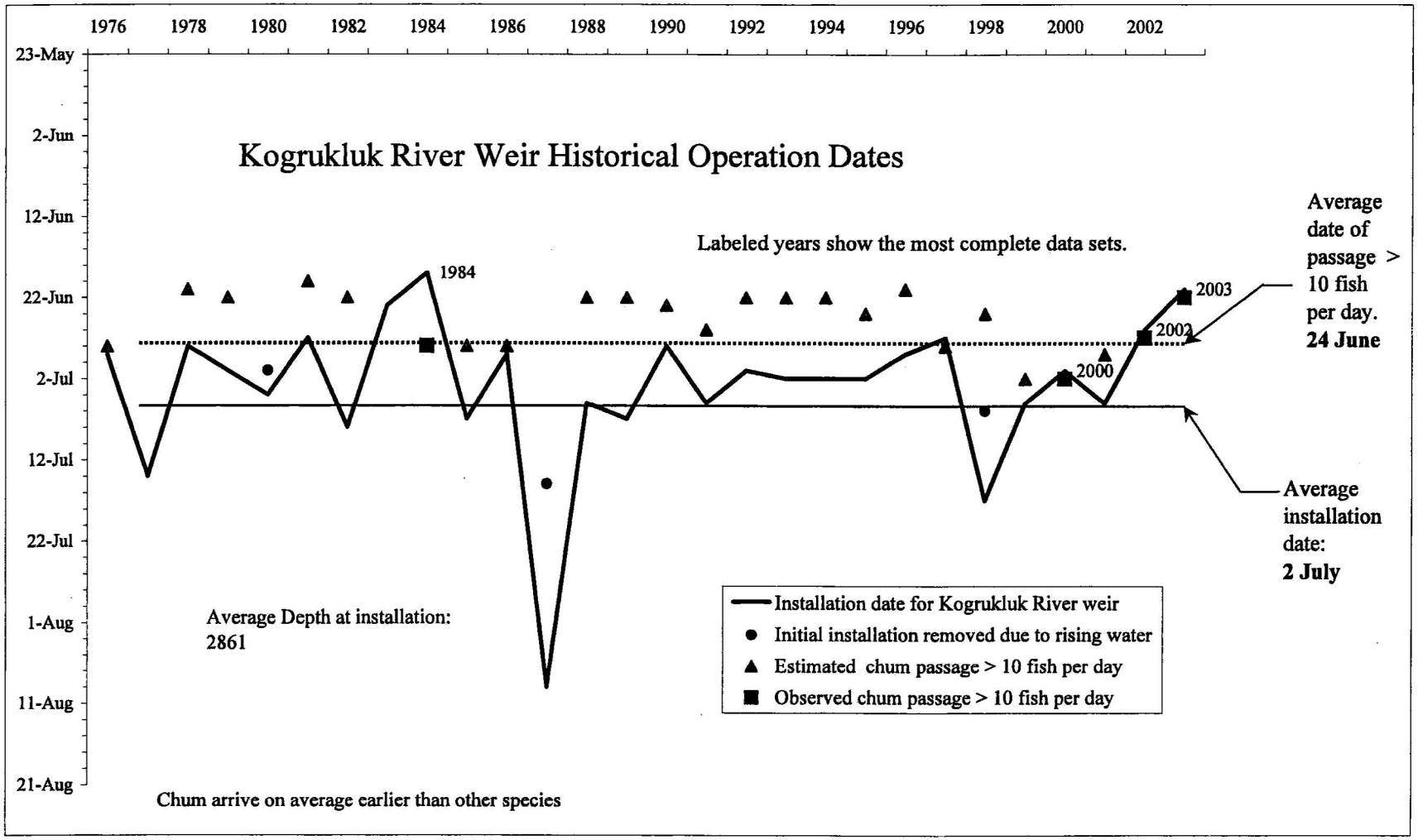


Figure 4. Historical operational dates for Kogrukluk River weir with earliest estimated fish arrivals by year.

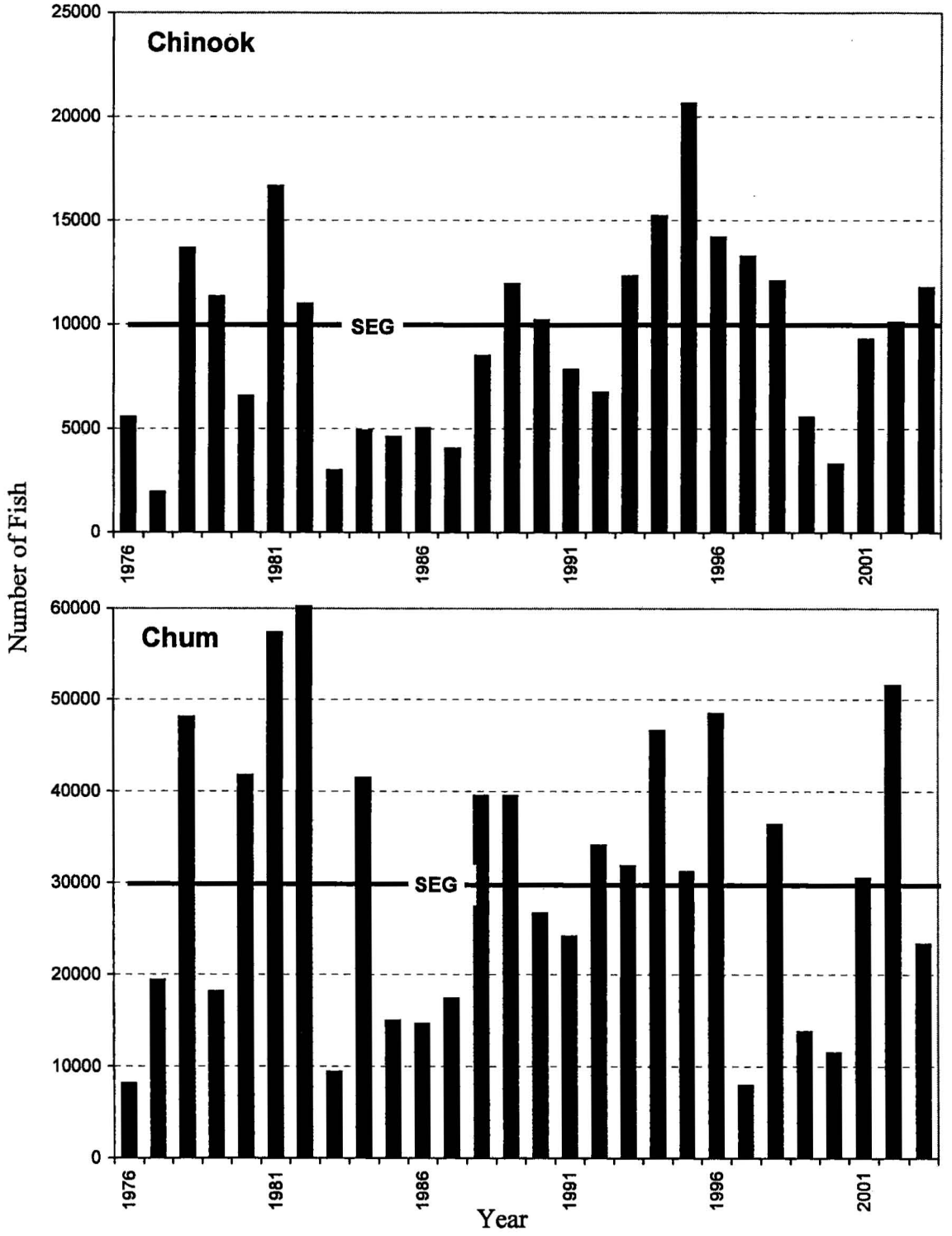


Figure 5. Historic chinook and chum salmon escapement with sustainable escapement goal (SEG) at the Kogrukluk River weir.

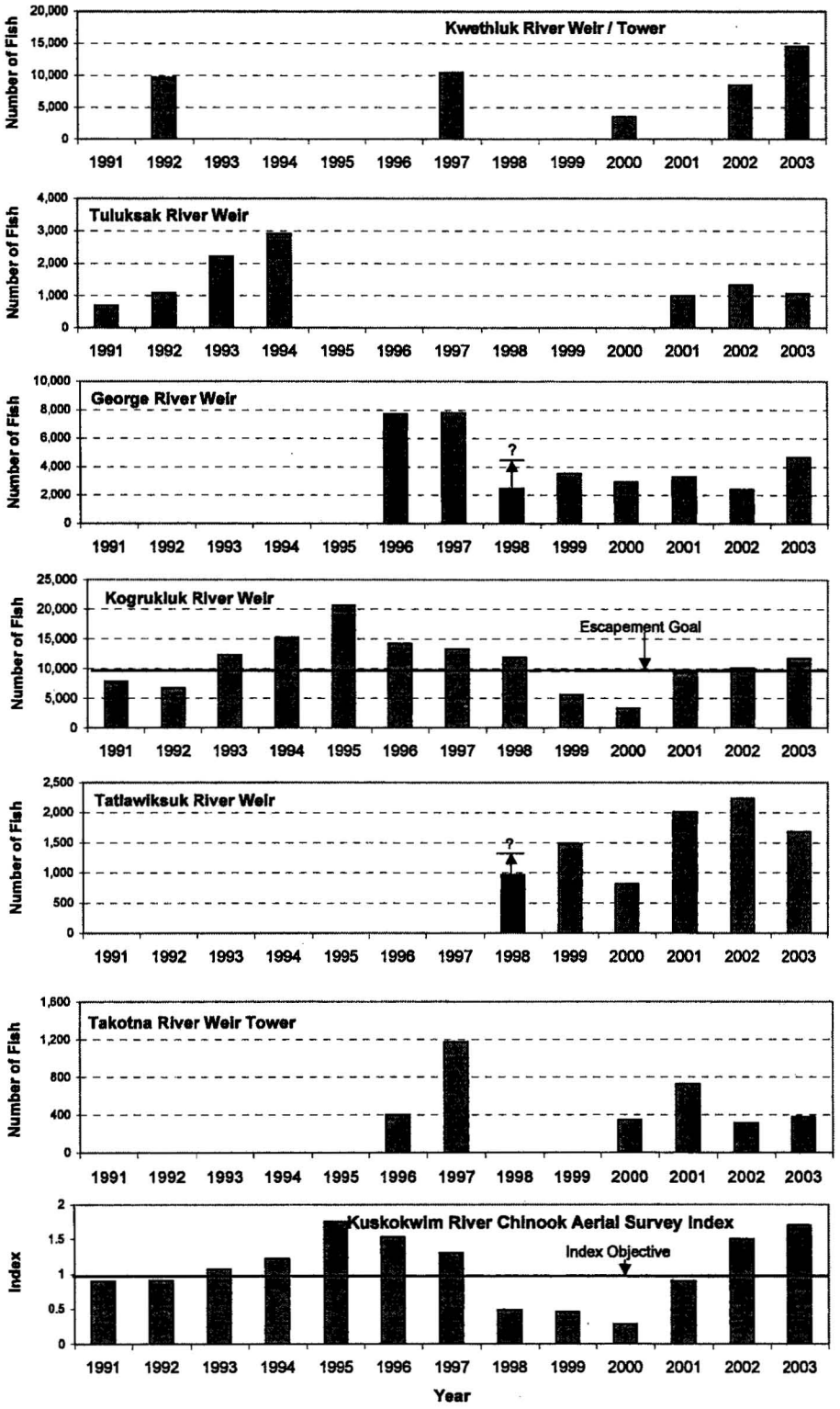


Figure 6. Chinook salmon escapement into six Kuskokwim River tributaries, and Kuskokwim River chinook salmon aerial survey indicies, 1991 through 2003.

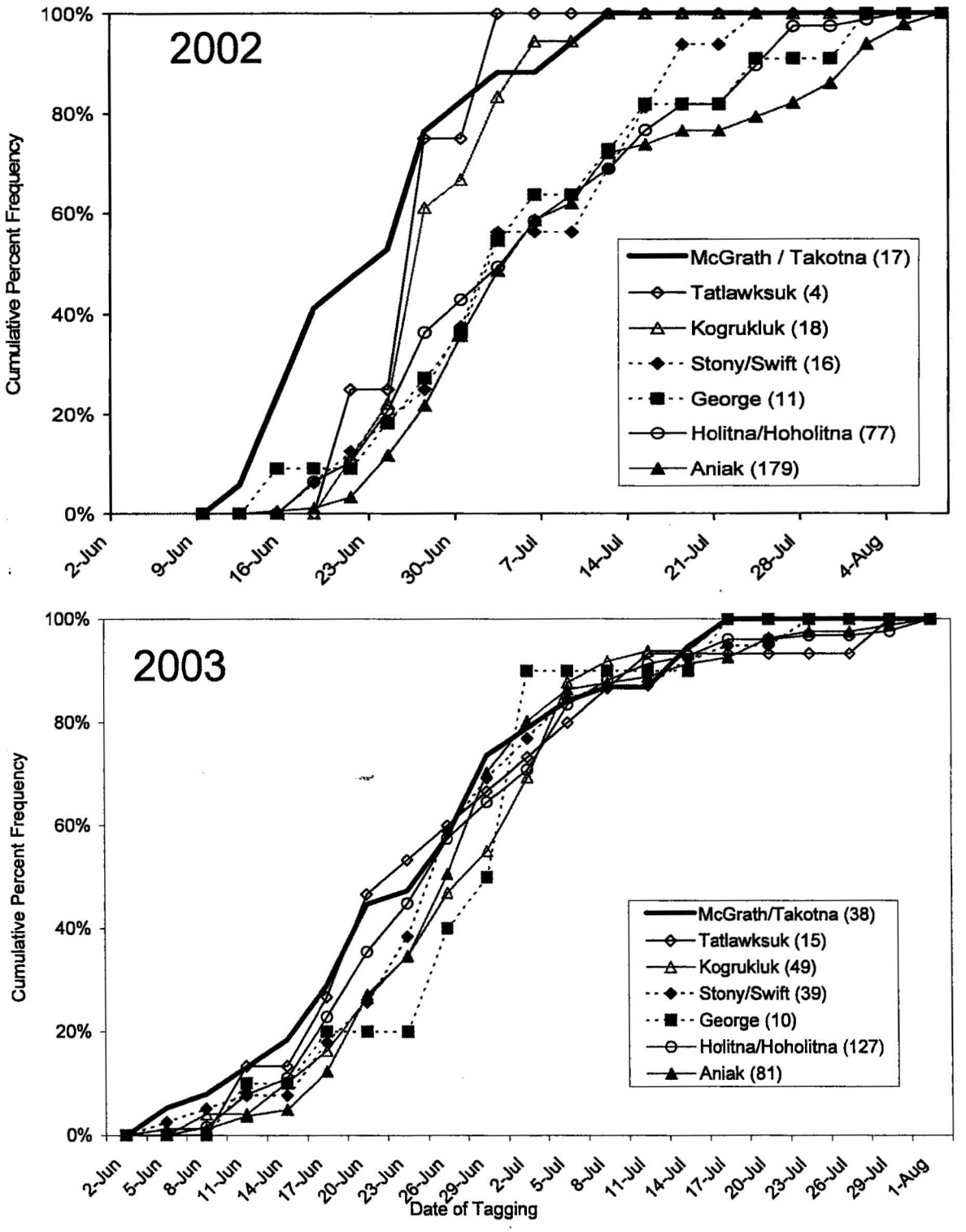


Figure 7. Preliminary cumulative percent frequency of chinook salmon of known final destination with their respective dates of initial tagging in 2002 and 2003 (Stuby 2003, Stuby *in prep*.). Sample size is in parentheses.

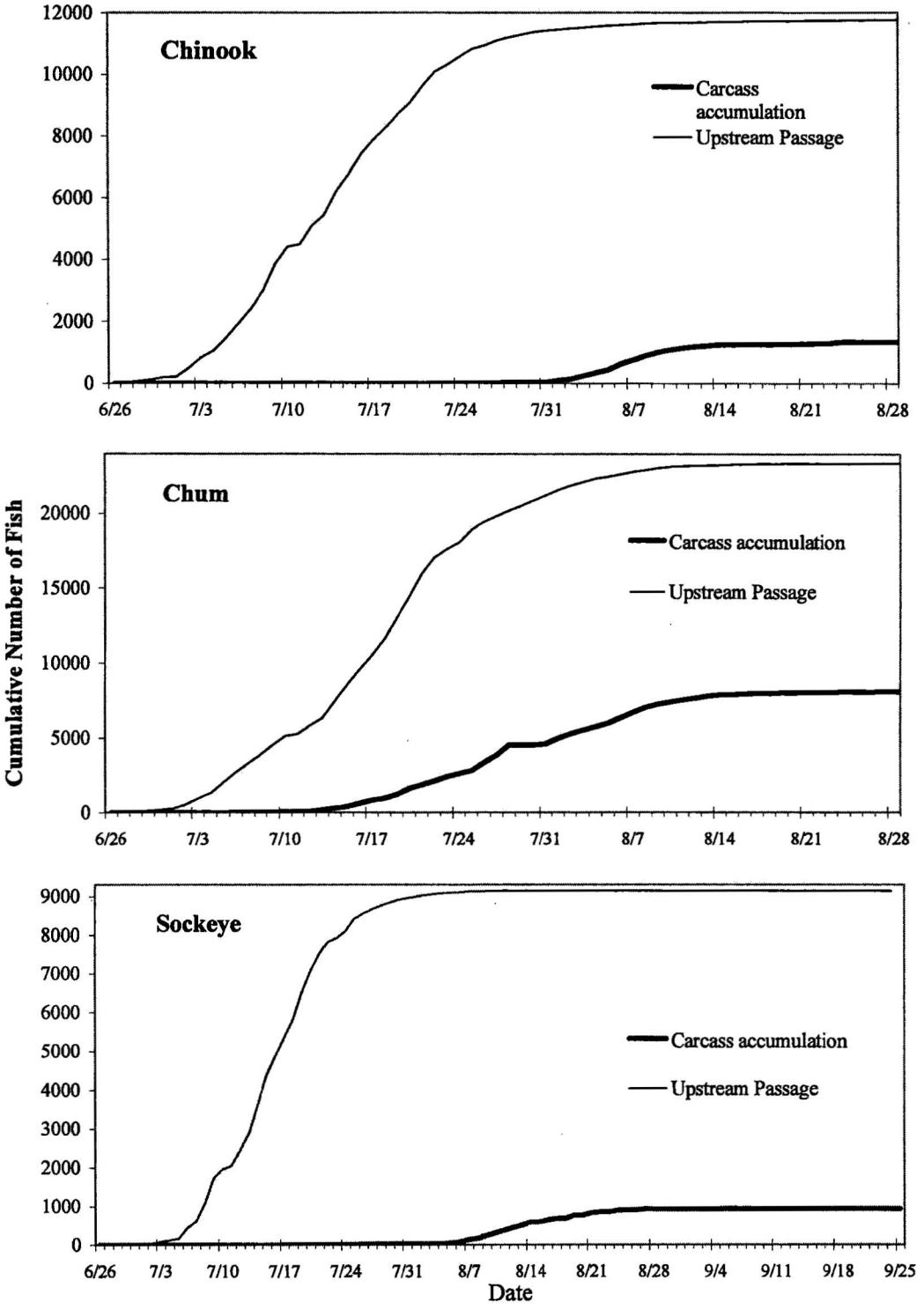


Figure 8. Cumulative upstream passage and downstream carcass accumulation by species at the Kogrukluk River weir, 2003.

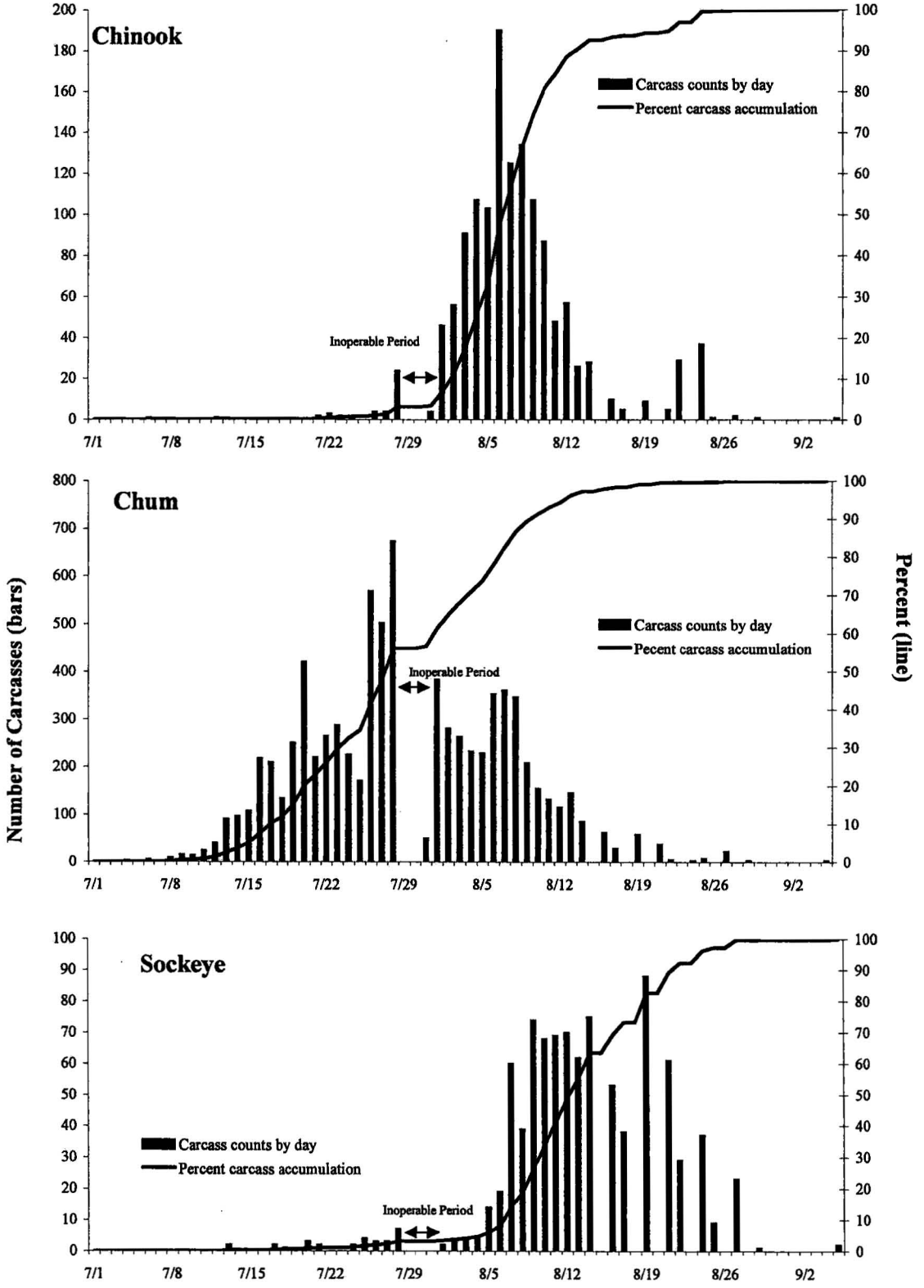


Figure 9. Carcass counts by day (bars) and cumulative percent (line) at Kogrukluk River weir, 2003.

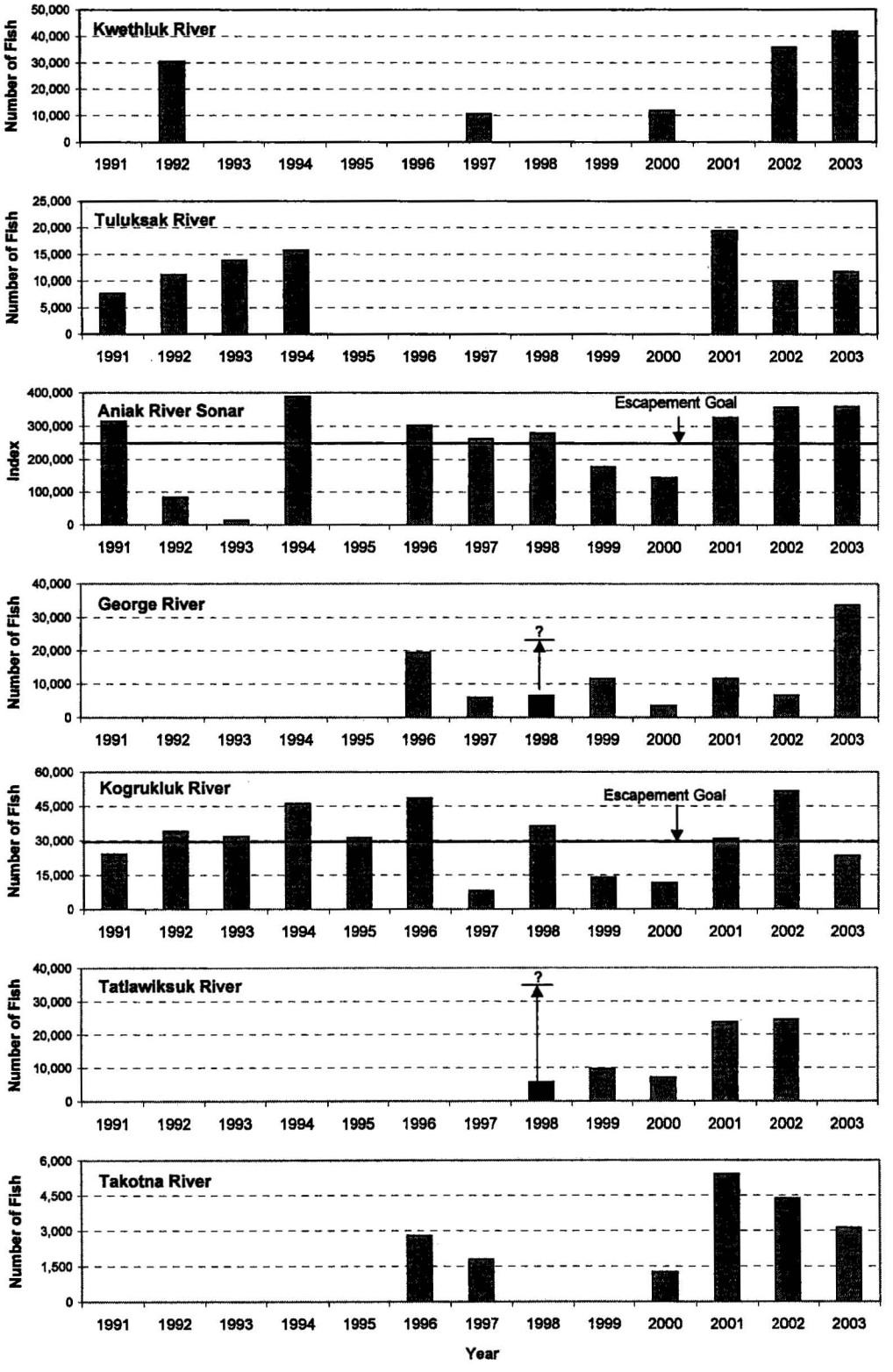


Figure 10. Chum salmon escapement into seven Kuskokwim River tributaries, 1991 through 2003.

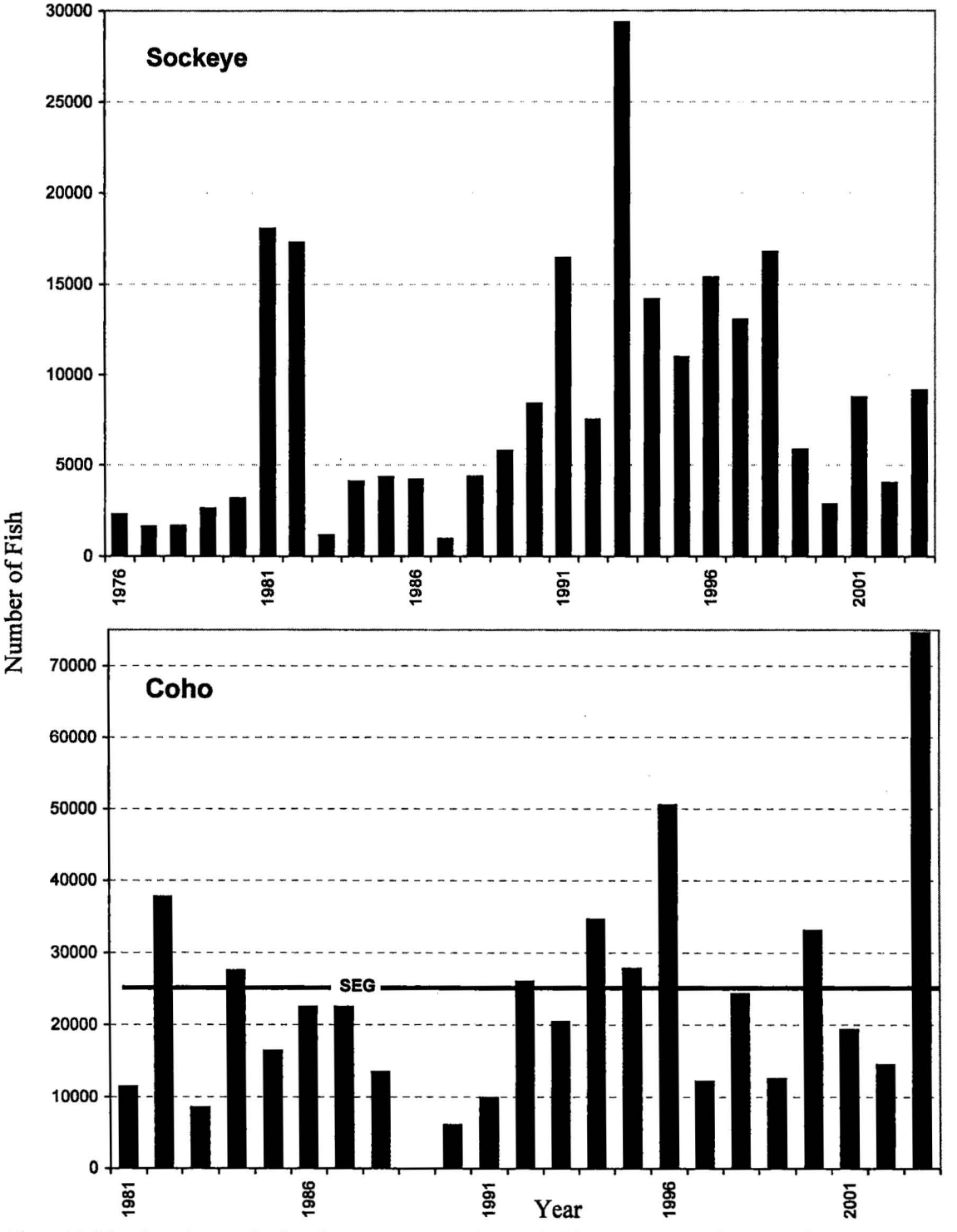


Figure 11. Historic sockeye and coho salmon escapement with sustainable escapement goal (SEG) at the Kogrukluk River weir.

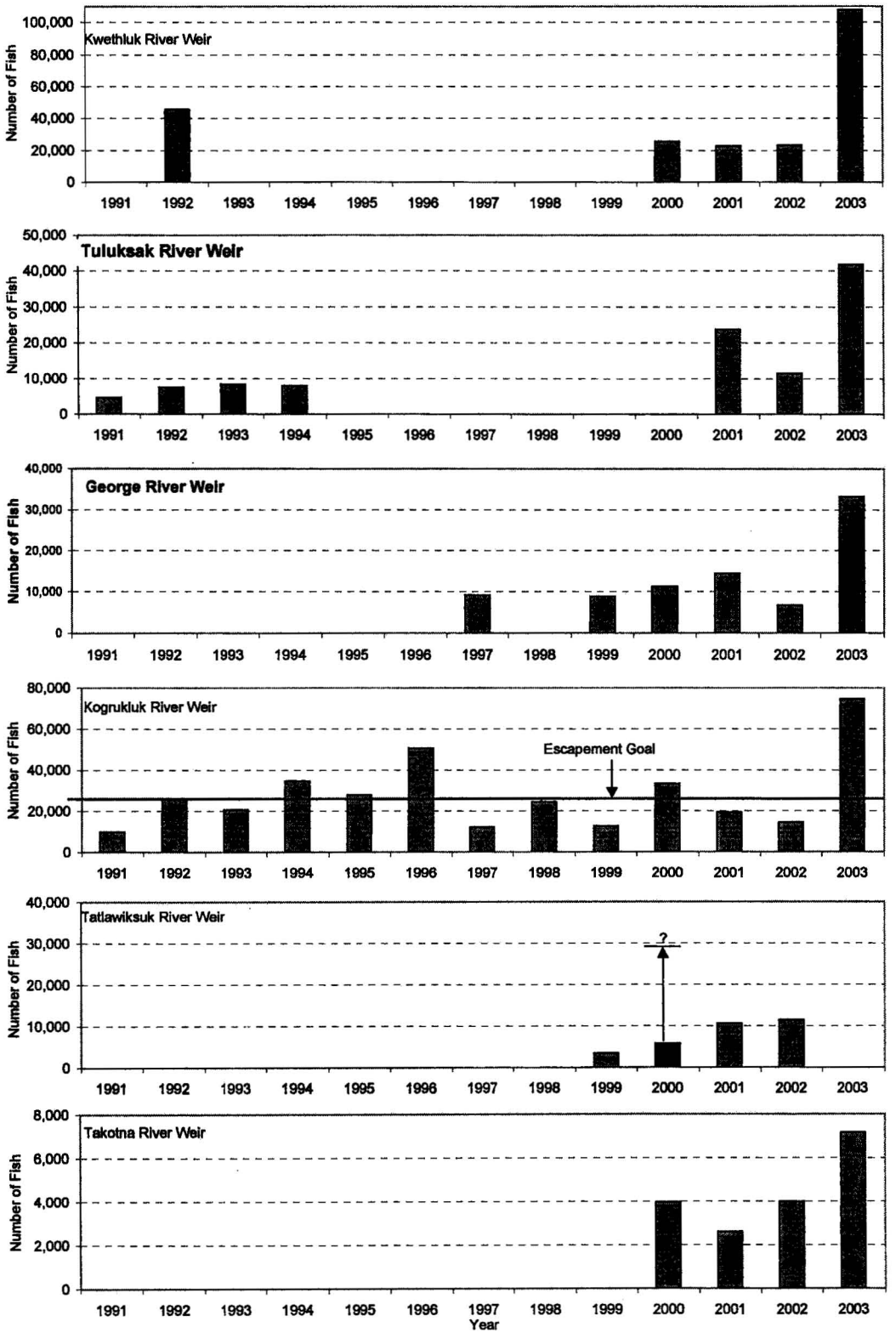


Figure 12. Coho salmon escapement into six Kuskokwim River tributaries, 1991 through 2003.

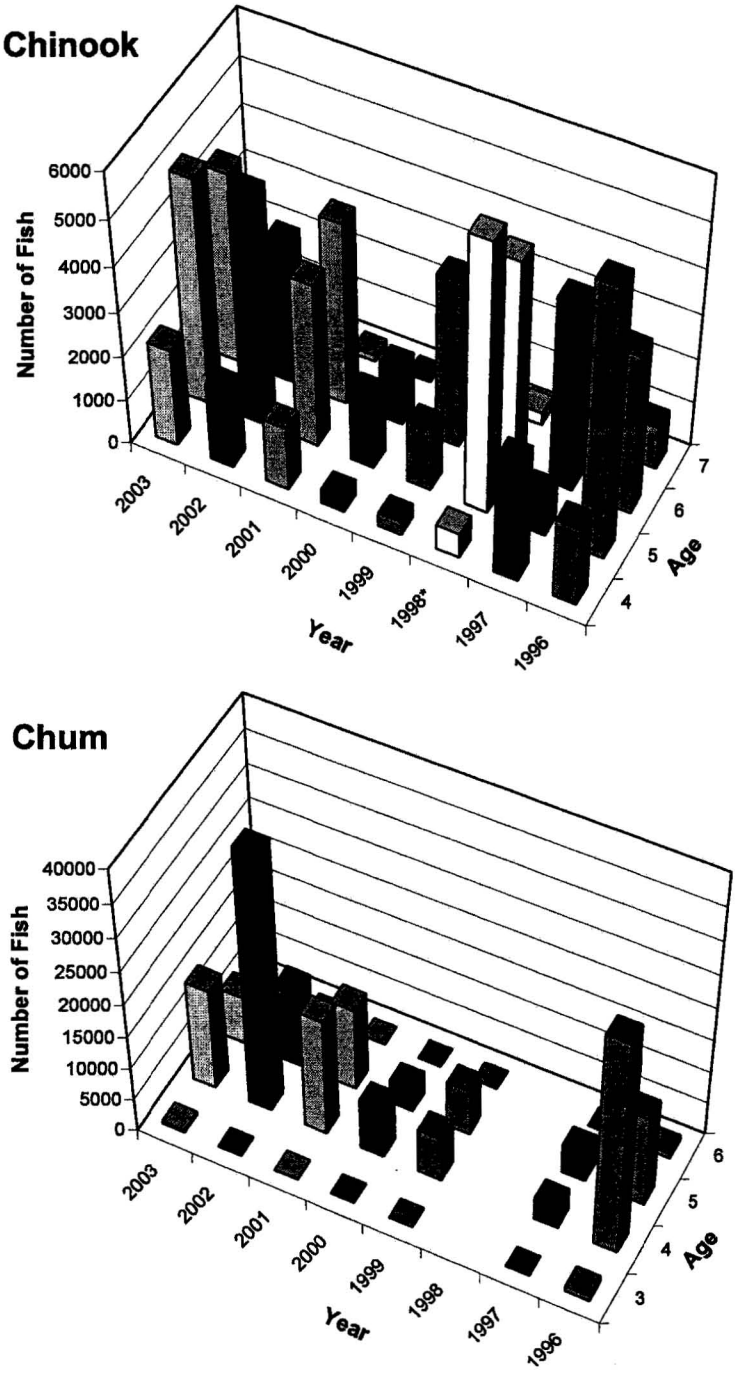


Figure 13. Chinook and chum salmon age distribution over time at the Kogrukluk River weir. *denotes incomplete sampling and escapement estimates (Folletti 2004).

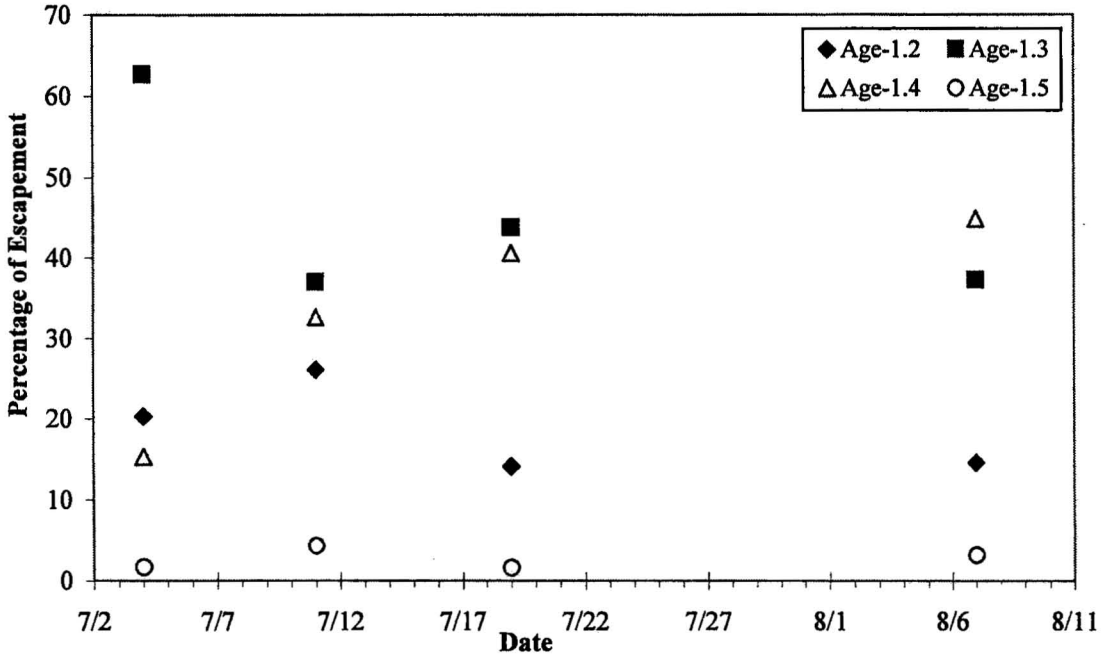


Figure 14. Age composition of chinook salmon sampled at the Kogrukluk River weir, 2003.

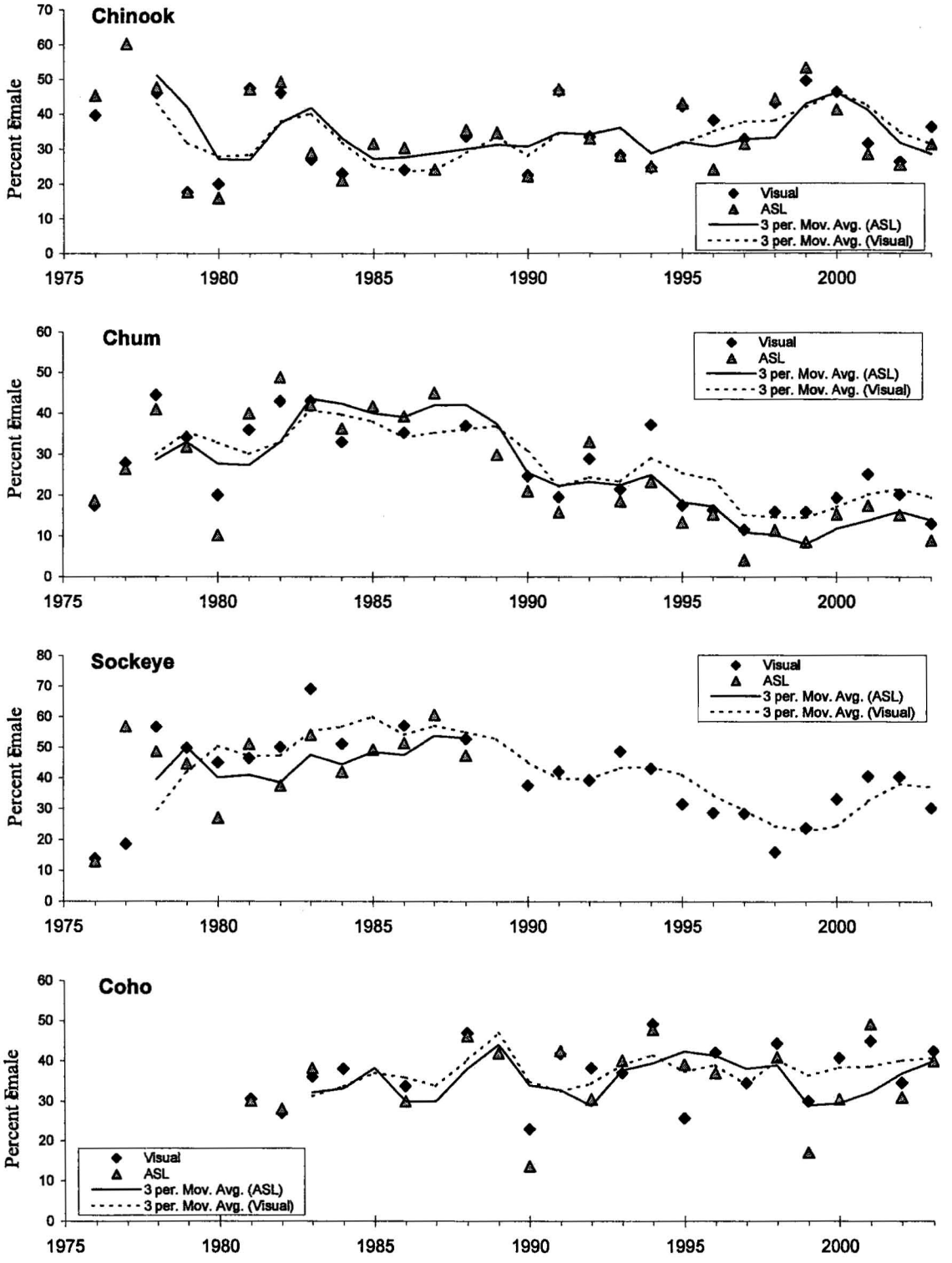


Figure 15. Historical annual percentage of female salmon as determined by weighted ASL sampling and visual identification at Kogrukluk River weir. Trend lines represent three year moving averages.

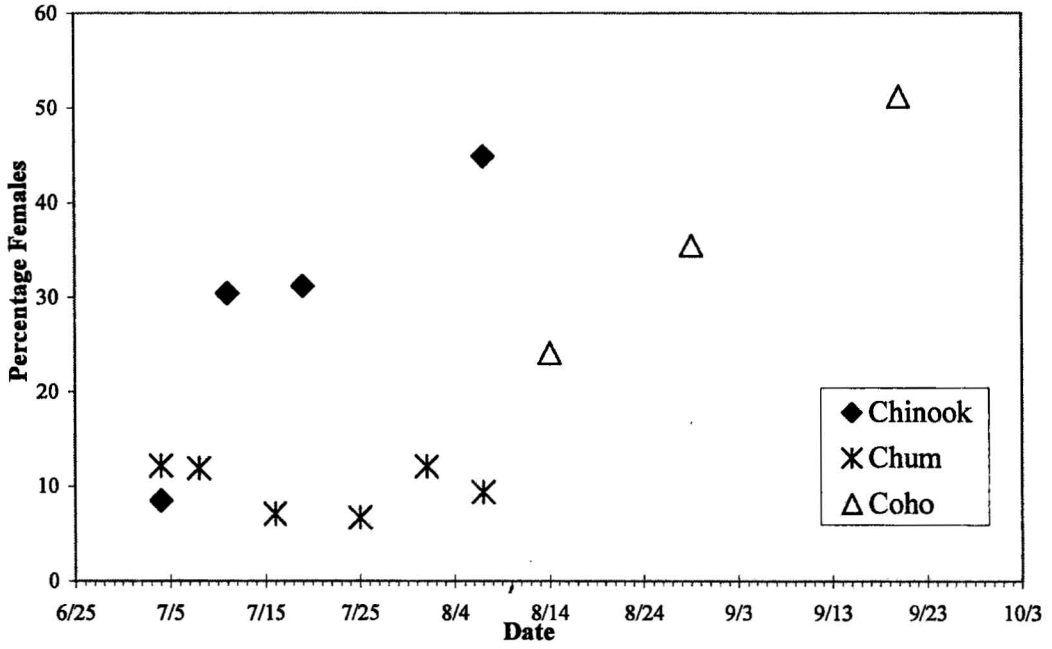


Figure 16. Percentage of female chinook, chum, and coho salmon at the Kogrukluk River weir by AS sampling date, 2003.

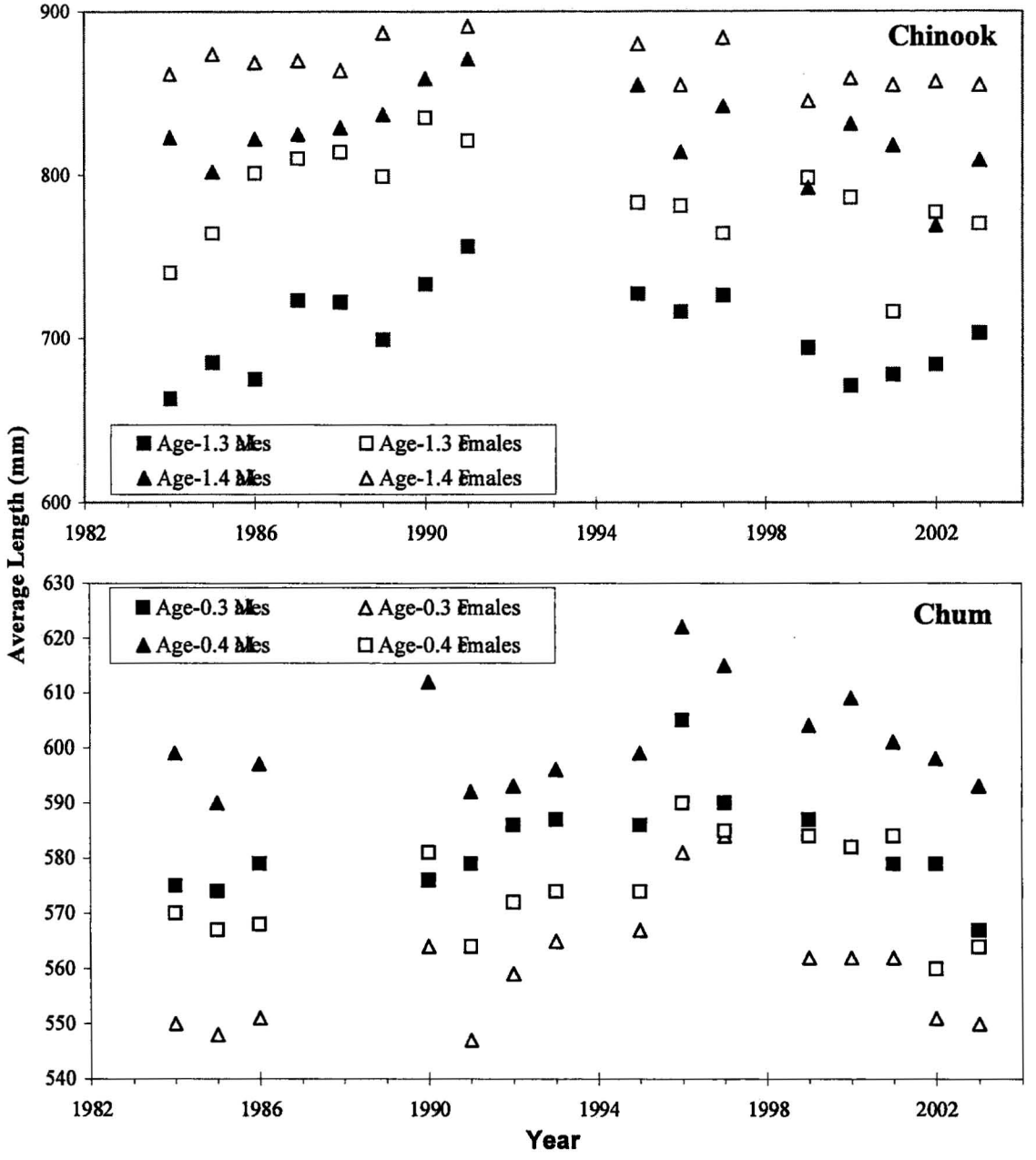


Figure 17. Historical average annual length of male and female chinook and chum salmon at the Kogrukluk River weir.

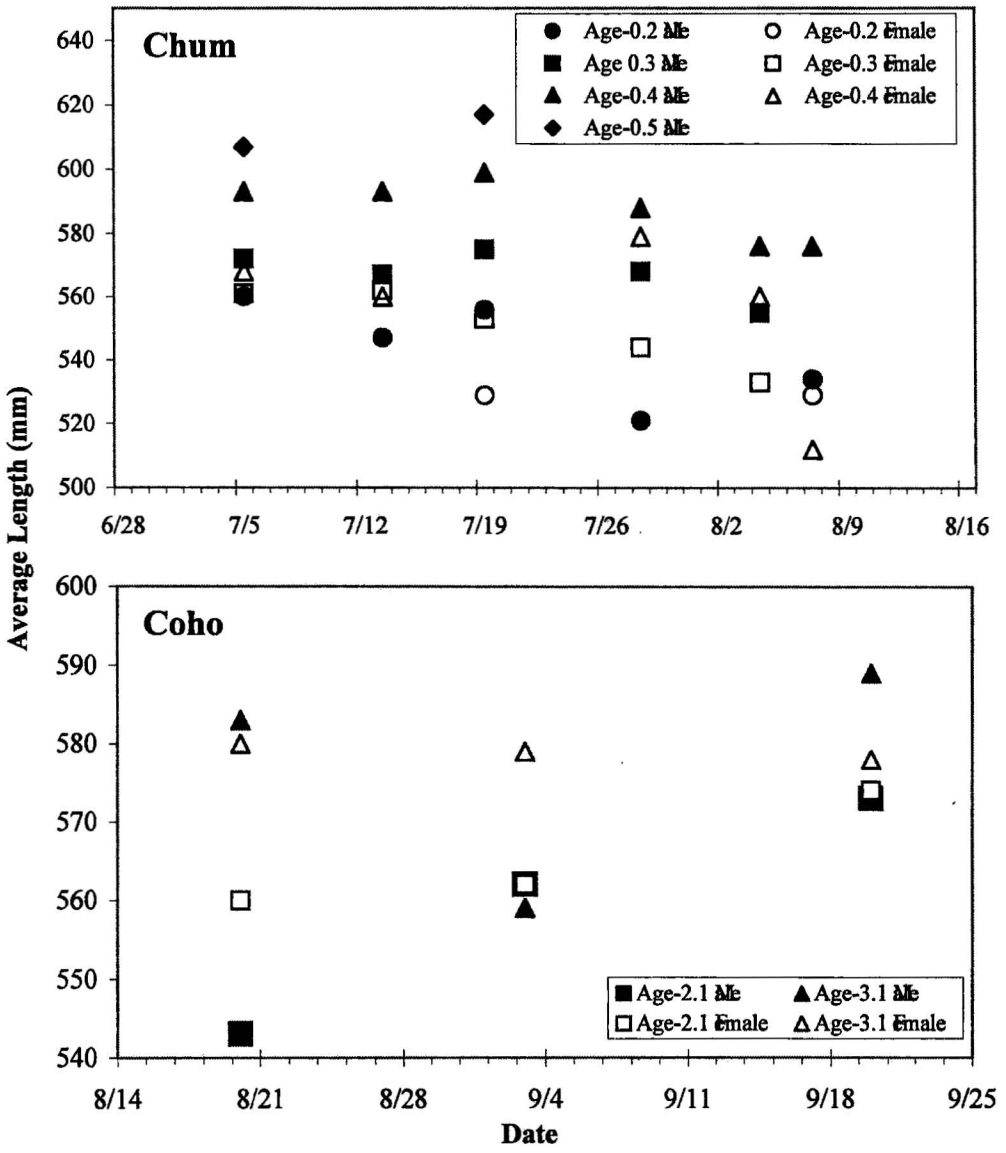


Figure 18. Mean length by date, age and sex for trap caught chum and coho salmon at the Kogrukluk River weir, 2003.

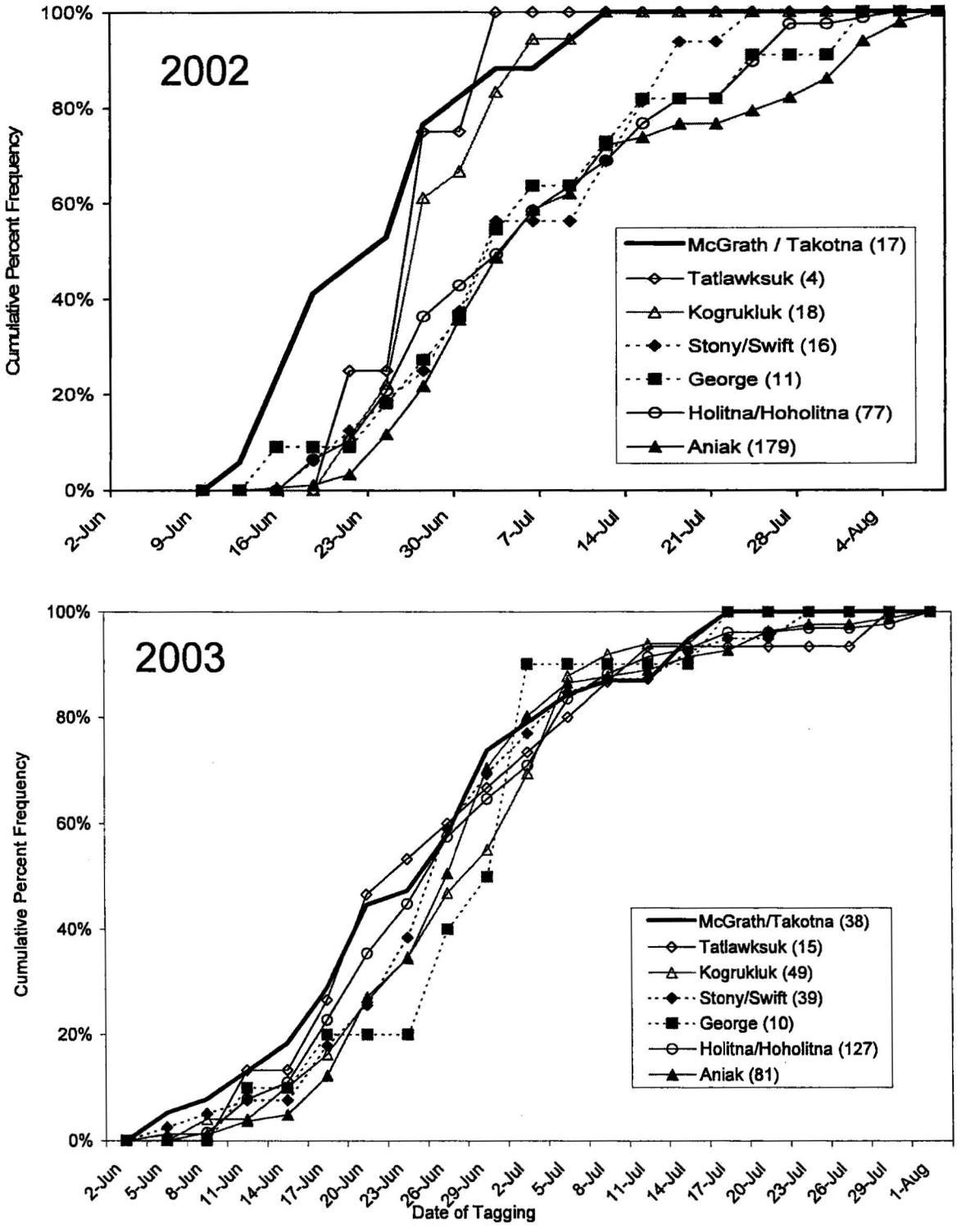


Figure 19. Preliminary cumulative percent frequency of chinook salmon of known final destination with their respective dates of initial tagging in 2002 and 2003 (Ruby 2003, Ruby *in prep*.). Sample size is in parentheses.

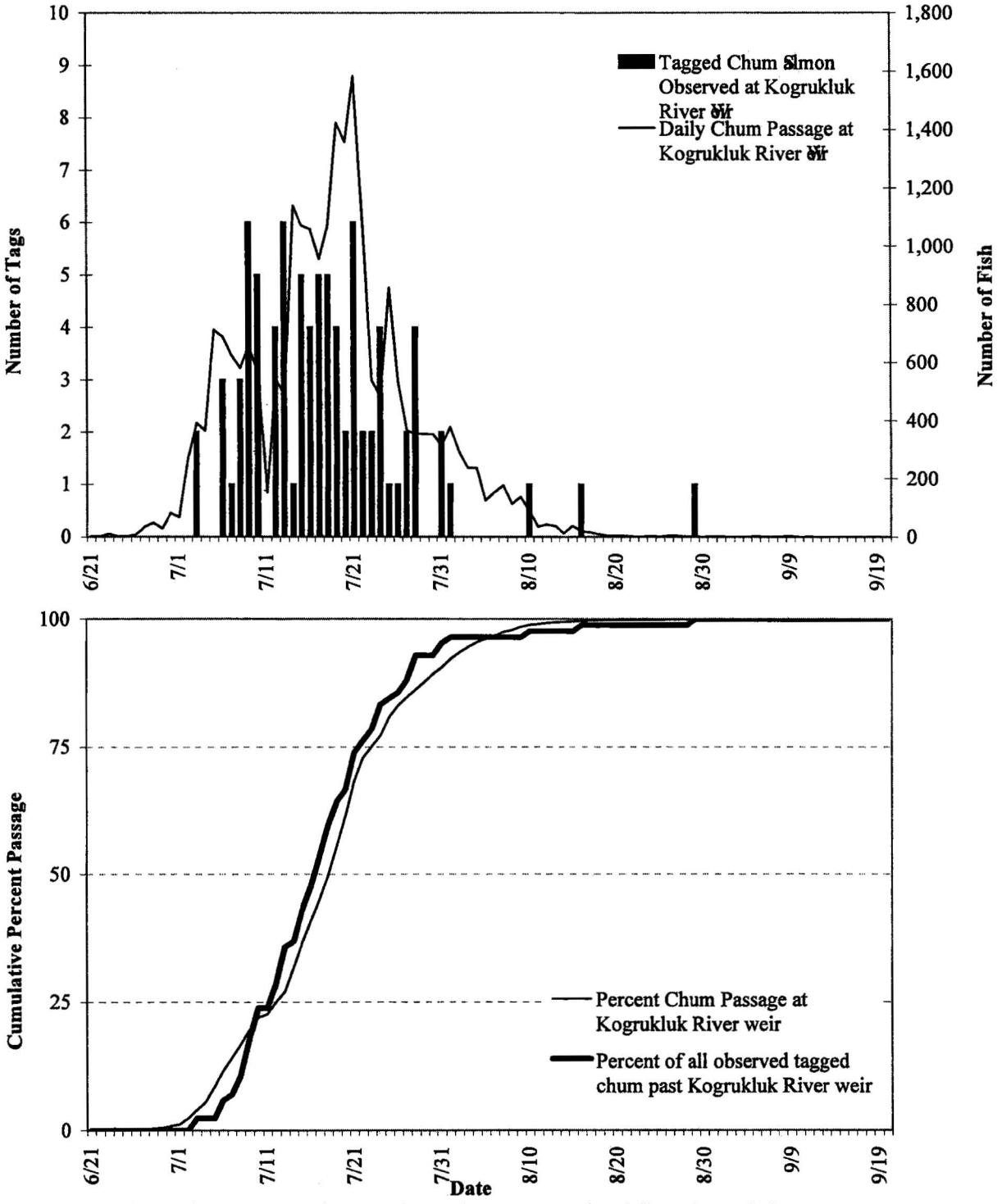


Figure 20. Observed and recaptured tagged chum salmon compared to daily and cumulative percent passage at the Kogrukluk River, 2003.

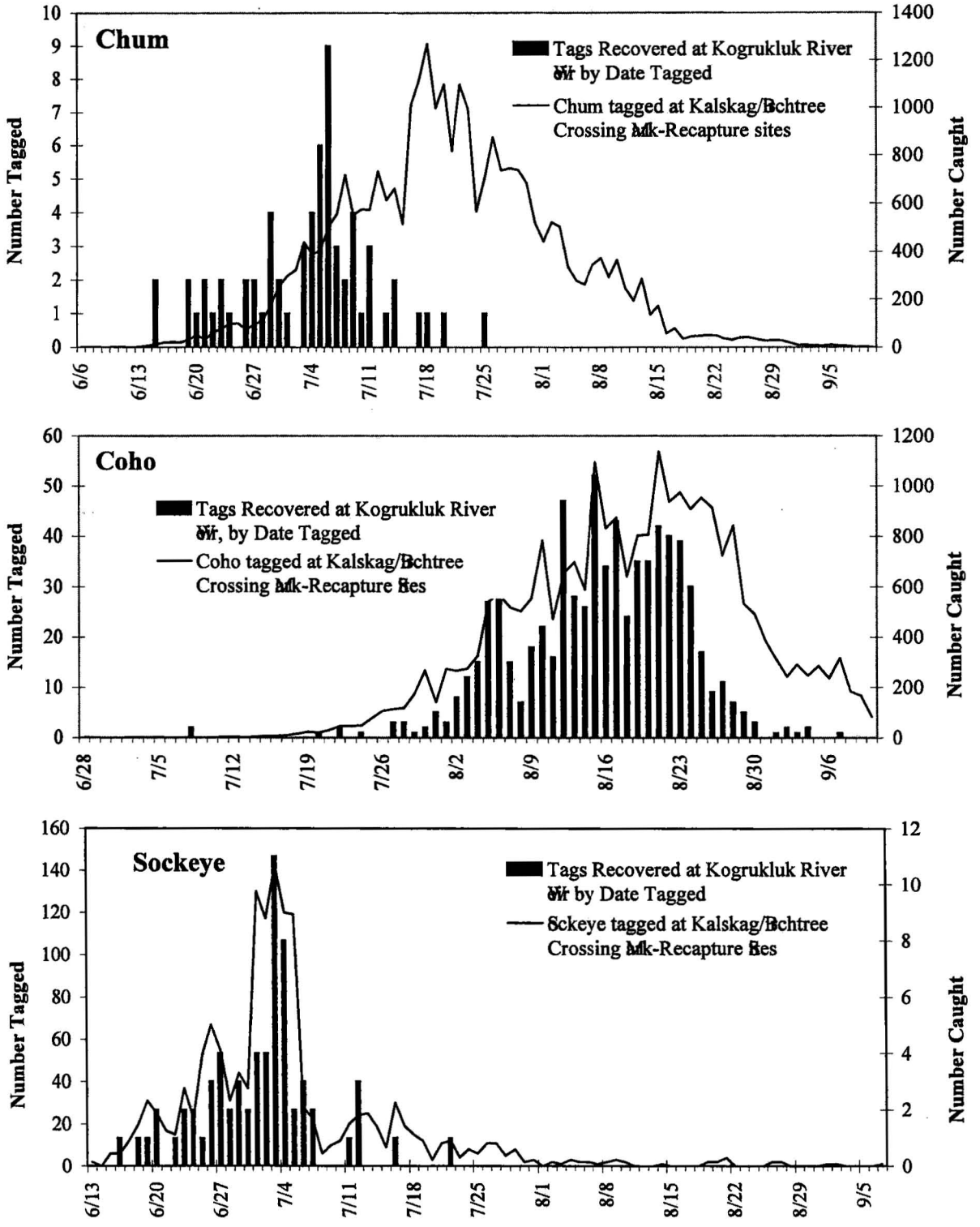


Figure 21. Run timing of salmon captured at the Kalskag/Aniak mark-recapture site by date, compared to run timing of salmon recovered at Kogrukluk River weir by date tagged, 2003

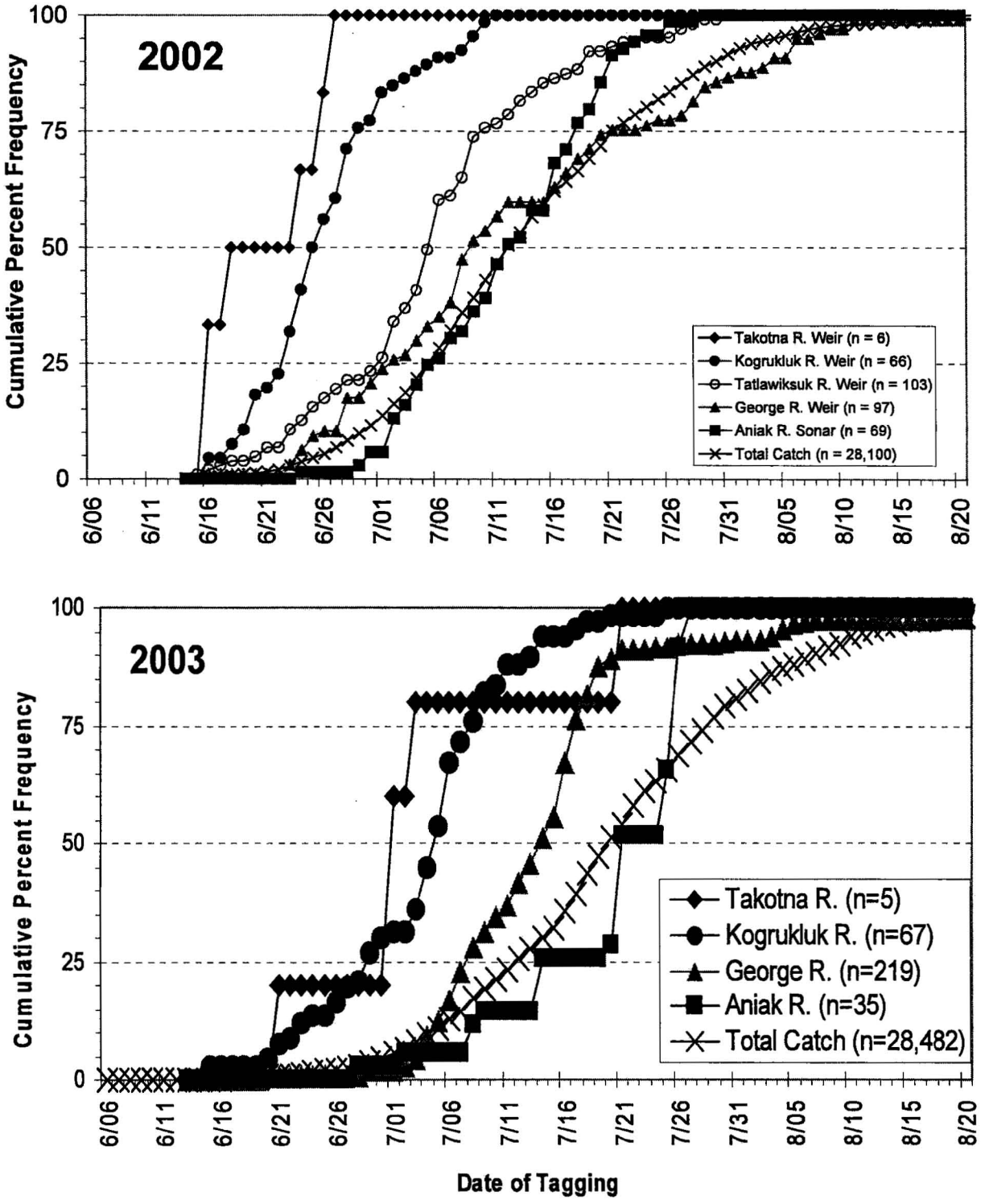


Figure 22. Cumulative percent freqency of chum salmon of known final destination with their respective dates of initial tagging in 2002 and 2003, plus the total number of chum salmon tagged at the Kalskag-Aniak tagging site (Kerkvliet and Hamazaki 2003, Kerkvliet et al. 2004). Sample sizes are in paretheses.

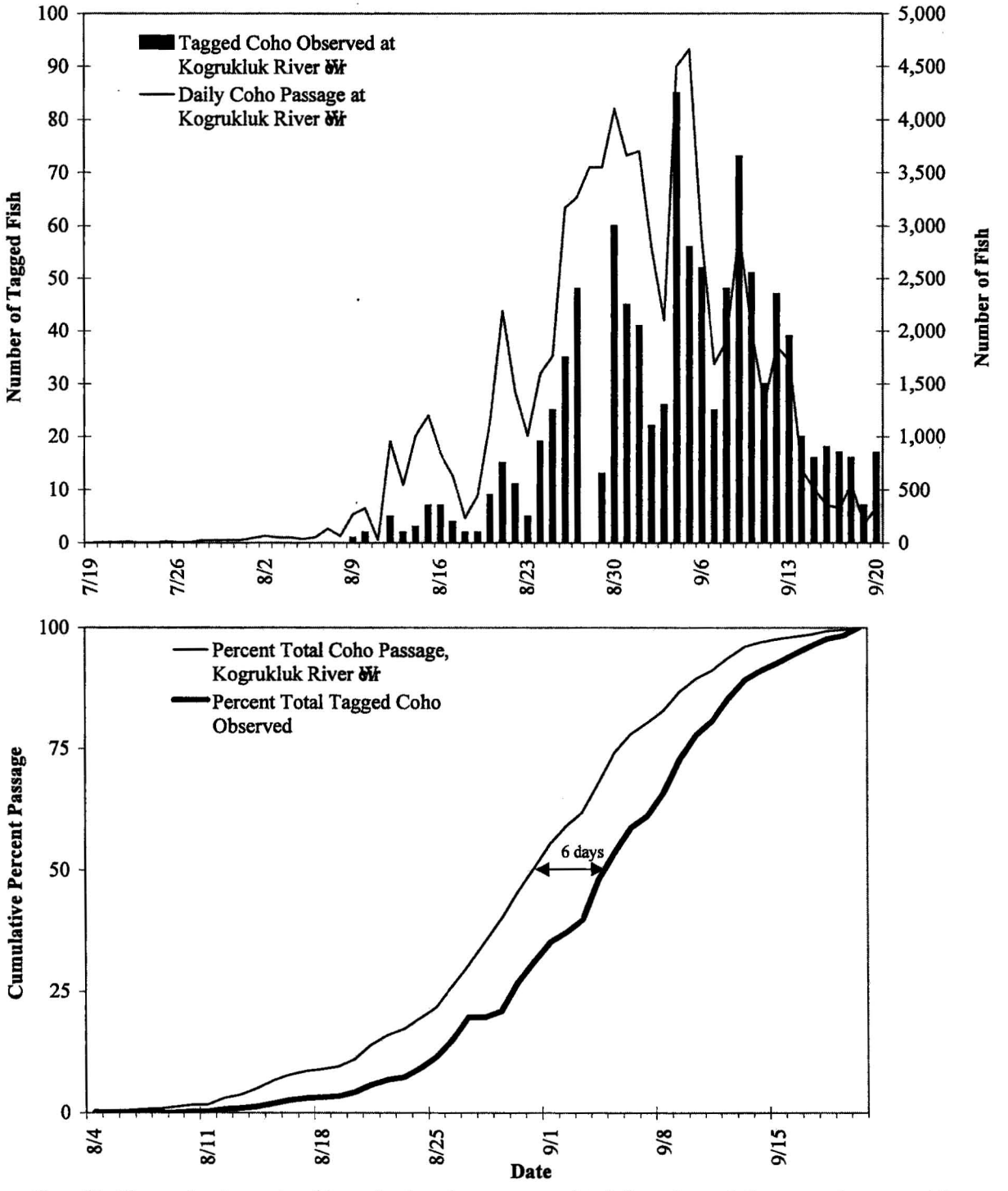


Figure 23. Observed and recaptured tagged coho salmon compared to daily and cumulative percent passage at the Kogrukluk River, 2003.

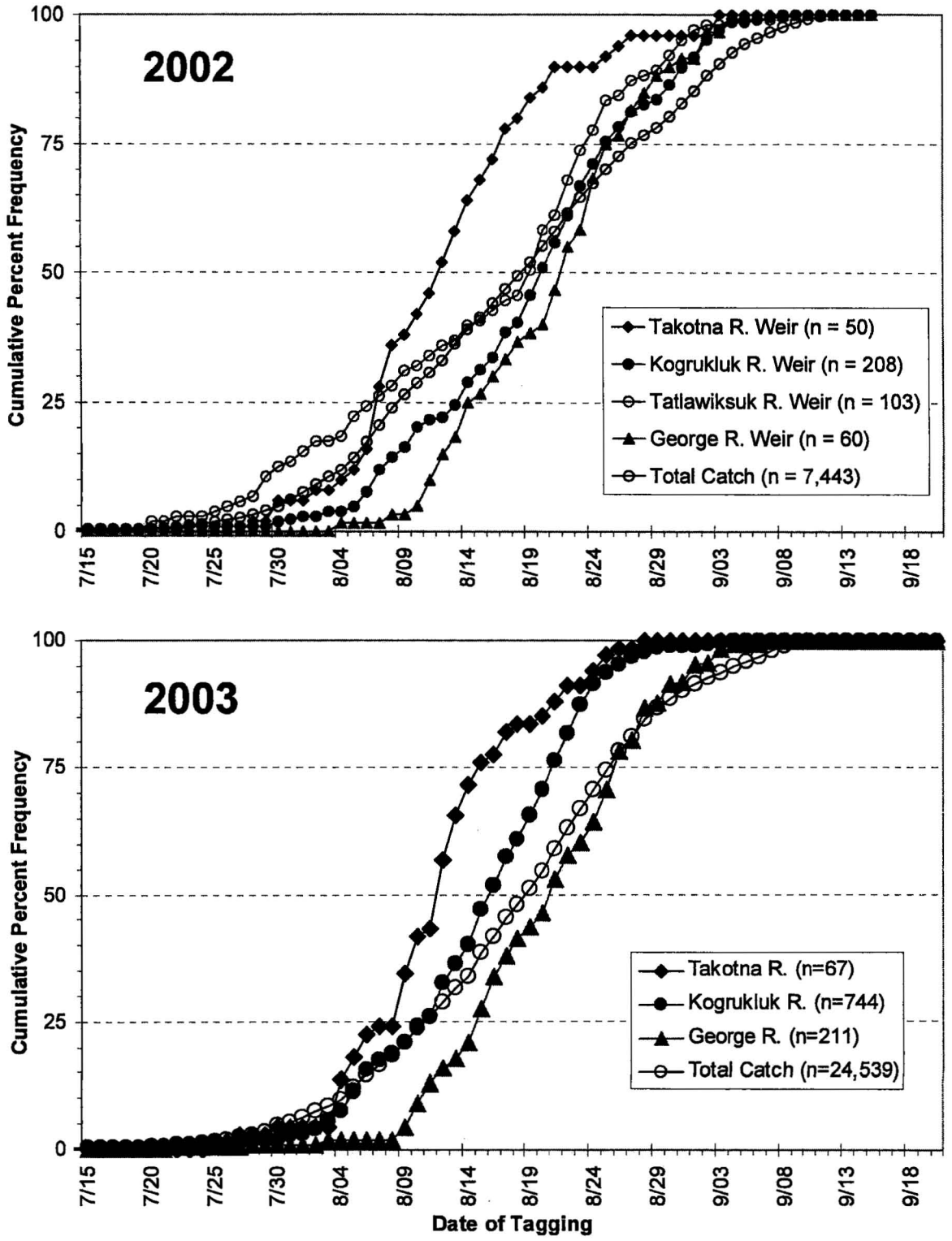


Figure 24. Cumulative percent freqency of coho salmon of known final destination with their respective dates of initial tagging in 2002 and 2003, plus the total number of coho salmon tagged at the Kalskag-Aniak tagging site (Kerkvliet and Hamazaki 2003, Kerkvliet et al. 2004). Sample sizes are in paretheses.

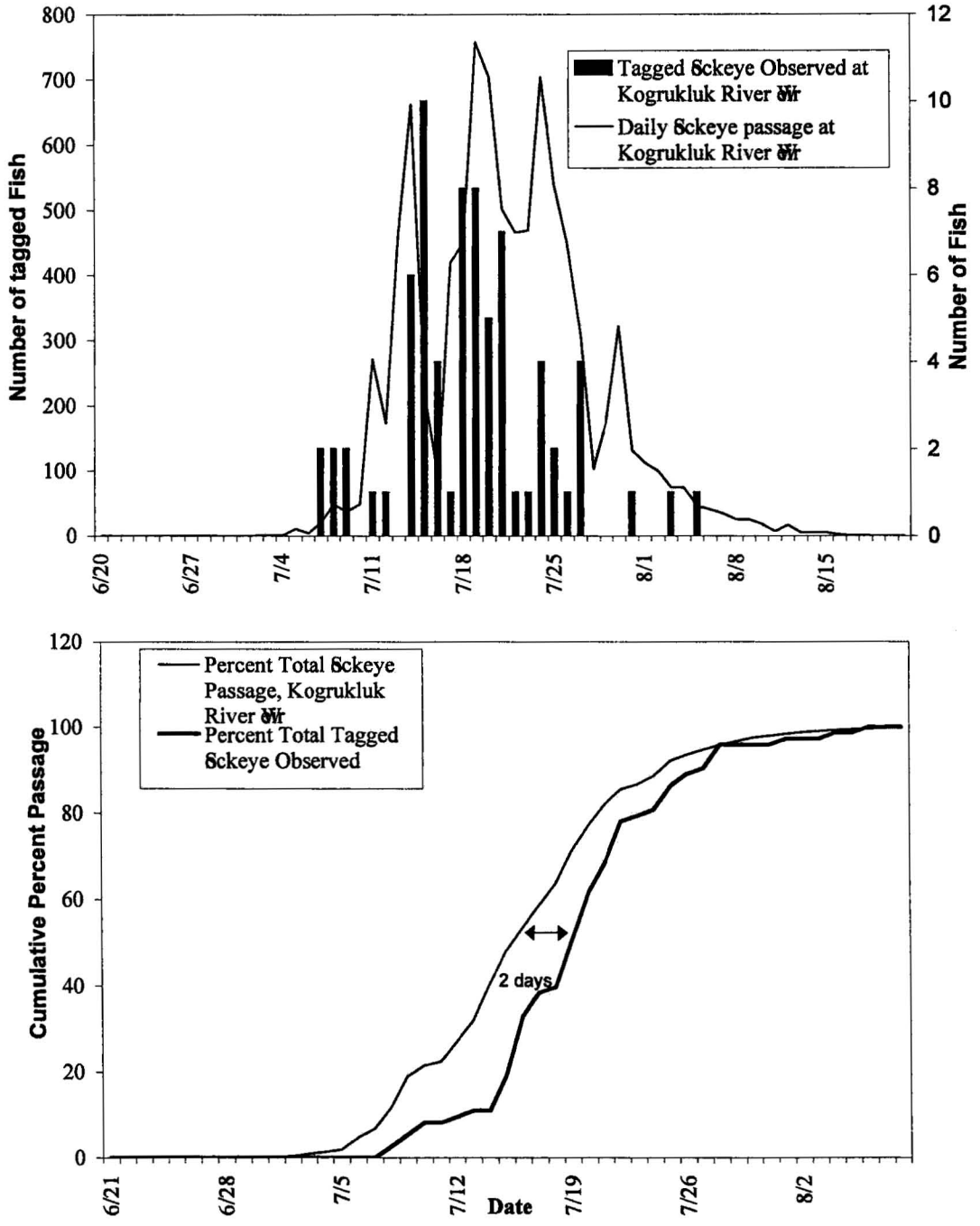


Figure 25 . Observed and recaptured tagged sockeye salmon compared to daily and cumulative percent passage at the Kogrukluk River weir, 2003

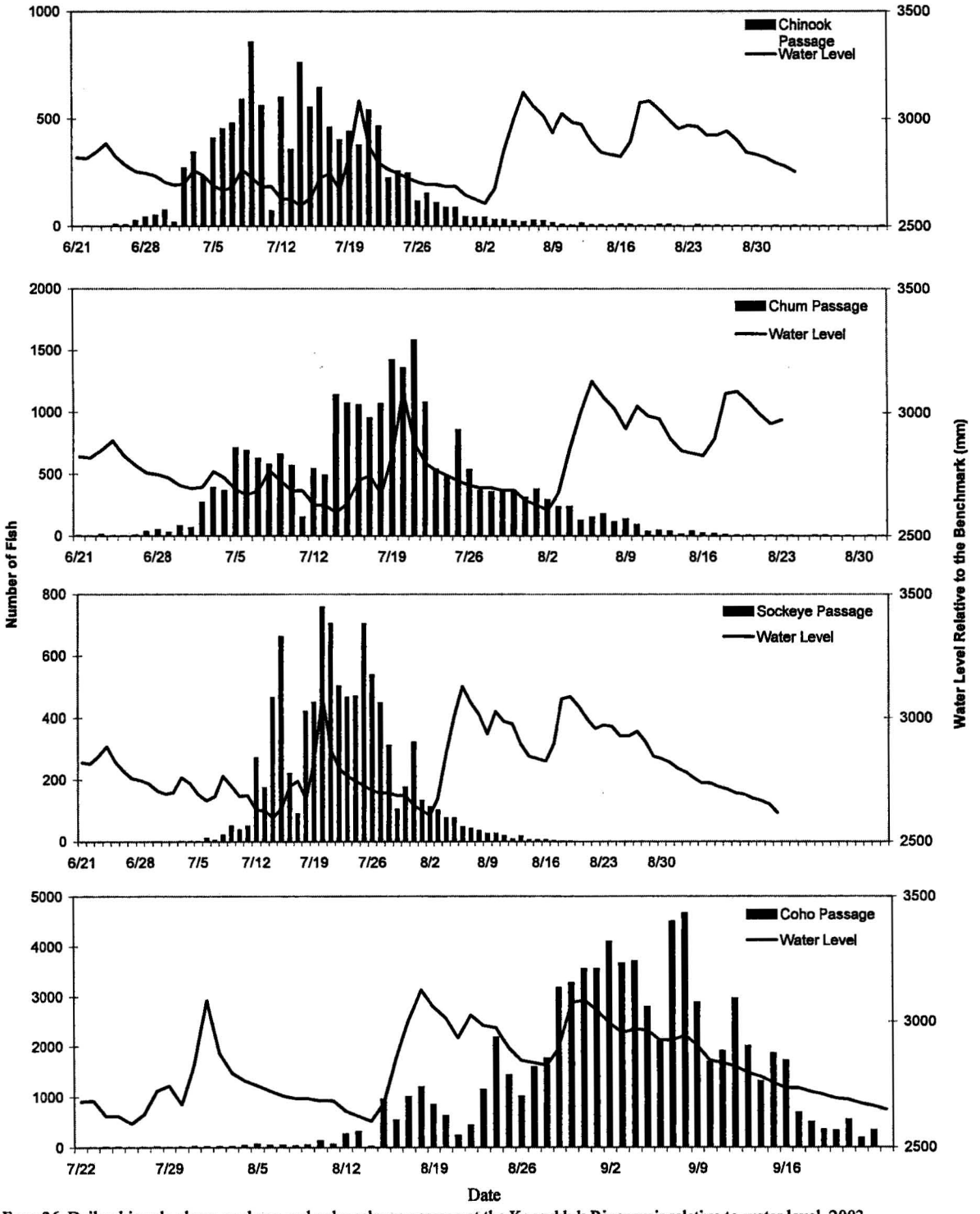


Figure 26. Daily chinook, chum, sockeye and coho salmon passage at the Kogrukluk River weir relative to water level, 2003.

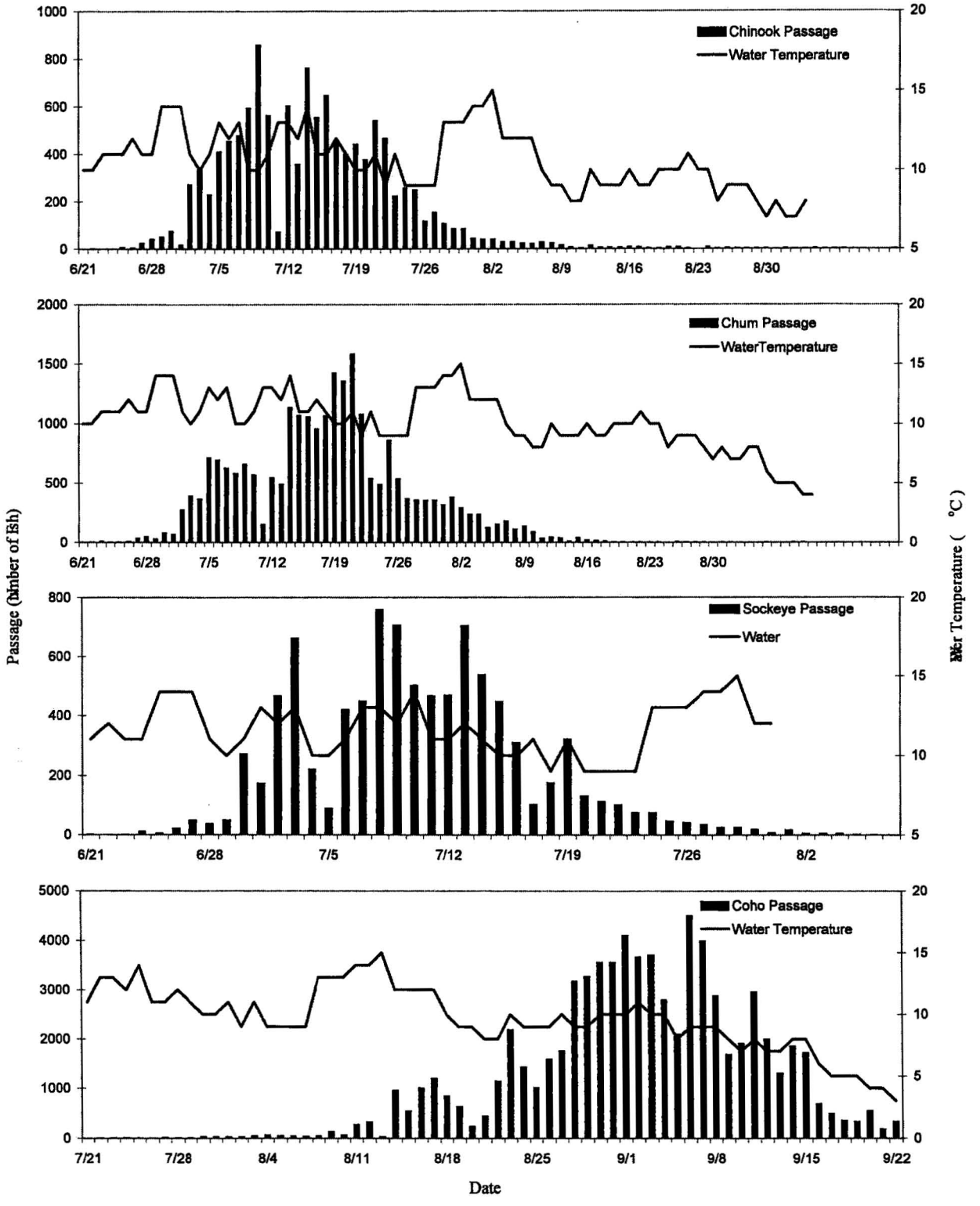


Figure 27. Daily chinook, chum, sockeye and coho salmon passage at the Kogrukluk River weir relative to daily water temperature , 2003.

# APPENDIX A
# HISTORICAL SALMON PASSAGE AT THE KOGRUKLUK RIVER WEIR

Appendix A.1. Historic chinook salmon passage at the Kogrukluk River weir.

| Date | | | | | | | | | | | | | | | | Daily Passage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 6/15 | | | | | b | | | | | | | b | | 0 b | | |
| 6/16 | | | | | b | | | | | | | b | | 0 b | | |
| 6/17 | | | | | b | 0 b | | | | | | b | | 0 b | | |
| 6/18 | | | 0 b | | b | 1 b | 0 b | | | | | b | | 0 b | | |
| 6/19 | | | 1 b | | b | 2 b | 1 b | | 1 | | | b | | 1 b | 1 b | |
| 6/20 | | | 2 b | 0 b | b | 5 b | 2 b | | 0 | | | b | | 1 b | 0 b | 1 b |
| 6/21 | | | 3 b | 1 b | b | 10 b | 5 b | | 0 | | | b | | 2 b | 2 b | 1 b |
| 6/22 | | | 5 b | 2 b | b | 20 b | 15 b | | 0 | | | b | | 4 b | 3 b | 3 b |
| 6/23 | | | 8 b | 4 b | b | 40 b | 30 b | 0 | 2 | | | b | | 9 b | 7 b | 6 b |
| 6/24 | | | 10 b | 8 b | b | 80 b | 45 b | 0 | 1 | 0 b | | b | 0 b | 14 b | 12 b | 9 b |
| 6/25 | | | 20 b | 15 b | b | 160 b | 65 b | 0 | 2 | 1 b | | b | 3 b | 26 b | 22 b | 17 b |
| 6/26 | | | 50 b | 30 b | b | 100 b | 90 b | 0 | 1 | 2 b | | b | 5 b | 29 b | 25 b | 19 b |
| 6/27 | | | 80 b | 45 b | b | 320 b | 120 b | 0 | 4 | 3 b | | b | 10 b | 57 b | 49 b | 37 b |
| 6/28 | | | 100 b | 25 b | b | 334 | 150 b | 0 | 57 | 5 b | | b | 30 b | 79 b | 6 | 52 b |
| 6/29 | 0 | | 112 | 75 b | b | 533 | 185 b | 57 | 87 | 10 b | 0 | b | 50 b | 119 b | 23 | 78 b |
| 6/30 | 5 | | 65 | 85 b | b | 562 | 230 b | 79 | 45 | 20 b | 3 | b | 80 b | 121 b | 119 | 80 b |
| 7/1 | 16 | | 342 | 130 b | b | 617 | 290 b | 31 | 315 | 20 b | 25 | b | 50 b | 241 b | 49 | 159 b |
| 7/2 | 2 | | 118 | 156 | 87 | 904 | 355 b | 317 | 304 | 50 b | 97 | b | 110 b | 284 b | 463 | 187 b |
| 7/3 | 18 | | 485 | 107 | 46 | 879 | 420 b | 102 b | 254 | 120 b | 67 | b | 215 b | 339 b | 361 | 223 b |
| 7/4 | 15 | | 804 | 258 | 34 | 740 | 520 b | 102 b | 139 | 45 b | 91 | b | 275 b | 351 b | 179 | 230 b |
| 7/5 | 70 | | 629 | 371 | 69 | 1,001 | 650 b | 102 b | 97 | 35 b | 61 | b | 349 | 386 b | 427 | 150 b |
| 7/6 | 43 | | 345 | 382 | 10 | 1,080 | 780 b | 75 | 238 | 22 b | 51 | b | 465 | 425 b | 453 | 168 b |
| 7/7 | 66 | | 253 | 309 | b | 1,215 | 840 b | 62 | 174 | 60 | 60 | b | 696 | 433 | 255 | 186 b |
| 7/8 | 157 | | 619 | 390 | b | 773 | 875 b | 48 | 144 | 106 | 130 | b | 583 | 378 | 842 | 204 |
| 7/9 | 312 | | 884 | 343 | 19 | 1,047 | 960 | 241 | 165 | 119 | 77 | b | 571 | 368 | 151 | 622 |
| 7/10 | 461 | | 671 | 619 | 414 | 983 | 609 | 71 | 23 | 416 | 482 | b | 684 | 463 | 1,228 | 517 |
| 7/11 | 347 | | 701 | 462 | 164 | 749 | 465 | 51 | 104 | 166 | 282 | b | 704 | 887 | 528 | 281 |
| 7/12 | 274 | | 632 | 760 | b | 526 | 380 | 84 b | 285 | 245 | 109 | b | 658 | 932 | 1,001 | 441 |
| 7/13 | 716 | | 597 | 932 | b | 491 | 349 | 84 b | 262 | 305 | 457 | b | 492 | 633 | 111 | 688 |
| 7/14 | 312 | 5 | 613 | 982 | b | 458 | 371 | 84 b | 324 | 269 | 281 | b | 595 | 814 | 387 | 517 |
| 7/15 | 251 | 9 | 673 | 548 | b | 560 | 159 | 84 b | 331 | 146 | 304 | 233 | 450 | 534 b | 1,055 | 320 |
| 7/16 | 247 | 46 | 727 | 700 | b | 452 | 424 | 84 b | 276 | 328 | 135 | 114 | 311 | 551 b | 647 | 417 a |
| 7/17 | 287 | 82 | 652 | 670 | b | 379 | 334 | 84 b | 225 | 175 | 194 | b | 150 | 466 b | 218 | 515 |
| 7/18 | 424 | 64 | 488 | 464 | b | 322 | 231 | 84 b | 105 | 299 | 299 b | b | 103 | 465 b | 408 | 378 |
| 7/19 | 283 | 223 | 561 | 355 | b | 298 | 165 | 84 b | 99 | 259 | 259 b | b | 124 | 395 b | 60 | 328 |
| 7/20 | 94 | 193 | 475 | 334 | b | 243 | 192 | 84 b | 137 | 177 | 197 b | b | 47 | 297 b | 97 | 291 |
| 7/21 | 392 | 135 | 271 | 345 | b | 187 | 102 | 84 b | 124 | 151 | 151 | b | 107 | 320 b | 197 | 158 |
| 7/22 | 190 | 148 | 302 | 178 | b | 183 | 47 | 84 b | 111 | 72 | 92 | b | 108 | 207 b | 101 | 169 |
| 7/23 | 171 | 117 | 203 | 131 | b | 118 | 81 | 84 b | 89 | 104 | 104 | b | 84 | 189 b | 128 | 46 |
| 7/24 | 82 | 151 | 299 | 308 | b | 78 | 54 | 84 b | 69 | 170 | 215 | b | 56 | 230 b | 57 | 46 a |
| 7/25 | 87 | 125 | 180 | 116 b | b | 42 | 61 | 84 b | 36 | 116 | 116 | b | 46 | 143 b | 37 | 45 |
| 7/26 | 56 | 75 | 114 | 140 b | b | 41 | 39 | 84 b | 44 | 130 | 140 | b | 38 | 141 b | 55 | 39 |
| 7/27 | 50 | 12 | 92 | 66 b | b | 31 | 52 | 84 b | 30 | 66 | 66 | b | 27 | 86 b | 35 | 30 |
| 7/28 | 20 | | 72 | 98 b | b | 36 | 34 | 84 b | 37 | 78 | 98 | b | 16 | 91 b | 44 | 38 |
| 7/29 | 28 | | 64 | 55 b | b | 31 | 20 | 84 b | 32 | 55 | 55 | b | 27 | 67 b | 70 | 34 |
| 7/30 | 24 | | 59 | 38 b | b | 24 | 32 | 84 b | 26 | 28 | 38 | b | 31 | 52 b | 47 | 12 |
| 7/31 | 18 b | | 52 b | 33 b | b | | 24 | 84 b | 22 | 33 | 33 | b | 23 | 45 b | 56 | 18 |
| 8/1 | 15 b | | 34 b | 42 b | b | | 16 | | 16 | 35 | 42 | b | 17 a | 42 b | 45 | 11 |
| 8/2 | 12 b | | 20 b | 35 b | b | | 18 | | 22 | 35 | 35 | b | 10 a | 39 b | 42 | 25 |
| 8/3 | 9 b | | 32 b | 26 b | b | | 27 | | 18 | 24 | 26 | b | 4 | 32 b | 29 | 16 |
| 8/4 | 6 b | | 24 b | 7 b | b | | 20 | | 12 | 7 | 7 | b | 12 | 17 b | 11 | 8 |
| 8/5 | 3 b | | 16 b | 15 b | b | | 11 | | 4 | 14 | 15 | b | 6 | 16 b | 14 | 3 |

-Continued-

Appendix A.1. (Page 2 of 12).

| Date | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | Daily Passage 1991 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8/6 | 3 b | | 18 b | 14 b | b | | 8 | | 3 | 14 | 14 | b | 7 | 15 b | 11 | 5 |
| 8/7 | 1 b | | 27 b | 3 b | b | | 10 | | 4 | 2 | 3 | b | 6 | 8 b | 6 | 5 |
| 8/8 | 1 b | | 20 b | 18 b | b | | 5 | | 8 | 18 | 18 | b | 10 | 19 b | 9 | 0 |
| 8/9 | 2 b | | 11 b | 9 b | b | | 4 | | 3 | 8 | 9 | 1 | 3 | 9 b | 7 | 0 |
| 8/10 | 5 b | | 8 b | 19 b | b | | 3 | | 1 | 19 | 19 | 15 | 1 | 15 b | 2 | 1 |
| 8/11 | 2 b | | 10 b | 14 b | b | | 5 | | 3 | 13 | 14 | 11 | 5 | 13 b | 10 | 3 |
| 8/12 | 1 b | | 5 b | 12 b | b | | 6 | | 1 | 12 | 12 | 18 | 10 | 11 b | 4 | 1 |
| 8/13 | 1 b | | 4 b | 6 b | b | | 5 | | 5 | 5 | 6 | 11 | 2 | 7 b | 2 | 2 |
| 8/14 | 0 b | | 3 b | 6 b | b | | 1 | | 1 | 6 | 6 | 15 | 3 | 5 b | 1 | 2 |
| 8/15 | | | 1 b | 2 b | b | | 0 | | 1 | 1 | 2 | 9 | 2 | 2 b | 3 | 0 |
| 8/16 | | | 0 b | 0 b | b | | 1 | | 1 | 0 | 0 | 14 | 3 | 1 b | 2 | 1 |
| 8/17 | | | 1 b | 6 b | b | | 0 | | 1 | 0 | 6 | 17 | 5 | 3 b | 0 | 2 |
| 8/18 | | | 0 b | 3 b | b | | | | 0 | 0 | 3 | 11 | 4 | 2 b | 1 | 0 |
| 8/19 | | | | 9 b | b | | | | 2 | 0 | 9 | 6 | 3 | 4 b | 1 | 1 |
| 8/20 | | | | 7 b | b | | | | 0 | 0 | 7 | 12 | 3 | 3 b | 0 | 1 |
| 8/21 | | | | 4 b | b | | | | 1 | 0 | 2 | 11 | 3 | 2 b | 1 | 0 |
| 8/22 | | | | 5 b | b | | | | | 0 | 7 | 5 | 3 | 3 b | 0 | 1 |
| 8/23 | | | | 3 b | b | | | | | 0 | 4 | 5 | 2 | 1 | 1 | 0 |
| 8/24 | | | | 2 b | b | | | | | 0 | 1 | 6 | 0 | 2 | 0 | 0 |
| 8/25 | | | | 1 b | b | | | | | 0 | 0 | 5 | 1 | | 0 | 1 |
| 8/26 | | | | 0 b | b | | | | | 0 | 0 | 2 | 1 | | 0 | 1 |
| 8/27 | | | | | b | | | | | 0 | 1 | 2 | 1 | | 0 | 0 |
| 8/28 | | | | | b | | | | | 0 | 1 | 2 | 4 | | 0 | 0 |
| 8/29 | | | | | b | | | | | 0 | 0 | 0 | 1 | | 0 | 0 |
| 8/30 | | | | | b | | | | | | | 0 | 0 | | 0 | 0 |
| 8/31 | | | | | b | | | | | | | 0 | 0 | | 0 | 0 |
| 9/1 | | | | | b | | | | | | | 0 | 0 | | 0 | 0 |
| 9/2 | | | | | b | | | | | | | 0 | 0 | | 0 | 0 |
| 9/3 | | | | | b | | | | | | | 0 | 0 | | 0 | 0 |
| 9/4 | | | | | b | | | | | | | 0 | 0 | | 0 | 0 |
| 9/5 | | | | | b | | | | | | | 0 | 0 | | 0 | 0 |
| 9/6 | | | | | b | | | | | | | 0 | 0 | | 0 | 0 |
| 9/7 | | | | | b | | | | | | | b | 0 | | 0 | 0 |
| 9/8 | | | | | b | | | | | | | b | 0 | | 0 | 0 |
| 9/9 | | | | | b | | | | | | | b | 0 | | 0 | 0 |
| 9/10 | | | | | b | | | | | | | b | 0 | | | 0 |
| 9/11 | | | | | b | | | | | | | b | 0 | | | 0 |
| 9/12 | | | | | b | | | | | | | b | 0 | | | 0 |
| 9/13 | | | | | b | | | | | | | b | 0 | | | 0 |
| 9/14 | | | | | b | | | | | | | b | 0 | | | 0 |
| 9/15 | | | | | b | | | | | | | 0 | 0 | | | 0 |
| 9/16 | | | | | b | | | | | | | 0 | 0 | | | 0 |
| Obs. | 5,500 | 1,385 | 13,102 | 10,104 | 843 | 15,917 | 5,325 | 1,032 | 4,928 | 4,287 | 2,922 | 525 | 7,650 | 4,911 | 10,097 | 5,781 |
| Est. | 79 | 0 | 565 | 1,234 | 5,729 | 738 | 5,668 | 1,977 | 0 | 332 | 2,116 | 3,538 | 855 | 7,029 | 121 | 2,069 |
| Total | 5,579 | 1,385 f | 13,667 | 11,338 | 6,572 e | 16,655 | 10,993 | 3,009 e | 4,928 | 4,619 | 5,038 | 4,063 e | 8,505 | 11,940 | 10,218 | 7,850 |
| % Obs. | 99 | n.a. | 96 | 89 | 13 | 96 | 48 | 34 | 100 | 93 | 58 | 13 | 90 | 41 | 99 | 74 |

a = Daily passage was estimated due to the occurrence of a hole in the weir.
b = The weir was not operational; daily passage was estimated.
c = The weir was not operational; daily passage was not estimated
d = Partial day count, passage was not estimated.
e = Majority of the run estimated; weir not operational much of the season. Actual differentiated daily estimates not available. Estimate reported as one bulk sum.
f = In 1977, weir and tower were run concurrently. In the final report weir data was used for comparison only. Estimates of weir passage were not made for chinook salmon.

Appendix A.1. (Page 3 of 12).

| Date | Daily Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 6/15 | | | | | | | | | | | | |
| 6/16 | | | | | | | | | | | | |
| 6/17 | | | | | | | | | | | | |
| 6/18 | | | 1 b | | | 0 b | | | | | | |
| 6/19 | | 1 b | 2 b | 2 b | | 1 b | | | | | | |
| 6/20 | 1 b | 1 b | 4 b | 2 b | 1 b | 1 b | | | | | | |
| 6/21 | 1 b | 2 b | 9 b | 2 b | 1 b | 2 b | 1 b | | | 1 b | | 0 |
| 6/22 | 2 b | 4 b | 19 b | 6 b | 4 b | 4 b | 4 b | | | 3 b | | 1 |
| 6/23 | 5 b | 9 b | 38 b | 17 b | 12 b | 9 b | 2 b | | | 7 b | | 0 |
| 6/24 | 8 b | 14 b | 71 b | 23 b | 16 b | 15 b | 4 b | | | 9 b | | 0 |
| 6/25 | 14 b | 26 b | 146 b | 43 b | 30 b | 28 b | 3 b | | | 17 b | | 7 |
| 6/26 | 16 b | 30 b | 91 b | 51 b | 36 b | 34 b | 9 b | | | 27 b | 15 | 5 |
| 6/27 | 32 b | 59 b | 291 b | 97 b | 68 b | 67 b | 88 b | | | 44 b | 143 | 24 |
| 6/28 | 44 b | 81 b | 304 b | 137 b | 96 b | 51 | 39 b | | | 29 b | 103 | 40 |
| 6/29 | 67 b | 122 b | 485 b | 208 b | 146 b | 610 | 118 b | | | 124 b | 279 | 50 |
| 6/30 | 69 b | 125 b | 512 b | 206 b | 80 | 596 | 79 b | | | 54 b | 89 | 74 |
| 7/1 | 72 b | 250 b | 562 b | 417 b | 264 | 507 | 198 b | 6 b | | 139 b | 187 | 17 |
| 7/2 | 255 | 293 b | 423 | 516 b | 998 | 172 | 157 b | 2 b | 1 | 255 b | 310 | 272 |
| 7/3 | 387 | 606 | 268 | 313 | 831 | 927 | 254 b | 2 b | 42 | 242 b | 129 | 344 |
| 7/4 | 163 | 362 b | 458 | 2,024 | 397 | 587 | 398 b | 5 b | 40 | 543 b | 618 | 229 |
| 7/5 | 235 | 657 b | 1,130 | 1,462 | 1,464 | 1,025 | 433 b | 43 b | 95 | 160 | 90 | 410 |
| 7/6 | 74 | 708 | 1,110 | 1,779 | 1,688 | 790 | 516 b | 17 | 179 | 397 | 1,192 | 454 |
| 7/7 | 145 | 876 | 937 | 1,306 | 1,788 | 1,142 | 145 | 53 | 108 | 386 | 123 | 479 |
| 7/8 | 138 | 715 | 692 | 1,133 | 880 | 486 | 817 b | 41 | 46 | 698 | 726 | 592 |
| 7/9 | 817 | 880 | 1,245 | 679 | 683 | 708 | 769 b | 56 | 189 | 796 | 241 | 858 |
| 7/10 | 325 | 1,004 | 775 | 1,826 | 552 | 219 | 452 b | 148 | 124 | 336 | 450 | 562 |
| 7/11 | 431 | 683 | 682 b | 797 | 339 | 224 | 719 b | 199 | 234 | 644 | 804 | 71 |
| 7/12 | 485 | 653 | 479 b | 1,714 | 418 | 532 | 992 b | 258 | 282 | 515 | 547 | 602 |
| 7/13 | 138 | 688 | 447 b | 764 | 715 | 303 | 699 b | 204 | 149 | 408 | 442 | 357 |
| 7/14 | 305 | 426 | 417 b | 375 | 515 | 552 | 598 b | 287 | 152 | 448 | 402 | 761 |
| 7/15 | 408 | 367 | 510 b | 246 | 282 | 398 | 675 b | 129 | 186 | 221 | 381 | 554 |
| 7/16 | 165 | 409 | 412 b | 774 | 181 | 324 | 617 b | 355 | 221 | 444 | 315 | 646 |
| 7/17 | 326 | 334 | 345 b | 689 | 237 | 377 | 455 b | 331 | 150 | 230 | 330 | 459 |
| 7/18 | 280 | 411 | 598 | 373 | 227 | 477 | 229 b | 126 | 102 | 111 | 311 a | 400 |
| 7/19 | 195 | 162 | 271 b | 475 | 260 | 357 | 329 | 395 | 103 | 316 | 289 | 441 |
| 7/20 | 144 | 272 | 221 b | 274 | 88 | 392 | 264 | 221 | 51 | 264 b | 269 a | 376 |
| 7/21 | 167 | 200 | 171 b | 266 | 180 | 346 | 225 | 788 | 77 | 184 b | 269 a | 542 |
| 7/22 | 165 | 59 | 166 b | 362 | 98 | 208 | 215 | 265 | 113 | 208 b | 249 | 466 |
| 7/23 | 159 | 101 | 108 b | 151 | 56 | 110 | 98 | 230 | 78 | 218 b | 114 | 223 |
| 7/24 | 103 | 88 | 71 b | 134 | 77 | 53 | 112 | 235 | 93 | 141 b | 176 | 257 |
| 7/25 | 84 | 52 | 38 b | 220 | 99 | 34 | 205 | 429 | 57 | 115 b | 131 | 248 |
| 7/26 | 33 | 76 | 37 b | 159 | 31 | 100 | 127 | 81 | 30 | 57 b | 82 | 116 |
| 7/27 | 26 | 77 | 29 b | 135 | 25 | 13 | 184 | 113 | 53 | 43 b | 50 | 153 |
| 7/28 | 27 | 121 | 47 | 67 | 27 | 81 | 194 | 68 | 25 | 50 | 37 | 106 |
| 7/29 | 30 | 76 b | 141 | 67 | 52 | 37 | 114 | 93 | 19 | 72 | 32 | 85 b |
| 7/30 | 20 | 30 b | 108 | 76 | 99 | 47 | 110 | 88 | 14 | 77 | 31 | 85 b |
| 7/31 | 21 | 19 | 86 | 27 | 19 | 36 | 101 | 52 | 41 | 46 | 8 | 43 |
| 8/1 | 17 | 14 | 58 | 24 | 16 b | 20 | 64 | 54 | 24 | 29 | 23 | 39 |
| 8/2 | 25 | 7 | 27 | 25 | 12 b | 30 | 58 | 41 | 37 | 53 | 12 | 40 |
| 8/3 | 10 | 16 | 25 | 47 | 9 | 25 | 31 | 24 | 35 b | 24 | 11 | 31 a |
| 8/4 | 9 b | 25 | 22 b | 21 | 7 | 13 | 25 | 18 | 29 b | 17 | 11 | 31 a |
| 8/5 | 9 b | 23 | 21 b | 11 | 2 | 18 | 30 | 23 | 26 b | 9 | 11 | 23 |

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Appendix A.1. (Page 4 of 12).

| Date | Daily Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 8/6 | 8 b | 20 | 18 b | 10 | 6 | 19 | 17 | 17 | 22 b | 14 | 9 | 20 |
| 8/7 | 14 b | 29 | 16 | 4 | 8 | 13 | 14 | 7 | 18 b | 4 | 6 | 27 |
| 8/8 | 13 b | 21 | 19 | 15 | 10 | 10 | 20 | 10 | 4 | 12 | 11 | 24 |
| 8/9 | 15 b | 11 | 2 | 10 | 2 | 23 | 15 | 4 | 7 | 1 | 7 | 15 |
| 8/10 | 7 | 15 | 6 | 10 b | 14 | 28 | 5 | 2 | 10 | 6 | 1 | 7 |
| 8/11 | 7 | 5 | 6 b | 10 b | 7 b | 33 | 10 | 2 | 3 | 3 | 5 | 3 |
| 8/12 | 7 | 11 | 6 | 15 b | 10 b | 9 b | 3 | 8 | 3 | 1 | 5 | 14 |
| 8/13 | 8 | 6 | 5 | 6 b | 4 b | 4 b | 7 | 5 | 9 | 7 | 3 | 5 |
| 8/14 | 1 | 0 | 9 | 4 b | 3 b | 4 | 5 | 4 | 6 | 4 | 4 | 6 |
| 8/15 | 5 | 0 | 7 | 2 b | 5 | 13 | 5 | 1 | 5 | 11 | 2 | 5 |
| 8/16 | 9 | 0 | 4 | 1 | 1 | 6 | 5 | 2 | 1 | 2 | 1 | 8 |
| 8/17 | 2 | 0 | 3 | 3 | 0 | 5 | 3 | 3 | 0 | 1 | 0 | 7 |
| 8/18 | 4 | 0 | 0 | 2 | 1 | 1 | 2 | 3 | 0 | 0 | 0 | 3 |
| 8/19 | 2 | 0 | 5 | 0 | 0 | 5 | 7 | 0 | 1 | 4 | 0 | 2 |
| 8/20 | 1 | 0 | 1 | 2 | 3 | 4 | 4 | 1 | 3 | 0 | 0 | 7 |
| 8/21 | 0 | 0 | 3 | 3 | 2 | 1 | 4 | 0 | 0 | 1 | 1 | 7 |
| 8/22 | | 0 | 1 | 1 | 3 | 2 | 1 | 2 | 1 | 1 | 2 | 2 |
| 8/23 | | 0 | 0 | 1 | 4 | 1 | 0 | 0 | 2 | 1 | 3 | 0 |
| 8/24 | | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 7 |
| 8/25 | | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 1 | 2 | 2 | 2 |
| 8/26 | | 0 | 0 | 0 | 2 | 4 | 3 | 1 | 0 | 2 | 0 | 3 |
| 8/27 | | 0 | 0 | 3 | 1 | 4 | 1 | 2 | 2 | 3 | 1 | 2 b |
| 8/28 | | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 3 | 0 | 3 | 2 b |
| 8/29 | | 0 | 6 | 4 | 2 | 7 | 0 | 0 | 0 | 0 | 1 | 2 b |
| 8/30 | | 0 | 0 | 0 | 0 | 0 | 3 | 13 | 4 | 0 | 2 | 2 |
| 8/31 | | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 1 |
| 9/1 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 |
| 9/2 | | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 2 | 1 |
| 9/3 | | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| 9/4 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 9/5 | | 0 | | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 9/6 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 9/7 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 9/8 | | | | | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 9/9 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 9/10 | | | | | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 9/11 | | | | | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 9/12 | | | | | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 |
| 9/13 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/14 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/15 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/16 | | | | | | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Obs. | 6,356 | 10,190 | 8,221 | 18,856 | 13,734 | 13,112 | 2,780 | 5,472 | 3,180 | 6,572 | 9,590 | 11,585 |
| Est. | 399 | 2,142 | 7,006 | 1,774 | 465 | 174 | 9,327 | 98 | 130 | 2,726 | 514 | 186 |
| Total | 6,755 | 12,332 | 15,227 | 20,630 | 14,199 | 13,286 | 12,107 | 5,570 | 3,310 | 9,298 | 10,104 | 11,771 |
| % Obs. | 94 | 83 | 54 | 91 | 97 | 99 | 23 | 98 | 96 | 71 | 95 | 98 |

a = Daily passage was estimated due to the occurrence of a hole in the weir.
b = The weir was not operational; daily passage was estimated.
c = The weir was not operational; daily passage was not estimated
d = Partial day count, passage was not estimated.
e = Majority of the run estimated; weir not operational much of the season. Actual differentiated daily estimates not available. Estimate reported as one bulk sum.

Appendix A.1. (Page 5 of 12).

| Date | Cumulative Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 6/15 | | | | | | | | | | | | | | 0 | | |
| 6/16 | | | | | | | | | | | | | | 0 | | |
| 6/17 | | | | | | 0 | | | | | | | | 0 | | |
| 6/18 | | | 0 | | | 1 | 0 | | | | | | | 0 | | |
| 6/19 | | | 1 | | | 3 | 1 | | 1 | | | | | 1 | 1 | |
| 6/20 | | | 3 | 0 | | 8 | 3 | | 1 | | | | | 2 | 1 | 1 |
| 6/21 | | | 6 | 1 | | 18 | 8 | | 1 | | | | | 3 | 3 | 2 |
| 6/22 | | | 11 | 3 | | 38 | 23 | | 1 | | | | | 7 | 6 | 5 |
| 6/23 | | | 19 | 7 | | 78 | 53 | 0 | 3 | | | | | 16 | 13 | 11 |
| 6/24 | | | 29 | 15 | | 158 | 98 | 0 | 4 | 0 | | | 0 | 30 | 25 | 20 |
| 6/25 | | | 49 | 30 | | 318 | 163 | 0 | 6 | 1 | | | 3 | 56 | 47 | 37 |
| 6/26 | | | 99 | 60 | | 418 | 253 | 0 | 7 | 3 | | | 8 | 84 | 72 | 56 |
| 6/27 | | | 179 | 105 | | 738 | 373 | 0 | 11 | 6 | | | 18 | 141 | 121 | 93 |
| 6/28 | | | 279 | 130 | | 1,072 | 523 | 0 | 68 | 11 | | | 48 | 220 | 127 | 145 |
| 6/29 | 0 | | 391 | 205 | | 1,605 | 708 | 57 | 155 | 21 | 0 | | 98 | 338 | 150 | 223 |
| 6/30 | 5 | | 456 | 290 | | 2,167 | 938 | 136 | 200 | 41 | 3 | | 178 | 459 | 269 | 303 |
| 7/1 | 21 | | 798 | 420 | | 2,784 | 1,228 | 167 | 515 | 61 | 28 | | 228 | 701 | 318 | 462 |
| 7/2 | 23 | | 916 | 576 | 87 | 3,688 | 1,583 | 484 | 819 | 111 | 125 | | 338 | 985 | 781 | 649 |
| 7/3 | 41 | | 1,401 | 683 | 133 | 4,567 | 2,003 | 586 | 1,073 | 231 | 192 | | 553 | 1,323 | 1,142 | 872 |
| 7/4 | 56 | | 2,205 | 941 | 167 | 5,307 | 2,523 | 689 | 1,212 | 276 | 283 | | 828 | 1,674 | 1,321 | 1,102 |
| 7/5 | 126 | | 2,834 | 1,312 | 236 | 6,308 | 3,173 | 791 | 1,309 | 311 | 344 | | 1,177 | 2,060 | 1,748 | 1,252 |
| 7/6 | 169 | | 3,179 | 1,694 | 246 | 7,388 | 3,953 | 866 | 1,547 | 333 | 395 | | 1,642 | 2,485 | 2,201 | 1,420 |
| 7/7 | 235 | | 3,432 | 2,003 | 246 | 8,603 | 4,793 | 928 | 1,721 | 393 | 455 | | 2,338 | 2,918 | 2,456 | 1,606 |
| 7/8 | 392 | | 4,051 | 2,393 | 246 | 9,376 | 5,668 | 976 | 1,865 | 499 | 585 | | 2,921 | 3,296 | 3,298 | 1,810 |
| 7/9 | 704 | | 4,935 | 2,736 | 265 | 10,423 | 6,628 | 1,217 | 2,030 | 618 | 662 | | 3,492 | 3,664 | 3,449 | 2,432 |
| 7/10 | 1,165 | | 5,606 | 3,355 | 679 | 11,406 | 7,237 | 1,288 | 2,053 | 1,034 | 1,144 | | 4,176 | 4,127 | 4,677 | 2,949 |
| 7/11 | 1,512 | | 6,307 | 3,817 | 843 | 12,155 | 7,702 | 1,339 | 2,157 | 1,200 | 1,426 | | 4,880 | 5,014 | 5,205 | 3,230 |
| 7/12 | 1,786 | | 6,939 | 4,577 | | 12,681 | 8,082 | 1,423 | 2,442 | 1,445 | 1,535 | | 5,538 | 5,946 | 6,206 | 3,671 |
| 7/13 | 2,502 | | 7,536 | 5,509 | | 13,172 | 8,431 | 1,506 | 2,704 | 1,750 | 1,992 | | 6,030 | 6,579 | 6,317 | 4,359 |
| 7/14 | 2,814 | 5 | 8,149 | 6,491 | | 13,630 | 8,802 | 1,590 | 3,028 | 2,019 | 2,273 | | 6,625 | 7,393 | 6,704 | 4,876 |
| 7/15 | 3,065 | 14 | 8,822 | 7,039 | | 14,190 | 8,961 | 1,673 | 3,359 | 2,165 | 2,577 | 233 | 7,075 | 7,927 | 7,759 | 5,196 |
| 7/16 | 3,312 | 60 | 9,549 | 7,739 | | 14,642 | 9,385 | 1,757 | 3,635 | 2,493 | 2,712 | 347 | 7,386 | 8,478 | 8,406 | 5,613 |
| 7/17 | 3,599 | 142 | 10,201 | 8,409 | | 15,021 | 9,719 | 1,840 | 3,860 | 2,668 | 2,906 | 347 | 7,536 | 8,943 | 8,624 | 6,128 |
| 7/18 | 4,023 | 206 | 10,689 | 8,873 | | 15,343 | 9,950 | 1,924 | 3,965 | 2,967 | 3,205 | 347 | 7,639 | 9,408 | 9,032 | 6,506 |
| 7/19 | 4,306 | 429 | 11,250 | 9,228 | | 15,641 | 10,115 | 2,007 | 4,064 | 3,226 | 3,464 | 347 | 7,763 | 9,803 | 9,092 | 6,834 |
| 7/20 | 4,400 | 622 | 11,725 | 9,562 | | 15,884 | 10,307 | 2,091 | 4,201 | 3,403 | 3,661 | 347 | 7,810 | 10,100 | 9,189 | 7,125 |
| 7/21 | 4,792 | 757 | 11,996 | 9,907 | | 16,071 | 10,409 | 2,174 | 4,325 | 3,554 | 3,812 | 347 | 7,917 | 10,420 | 9,386 | 7,283 |
| 7/22 | 4,982 | 905 | 12,298 | 10,085 | | 16,254 | 10,456 | 2,258 | 4,436 | 3,626 | 3,904 | 347 | 8,025 | 10,627 | 9,487 | 7,452 |
| 7/23 | 5,153 | 1,022 | 12,501 | 10,216 | | 16,372 | 10,537 | 2,341 | 4,525 | 3,730 | 4,008 | 347 | 8,109 | 10,816 | 9,615 | 7,498 |
| 7/24 | 5,235 | 1,173 | 12,800 | 10,524 | | 16,450 | 10,591 | 2,425 | 4,594 | 3,900 | 4,223 | 347 | 8,165 | 11,046 | 9,672 | 7,544 |
| 7/25 | 5,322 | 1,298 | 12,980 | 10,640 | | 16,492 | 10,652 | 2,508 | 4,630 | 4,016 | 4,339 | 347 | 8,211 | 11,189 | 9,709 | 7,589 |
| 7/26 | 5,378 | 1,373 | 13,094 | 10,780 | | 16,533 | 10,691 | 2,592 | 4,674 | 4,146 | 4,479 | 347 | 8,249 | 11,330 | 9,764 | 7,628 |
| 7/27 | 5,428 | 1,385 | 13,186 | 10,846 | | 16,564 | 10,743 | 2,675 | 4,704 | 4,212 | 4,545 | 347 | 8,276 | 11,416 | 9,799 | 7,658 |
| 7/28 | 5,448 | | 13,258 | 10,944 | | 16,600 | 10,777 | 2,759 | 4,741 | 4,290 | 4,643 | 347 | 8,292 | 11,507 | 9,843 | 7,696 |
| 7/29 | 5,476 | | 13,322 | 10,999 | | 16,631 | 10,797 | 2,842 | 4,773 | 4,345 | 4,698 | 347 | 8,319 | 11,574 | 9,913 | 7,730 |
| 7/30 | 5,500 | | 13,381 | 11,037 | | 16,655 | 10,829 | 2,926 | 4,799 | 4,373 | 4,736 | 347 | 8,350 | 11,625 | 9,960 | 7,742 |
| 7/31 | 5,518 | | 13,433 | 11,070 | | | 10,853 | 3,009 | 4,821 | 4,406 | 4,769 | 347 | 8,373 | 11,670 | 10,016 | 7,760 |
| 8/1 | 5,533 | | 13,467 | 11,112 | | | 10,869 | | 4,837 | 4,441 | 4,811 | 347 | 8,390 | 11,712 | 10,061 | 7,771 |
| 8/2 | 5,545 | | 13,487 | 11,147 | | | 10,887 | | 4,859 | 4,476 | 4,846 | 347 | 8,400 | 11,751 | 10,103 | 7,796 |
| 8/3 | 5,554 | | 13,519 | 11,173 | | | 10,914 | | 4,877 | 4,500 | 4,872 | 347 | 8,404 | 11,782 | 10,132 | 7,812 |
| 8/4 | 5,560 | | 13,543 | 11,180 | | | 10,934 | | 4,889 | 4,507 | 4,879 | 347 | 8,416 | 11,799 | 10,143 | 7,820 |
| 8/5 | 5,563 | | 13,559 | 11,195 | | | 10,945 | | 4,893 | 4,521 | 4,894 | 347 | 8,422 | 11,815 | 10,157 | 7,823 |

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Appendix A.1. (Page 6 of 12).

| Date | Cumulative Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 8/6 | 5,566 | | 13,577 | 11,209 | | | 10,953 | | 4,896 | 4,535 | 4,908 | 347 | 8,429 | 11,830 | 10,168 | 7,828 |
| 8/7 | 5,567 | | 13,604 | 11,212 | | | 10,963 | | 4,900 | 4,537 | 4,911 | 347 | 8,435 | 11,838 | 10,174 | 7,833 |
| 8/8 | 5,568 | | 13,624 | 11,230 | | | 10,968 | | 4,908 | 4,555 | 4,929 | 347 | 8,445 | 11,857 | 10,183 | 7,833 |
| 8/9 | 5,570 | | 13,635 | 11,239 | | | 10,972 | | 4,911 | 4,563 | 4,938 | 348 | 8,448 | 11,865 | 10,190 | 7,833 |
| 8/10 | 5,575 | | 13,643 | 11,258 | | | 10,975 | | 4,912 | 4,582 | 4,957 | 363 | 8,449 | 11,880 | 10,192 | 7,834 |
| 8/11 | 5,577 | | 13,653 | 11,272 | | | 10,980 | | 4,915 | 4,595 | 4,971 | 374 | 8,454 | 11,894 | 10,202 | 7,837 |
| 8/12 | 5,578 | | 13,658 | 11,284 | | | 10,986 | | 4,916 | 4,607 | 4,983 | 392 | 8,464 | 11,905 | 10,206 | 7,838 |
| 8/13 | 5,579 | | 13,662 | 11,290 | | | 10,991 | | 4,921 | 4,612 | 4,989 | 403 | 8,466 | 11,911 | 10,208 | 7,840 |
| 8/14 | 5,579 | | 13,665 | 11,296 | | | 10,992 | | 4,922 | 4,618 | 4,995 | 418 | 8,469 | 11,917 | 10,209 | 7,842 |
| 8/15 | | | 13,666 | 11,298 | | | 10,992 | | 4,923 | 4,619 | 4,997 | 427 | 8,471 | 11,918 | 10,212 | 7,842 |
| 8/16 | | | 13,666 | 11,298 | | | 10,993 | | 4,924 | 4,619 | 4,997 | 441 | 8,474 | 11,919 | 10,214 | 7,843 |
| 8/17 | | | 13,667 | 11,304 | | | 10,993 | | 4,925 | 4,619 | 5,003 | 458 | 8,479 | 11,923 | 10,214 | 7,845 |
| 8/18 | | | 13,667 | 11,307 | | | | | 4,925 | 4,619 | 5,006 | 469 | 8,483 | 11,925 | 10,215 | 7,845 |
| 8/19 | | | | 11,316 | | | | | 4,927 | 4,619 | 5,015 | 475 | 8,486 | 11,929 | 10,216 | 7,846 |
| 8/20 | | | | 11,323 | | | | | 4,927 | 4,619 | 5,022 | 487 | 8,489 | 11,932 | 10,216 | 7,847 |
| 8/21 | | | | 11,327 | | | | | 4,928 | 4,619 | 5,024 | 498 | 8,492 | 11,934 | 10,217 | 7,847 |
| 8/22 | | | | 11,332 | | | | | | 4,619 | 5,031 | 503 | 8,495 | 11,937 | 10,217 | 7,848 |
| 8/23 | | | | 11,335 | | | | | | 4,619 | 5,035 | 508 | 8,497 | 11,938 | 10,218 | 7,848 |
| 8/24 | | | | 11,337 | | | | | | 4,619 | 5,036 | 514 | 8,497 | 11,940 | 10,218 | 7,848 |
| 8/25 | | | | 11,338 | | | | | | 4,619 | 5,036 | 519 | 8,498 | | 10,218 | 7,849 |
| 8/26 | | | | 11,338 | | | | | | 4,619 | 5,036 | 521 | 8,499 | | 10,218 | 7,850 |
| 8/27 | | | | | | | | | | 4,619 | 5,037 | 523 | 8,500 | | 10,218 | 7,850 |
| 8/28 | | | | | | | | | | 4,619 | 5,038 | 525 | 8,504 | | 10,218 | 7,850 |
| 8/29 | | | | | | | | | | 4,619 | 5,038 | 525 | 8,505 | | 10,218 | 7,850 |
| 8/30 | | | | | | | | | | | | 525 | 8,505 | | 10,218 | 7,850 |
| 8/31 | | | | | | | | | | | | 525 | 8,505 | | 10,218 | 7,850 |
| 9/1 | | | | | | | | | | | | 525 | 8,505 | | 10,218 | 7,850 |
| 9/2 | | | | | | | | | | | | 525 | 8,505 | | 10,218 | 7,850 |
| 9/3 | | | | | | | | | | | | 525 | 8,505 | | 10,218 | 7,850 |
| 9/4 | | | | | | | | | | | | 525 | 8,505 | | 10,218 | 7,850 |
| 9/5 | | | | | | | | | | | | 525 | 8,505 | | 10,218 | 7,850 |
| 9/6 | | | | | | | | | | | | 525 | 8,505 | | 10,218 | 7,850 |
| 9/7 | | | | | | | | | | | | 525 | 8,505 | | 10,218 | 7,850 |
| 9/8 | | | | | | | | | | | | 525 | 8,505 | | 10,218 | 7,850 |
| 9/9 | | | | | | | | | | | | 525 | 8,505 | | 10,218 | 7,850 |
| 9/10 | | | | | | | | | | | | 525 | 8,505 | | | 7,850 |
| 9/11 | | | | | | | | | | | | 525 | 8,505 | | | 7,850 |
| 9/12 | | | | | | | | | | | | 525 | 8,505 | | | 7,850 |
| 9/13 | | | | | | | | | | | | 525 | 8,505 | | | 7,850 |
| 9/14 | | | | | | | | | | | | 525 | 8,505 | | | 7,850 |
| 9/15 | | | | | | | | | | | | 525 | 8,505 | | | 7,850 |
| 9/16 | | | | | | | | | | | | 525 | 8,505 | | | 7,850 |

Appendix C.2. (Page 7 of 12).

| Date | Cumulative Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 6/15 | | | | | | | | | | | | |
| 6/16 | | | | | | | | | | | | |
| 6/17 | | | | | | | | | | | | 0 |
| 6/18 | | | 1 | | | 0 | | | | | | 0 |
| 6/19 | | 1 | 3 | 2 | | 1 | | | | | | 0 |
| 6/20 | 1 | 2 | 7 | 4 | 1 | 2 | | | | | | 0 |
| 6/21 | 2 | 4 | 16 | 6 | 3 | 4 | 1 | | | 1 | | 0 |
| 6/22 | 4 | 8 | 35 | 12 | 7 | 8 | 5 | | | 4 | | 1 |
| 6/23 | 9 | 17 | 73 | 29 | 19 | 17 | 7 | | | 11 | | 1 |
| 6/24 | 17 | 31 | 144 | 52 | 35 | 32 | 11 | | | 20 | | 1 |
| 6/25 | 31 | 57 | 290 | 95 | 65 | 60 | 14 | | | 36 | | 8 |
| 6/26 | 47 | 87 | 381 | 146 | 102 | 94 | 24 | | | 64 | 15 | 13 |
| 6/27 | 79 | 146 | 672 | 243 | 170 | 161 | 111 | | | 108 | 158 | 37 |
| 6/28 | 123 | 227 | 976 | 380 | 265 | 212 | 151 | | | 137 | 261 | 77 |
| 6/29 | 190 | 349 | 1,461 | 588 | 412 | 822 | 268 | | | 261 | 540 | 127 |
| 6/30 | 259 | 474 | 1,973 | 794 | 492 | 1,418 | 348 | | | 315 | 629 | 201 |
| 7/1 | 331 | 724 | 2,535 | 1,211 | 756 | 1,925 | 546 | 6 | | 454 | 816 | 218 |
| 7/2 | 586 | 1,017 | 2,958 | 1,727 | 1,754 | 2,097 | 703 | 8 | 1 | 709 | 1,126 | 490 |
| 7/3 | 973 | 1,623 | 3,226 | 2,040 | 2,585 | 3,024 | 957 | 10 | 43 | 952 | 1,255 | 834 |
| 7/4 | 1,136 | 1,985 | 3,684 | 4,064 | 2,982 | 3,611 | 1,355 | 15 | 83 | 1,495 | 1,873 | 1,063 |
| 7/5 | 1,371 | 2,642 | 4,814 | 5,526 | 4,446 | 4,636 | 1,789 | 58 | 178 | 1,655 | 1,963 | 1,473 |
| 7/6 | 1,445 | 3,350 | 5,924 | 7,305 | 6,134 | 5,426 | 2,305 | 75 | 357 | 2,052 | 3,155 | 1,927 |
| 7/7 | 1,590 | 4,226 | 6,861 | 8,611 | 7,922 | 6,568 | 2,450 | 128 | 465 | 2,438 | 3,278 | 2,406 |
| 7/8 | 1,728 | 4,941 | 7,553 | 9,744 | 8,802 | 7,054 | 3,267 | 169 | 511 | 3,136 | 4,004 | 2,998 |
| 7/9 | 2,545 | 5,821 | 8,798 | 10,423 | 9,485 | 7,762 | 4,036 | 225 | 700 | 3,932 | 4,245 | 3,856 |
| 7/10 | 2,870 | 6,825 | 9,573 | 12,249 | 10,037 | 7,981 | 4,488 | 373 | 824 | 4,268 | 4,695 | 4,418 |
| 7/11 | 3,301 | 7,508 | 10,255 | 13,046 | 10,376 | 8,205 | 5,207 | 572 | 1,058 | 4,912 | 5,499 | 4,489 |
| 7/12 | 3,786 | 8,161 | 10,734 | 14,760 | 10,794 | 8,737 | 6,199 | 830 | 1,340 | 5,427 | 6,046 | 5,091 |
| 7/13 | 3,924 | 8,849 | 11,181 | 15,524 | 11,509 | 9,040 | 6,898 | 1,034 | 1,489 | 5,835 | 6,488 | 5,448 |
| 7/14 | 4,229 | 9,275 | 11,598 | 15,899 | 12,024 | 9,592 | 7,496 | 1,321 | 1,641 | 6,283 | 6,890 | 6,209 |
| 7/15 | 4,637 | 9,642 | 12,108 | 16,145 | 12,306 | 9,990 | 8,172 | 1,450 | 1,827 | 6,504 | 7,271 | 6,763 |
| 7/16 | 4,802 | 10,051 | 12,520 | 16,919 | 12,487 | 10,314 | 8,788 | 1,805 | 2,048 | 6,948 | 7,586 | 7,409 |
| 7/17 | 5,128 | 10,385 | 12,865 | 17,608 | 12,724 | 10,691 | 9,243 | 2,136 | 2,198 | 7,178 | 7,916 | 7,868 |
| 7/18 | 5,408 | 10,796 | 13,463 | 17,981 | 12,951 | 11,168 | 9,472 | 2,262 | 2,300 | 7,289 | 8,227 | 8,268 |
| 7/19 | 5,603 | 10,958 | 13,734 | 18,456 | 13,211 | 11,525 | 9,801 | 2,657 | 2,403 | 7,605 | 8,516 | 8,709 |
| 7/20 | 5,747 | 11,230 | 13,955 | 18,730 | 13,299 | 11,917 | 10,065 | 2,878 | 2,454 | 7,869 | 8,785 | 9,085 |
| 7/21 | 5,914 | 11,430 | 14,126 | 18,996 | 13,479 | 12,263 | 10,290 | 3,666 | 2,531 | 8,053 | 9,054 | 9,627 |
| 7/22 | 6,079 | 11,489 | 14,292 | 19,358 | 13,577 | 12,471 | 10,505 | 3,931 | 2,644 | 8,262 | 9,303 | 10,093 |
| 7/23 | 6,238 | 11,590 | 14,400 | 19,509 | 13,633 | 12,581 | 10,603 | 4,161 | 2,722 | 8,480 | 9,417 | 10,316 |
| 7/24 | 6,341 | 11,678 | 14,471 | 19,643 | 13,710 | 12,634 | 10,715 | 4,396 | 2,815 | 8,621 | 9,593 | 10,573 |
| 7/25 | 6,425 | 11,730 | 14,509 | 19,863 | 13,809 | 12,668 | 10,920 | 4,825 | 2,872 | 8,736 | 9,724 | 10,821 |
| 7/26 | 6,458 | 11,806 | 14,546 | 20,022 | 13,840 | 12,768 | 11,047 | 4,906 | 2,902 | 8,793 | 9,806 | 10,937 |
| 7/27 | 6,484 | 11,883 | 14,575 | 20,157 | 13,865 | 12,781 | 11,231 | 5,019 | 2,955 | 8,836 | 9,856 | 11,090 |
| 7/28 | 6,511 | 12,004 | 14,622 | 20,224 | 13,892 | 12,862 | 11,425 | 5,087 | 2,980 | 8,886 | 9,893 | 11,196 |
| 7/29 | 6,541 | 12,080 | 14,763 | 20,291 | 13,944 | 12,899 | 11,539 | 5,180 | 2,999 | 8,958 | 9,925 | 11,281 |
| 7/30 | 6,561 | 12,110 | 14,871 | 20,367 | 14,043 | 12,946 | 11,649 | 5,268 | 3,013 | 9,035 | 9,956 | 11,367 |
| 7/31 | 6,582 | 12,129 | 14,957 | 20,394 | 14,062 | 12,982 | 11,750 | 5,320 | 3,054 | 9,081 | 9,964 | 11,410 |
| 8/1 | 6,599 | 12,143 | 15,015 | 20,418 | 14,078 | 13,002 | 11,814 | 5,374 | 3,078 | 9,110 | 9,987 | 11,449 |
| 8/2 | 6,624 | 12,150 | 15,042 | 20,443 | 14,090 | 13,032 | 11,872 | 5,415 | 3,115 | 9,163 | 9,999 | 11,489 |
| 8/3 | 6,634 | 12,166 | 15,067 | 20,490 | 14,099 | 13,057 | 11,903 | 5,439 | 3,150 | 9,187 | 10,010 | 11,519 |
| 8/4 | 6,643 | 12,191 | 15,089 | 20,511 | 14,106 | 13,070 | 11,928 | 5,457 | 3,179 | 9,204 | 10,020 | 11,550 |
| 8/5 | 6,653 | 12,214 | 15,110 | 20,522 | 14,108 | 13,088 | 11,958 | 5,480 | 3,205 | 9,213 | 10,031 | 11,573 |

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Appendix C.2. (Page 8 of 12).

| Date | Cumulative Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 8/6 | 6,661 | 12,234 | 15,128 | 20,532 | 14,114 | 13,107 | 11,975 | 5,497 | 3,227 | 9,227 | 10,040 | 11,593 |
| 8/7 | 6,674 | 12,263 | 15,144 | 20,536 | 14,122 | 13,120 | 11,989 | 5,504 | 3,245 | 9,231 | 10,046 | 11,620 |
| 8/8 | 6,687 | 12,284 | 15,163 | 20,551 | 14,132 | 13,130 | 12,009 | 5,514 | 3,249 | 9,243 | 10,057 | 11,644 |
| 8/9 | 6,702 | 12,295 | 15,165 | 20,561 | 14,134 | 13,153 | 12,024 | 5,518 | 3,256 | 9,244 | 10,064 | 11,659 |
| 8/10 | 6,709 | 12,310 | 15,171 | 20,571 | 14,148 | 13,181 | 12,029 | 5,520 | 3,266 | 9,250 | 10,065 | 11,666 |
| 8/11 | 6,716 | 12,315 | 15,177 | 20,581 | 14,155 | 13,214 | 12,039 | 5,522 | 3,269 | 9,253 | 10,070 | 11,669 |
| 8/12 | 6,723 | 12,326 | 15,183 | 20,596 | 14,165 | 13,223 | 12,042 | 5,530 | 3,272 | 9,254 | 10,075 | 11,683 |
| 8/13 | 6,731 | 12,332 | 15,188 | 20,602 | 14,170 | 13,227 | 12,049 | 5,535 | 3,281 | 9,261 | 10,078 | 11,688 |
| 8/14 | 6,732 | 12,332 | 15,197 | 20,606 | 14,173 | 13,231 | 12,054 | 5,539 | 3,287 | 9,265 | 10,082 | 11,694 |
| 8/15 | 6,737 | 12,332 | 15,204 | 20,608 | 14,178 | 13,244 | 12,059 | 5,540 | 3,292 | 9,276 | 10,084 | 11,699 |
| 8/16 | 6,746 | 12,332 | 15,208 | 20,609 | 14,179 | 13,250 | 12,064 | 5,542 | 3,293 | 9,278 | 10,085 | 11,707 |
| 8/17 | 6,748 | 12,332 | 15,211 | 20,612 | 14,179 | 13,255 | 12,067 | 5,545 | 3,293 | 9,279 | 10,085 | 11,714 |
| 8/18 | 6,752 | 12,332 | 15,211 | 20,614 | 14,180 | 13,256 | 12,069 | 5,548 | 3,293 | 9,279 | 10,085 | 11,717 |
| 8/19 | 6,754 | 12,332 | 15,216 | 20,614 | 14,180 | 13,261 | 12,076 | 5,548 | 3,294 | 9,283 | 10,085 | 11,719 |
| 8/20 | 6,755 | 12,332 | 15,217 | 20,616 | 14,183 | 13,265 | 12,080 | 5,549 | 3,297 | 9,283 | 10,085 | 11,726 |
| 8/21 | 6,755 | 12,332 | 15,220 | 20,619 | 14,185 | 13,266 | 12,084 | 5,549 | 3,297 | 9,284 | 10,086 | 11,733 |
| 8/22 | | 12,332 | 15,221 | 20,620 | 14,188 | 13,268 | 12,085 | 5,551 | 3,298 | 9,285 | 10,088 | 11,735 |
| 8/23 | | 12,332 | 15,221 | 20,621 | 14,192 | 13,269 | 12,085 | 5,551 | 3,300 | 9,286 | 10,091 | 11,735 |
| | | 12,332 | 15,221 | 20,621 | 14,193 | 13,269 | 12,086 | 5,552 | 3,300 | 9,287 | 10,092 | 11,742 |
| | | 12,332 | 15,221 | 20,621 | 14,193 | 13,271 | 12,087 | 5,554 | 3,301 | 9,289 | 10,094 | 11,744 |
| | | 12,332 | 15,221 | 20,621 | 14,195 | 13,275 | 12,090 | 5,555 | 3,301 | 9,291 | 10,094 | 11,747 |
| | | 12,332 | 15,221 | 20,624 | 14,196 | 13,279 | 12,091 | 5,557 | 3,303 | 9,294 | 10,095 | 11,749 |
| | | 12,332 | 15,221 | 20,626 | 14,197 | 13,279 | 12,091 | 5,557 | 3,306 | 9,294 | 10,098 | 11,751 |
| | | 12,332 | 15,227 | 20,630 | 14,199 | 13,286 | 12,091 | 5,557 | 3,306 | 9,294 | 10,099 | 11,753 |
| | | 12,332 | 15,227 | 20,630 | 14,199 | 13,286 | 12,094 | 5,570 | 3,310 | 9,294 | 10,101 | 11,755 |
| | | 12,332 | 15,227 | 20,630 | 14,199 | 13,286 | 12,098 | 5,570 | 3,310 | 9,294 | 10,102 | 11,756 |
| | | 12,332 | 15,227 | 20,630 | 14,199 | 13,286 | 12,098 | 5,570 | 3,310 | 9,295 | 10,102 | 11,759 |
| | | 12,332 | 15,227 | 20,630 | 14,199 | 13,286 | 12,099 | 5,570 | 3,310 | 9,297 | 10,104 | 11,760 |
| | | 12,332 | 15,227 | 20,630 | 14,199 | 13,286 | 12,101 | 5,570 | 3,310 | 9,297 | 10,104 | 11,762 |
| | | 12,332 | 15,227 | 20,630 | 14,199 | 13,286 | 12,101 | 5,570 | 3,310 | 9,297 | 10,104 | 11,764 |
| | | 12,332 | | 20,630 | 14,199 | 13,286 | 12,102 | 5,570 | 3,310 | 9,297 | 10,104 | 11,765 |
| | | 12,332 | | 20,630 | 14,199 | 13,286 | 12,102 | 5,570 | 3,310 | 9,297 | 10,104 | 11,766 |
| | | | | | 14,199 | 13,286 | 12,102 | 5,570 | 3,310 | 9,297 | 10,104 | 11,767 |
| | | | | | 14,199 | 13,286 | 12,103 | 5,570 | 3,310 | 9,297 | 10,104 | 11,768 |
| | | | | | 14,199 | 13,286 | 12,103 | 5,570 | 3,310 | 9,297 | 10,104 | 11,769 |
| | | | | | 14,199 | 13,286 | 12,104 | 5,570 | 3,310 | 9,297 | 10,104 | 11,769 |
| | | | | | 14,199 | 13,286 | 12,105 | 5,570 | 3,310 | 9,297 | 10,104 | 11,769 |
| | | | | | 14,199 | 13,286 | 12,106 | 5,570 | 3,310 | 9,298 | 10,104 | 11,771 |
| | | | | | 14,199 | 13,286 | 12,106 | 5,570 | 3,310 | 9,298 | 10,104 | 11,771 |
| | | | | | 14,199 | 13,286 | 12,106 | 5,570 | 3,310 | 9,298 | 10,104 | 11,771 |
| | | | | | 14,199 | 13,286 | 12,106 | 5,570 | 3,310 | 9,298 | 10,104 | 11,771 |
| | | | | | | 13,286 | 12,107 | 5,570 | 3,310 | 9,298 | 10,104 | 11,771 |

Appendix A.1. (Page 9 of 12).

| Date | Cumulative Percent Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 6/15 | | | | | | | | | | | | | | 0 | | |
| 6/16 | | | | | | | | | | | | | | 0 | | |
| 6/17 | | | | | | 0 | | | | | | | | 0 | | |
| 6/18 | | | 0 | | | 0 | 0 | | | | | | | 0 | | |
| 6/19 | | | 0 | | | 0 | 0 | | 0 | | | | | 0 | 0 | |
| 6/20 | | | 0 | 0 | | 0 | 0 | | 0 | | | | | 0 | 0 | 0 |
| 6/21 | | | 0 | 0 | | 0 | 0 | | 0 | | | | | 0 | 0 | 0 |
| 6/22 | | | 0 | 0 | | 0 | 0 | | 0 | | | | | 0 | 0 | 0 |
| 6/23 | | | 0 | 0 | | 0 | 0 | 0 | 0 | | | | | 0 | 0 | 0 |
| 6/24 | | | 0 | 0 | | 1 | 1 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 |
| 6/25 | | | 0 | 0 | | 2 | 1 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 |
| 6/26 | | | 1 | 1 | | 3 | 2 | 0 | 0 | 0 | | | 0 | 1 | 1 | 1 |
| 6/27 | | | 1 | 1 | | 4 | 3 | 0 | 0 | 0 | | | 0 | 1 | 1 | 1 |
| 6/28 | | | 2 | 1 | | 6 | 5 | 0 | 1 | 0 | | | 1 | 2 | 1 | 2 |
| 6/29 | 0 | | 3 | 2 | | 10 | 6 | 2 | 3 | 0 | 0 | | 1 | 3 | 1 | 3 |
| 6/30 | 0 | | 3 | 3 | | 13 | 9 | 5 | 4 | 1 | 0 | | 2 | 4 | 3 | 4 |
| 7/1 | 0 | | 6 | 4 | | 17 | 11 | 6 | 10 | 1 | 1 | | 3 | 6 | 3 | 6 |
| 7/2 | 0 | | 7 | 5 | | 22 | 14 | 16 | 17 | 2 | 2 | | 4 | 8 | 8 | 8 |
| 7/3 | 1 | | 10 | 6 | | 27 | 18 | 19 | 22 | 5 | 4 | | 7 | 11 | 11 | 11 |
| 7/4 | 1 | | 16 | 8 | | 32 | 23 | 23 | 25 | 6 | 6 | | 10 | 14 | 13 | 14 |
| 7/5 | 2 | | 21 | 12 | | 38 | 29 | 26 | 27 | 7 | 7 | | 14 | 17 | 17 | 16 |
| 7/6 | 3 | | 23 | 15 | | 44 | 36 | 29 | 31 | 7 | 8 | | 19 | 21 | 22 | 18 |
| 7/7 | 4 | | 25 | 18 | | 52 | 44 | 31 | 35 | 9 | 9 | | 27 | 24 | 24 | 20 |
| 7/8 | 7 | | 30 | 21 | | 56 | 52 | 32 | 38 | 11 | 12 | | 34 | 28 | 32 | 23 |
| 7/9 | 13 | | 36 | 24 | | 63 | 60 | 40 | 41 | 13 | 13 | | 41 | 31 | 34 | 31 |
| 7/10 | 21 | | 41 | 30 | | 68 | 66 | 43 | 42 | 22 | 23 | | 49 | 35 | 46 | 38 |
| 7/11 | 27 | | 46 | 34 | | 73 | 70 | 44 | 44 | 26 | 28 | | 57 | 42 | 51 | 41 |
| 7/12 | 32 | | 51 | 40 | | 76 | 74 | 47 | 50 | 31 | 30 | | 65 | 50 | 61 | 47 |
| 7/13 | 45 | | 55 | 49 | | 79 | 77 | 50 | 55 | 38 | 40 | | 71 | 55 | 62 | 56 |
| 7/14 | 50 | | 60 | 57 | | 82 | 80 | 53 | 61 | 44 | 45 | | 78 | 62 | 66 | 62 |
| 7/15 | 55 | | 65 | 62 | | 85 | 82 | 56 | 68 | 47 | 51 | | 83 | 66 | 76 | 66 |
| 7/16 | 59 | | 70 | 68 | | 88 | 85 | 58 | 74 | 54 | 54 | | 87 | 71 | 82 | 72 |
| 7/17 | 65 | | 75 | 74 | | 90 | 88 | 61 | 78 | 58 | 58 | | 89 | 75 | 84 | 78 |
| 7/18 | 72 | | 78 | 78 | | 92 | 91 | 64 | 80 | 64 | 64 | | 90 | 79 | 88 | 83 |
| 7/19 | 77 | | 82 | 81 | | 94 | 92 | 67 | 82 | 70 | 69 | | 91 | 82 | 89 | 87 |
| 7/20 | 79 | | 86 | 84 | | 95 | 94 | 69 | 85 | 74 | 73 | | 92 | 85 | 90 | 91 |
| 7/21 | 86 | | 88 | 87 | | 96 | 95 | 72 | 88 | 77 | 76 | | 93 | 87 | 92 | 93 |
| 7/22 | 89 | | 90 | 89 | | 98 | 95 | 75 | 90 | 79 | 77 | | 94 | 89 | 93 | 95 |
| 7/23 | 92 | | 91 | 90 | | 98 | 96 | 78 | 92 | 81 | 80 | | 95 | 91 | 94 | 96 |
| 7/24 | 94 | | 94 | 93 | | 99 | 96 | 81 | 93 | 84 | 84 | | 96 | 93 | 95 | 96 |
| 7/25 | 95 | | 95 | 94 | | 99 | 97 | 83 | 94 | 87 | 86 | | 97 | 94 | 95 | 97 |
| 7/26 | 96 | | 96 | 95 | | 99 | 97 | 86 | 95 | 90 | 89 | | 97 | 95 | 96 | 97 |
| 7/27 | 97 | | 96 | 96 | | 99 | 98 | 89 | 95 | 91 | 90 | | 97 | 96 | 96 | 98 |
| 7/28 | 98 | | 97 | 97 | | 100 | 98 | 92 | 96 | 93 | 92 | | 97 | 96 | 96 | 98 |
| 7/29 | 98 | | 97 | 97 | | 100 | 98 | 94 | 97 | 94 | 93 | | 98 | 97 | 97 | 98 |
| 7/30 | 99 | | 98 | 97 | | 100 | 99 | 97 | 97 | 95 | 94 | | 98 | 97 | 97 | 99 |
| 7/31 | 99 | | 98 | 98 | | | 99 | 100 | 98 | 95 | 95 | | 98 | 98 | 98 | 99 |
| 8/1 | 99 | | 99 | 98 | | | 99 | | 98 | 96 | 95 | | 99 | 98 | 98 | 99 |
| 8/2 | 99 | | 99 | 98 | | | 99 | | 99 | 97 | 96 | | 99 | 98 | 99 | 99 |
| 8/3 | 100 | | 99 | 99 | | | 99 | | 99 | 97 | 97 | | 99 | 99 | 99 | 100 |
| 8/4 | 100 | | 99 | 99 | | | 99 | | 99 | 98 | 97 | | 99 | 99 | 99 | 100 |
| 8/5 | 100 | | 99 | 99 | | | 100 | | 99 | 98 | 97 | | 99 | 99 | 99 | 100 |

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Appendix A.1. (Page 10 of 12).

| Date | Cumulative Percent Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 8/6 | 100 | | 99 | 99 | | | 100 | | 99 | 98 | 97 | | 99 | 99 | 100 | 100 |
| 8/7 | 100 | | 100 | 99 | | | 100 | | 99 | 98 | 97 | | 99 | 99 | 100 | 100 |
| 8/8 | 100 | | 100 | 99 | | | 100 | | 100 | 99 | 98 | | 99 | 99 | 100 | 100 |
| 8/9 | 100 | | 100 | 99 | | | 100 | | 100 | 99 | 98 | | 99 | 99 | 100 | 100 |
| 8/10 | 100 | | 100 | 99 | | | 100 | | 100 | 99 | 98 | | 99 | 100 | 100 | 100 |
| 8/11 | 100 | | 100 | 99 | | | 100 | | 100 | 99 | 99 | | 99 | 100 | 100 | 100 |
| 8/12 | 100 | | 100 | 100 | | | 100 | | 100 | 100 | 99 | | 100 | 100 | 100 | 100 |
| 8/13 | 100 | | 100 | 100 | | | 100 | | 100 | 100 | 99 | | 100 | 100 | 100 | 100 |
| 8/14 | 100 | | 100 | 100 | | | 100 | | 100 | 100 | 99 | | 100 | 100 | 100 | 100 |
| 8/15 | | | 100 | 100 | | | 100 | | 100 | 100 | 99 | | 100 | 100 | 100 | 100 |
| 8/16 | | | 100 | 100 | | | 100 | | 100 | 100 | 99 | | 100 | 100 | 100 | 100 |
| 8/17 | | | 100 | 100 | | | 100 | | 100 | 100 | 99 | | 100 | 100 | 100 | 100 |
| 8/18 | | | 100 | 100 | | | | | 100 | 100 | 99 | | 100 | 100 | 100 | 100 |
| 8/19 | | | | 100 | | | | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/20 | | | | 100 | | | | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/21 | | | | 100 | | | | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/22 | | | | 100 | | | | | | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/23 | | | | 100 | | | | | | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/24 | | | | 100 | | | | | | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/25 | | | | 100 | | | | | | 100 | 100 | | 100 | | 100 | 100 |
| 8/26 | | | | 100 | | | | | | 100 | 100 | | 100 | | 100 | 100 |
| 8/27 | | | | | | | | | | 100 | 100 | | 100 | | 100 | 100 |
| 8/28 | | | | | | | | | | 100 | 100 | | 100 | | 100 | 100 |
| 8/29 | | | | | | | | | | 100 | 100 | | 100 | | 100 | 100 |
| 8/30 | | | | | | | | | | | | | 100 | | 100 | 100 |
| 8/31 | | | | | | | | | | | | | 100 | | 100 | 100 |
| 9/1 | | | | | | | | | | | | | 100 | | 100 | 100 |
| 9/2 | | | | | | | | | | | | | 100 | | 100 | 100 |
| 9/3 | | | | | | | | | | | | | 100 | | 100 | 100 |
| 9/4 | | | | | | | | | | | | | 100 | | 100 | 100 |
| 9/5 | | | | | | | | | | | | | 100 | | 100 | 100 |
| 9/6 | | | | | | | | | | | | | 100 | | 100 | 100 |
| 9/7 | | | | | | | | | | | | | 100 | | 100 | 100 |
| 9/8 | | | | | | | | | | | | | 100 | | 100 | 100 |
| 9/9 | | | | | | | | | | | | | 100 | | 100 | 100 |
| 9/10 | | | | | | | | | | | | | 100 | | | 100 |
| 9/11 | | | | | | | | | | | | | 100 | | | 100 |
| 9/12 | | | | | | | | | | | | | 100 | | | 100 |
| 9/13 | | | | | | | | | | | | | 100 | | | 100 |
| 9/14 | | | | | | | | | | | | | 100 | | | 100 |
| 9/15 | | | | | | | | | | | | | 100 | | | 100 |
| 9/16 | | | | | | | | | | | | | 100 | | | 100 |

Appendix A.1. (Page 11 of 12).

| Date | Cumulative Percent Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 6/15 | | | | | | | | | | | | |
| 6/16 | | | | | | | | | | | | |
| 6/17 | | | | | | | | | | | | |
| 6/18 | | | 0 | | | 0 | | | | | | |
| 6/19 | | 0 | 0 | 0 | | 0 | | | | | | |
| 6/20 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | 0 |
| 6/21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | | 0 |
| 6/22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | | 0 |
| 6/23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | | 0 |
| 6/24 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | | | 0 | | 0 |
| 6/25 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | | | 0 | | 0 |
| 6/26 | 1 | 1 | 3 | 1 | 1 | 1 | 0 | | | 1 | 0 | 0 |
| 6/27 | 1 | 1 | 4 | 1 | 1 | 1 | 1 | | | 1 | 2 | 0 |
| 6/28 | 2 | 2 | 6 | 2 | 2 | 2 | 1 | | | 1 | 3 | 1 |
| 6/29 | 3 | 3 | 10 | 3 | 3 | 6 | 2 | | | 3 | 5 | 1 |
| 6/30 | 4 | 4 | 13 | 4 | 3 | 11 | 3 | | | 3 | 6 | 2 |
| 7/1 | 5 | 6 | 17 | 6 | 5 | 14 | 5 | 0 | | 5 | 8 | 2 |
| 7/2 | 9 | 8 | 19 | 8 | 12 | 16 | 6 | 0 | 0 | 8 | 11 | 4 |
| 7/3 | 14 | 13 | 21 | 10 | 18 | 23 | 8 | 0 | 1 | 10 | 12 | 7 |
| 7/4 | 17 | 16 | 24 | 20 | 21 | 27 | 11 | 0 | 3 | 16 | 19 | 9 |
| 7/5 | 20 | 21 | 32 | 27 | 31 | 35 | 15 | 1 | 5 | 18 | 19 | 13 |
| 7/6 | 21 | 27 | 39 | 35 | 43 | 41 | 19 | 1 | 11 | 22 | 31 | 16 |
| 7/7 | 24 | 34 | 45 | 42 | 56 | 49 | 20 | 2 | 14 | 26 | 32 | 20 |
| 7/8 | 26 | 40 | 50 | 47 | 62 | 53 | 27 | 3 | 15 | 34 | 40 | 25 |
| 7/9 | 38 | 47 | 58 | 51 | 67 | 58 | 33 | 4 | 21 | 42 | 42 | 33 |
| 7/10 | 42 | 55 | 63 | 59 | 71 | 60 | 37 | 7 | 25 | 46 | 46 | 38 |
| 7/11 | 49 | 61 | 67 | 63 | 73 | 62 | 43 | 10 | 32 | 53 | 54 | 38 |
| 7/12 | 56 | 66 | 70 | 72 | 76 | 66 | 51 | 15 | 40 | 58 | 60 | 43 |
| 7/13 | 58 | 72 | 73 | 75 | 81 | 68 | 57 | 19 | 45 | 63 | 64 | 46 |
| 7/14 | 63 | 75 | 76 | 77 | 85 | 72 | 62 | 24 | 50 | 68 | 68 | 53 |
| 7/15 | 69 | 78 | 80 | 78 | 87 | 75 | 67 | 26 | 55 | 70 | 72 | 57 |
| 7/16 | 71 | 82 | 82 | 82 | 88 | 78 | 73 | 32 | 62 | 75 | 75 | 63 |
| 7/17 | 76 | 84 | 84 | 85 | 90 | 80 | 76 | 38 | 66 | 77 | 78 | 67 |
| 7/18 | 80 | 88 | 88 | 87 | 91 | 84 | 78 | 41 | 69 | 78 | 81 | 70 |
| 7/19 | 83 | 89 | 90 | 89 | 93 | 87 | 81 | 48 | 73 | 82 | 84 | 74 |
| 7/20 | 85 | 91 | 92 | 91 | 94 | 90 | 83 | 52 | 74 | 85 | 87 | 77 |
| 7/21 | 88 | 93 | 93 | 92 | 95 | 92 | 85 | 66 | 76 | 87 | 90 | 82 |
| 7/22 | 90 | 93 | 94 | 94 | 96 | 94 | 87 | 71 | 80 | 89 | 92 | 86 |
| 7/23 | 92 | 94 | 95 | 95 | 96 | 95 | 88 | 75 | 82 | 91 | 93 | 88 |
| 7/24 | 94 | 95 | 95 | 95 | 97 | 95 | 89 | 79 | 85 | 93 | 95 | 90 |
| 7/25 | 95 | 95 | 95 | 96 | 97 | 95 | 90 | 87 | 87 | 94 | 96 | 92 |
| 7/26 | 96 | 96 | 96 | 97 | 97 | 96 | 91 | 88 | 88 | 95 | 97 | 93 |
| 7/27 | 96 | 96 | 96 | 98 | 98 | 96 | 93 | 90 | 89 | 95 | 98 | 94 |
| 7/28 | 96 | 97 | 96 | 98 | 98 | 97 | 94 | 91 | 90 | 96 | 98 | 95 |
| 7/29 | 97 | 98 | 97 | 98 | 98 | 97 | 95 | 93 | 91 | 96 | 98 | 96 |
| 7/30 | 97 | 98 | 98 | 99 | 99 | 97 | 96 | 95 | 91 | 97 | 99 | 97 |
| 7/31 | 97 | 98 | 98 | 99 | 99 | 98 | 97 | 96 | 92 | 98 | 99 | 97 |
| 8/1 | 98 | 98 | 99 | 99 | 99 | 98 | 98 | 96 | 93 | 98 | 99 | 97 |
| 8/2 | 98 | 99 | 99 | 99 | 99 | 98 | 98 | 97 | 94 | 99 | 99 | 98 |
| 8/3 | 98 | 99 | 99 | 99 | 99 | 98 | 98 | 98 | 95 | 99 | 99 | 98 |
| 8/4 | 98 | 99 | 99 | 99 | 99 | 98 | 99 | 98 | 96 | 99 | 99 | 98 |
| 8/5 | 98 | 99 | 99 | 99 | 99 | 99 | 99 | 98 | 97 | 99 | 99 | 98 |

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Appendix A.1. (Page 12 of 12).

| Date | Cumulative Percent Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 8/6 | 99 | 99 | 99 | 100 | 99 | 99 | 99 | 99 | 97 | 99 | 99 | 98 |
| 8/7 | 99 | 99 | 99 | 100 | 99 | 99 | 99 | 99 | 98 | 99 | 99 | 99 |
| 8/8 | 99 | 100 | 100 | 100 | 100 | 99 | 99 | 99 | 98 | 99 | 100 | 99 |
| 8/9 | 99 | 100 | 100 | 100 | 100 | 99 | 99 | 99 | 98 | 99 | 100 | 99 |
| 8/10 | 99 | 100 | 100 | 100 | 100 | 99 | 99 | 99 | 99 | 99 | 100 | 99 |
| 8/11 | 99 | 100 | 100 | 100 | 100 | 99 | 99 | 99 | 99 | 100 | 100 | 99 |
| 8/12 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 99 | 99 | 100 | 100 | 99 |
| 8/13 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 99 | 100 | 100 | 99 |
| 8/14 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 99 | 100 | 100 | 99 |
| 8/15 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 99 | 100 | 100 | 99 |
| 8/16 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 99 | 100 | 100 | 99 |
| 8/17 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | 100 | 100 |
| 8/18 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | 100 | 100 |
| 8/19 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/20 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/21 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/22 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/23 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/24 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/25 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/26 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/27 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/28 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/29 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/30 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/31 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/1 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/2 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/3 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/4 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/5 | | 100 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/6 | | 100 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/7 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/8 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/9 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/10 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/11 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/12 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/13 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/14 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/15 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/16 | | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Appendix A.2. Historical chum salmon passage at the Kogrukluk River weir.

| Date | Daily Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 6/15 | | b | | | b | 2 b | | | | | | b | | | | |
| 6/16 | | b | 2 b | | b | 0 b | | | | | | b | | | | |
| 6/17 | | b | 0 b | 2 b | b | 0 b | 2 b | | | | | b | 2 b | 1 b | | |
| 6/18 | | b | 0 b | 0 b | b | 9 b | 0 b | | | | | b | 0 b | 1 b | 1 b | |
| 6/19 | | b | 9 b | 0 b | b | 3 b | 0 b | | 2 | | | b | 0 b | 1 b | 1 b | |
| 6/20 | | b | 3 b | 9 b | b | 13 b | 9 b | | 0 | | | b | 9 b | 5 b | 3 b | |
| 6/21 | | b | 13 b | 3 b | b | 39 b | 3 b | | 0 | | | b | 3 b | 5 b | 4 b | |
| 6/22 | | b | 39 b | 13 b | b | 42 b | 13 b | | 9 | | | b | 13 b | 13 b | 9 b | |
| 6/23 | 2 b | b | 42 b | 39 b | b | 43 b | 39 b | | 3 | 2 b | 2 b | b | 39 b | 26 b | 17 b | 3 b |
| 6/24 | 0 b | b | 43 b | 42 b | b | 38 b | 42 b | | 13 | 0 b | 0 b | b | 42 b | 26 b | 18 b | 0 b |
| 6/25 | 0 b | b | 38 b | 43 b | b | 222 b | 43 b | | 39 | 0 b | 0 b | b | 43 b | 43 b | 29 b | 0 b |
| 6/26 | 9 b | b | 222 b | 38 b | b | 275 b | 38 b | | 42 | 9 b | 9 b | b | 38 b | 72 b | 49 b | 15 b |
| 6/27 | 3 b | b | 275 b | 50 b | b | 417 b | 222 b | | 43 | 3 b | 3 b | b | 222 b | 117 b | 79 b | 5 b |
| 6/28 | 13 b | b | 308 | 65 b | b | 1,203 | 275 b | | 38 | 13 b | 13 b | b | 275 b | 204 b | 18 b | 21 b |
| 6/29 | 26 | b | 618 | 80 b | b | 2,264 | 417 b | 345 | 222 | 39 b | 30 | b | 417 b | 382 b | 69 b | 50 b |
| 6/30 | 49 | b | 629 | 100 b | b | 2,255 | 1,203 b | 222 | 275 | 42 b | 69 | b | 939 b | 529 b | 131 b | 80 b |
| 7/1 | 118 | b | 648 | 95 b | 281 | 2,650 | 2,264 b | 345 | 417 | 43 b | 184 | b | 2,000 b | 838 b | 179 b | 69 b |
| 7/2 | 81 | b | 1,032 | 127 | 269 | 3,516 | 2,255 b | 536 | 939 | 38 b | 152 | b | 2,500 b | 1,026 b | 746 | 61 b |
| 7/3 | 130 | b | 1,695 | 117 | 135 | 3,607 | 2,650 b | 279 b | 1,154 | 222 b | 291 | b | 2,500 b | 1,263 b | 1,037 | 358 b |
| 7/4 | 189 | b | 1,679 | 313 | 202 | 2,107 | 3,516 b | 279 b | 1,371 | 275 b | 472 | b | 2,000 b | 1,321 b | 1,439 | 443 b |
| 7/5 | 182 | b | 1,954 | 298 | 282 | 1,936 | 3,607 b | 279 b | 841 | 417 b | 306 | b | 1,845 | 1,251 b | 1,783 | 357 |
| 7/6 | 339 | b | 2,151 | 210 | 69 | 2,873 | 2,107 b | 178 | 1,616 | 261 | 343 | b | 1,380 | 1,298 b | 1,592 | 320 b |
| 7/7 | 523 | b | 1,403 | 259 | 63 | 2,246 | 1,936 b | 590 | 1,896 | 685 | 366 | b | 1,694 | 993 | 801 | 282 b |
| 7/8 | 613 | b | 2,156 | 215 | 343 | 1,900 | | 411 | 1,950 | 381 | 509 | b | 1,959 | 837 | 1,741 | 245 |
| 7/9 | 679 | b | 2,296 | 237 | 2,508 | 2,892 | 2,873 | 415 | 1,964 | 618 | 925 | b | 2,751 | 1,506 | 1,089 | 780 |
| 7/10 | 510 | b | 2,802 | 567 | 2,171 | 3,513 | 4,469 | 201 | 1,092 | 542 | 1,399 | b | 2,151 | 1,726 | 1,987 | 549 |
| 7/11 | 365 | b | 2,969 | 865 | b | 2,888 | 3,396 | 5 | 1,301 | 382 | 1,621 | b | 2,638 | 2,811 | 1,414 | 517 |
| 7/12 | 421 | b | 2,350 | 1,227 | b | 2,031 | 2,999 | b | 2,766 | 499 | 1,167 | b | 2,635 | 3,081 | 993 | 1,159 |
| 7/13 | 336 | b | 2,172 | 1,296 | b | 1,869 | 2,581 | b | 2,077 | 539 | 939 | b | 1,960 | 2,335 | 728 | 1,436 |
| 7/14 | 322 | 108 | 3,351 | 1,165 | b | 2,287 | 2,961 | b | 2,323 | 707 | 854 | b | 2,078 | 2,252 | 872 | 1,018 |
| 7/15 | 323 | 169 | 2,502 | 810 | b | 2,456 | 2,442 | b | 2,512 | 557 | 891 | 577 | 1,772 | 1,809 b | 1,553 | 1,001 |
| 7/16 | 341 | 244 | 2,580 | 967 | b | 1,930 | 1,945 | b | 2,271 | 836 | 476 | 1,163 | 997 | 1,701 b | 1,223 | 980 |
| 7/17 | 265 | 173 | 1,881 | 949 | b | 1,180 | 2,421 | b | 1,907 | 724 | 600 | b | 727 | 1,511 b | 664 | 959 |
| 7/18 | 333 | 265 | 1,522 | 653 | b | 1,300 | 3,018 | b | 1,336 | 646 | 362 | b | 410 | 1,234 b | 1,117 | 1,040 |
| 7/19 | 282 | 770 | 1,381 | 594 | b | 928 | 2,563 | b | 969 | 628 | 344 b | b | 459 | 1,062 b | 203 | 742 |
| 7/20 | 240 | 1,255 | 1,311 | 551 | b | 429 | 1,919 | b | 1,420 | 511 | 230 b | b | 335 | 936 b | 403 | 467 |
| 7/21 | 591 | 581 | 645 | 573 | b | 724 | 1,710 | b | 1,688 | 472 | 193 b | b | 344 | 1,080 b | 607 | 462 |
| 7/22 | 253 | 1,154 | 975 | 414 | b | 686 | 1,414 | b | 1,652 | 473 | 228 b | b | 230 | 846 b | 441 | 788 |
| 7/23 | 166 | 882 | 766 | 455 | b | 531 | 904 | b | 1,205 | 449 | 95 b | b | 193 | 680 b | 316 | 813 |
| 7/24 | 173 | 1,145 | 879 | 1,097 | b | 501 | 916 | b | 712 | 525 | 124 b | b | 228 | 814 b | 76 | 858 |
| 7/25 | 74 | 1,277 | 815 | 100 b | b | 265 | 747 | b | 390 | 575 | 103 b | b | 95 | 548 b | 99 | 903 |
| 7/26 | 32 | 1,241 | 563 | 265 b | b | 348 | 638 | b | 417 | 459 | 119 b | b | 124 | 424 b | 95 | 940 |
| 7/27 | 33 | 1,124 | 390 | 348 b | b | 378 | 547 | b | 457 | 316 | 97 b | b | 103 | 379 b | 95 | 767 |
| 7/28 | 12 | b | 239 | 378 b | b | 492 | 476 | b | 325 | 341 | 147 b | b | 119 | 374 b | 162 | 648 |
| 7/29 | 24 | b | 215 | 492 b | b | 383 | 393 | b | 320 | 242 | 134 b | b | 97 | 360 b | 362 | 496 |
| 7/30 | 14 | b | 110 | 383 b | b | 362 | 384 | b | 268 | 217 | 113 b | b | 147 | 308 b | 324 | 612 |
| 7/31 | 7 | b | 112 | 362 b | b | 284 | 440 | b | 318 | 259 | 92 b | b | 134 | 292 b | 281 | 852 |
| 8/1 | 12 b | b | 100 b | 284 b | b | 209 | 273 | | 280 | 149 | 71 b | b | 113 | 222 b | 348 | 754 |
| 8/2 | 12 b | b | 74 b | 209 b | b | 183 | 230 | | 217 | 149 | 72 b | b | 92 | 188 b | 423 | 594 |
| 8/3 | 5 b | b | 32 b | 183 b | b | 146 | 187 | | 159 | 91 | 61 b | b | 71 | 142 b | 298 | 487 |
| 8/4 | 9 b | b | 33 b | 146 b | b | 78 | 172 | | 133 | 87 | 62 b | b | 72 | 121 b | 235 | 319 |
| 8/5 | 1 b | b | 12 b | 78 b | b | 35 | 91 | | 50 | 58 | 55 b | b | 61 | 75 b | 157 | 283 |
| 8/6 | 0 b | b | 24 b | 35 b | b | 55 | 104 | | 20 | 52 | 53 b | b | 62 | 57 b | 78 | 213 |
| 8/7 | 0 b | b | 14 b | 55 b | b | 43 | 32 | | 13 | 52 | 45 b | b | 55 | 56 b | 75 | 92 |
| 8/8 | 1 b | b | 7 b | 43 b | b | 43 | 37 | | 8 | 77 | 47 b | b | 53 | 60 b | 41 | 58 |
| 8/9 | 0 b | b | 12 b | 43 b | b | 41 | 22 | | 9 | 45 | 35 b | b | 45 | 47 b | 49 | 36 |

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Appendix A.2. (Page 2 of 12).

| Date | Daily Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 8/10 | 1 b | b | 12 b | 41 b | b | 47 | 38 | | 11 | 82 | 37 b | 98 | 47 | 58 b | 46 | 49 |
| 8/11 | 2 b | b | 5 b | 47 b | b | 29 | 19 | | 11 | 54 | 18 b | 90 | 35 | 42 b | 42 | 15 |
| 8/12 | 1 b | b | 9 b | 29 b | b | 25 | 16 | | 9 | 30 | 16 b | 96 | 37 | 30 b | 39 | 37 |
| 8/13 | | b | 1 b | 25 b | b | 27 | 16 | | 0 | 38 | 7 b | 64 | 18 | 24 b | 18 | 28 |
| 8/14 | | b | 0 b | 27 b | b | 24 | 15 | | 1 | 19 | 13 b | 42 | 16 | 20 b | 23 | 20 |
| 8/15 | | b | 0 b | 24 b | b | 23 | 6 | | 1 | 16 | 20 b | 35 | 7 | 19 b | 12 | 8 |
| 8/16 | | b | 1 b | 23 b | b | 6 | 2 | | 0 | 15 b | 20 b | 15 | 13 | 18 b | 6 | 7 |
| 8/17 | | b | 0 b | 6 b | b | 5 | 2 | | 1 | 12 b | 15 b | 28 | 20 | 12 b | 11 | 34 |
| 8/18 | | b | 1 b | 5 b | b | 4 | 4 | | 1 | 12 b | 12 b | 29 | 20 | 11 b | 1 | 35 |
| 8/19 | | b | 2 b | 4 b | b | 2 | 0 | | 0 | 5 b | 12 b | 22 | 15 | 8 b | 4 | 12 |
| 8/20 | | b | 1 b | 2 b | b | 9 | 0 | | 0 | 9 b | 5 b | 20 | 12 | 7 b | 3 | 0 |
| 8/21 | | b | | 9 b | b | 5 | 0 | | 0 | 1 b | 9 b | 13 | 12 | 7 b | 2 | 5 |
| 8/22 | | b | | 5 b | b | 0 | 0 | | 0 | 0 b | 1 b | 7 | 5 | 2 b | 0 | 0 |
| 8/23 | | b | | 0 b | b | 1 | 0 | | 0 | 0 b | 0 b | 6 | 9 | 1 | 0 | 0 |
| 8/24 | | b | | 1 b | b | 3 | 0 | | 0 | 1 b | 0 b | 6 | 1 | 1 | 1 | 1 |
| 8/25 | | b | | 3 b | b | 2 | 0 | | 0 | 0 b | 1 b | 3 | 0 | | 1 | 3 |
| 8/26 | | b | | 2 b | b | 1 | 0 | | 0 | 1 b | 0 b | 1 | 0 | | 0 | 1 |
| 8/27 | | b | | 1 b | b | 2 | 0 | | 0 | 2 b | 1 b | 5 | 1 | | 1 | 0 |
| 8/28 | | b | | 2 b | b | 0 | 0 | | 0 | 1 b | 2 b | 1 | 0 | | 0 | 0 |
| 8/29 | | b | | 0 b | b | 0 | 0 | | 0 | | 1 b | 4 | 1 | | 1 | 1 |
| 8/30 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 8/31 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/1 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/2 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/3 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/4 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/5 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/6 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/7 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/8 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/9 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/10 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/11 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/12 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/13 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/14 | | b | | | b | 0 | 0 | | 0 | | | | | | | |
| 9/15 | | b | | | b | 0 | | | 0 | | | | | | | |
| 9/16 | | b | | | b | 0 | | | | | | | | | | |
| 9/17 | | b | | | b | 0 | | | | | | | | | | |
| 9/18 | | b | | | b | 0 | | | | | | | | | | |
| 9/19 | | b | | | b | 0 | | | | | | | | | | |
| 9/20 | | b | | | b | 0 | | | | | | | | | | |
| 9/21 | | | | | | | | | | | | | | | | |
| 9/22 | | | | | | | | | | | | | | | | |
| 9/23 | | | | | | | | | | | | | | | | |
| 9/24 | | | | | | | | | | | | | | | | |
| 9/25 | | | | | | | | | | | | | | | | |
| Obs. | 8,046 | 10,388 | 47,099 | 13,959 | 6,323 | 56,262 | 43,422 | 3,248 | 41,484 | 13,843 | 11,956 | 2,325 | 28,498 | 15,543 | 26,158 | 22,481 |
| Est. | 71 | 9,055 | 1,026 | 4,239 | 35,454 | 1,103 | 20,641 | 6,159 | 0 | 1,162 | 2,737 | 15,097 | 11,042 | 24,006 | 607 | 1,707 |
| Total | 8,117 | 19,443 e | 48,125 | 18,198 | 41,777 e | 57,365 | 64,063 | 9,407 e | 41,484 | 15,005 | 14,693 | 17,422 e | 39,540 | 39,549 | 26,765 | 24,188 |
| % Obs. | 99 | 53 f | 98 | 77 | 15 | 98 | 68 | 35 | 100 | 92 | 81 | 13 | 72 | 39 | 98 | 93 |

a = Daily passage was estimated due to the occurrence of a hole in the weir.
b = The weir was not operational; daily passage was estimated.
c = The weir was not operational; daily passage was not estimated
d = Partial day count, passage was not estimated.
e = Majority of the run estimated; weir not operational much of the season. Actual differentiated daily estimates not available. Estimate reported as one bulk sum.
f = In 1977, weir and tower were run concurrently. In the final report, weir data was used for comparison only. Estimates of weir passage were made for chum salmon later (Shneiderhan 1989).

Appendix A.2. (Page 3 of 12).

| Date | Daily Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 6/15 | | | | | | | | | | | | |
| 6/16 | | | | | | 0 b | | | | | | |
| 6/17 | 1 b | 1 b | 1 b | | | 0 b | | | | | | |
| 6/18 | 1 b | 0 b | 1 b | | | 0 b | | | | | | |
| 6/19 | 1 b | 2 b | 2 b | 3 b | 5 b | 0 b | | | | | | |
| 6/20 | 5 b | 4 b | 6 b | 0 b | 0 b | 0 b | 0 b | | | | | |
| 6/21 | 5 b | 4 b | 7 b | 3 b | 10 b | 0 b | 0 b | | | | | 2 |
| 6/22 | 11 b | 11 b | 16 b | 9 b | 24 b | 1 b | 5 b | | | | | 2 |
| 6/23 | 22 b | 20 b | 33 b | 9 b | 34 b | 1 b | 5 b | | | | | 10 |
| 6/24 | 22 b | 21 b | 32 b | 16 b | 34 b | 2 b | 10 b | | | | | 2 |
| 6/25 | 36 b | 34 b | 53 b | 31 b | 49 b | 6 b | 29 b | | | | | 2 |
| 6/26 | 61 b | 58 b | 92 b | 44 b | 122 b | 8 b | 38 b | | | | 247 | 7 |
| 6/27 | 100 b | 94 b | 197 b | 63 b | 161 b | 7 b | 33 b | | | | 630 | 34 |
| 6/28 | 175 b | 165 b | 249 b | 25 b | 229 b | 44 b | 54 b | | | 6 b | 474 | 48 |
| 6/29 | 329 b | 308 b | 302 b | 125 b | 428 b | 216 | 203 b | | | 26 b | 973 | 28 |
| 6/30 | 456 b | 427 b | 354 b | 181 b | 205 | 157 | 230 b | | | 9 b | 1,081 | 81 |
| 7/1 | 1,054 b | 675 b | 406 b | 328 b | 1,134 | 156 | 401 b | 3 b | | 37 b | 1,045 | 67 |
| 7/2 | 2,416 | 828 | 459 | 525 b | 3,055 | 165 | 430 b | 15 b | 27 | 86 b | 933 | 272 |
| 7/3 | 2,615 | 844 | 511 | 913 | 2,834 | 251 | 573 b | 7 b | 61 | 152 b | 1,111 | 391 |
| 7/4 | 1,915 | 1,066 | 547 | 1,583 | 2,212 | 245 | 1,146 b | 21 b | 121 | 338 b | 1,927 | 365 |
| 7/5 | 1,695 | 1,000 | 593 | 2,050 | 3,537 | 499 | 788 b | 51 b | 190 | 423 | 1,705 | 712 |
| 7/6 | 1,011 | 1,314 | 1,135 | 1,134 | 2,868 | 346 | 1,377 b | 172 | 290 | 363 | 2,389 | 689 |
| 7/7 | 1,207 | 1,418 | 1,630 | 2,149 | 2,686 | 389 | 836 | 312 | 470 | 620 | 2,266 | 626 |
| 7/8 | 914 | 1,244 | 2,439 | 1,399 | 3,699 | 362 | 2,053 b | 379 | 437 | 771 | 2,276 | 580 |
| 7/9 | 1,169 | 1,417 | 3,317 | 766 | 1,277 | 157 | 1,442 b | 421 | 527 | 918 | 2,373 | 658 |
| 7/10 | 719 | 1,436 | 2,421 | 1,196 | 2,470 | 192 | 1,652 b | 590 | 625 | 1,044 | 3,143 | 567 |
| 7/11 | 1,261 | 1,251 | 2,634 b | 1,146 | 1,511 | 210 | 2,691 b | 766 | 698 | 1,059 | 3,402 | 152 |
| 7/12 | 1,250 | 1,082 | 3,474 b | 1,339 b | 1,754 | 272 | 1,876 b | 963 | 649 | 1,211 | 3,056 | 544 |
| 7/13 | 944 | 1,390 | 2,594 b | 1,531 | 3,064 | 334 | 1,649 b | 880 | 429 | 1,765 | 2,337 | 489 |
| 7/14 | 1,343 | 1,006 | 2,750 b | 1,151 | 2,054 | 329 | 1,312 b | 651 | 402 | 1,846 | 2,094 | 1,137 |
| 7/15 | 1,466 | 1,405 | 2,346 b | 867 | 1,366 | 391 | 2,069 b | 539 | 530 | 1,589 | 2,154 | 1,070 |
| 7/16 | 1,254 | 1,511 | 1,319 b | 1,007 | 1,391 | 304 | 1,274 b | 590 | 786 | 1,811 | 2,175 | 1,057 |
| 7/17 | 907 | 2,030 | 962 b | 1,770 | 1,601 | 247 | 2,089 b | 473 | 491 | 780 | 665 | 955 |
| 7/18 | 1,262 | 1,785 | 2,784 | 1,023 | 1,033 | 313 | 592 | 441 | 538 | 1,221 | 1,283 a | 1,067 |
| 7/19 | 1,071 | 524 | 608 b | 1,188 | 864 | 320 | 1,175 | 591 | 504 | 1,652 | 1,008 | 1,422 |
| 7/20 | 812 | 1,017 | 443 b | 553 | 628 | 174 | 1,522 | 556 | 338 | 1,207 b | 1,103 a | 1,357 |
| 7/21 | 484 | 1,242 | 456 b | 1,023 | 1,139 | 263 | 1,492 | 577 | 383 | 1,285 b | 1,103 a | 1,583 |
| 7/22 | 518 | 500 | 304 b | 933 | 569 | 128 | 1,101 | 422 | 340 | 1,254 b | 1,198 | 1,078 |
| 7/23 | 910 | 487 | 255 b | 1,015 | 814 | 163 | 822 | 481 | 306 | 765 b | 1,152 | 539 |
| 7/24 | 553 | 336 | 1,021 b | 727 | 483 | 71 | 585 | 458 | 251 | 990 b | 2,913 | 484 |
| 7/25 | 680 | 490 | 477 b | 542 | 265 | 55 | 722 | 365 | 170 | 681 b | 1,138 | 858 |
| 7/26 | 398 | 266 | 206 b | 334 | 182 | 123 | 514 | 320 | 221 | 703 b | 556 | 535 |
| 7/27 | 467 | 377 | 213 b | 306 | 117 | 100 | 670 | 353 | 203 | 459 b | 468 | 366 |
| 7/28 | 374 | 489 | 681 | 249 | 355 | 192 | 710 | 269 | 204 | 407 | 260 | 356 |
| 7/29 | 299 | 451 | 1,418 | 285 | 597 | 123 | 507 | 288 | 139 | 780 | 252 | 354 b |
| 7/30 | 277 | 414 | 1,354 | 329 | 415 | 77 | 359 | 324 | 161 | 851 | 149 | 354 b |
| 7/31 | 254 | 307 | 1,272 | 216 | 190 | 36 | 290 | 252 | 205 | 539 | 106 | 315 |
| 8/1 | 164 | 205 | 793 | 171 | 170 b | 48 | 153 | 245 | 100 | 449 | 73 | 379 |
| 8/2 | 240 | 127 | 642 | 206 | 151 b | 50 | 141 | 173 | 85 | 555 | 55 | 292 |
| 8/3 | 183 | 109 | 655 | 209 | 131 | 56 | 120 | 129 | 107 b | 318 | 38 b | 237 a |
| 8/4 | 104 | 127 | 537 b | 104 | 99 | 38 | 192 | 187 | 91 b | 256 | 38 b | 237 a |
| 8/5 | 65 | 104 | 420 b | 59 | 53 | 33 | 145 | 123 b | 83 b | 339 | 38 b | 125 |
| 8/6 | 49 | 150 | 303 b | 42 | 82 | 42 | 92 | 103 b | 71 b | 227 | 21 | 152 |
| 8/7 | 97 | 114 | 185 | 47 | 51 | 32 | 51 | 34 | 62 b | 168 | 14 | 177 |
| 8/8 | 59 | 79 | 183 | 44 | 50 | 21 | 42 | 57 | 9 | 154 | 18 | 113 |
| 8/9 | 29 | 43 | 118 | 37 | 24 | 28 | 25 | 35 | 26 | 68 | 15 | 137 |

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Appendix A.2. (Page 4 of 12).

| Date | Daily Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 8/10 | 60 | 15 | 100 | 32 | 60 | 27 | 23 | 30 | 29 | 74 | 8 | 88 |
| 8/11 | 69 | 10 | 75 b | 41 b | 15 b | 68 | 19 | 27 | 15 | 75 | 5 | 34 |
| 8/12 | 70 | 15 | 51 | 53 b | 19 b | 15 b | 10 | 34 | 17 | 74 | 18 | 42 |
| 8/13 | 82 | 26 | 36 | 47 b | 29 b | 16 b | 8 | 23 | 34 | 31 | 25 | 37 |
| 8/14 | 25 | 4 b | 39 | 28 b | 5 b | 7 | 11 | 12 | 11 | 24 | 6 | 12 |
| 8/15 | 25 | 0 b | 26 | 16 b | 16 | 11 | 11 | 11 | 4 | 18 | 5 | 38 |
| 8/16 | 17 | 4 b | 20 | 5 | 5 | 15 | 3 | 5 | 6 | 28 | 4 | 20 |
| 8/17 | 16 | 4 b | 19 | 2 | 2 | 5 | 11 | 10 | 6 | 13 | 2 | 16 |
| 8/18 | 9 | 4 b | 15 | 3 | 5 | 2 | 3 | 3 | 22 | 11 | 3 | 9 |
| 8/19 | 1 | 4 b | 5 | 7 | 6 | 2 | 4 | 0 | 6 | 8 b | 1 | 4 |
| 8/20 | 4 | 4 b | 7 | 3 | 4 | 4 | 4 | 4 | 1 | 7 b | 0 | 4 |
| 8/21 | 13 | | 3 | 1 | 8 | 1 | 1 | 5 | 1 | 7 b | 6 | 3 |
| 8/22 | | | 1 | 3 | 5 | 0 | 3 | 6 | 0 | 2 | 5 | 2 |
| 8/23 | | | 2 | 0 | 6 | 0 | 1 | 2 | 0 | 5 | 3 | 2 |
| 8/24 | | | 4 | 6 | 1 | 0 | 3 | 1 | 1 | 3 | 3 | 3 |
| 8/25 | | | 2 | 0 | 7 | 1 | 1 | 4 | 0 | 2 | 3 | 1 |
| 8/26 | | | 5 | 2 | 3 | 0 | 5 | 1 | 6 | 1 | 1 | 5 |
| 8/27 | | | 5 | 1 | 2 | 0 | 2 | 2 | 0 | 0 | 0 | 4 b |
| 8/28 | | | 5 | 1 | 1 | 2 | 5 | 0 | 0 | 1 | 1 | 2 b |
| 8/29 | | | 5 | 9 | 20 | 5 | 1 | 2 | 0 | 0 | 1 | 2 b |
| 8/30 | | | | | | | 1 | 22 | 2 | 4 | 1 | 1 |
| 8/31 | | | | | | | 0 | | 0 | 0 | 1 | 2 |
| 9/1 | | | | | | | 0 | | 0 | 0 | 0 | 2 |
| 9/2 | | | | | | | 2 | | 0 | 0 | 1 | 1 |
| 9/3 | | | | | | | 2 | | 0 | 0 | 2 | 1 |
| 9/4 | | | | | | | 4 | | 0 | 0 | 1 | 0 |
| 9/5 | | | | | | | 1 | | 0 | 0 | 0 | 3 |
| 9/6 | | | | | | | 0 | | 0 | 0 | 0 | 1 |
| 9/7 | | | | | | | 1 | | 0 | 0 | 1 | 0 |
| 9/8 | | | | | | | 0 | | 0 | 0 | 2 | 2 |
| 9/9 | | | | | | | 1 | | 0 | 0 | 0 | 3 |
| 9/10 | | | | | | | 3 | | 0 | 0 | 0 | 0 |
| 9/11 | | | | | | | 4 | | 0 | 0 | 0 | 1 |
| 9/12 | | | | | | | 1 | | 0 | 0 | 1 | 1 |
| 9/13 | | | | | | | 1 | | 0 | 0 | 1 | 1 |
| 9/14 | | | | | | | 2 | | 0 | 0 | 1 | 0 |
| 9/15 | | | | | | | 1 | | 0 | 0 | 2 | 0 |
| 9/16 | | | | | | | 1 | | 0 | 0 | 0 | 0 |
| 9/17 | | | | | | | 1 | | 0 | 0 | 0 | 0 |
| 9/18 | | | | | | | 1 | | 0 | 0 | 0 | 0 |
| 9/19 | | | | | | | 0 | | 0 | 0 | 0 | 1 |
| 9/20 | | | | | | | | | 0 | 0 | 0 | 0 |
| 9/21 | | | | | | | | | | 0 | 0 | |
| 9/22 | | | | | | | | | | 0 | 0 | |
| 9/23 | | | | | | | | | | 0 | 0 | |
| 9/24 | | | | | | | | | | 0 | 1 | |
| 9/25 | | | | | | | | | | 0 | | |
| Obs. | 31,826 | 29,223 | 23,487 | 28,379 | 47,010 | 7,858 | 13,014 | 13,497 | 11,077 | 22,550 | 49,494 | 22,514 |
| Est. | 2,279 | 2,676 | 23,148 | 2,886 | 1,485 | 100 | 23,428 | 323 | 414 | 8,019 | 2,076 | 899 |
| Total | 34,105 | 31,899 | 46,635 | 31,265 | 48,495 | 7,958 | 36,442 | 13,820 | 11,491 | 30,569 | 51,570 | 23,413 |
| % Obs. | 93 | 92 | 50 | 91 | 97 | 99 | 36 | 98 | 96 | 74 | 96 | 96 |

a = Daily passage was estimated due to the occurrence of a hole in the weir.
b = The weir was not operational; daily passage was estimated.
c = The weir was not operational; daily passage was not estimated
d = Partial day count, passage was not estimated.
e = Majority of the run estimated; weir not operational much of the season. Actual differentiated daily estimates not available. Estimate reported as one bulk sum.

Appendix A.2. (Page 5 of 12).

| Date | Cumulative Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 6/15 | | | | | | 2 | | | | | | | | | | |
| 6/16 | | | 2 | | | 2 | | | | | | | | | | |
| 6/17 | | | 2 | 2 | | 2 | 2 | | | | | | 2 | 1 | | |
| 6/18 | | | 2 | 2 | | 11 | 2 | | | | | | 2 | 2 | 1 | |
| 6/19 | | | 11 | 2 | | 14 | 2 | | 2 | | | | 2 | 3 | 2 | |
| 6/20 | | | 14 | 11 | | 27 | 11 | | 2 | | | | 11 | 8 | 5 | |
| 6/21 | | | 27 | 14 | | 66 | 14 | | 2 | | | | 14 | 13 | 9 | |
| 6/22 | | | 66 | 27 | | 108 | 27 | | 11 | | | | 27 | 26 | 18 | |
| 6/23 | 2 | | 108 | 66 | | 151 | 66 | | 14 | 2 | 2 | | 66 | 52 | 35 | 3 |
| 6/24 | 2 | | 151 | 108 | | 189 | 108 | | 27 | 2 | 2 | | 108 | 78 | 53 | 3 |
| 6/25 | 2 | | 189 | 151 | | 411 | 151 | | 66 | 2 | 2 | | 151 | 121 | 82 | 3 |
| 6/26 | 11 | | 411 | 189 | | 686 | 189 | | 108 | 11 | 11 | | 189 | 193 | 131 | 18 |
| 6/27 | 14 | | 686 | 239 | | 1,103 | 411 | | 151 | 14 | 14 | | 411 | 310 | 210 | 23 |
| 6/28 | 27 | | 994 | 304 | | 2,306 | 686 | | 189 | 27 | 27 | | 686 | 514 | 228 | 44 |
| 6/29 | 53 | | 1,612 | 384 | | 4,570 | 1,103 | 345 | 411 | 66 | 57 | | 1,103 | 896 | 297 | 94 |
| 6/30 | 102 | | 2,241 | 484 | | 6,825 | 2,306 | 567 | 686 | 108 | 126 | | 2,042 | 1,425 | 428 | 174 |
| 7/1 | 220 | | 2,889 | 579 | 281 | 9,475 | 4,570 | 912 | 1,103 | 151 | 310 | | 4,042 | 2,263 | 607 | 243 |
| 7/2 | 301 | | 3,921 | 706 | 550 | 12,991 | 6,825 | 1,448 | 2,042 | 189 | 462 | | 6,542 | 3,289 | 1,353 | 304 |
| 7/3 | 431 | | 5,616 | 823 | 685 | 16,598 | 9,475 | 1,727 | 3,196 | 411 | 753 | | 9,042 | 4,552 | 2,390 | 662 |
| 7/4 | 620 | | 7,295 | 1,136 | 887 | 18,705 | 12,991 | 2,006 | 4,567 | 686 | 1,225 | | 11,042 | 5,873 | 3,829 | 1,105 |
| 7/5 | 802 | | 9,249 | 1,434 | 1,169 | 20,641 | 16,598 | 2,285 | 5,408 | 1,103 | 1,531 | | 12,887 | 7,124 | 5,612 | 1,462 |
| 7/6 | 1,141 | | 11,400 | 1,644 | 1,238 | 23,514 | 18,705 | 2,463 | 7,024 | 1,364 | 1,874 | | 14,267 | 8,422 | 7,204 | 1,782 |
| 7/7 | 1,664 | | 12,803 | 1,903 | 1,301 | 25,760 | 20,641 | 3,053 | 8,920 | 2,049 | 2,240 | | 15,961 | 9,415 | 8,005 | 2,064 |
| 7/8 | 2,277 | | 14,959 | 2,118 | 1,644 | 27,660 | 20,641 | 3,464 | 10,870 | 2,430 | 2,749 | | 17,920 | 10,252 | 9,746 | 2,309 |
| 7/9 | 2,956 | | 17,255 | 2,355 | 4,152 | 30,552 | 23,514 | 3,879 | 12,834 | 3,048 | 3,674 | | 20,671 | 11,758 | 10,835 | 3,089 |
| 7/10 | 3,466 | | 20,057 | 2,922 | 6,323 | 34,065 | 27,983 | 4,080 | 13,926 | 3,590 | 5,073 | | 22,822 | 13,484 | 12,822 | 3,638 |
| 7/11 | 3,831 | | 23,026 | 3,787 | | 36,953 | 31,379 | 4,085 | 15,227 | 3,972 | 6,694 | | 25,460 | 16,295 | 14,236 | 4,155 |
| 7/12 | 4,252 | | 25,376 | 5,014 | | 38,984 | 34,378 | | 17,993 | 4,471 | 7,861 | | 28,095 | 19,376 | 15,229 | 5,314 |
| 7/13 | 4,588 | | 27,548 | 6,310 | | 40,853 | 36,959 | | 20,070 | 5,010 | 8,800 | | 30,055 | 21,711 | 15,957 | 6,750 |
| 7/14 | 4,910 | 108 | 30,899 | 7,475 | | 43,140 | 39,920 | | 22,393 | 5,717 | 9,654 | | 32,133 | 23,963 | 16,829 | 7,768 |
| 7/15 | 5,233 | 277 | 33,401 | 8,285 | | 45,596 | 42,362 | | 24,905 | 6,274 | 10,545 | 577 | 33,905 | 25,772 | 18,382 | 8,769 |
| 7/16 | 5,574 | 521 | 35,981 | 9,252 | | 47,526 | 44,307 | | 27,176 | 7,110 | 11,021 | 1,740 | 34,902 | 27,473 | 19,605 | 9,749 |
| 7/17 | 5,839 | 694 | 37,862 | 10,201 | | 48,706 | 46,728 | | 29,083 | 7,834 | 11,621 | 1,740 | 35,629 | 28,984 | 20,269 | 10,708 |
| 7/18 | 6,172 | 959 | 39,384 | 10,854 | | 50,006 | 49,746 | | 30,419 | 8,480 | 11,983 | 1,740 | 36,039 | 30,218 | 21,386 | 11,748 |
| 7/19 | 6,454 | 1,729 | 40,765 | 11,448 | | 50,934 | 52,309 | | 31,388 | 9,108 | 12,327 | 1,740 | 36,498 | 31,280 | 21,589 | 12,490 |
| 7/20 | 6,694 | 2,984 | 42,076 | 11,999 | | 51,363 | 54,228 | | 32,808 | 9,619 | 12,557 | 1,740 | 36,833 | 32,216 | 21,992 | 12,957 |
| 7/21 | 7,285 | 3,565 | 42,721 | 12,572 | | 52,087 | 55,938 | | 34,496 | 10,091 | 12,750 | 1,740 | 37,177 | 33,296 | 22,599 | 13,419 |
| 7/22 | 7,538 | 4,719 | 43,696 | 12,986 | | 52,773 | 57,352 | | 36,148 | 10,564 | 12,978 | 1,740 | 37,407 | 34,142 | 23,040 | 14,207 |
| 7/23 | 7,704 | 5,601 | 44,462 | 13,441 | | 53,304 | 58,256 | | 37,353 | 11,013 | 13,073 | 1,740 | 37,600 | 34,822 | 23,356 | 15,020 |
| 7/24 | 7,877 | 6,746 | 45,341 | 14,538 | | 53,805 | 59,172 | | 38,065 | 11,538 | 13,197 | 1,740 | 37,828 | 35,636 | 23,432 | 15,878 |
| 7/25 | 7,951 | 8,023 | 46,156 | 14,638 | | 54,070 | 59,919 | | 38,455 | 12,113 | 13,300 | 1,740 | 37,923 | 36,184 | 23,531 | 16,781 |
| 7/26 | 7,983 | 9,264 | 46,719 | 14,903 | | 54,418 | 60,557 | | 38,872 | 12,572 | 13,419 | 1,740 | 38,047 | 36,608 | 23,626 | 17,721 |
| 7/27 | 8,016 | 10,388 | 47,109 | 15,251 | | 54,796 | 61,104 | | 39,329 | 12,888 | 13,516 | 1,740 | 38,150 | 36,987 | 23,721 | 18,488 |
| 7/28 | 8,028 | | 47,348 | 15,629 | | 55,288 | 61,580 | | 39,654 | 13,229 | 13,663 | 1,740 | 38,269 | 37,361 | 23,883 | 19,136 |
| 7/29 | 8,052 | | 47,563 | 16,121 | | 55,671 | 61,973 | | 39,974 | 13,471 | 13,797 | 1,740 | 38,366 | 37,721 | 24,245 | 19,632 |
| 7/30 | 8,066 | | 47,673 | 16,504 | | 56,033 | 62,357 | | 40,242 | 13,688 | 13,910 | 1,740 | 38,513 | 38,029 | 24,569 | 20,244 |
| 7/31 | 8,073 | | 47,785 | 16,866 | | 56,317 | 62,797 | | 40,560 | 13,947 | 14,002 | 1,740 | 38,647 | 38,321 | 24,850 | 21,096 |
| 8/1 | 8,085 | | 47,885 | 17,150 | | 56,526 | 63,070 | | 40,840 | 14,096 | 14,073 | 1,740 | 38,760 | 38,543 | 25,198 | 21,850 |
| 8/2 | 8,097 | | 47,959 | 17,359 | | 56,709 | 63,300 | | 41,057 | 14,245 | 14,145 | 1,740 | 38,852 | 38,731 | 25,621 | 22,444 |
| 8/3 | 8,102 | | 47,991 | 17,542 | | 56,855 | 63,487 | | 41,216 | 14,336 | 14,206 | 1,740 | 38,923 | 38,873 | 25,919 | 22,931 |
| 8/4 | 8,111 | | 48,024 | 17,688 | | 56,933 | 63,659 | | 41,349 | 14,423 | 14,268 | 1,740 | 38,995 | 38,994 | 26,154 | 23,250 |
| 8/5 | 8,112 | | 48,036 | 17,766 | | 56,968 | 63,750 | | 41,399 | 14,481 | 14,323 | 1,740 | 39,056 | 39,069 | 26,311 | 23,533 |
| 8/6 | 8,112 | | 48,060 | 17,801 | | 57,023 | 63,854 | | 41,419 | 14,533 | 14,376 | 1,740 | 39,118 | 39,126 | 26,389 | 23,746 |
| 8/7 | 8,112 | | 48,074 | 17,856 | | 57,066 | 63,886 | | 41,432 | 14,585 | 14,421 | 1,740 | 39,173 | 39,182 | 26,464 | 23,838 |
| 8/8 | 8,113 | | 48,081 | 17,899 | | 57,109 | 63,923 | | 41,440 | 14,662 | 14,468 | 1,740 | 39,226 | 39,242 | 26,505 | 23,896 |
| 8/9 | 8,113 | | 48,093 | 17,942 | | 57,150 | 63,945 | | 41,449 | 14,707 | 14,503 | 1,740 | 39,271 | 39,289 | 26,554 | 23,932 |

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Appendix A.2. (Page 6 of 12).

| Date | Cumulative Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 8/10 | 8,114 | | 48,105 | 17,983 | | 57,197 | 63,983 | | 41,460 | 14,789 | 14,540 | 1,838 | 39,318 | 39,347 | 26,600 | 23,981 |
| 8/11 | 8,116 | | 48,110 | 18,030 | | 57,226 | 64,002 | | 41,471 | 14,843 | 14,558 | 1,928 | 39,353 | 39,389 | 26,642 | 23,996 |
| 8/12 | 8,117 | | 48,119 | 18,059 | | 57,251 | 64,018 | | 41,480 | 14,873 | 14,574 | 2,024 | 39,390 | 39,419 | 26,681 | 24,033 |
| 8/13 | | | 48,120 | 18,084 | | 57,278 | 64,034 | | 41,480 | 14,911 | 14,581 | 2,088 | 39,408 | 39,443 | 26,699 | 24,061 |
| 8/14 | | | 48,120 | 18,111 | | 57,302 | 64,049 | | 41,481 | 14,930 | 14,594 | 2,130 | 39,424 | 39,463 | 26,722 | 24,081 |
| 8/15 | | | 48,120 | 18,135 | | 57,325 | 64,055 | | 41,482 | 14,946 | 14,614 | 2,165 | 39,431 | 39,482 | 26,734 | 24,089 |
| 8/16 | | | 48,121 | 18,158 | | 57,331 | 64,057 | | 41,482 | 14,961 | 14,634 | 2,180 | 39,444 | 39,500 | 26,740 | 24,096 |
| 8/17 | | | 48,121 | 18,164 | | 57,336 | 64,059 | | 41,483 | 14,973 | 14,649 | 2,208 | 39,464 | 39,512 | 26,751 | 24,130 |
| 8/18 | | | 48,122 | 18,169 | | 57,340 | 64,063 | | 41,484 | 14,985 | 14,661 | 2,237 | 39,484 | 39,523 | 26,752 | 24,165 |
| 8/19 | | | 48,124 | 18,173 | | 57,342 | 64,063 | | 41,484 | 14,990 | 14,673 | 2,259 | 39,499 | 39,531 | 26,756 | 24,177 |
| 8/20 | | | 48,125 | 18,175 | | 57,351 | 64,063 | | 41,484 | 14,999 | 14,678 | 2,279 | 39,511 | 39,538 | 26,759 | 24,177 |
| 8/21 | | | | 18,184 | | 57,356 | 64,063 | | 41,484 | 15,000 | 14,687 | 2,292 | 39,523 | 39,545 | 26,761 | 24,182 |
| 8/22 | | | | 18,189 | | 57,356 | 64,063 | | 41,484 | 15,000 | 14,688 | 2,299 | 39,528 | 39,547 | 26,761 | 24,182 |
| 8/23 | | | | 18,189 | | 57,357 | 64,063 | | 41,484 | 15,000 | 14,688 | 2,305 | 39,537 | 39,548 | 26,761 | 24,182 |
| 8/24 | | | | 18,190 | | 57,360 | 64,063 | | 41,484 | 15,001 | 14,688 | 2,311 | 39,538 | 39,549 | 26,762 | 24,183 |
| 8/25 | | | | 18,193 | | 57,362 | 64,063 | | 41,484 | 15,001 | 14,689 | 2,314 | 39,538 | | 26,763 | 24,186 |
| 8/26 | | | | 18,195 | | 57,363 | 64,063 | | 41,484 | 15,002 | 14,689 | 2,315 | 39,538 | | 26,763 | 24,187 |
| 8/27 | | | | 18,196 | | 57,365 | 64,063 | | 41,484 | 15,004 | 14,690 | 2,320 | 39,539 | | 26,764 | 24,187 |
| 8/28 | | | | 18,198 | | 57,365 | 64,063 | | 41,484 | 15,005 | 14,692 | 2,321 | 39,539 | | 26,764 | 24,187 |
| 8/29 | | | | 18,198 | | 57,365 | 64,063 | | 41,484 | | 14,693 | 2,325 | 39,540 | | 26,765 | 24,188 |
| 8/30 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 8/31 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/1 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/2 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/3 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/4 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/5 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/6 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/7 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/8 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/9 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/10 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/11 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/12 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/13 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/14 | | | | | | 57,365 | 64,063 | | 41,484 | | | | | | | |
| 9/15 | | | | | | 57,365 | | | 41,484 | | | | | | | |
| 9/16 | | | | | | 57,365 | | | | | | | | | | |
| 9/17 | | | | | | 57,365 | | | | | | | | | | |
| 9/18 | | | | | | 57,365 | | | | | | | | | | |
| 9/19 | | | | | | 57,365 | | | | | | | | | | |
| 9/20 | | | | | | 57,365 | | | | | | | | | | |
| 9/21 | | | | | | | | | | | | | | | | |
| 9/22 | | | | | | | | | | | | | | | | |
| 9/23 | | | | | | | | | | | | | | | | |
| 9/24 | | | | | | | | | | | | | | | | |
| 9/25 | | | | | | | | | | | | | | | | |

Appendix A.2. (Page 7 of 12).

| Date | Cumulative Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 6/15 | | | | | | | | | | | | |
| 6/16 | | | | | | 0 | | | | | | |
| 6/17 | 1 | 1 | 1 | | | 0 | | | | | | |
| 6/18 | 2 | 1 | 2 | | | 0 | | | | | | |
| 6/19 | 3 | 3 | 4 | 3 | 5 | 0 | | | | | | |
| 6/20 | 8 | 7 | 10 | 3 | 5 | 0 | 0 | | | | | |
| 6/21 | 13 | 11 | 17 | 6 | 15 | 0 | 0 | | | | | 2 |
| 6/22 | 24 | 22 | 33 | 15 | 39 | 1 | 5 | | | | | 4 |
| 6/23 | 46 | 42 | 66 | 24 | 73 | 2 | 10 | | | | | 14 |
| 6/24 | 68 | 63 | 98 | 40 | 107 | 4 | 19 | | | | | 16 |
| 6/25 | 104 | 97 | 151 | 71 | 156 | 10 | 48 | | | | | 18 |
| 6/26 | 165 | 155 | 243 | 115 | 278 | 18 | 86 | | | | 247 | 25 |
| 6/27 | 265 | 249 | 440 | 178 | 439 | 25 | 119 | | | | 877 | 59 |
| 6/28 | 440 | 414 | 689 | 203 | 668 | 69 | 172 | | | 6 | 1,351 | 107 |
| 6/29 | 769 | 722 | 991 | 328 | 1,096 | 285 | 375 | | | 31 | 2,324 | 135 |
| 6/30 | 1,225 | 1,149 | 1,345 | 509 | 1,301 | 442 | 605 | | | 40 | 3,405 | 216 |
| 7/1 | 2,279 | 1,824 | 1,751 | 837 | 2,435 | 598 | 1,007 | 3 | | 77 | 4,450 | 283 |
| 7/2 | 4,695 | 2,652 | 2,210 | 1,362 | 5,490 | 763 | 1,437 | 18 | 27 | 163 | 5,383 | 555 |
| 7/3 | 7,310 | 3,496 | 2,721 | 2,275 | 8,324 | 1,014 | 2,010 | 25 | 88 | 315 | 6,494 | 946 |
| 7/4 | 9,225 | 4,562 | 3,268 | 3,858 | 10,536 | 1,259 | 3,156 | 46 | 209 | 653 | 8,421 | 1,311 |
| 7/5 | 10,920 | 5,562 | 3,861 | 5,908 | 14,073 | 1,758 | 3,945 | 97 | 399 | 1,076 | 10,126 | 2,023 |
| 7/6 | 11,931 | 6,876 | 4,996 | 7,042 | 16,941 | 2,104 | 5,322 | 269 | 689 | 1,439 | 12,515 | 2,712 |
| 7/7 | 13,138 | 8,294 | 6,626 | 9,191 | 19,627 | 2,493 | 6,158 | 581 | 1,159 | 2,059 | 14,781 | 3,338 |
| 7/8 | 14,052 | 9,538 | 9,065 | 10,590 | 23,326 | 2,855 | 8,211 | 960 | 1,596 | 2,830 | 17,057 | 3,918 |
| 7/9 | 15,221 | 10,955 | 12,382 | 11,356 | 24,603 | 3,012 | 9,652 | 1,381 | 2,123 | 3,748 | 19,430 | 4,576 |
| 7/10 | 15,940 | 12,391 | 14,803 | 12,552 | 27,073 | 3,204 | 11,304 | 1,971 | 2,748 | 4,792 | 22,573 | 5,143 |
| 7/11 | 17,201 | 13,642 | 17,437 | 13,698 | 28,584 | 3,414 | 13,995 | 2,737 | 3,446 | 5,851 | 25,975 | 5,295 |
| 7/12 | 18,451 | 14,724 | 20,911 | 15,037 | 30,338 | 3,686 | 15,871 | 3,700 | 4,095 | 7,062 | 29,031 | 5,839 |
| 7/13 | 19,395 | 16,114 | 23,505 | 16,568 | 33,402 | 4,020 | 17,520 | 4,580 | 4,524 | 8,827 | 31,368 | 6,328 |
| 7/14 | 20,738 | 17,120 | 26,255 | 17,719 | 35,456 | 4,349 | 18,832 | 5,231 | 4,926 | 10,673 | 33,462 | 7,465 |
| 7/15 | 22,204 | 18,525 | 28,601 | 18,586 | 36,822 | 4,740 | 20,902 | 5,770 | 5,456 | 12,262 | 35,616 | 8,535 |
| 7/16 | 23,458 | 20,036 | 29,920 | 19,593 | 38,213 | 5,044 | 22,175 | 6,360 | 6,242 | 14,073 | 37,791 | 9,592 |
| 7/17 | 24,365 | 22,066 | 30,882 | 21,363 | 39,814 | 5,291 | 24,264 | 6,833 | 6,733 | 14,853 | 38,456 | 10,547 |
| 7/18 | 25,627 | 23,851 | 33,666 | 22,386 | 40,847 | 5,604 | 24,856 | 7,274 | 7,271 | 16,074 | 39,739 | 11,614 |
| 7/19 | 26,698 | 24,375 | 34,274 | 23,574 | 41,711 | 5,924 | 26,031 | 7,865 | 7,775 | 17,726 | 40,747 | 13,036 |
| 7/20 | 27,510 | 25,392 | 34,717 | 24,127 | 42,339 | 6,098 | 27,553 | 8,421 | 8,113 | 18,933 | 41,850 | 14,393 |
| 7/21 | 27,994 | 26,634 | 35,173 | 25,150 | 43,478 | 6,361 | 29,045 | 8,998 | 8,496 | 20,218 | 42,953 | 15,976 |
| 7/22 | 28,512 | 27,134 | 35,477 | 26,083 | 44,047 | 6,489 | 30,146 | 9,420 | 8,836 | 21,472 | 44,151 | 17,054 |
| 7/23 | 29,422 | 27,621 | 35,732 | 27,098 | 44,861 | 6,652 | 30,968 | 9,901 | 9,142 | 22,237 | 45,303 | 17,593 |
| 7/24 | 29,975 | 27,957 | 36,753 | 27,825 | 45,344 | 6,723 | 31,553 | 10,359 | 9,393 | 23,227 | 48,216 | 18,077 |
| 7/25 | 30,655 | 28,447 | 37,230 | 28,367 | 45,609 | 6,778 | 32,275 | 10,724 | 9,563 | 23,909 | 49,354 | 18,935 |
| 7/26 | 31,053 | 28,713 | 37,436 | 28,701 | 45,791 | 6,901 | 32,789 | 11,044 | 9,784 | 24,611 | 49,910 | 19,470 |
| 7/27 | 31,520 | 29,090 | 37,649 | 29,007 | 45,908 | 7,001 | 33,459 | 11,397 | 9,987 | 25,070 | 50,378 | 19,836 |
| 7/28 | 31,894 | 29,579 | 38,330 | 29,256 | 46,263 | 7,193 | 34,169 | 11,666 | 10,191 | 25,477 | 50,638 | 20,192 |
| 7/29 | 32,193 | 30,030 | 39,748 | 29,541 | 46,860 | 7,316 | 34,676 | 11,954 | 10,330 | 26,257 | 50,890 | 20,546 |
| 7/30 | 32,470 | 30,444 | 41,102 | 29,870 | 47,275 | 7,393 | 35,035 | 12,278 | 10,491 | 27,108 | 51,039 | 20,900 |
| 7/31 | 32,724 | 30,751 | 42,374 | 30,086 | 47,465 | 7,429 | 35,325 | 12,530 | 10,696 | 27,647 | 51,145 | 21,215 |
| 8/1 | 32,888 | 30,956 | 43,167 | 30,257 | 47,635 | 7,477 | 35,478 | 12,775 | 10,796 | 28,096 | 51,218 | 21,594 |
| 8/2 | 33,128 | 31,083 | 43,809 | 30,463 | 47,786 | 7,527 | 35,619 | 12,948 | 10,881 | 28,651 | 51,273 | 21,886 |
| 8/3 | 33,311 | 31,192 | 44,464 | 30,672 | 47,917 | 7,583 | 35,739 | 13,077 | 10,988 | 28,969 | 51,311 | 22,123 |
| 8/4 | 33,415 | 31,319 | 45,001 | 30,776 | 48,016 | 7,621 | 35,931 | 13,264 | 11,079 | 29,225 | 51,349 | 22,360 |
| 8/5 | 33,480 | 31,423 | 45,421 | 30,835 | 48,069 | 7,654 | 36,076 | 13,387 | 11,162 | 29,564 | 51,387 | 22,485 |
| 8/6 | 33,529 | 31,573 | 45,724 | 30,877 | 48,151 | 7,696 | 36,168 | 13,490 | 11,233 | 29,791 | 51,408 | 22,637 |
| 8/7 | 33,625 | 31,687 | 45,909 | 30,924 | 48,202 | 7,728 | 36,219 | 13,524 | 11,295 | 29,959 | 51,422 | 22,814 |
| 8/8 | 33,684 | 31,766 | 46,092 | 30,968 | 48,252 | 7,749 | 36,261 | 13,581 | 11,304 | 30,113 | 51,440 | 22,927 |
| 8/9 | 33,714 | 31,809 | 46,210 | 31,005 | 48,276 | 7,777 | 36,286 | 13,616 | 11,330 | 30,181 | 51,455 | 23,064 |

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Appendix A.2. (Page 8 of 12).

| Date | Cumulative Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 8/10 | 33,774 | 31,824 | 46,310 | 31,037 | 48,336 | 7,804 | 36,309 | 13,646 | 11,359 | 30,255 | 51,463 | 23,152 |
| 8/11 | 33,843 | 31,834 | 46,385 | 31,078 | 48,351 | 7,872 | 36,328 | 13,673 | 11,374 | 30,330 | 51,468 | 23,186 |
| 8/12 | 33,913 | 31,849 | 46,436 | 31,131 | 48,370 | 7,887 | 36,338 | 13,707 | 11,391 | 30,404 | 51,486 | 23,228 |
| 8/13 | 33,995 | 31,875 | 46,472 | 31,178 | 48,399 | 7,903 | 36,346 | 13,730 | 11,425 | 30,435 | 51,511 | 23,265 |
| 8/14 | 34,020 | 31,879 | 46,511 | 31,206 | 48,404 | 7,910 | 36,357 | 13,742 | 11,436 | 30,459 | 51,517 | 23,277 |
| 8/15 | 34,045 | 31,879 | 46,537 | 31,222 | 48,420 | 7,921 | 36,368 | 13,753 | 11,440 | 30,477 | 51,522 | 23,315 |
| 8/16 | 34,062 | 31,883 | 46,557 | 31,227 | 48,425 | 7,936 | 36,371 | 13,758 | 11,446 | 30,505 | 51,526 | 23,335 |
| 8/17 | 34,078 | 31,887 | 46,576 | 31,229 | 48,427 | 7,941 | 36,382 | 13,768 | 11,452 | 30,518 | 51,528 | 23,351 |
| 8/18 | 34,087 | 31,891 | 46,591 | 31,232 | 48,432 | 7,943 | 36,385 | 13,771 | 11,474 | 30,529 | 51,531 | 23,360 |
| 8/19 | 34,088 | 31,895 | 46,596 | 31,239 | 48,438 | 7,945 | 36,389 | 13,771 | 11,480 | 30,537 | 51,532 | 23,364 |
| 8/20 | 34,092 | 31,899 | 46,603 | 31,242 | 48,442 | 7,949 | 36,393 | 13,775 | 11,481 | 30,544 | 51,532 | 23,368 |
| 8/21 | 34,105 | | 46,606 | 31,243 | 48,450 | 7,950 | 36,394 | 13,780 | 11,482 | 30,551 | 51,538 | 23,371 |
| 8/22 | | | 46,607 | 31,246 | 48,455 | 7,950 | 36,397 | 13,786 | 11,482 | 30,553 | 51,543 | 23,373 |
| 8/23 | | | 46,609 | 31,246 | 48,461 | 7,950 | 36,398 | 13,788 | 11,482 | 30,558 | 51,546 | 23,375 |
| 8/24 | | | 46,613 | 31,252 | 48,462 | 7,950 | 36,401 | 13,789 | 11,483 | 30,561 | 51,549 | 23,378 |
| 8/25 | | | 46,615 | 31,252 | 48,469 | 7,951 | 36,402 | 13,793 | 11,483 | 30,563 | 51,552 | 23,379 |
| 8/26 | | | 46,620 | 31,254 | 48,472 | 7,951 | 36,407 | 13,794 | 11,489 | 30,564 | 51,553 | 23,384 |
| 8/27 | | | 46,625 | 31,255 | 48,474 | 7,951 | 36,409 | 13,796 | 11,489 | 30,564 | 51,553 | 23,388 |
| 8/28 | | | 46,630 | 31,256 | 48,475 | 7,953 | 36,414 | 13,796 | 11,489 | 30,565 | 51,554 | 23,390 |
| 8/29 | | | 46,635 | 31,265 | 48,495 | 7,958 | 36,415 | 13,798 | 11,489 | 30,565 | 51,555 | 23,393 |
| 8/30 | | | | | | | 36,416 | 13,820 | 11,491 | 30,569 | 51,556 | 23,394 |
| 8/31 | | | | | | | 36,416 | | 11,491 | 30,569 | 51,557 | 23,396 |
| 9/1 | | | | | | | 36,424 | | 11,491 | 30,569 | 51,561 | 23,398 |
| 9/2 | | | | | | | 36,425 | | 11,491 | 30,569 | 51,561 | 23,399 |
| 9/3 | | | | | | | 36,425 | | 11,491 | 30,569 | 51,561 | 23,400 |
| 9/4 | | | | | | | 36,426 | | 11,491 | 30,569 | 51,562 | 23,400 |
| 9/5 | | | | | | | 36,426 | | 11,491 | 30,569 | 51,564 | 23,403 |
| 9/6 | | | | | | | 36,427 | | 11,491 | 30,569 | 51,564 | 23,404 |
| 9/7 | | | | | | | 36,426 | | 11,491 | 30,569 | 51,562 | 23,404 |
| 9/8 | | | | | | | 36,426 | | 11,491 | 30,569 | 51,564 | 23,406 |
| 9/9 | | | | | | | 36,427 | | 11,491 | 30,569 | 51,564 | 23,409 |
| 9/10 | | | | | | | 36,430 | | 11,491 | 30,569 | 51,564 | 23,409 |
| 9/11 | | | | | | | 36,434 | | 11,491 | 30,569 | 51,564 | 23,410 |
| 9/12 | | | | | | | 36,435 | | 11,491 | 30,569 | 51,565 | 23,411 |
| 9/13 | | | | | | | 36,436 | | 11,491 | 30,569 | 51,566 | 23,412 |
| 9/14 | | | | | | | 36,438 | | 11,491 | 30,569 | 51,567 | 23,412 |
| 9/15 | | | | | | | 36,439 | | 11,491 | 30,569 | 51,569 | 23,412 |
| 9/16 | | | | | | | 36,440 | | 11,491 | 30,569 | 51,569 | 23,412 |
| 9/17 | | | | | | | 36,441 | | 11,491 | 30,569 | 51,569 | 23,412 |
| 9/18 | | | | | | | 36,442 | | 11,491 | 30,569 | 51,569 | 23,412 |
| 9/19 | | | | | | | 36,442 | | 11,491 | 30,569 | 51,569 | 23,413 |
| 9/20 | | | | | | | | | 11,491 | 30,569 | 51,569 | 23,413 |
| 9/21 | | | | | | | | | | 30,569 | 51,569 | |
| 9/22 | | | | | | | | | | 30,569 | 51,569 | |
| 9/23 | | | | | | | | | | 30,569 | 51,569 | |
| 9/24 | | | | | | | | | | 30,569 | 51,570 | |
| 9/25 | | | | | | | | | | 30,569 | | |

Appendix A.2. (Page9 of 12).

| Date | Cumulative Percent Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 6/15 | | | | | | 0 | | | | | | | | | | |
| 6/16 | | | 0 | | | 0 | | | | | | | | | | |
| 6/17 | | | 0 | 0 | | 0 | 0 | | | | | | 0 | 0 | | |
| 6/18 | | | 0 | 0 | | 0 | 0 | | | | | | 0 | 0 | 0 | |
| 6/19 | | | 0 | 0 | | 0 | 0 | | 0 | | | | 0 | 0 | 0 | |
| 6/20 | | | 0 | 0 | | 0 | 0 | | 0 | | | | 0 | 0 | 0 | |
| 6/21 | | | 0 | 0 | | 0 | 0 | | 0 | | | | 0 | 0 | 0 | |
| 6/22 | | | 0 | 0 | | 0 | 0 | | 0 | | | | 0 | 0 | 0 | |
| 6/23 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| 6/24 | 0 | | 0 | 1 | | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| 6/25 | 0 | | 0 | 1 | | 1 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| 6/26 | 0 | | 1 | 1 | | 1 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| 6/27 | 0 | | 1 | 1 | | 2 | 1 | | 0 | 0 | 0 | | 1 | 1 | 1 | 0 |
| 6/28 | 0 | | 2 | 2 | | 4 | 1 | | 0 | 0 | 0 | | 2 | 1 | 1 | 0 |
| 6/29 | 1 | | 3 | 2 | | 8 | 2 | | 1 | 0 | 0 | | 3 | 2 | 1 | 0 |
| 6/30 | 1 | | 5 | 3 | | 12 | 4 | | 2 | 1 | 1 | | 5 | 4 | 2 | 1 |
| 7/1 | 3 | | 6 | 3 | | 17 | 7 | | 3 | 1 | 2 | | 10 | 6 | 2 | 1 |
| 7/2 | 4 | | 8 | 4 | | 23 | 11 | | 5 | 1 | 3 | | 17 | 8 | 5 | 1 |
| 7/3 | 5 | | 12 | 5 | | 29 | 15 | | 8 | 3 | 5 | | 23 | 12 | 9 | 3 |
| 7/4 | 8 | | 15 | 6 | | 33 | 20 | | 11 | 5 | 8 | | 28 | 15 | 14 | 5 |
| 7/5 | 10 | | 19 | 8 | | 36 | 26 | | 13 | 7 | 10 | | 33 | 18 | 21 | 6 |
| 7/6 | 14 | | 24 | 9 | | 41 | 29 | | 17 | 9 | 13 | | 36 | 21 | 27 | 7 |
| 7/7 | 21 | | 27 | 10 | | 45 | 32 | | 22 | 14 | 15 | | 40 | 24 | 30 | 9 |
| 7/8 | 28 | | 31 | 12 | | 48 | 32 | | 26 | 16 | 19 | | 45 | 26 | 36 | 10 |
| 7/9 | 36 | | 36 | 13 | | 53 | 37 | | 31 | 20 | 25 | | 52 | 30 | 40 | 13 |
| 7/10 | 43 | | 42 | 16 | | 59 | 44 | | 34 | 24 | 35 | | 58 | 34 | 48 | 15 |
| 7/11 | 47 | | 48 | 21 | | 64 | 49 | | 37 | 26 | 46 | | 64 | 41 | 53 | 17 |
| 7/12 | 52 | | 53 | 28 | | 68 | 54 | | 43 | 30 | 54 | | 71 | 49 | 57 | 22 |
| 7/13 | 57 | | 57 | 35 | | 71 | 58 | | 48 | 33 | 60 | | 76 | 55 | 60 | 28 |
| 7/14 | 60 | | 64 | 41 | | 75 | 62 | | 54 | 38 | 66 | | 81 | 61 | 63 | 32 |
| 7/15 | 64 | | 69 | 46 | | 79 | 66 | | 60 | 42 | 72 | | 86 | 65 | 69 | 36 |
| 7/16 | 69 | | 75 | 51 | | 83 | 69 | | 66 | 47 | 75 | | 88 | 69 | 73 | 40 |
| 7/17 | 72 | | 79 | 56 | | 85 | 73 | | 70 | 52 | 79 | | 90 | 73 | 76 | 44 |
| 7/18 | 76 | | 82 | 60 | | 87 | 78 | | 73 | 57 | 82 | | 91 | 76 | 80 | 49 |
| 7/19 | 80 | | 85 | 63 | | 89 | 82 | | 76 | 61 | 84 | | 92 | 79 | 81 | 52 |
| 7/20 | 82 | | 87 | 66 | | 90 | 85 | | 79 | 64 | 85 | | 93 | 81 | 82 | 54 |
| 7/21 | 90 | | 89 | 69 | | 91 | 87 | | 83 | 67 | 87 | | 94 | 84 | 84 | 55 |
| 7/22 | 93 | | 91 | 71 | | 92 | 90 | | 87 | 70 | 88 | | 95 | 86 | 86 | 59 |
| 7/23 | 95 | | 92 | 74 | | 93 | 91 | | 90 | 73 | 89 | | 95 | 88 | 87 | 62 |
| 7/24 | 97 | | 94 | 80 | | 94 | 92 | | 92 | 77 | 90 | | 96 | 90 | 88 | 66 |
| 7/25 | 98 | | 96 | 80 | | 94 | 94 | | 93 | 81 | 91 | | 96 | 91 | 88 | 69 |
| 7/26 | 98 | | 97 | 82 | | 95 | 95 | | 94 | 84 | 91 | | 96 | 93 | 88 | 73 |
| 7/27 | 99 | | 98 | 84 | | 96 | 95 | | 95 | 86 | 92 | | 96 | 94 | 89 | 76 |
| 7/28 | 99 | | 98 | 86 | | 96 | 96 | | 96 | 88 | 93 | | 97 | 94 | 89 | 79 |
| 7/29 | 99 | | 99 | 89 | | 97 | 97 | | 96 | 90 | 94 | | 97 | 95 | 91 | 81 |
| 7/30 | 99 | | 99 | 91 | | 98 | 97 | | 97 | 91 | 95 | | 97 | 96 | 92 | 84 |
| 7/31 | 99 | | 99 | 93 | | 98 | 98 | | 98 | 93 | 95 | | 98 | 97 | 93 | 87 |
| 8/1 | 100 | | 100 | 94 | | 99 | 98 | | 98 | 94 | 96 | | 98 | 97 | 94 | 90 |
| 8/2 | 100 | | 100 | 95 | | 99 | 99 | | 99 | 95 | 96 | | 98 | 98 | 96 | 93 |
| 8/3 | 100 | | 100 | 96 | | 99 | 99 | | 99 | 96 | 97 | | 98 | 98 | 97 | 95 |
| 8/4 | 100 | | 100 | 97 | | 99 | 99 | | 100 | 96 | 97 | | 99 | 99 | 98 | 96 |
| 8/5 | 100 | | 100 | 98 | | 99 | 100 | | 100 | 97 | 97 | | 99 | 99 | 98 | 97 |
| 8/6 | 100 | | 100 | 98 | | 99 | 100 | | 100 | 97 | 98 | | 99 | 99 | 99 | 98 |
| 8/7 | 100 | | 100 | 98 | | 99 | 100 | | 100 | 97 | 98 | | 99 | 99 | 99 | 99 |
| 8/8 | 100 | | 100 | 98 | | 100 | 100 | | 100 | 98 | 98 | | 99 | 99 | 99 | 99 |
| 8/9 | 100 | | 100 | 99 | | 100 | 100 | | 100 | 98 | 99 | | 99 | 99 | 99 | 99 |

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Appendix A.2. (Page 10 of 12).

| Date | Cumulative Percent Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 8/10 | 100 | | 100 | 99 | | 100 | 100 | | 100 | 99 | 99 | | 99 | 99 | 99 | 99 |
| 8/11 | 100 | | 100 | 99 | | 100 | 100 | | 100 | 99 | 99 | | 100 | 100 | 100 | 99 |
| 8/12 | 100 | | 100 | 99 | | 100 | 100 | | 100 | 99 | 99 | | 100 | 100 | 100 | 99 |
| 8/13 | | | 100 | 99 | | 100 | 100 | | 100 | 99 | 99 | | 100 | 100 | 100 | 99 |
| 8/14 | | | 100 | 100 | | 100 | 100 | | 100 | 100 | 99 | | 100 | 100 | 100 | 99 |
| 8/15 | | | 100 | 100 | | 100 | 100 | | 100 | 100 | 99 | | 100 | 100 | 100 | 100 |
| 8/16 | | | 100 | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/17 | | | 100 | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/18 | | | 100 | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/19 | | | 100 | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/20 | | | 100 | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/21 | | | | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/22 | | | | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/23 | | | | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/24 | | | | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/25 | | | | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 8/26 | | | | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 8/27 | | | | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 8/28 | | | | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 8/29 | | | | 100 | | 100 | 100 | | 100 | | 100 | | 100 | | 100 | 100 |
| 8/30 | | | | | | 100 | 100 | | 100 | | | | | | 100 | 100 |
| 8/31 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/1 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/2 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/3 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/4 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/5 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/6 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/7 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/8 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/9 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/10 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/11 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/12 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/13 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/14 | | | | | | 100 | 100 | | 100 | | | | | | | |
| 9/15 | | | | | | 100 | | | 100 | | | | | | | |
| 9/16 | | | | | | 100 | | | | | | | | | | |
| 9/17 | | | | | | 100 | | | | | | | | | | |
| 9/18 | | | | | | 100 | | | | | | | | | | |
| 9/19 | | | | | | 100 | | | | | | | | | | |
| 9/20 | | | | | | 100 | | | | | | | | | | |
| 9/21 | | | | | | | | | | | | | | | | |
| 9/22 | | | | | | | | | | | | | | | | |
| 9/23 | | | | | | | | | | | | | | | | |
| 9/24 | | | | | | | | | | | | | | | | |
| 9/25 | | | | | | | | | | | | | | | | |

Appendix A.2. (Page 11 of 12).

| Date | Cumulative Percent Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 6/15 | | | | | | | | | | | | |
| 6/16 | | | | | | 0 | | | | | | |
| 6/17 | 0 | 0 | 0 | | | 0 | | | | | | |
| 6/18 | 0 | 0 | 0 | | | 0 | | | | | | |
| 6/19 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| 6/20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| 6/21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| 6/22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| 6/23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| 6/24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| 6/25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | 0 |
| 6/26 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | | | | 0 | 0 |
| 6/27 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | | | | 2 | 0 |
| 6/28 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | | | 0 | 3 | 0 |
| 6/29 | 2 | 2 | 2 | 1 | 2 | 4 | 1 | | | 0 | 5 | 1 |
| 6/30 | 4 | 4 | 3 | 2 | 3 | 6 | 2 | | | 0 | 7 | 1 |
| 7/1 | 7 | 6 | 4 | 3 | 5 | 8 | 3 | 0 | | 0 | 9 | 1 |
| 7/2 | 14 | 8 | 5 | 4 | 11 | 10 | 4 | 0 | 0 | 1 | 10 | 2 |
| 7/3 | 21 | 11 | 6 | 7 | 17 | 13 | 6 | 0 | 1 | 1 | 13 | 4 |
| 7/4 | 27 | 14 | 7 | 12 | 22 | 16 | 9 | 0 | 2 | 2 | 16 | 6 |
| 7/5 | 32 | 17 | 8 | 19 | 29 | 22 | 11 | 1 | 3 | 4 | 20 | 9 |
| 7/6 | 35 | 22 | 11 | 23 | 35 | 26 | 15 | 2 | 6 | 5 | 24 | 12 |
| 7/7 | 39 | 26 | 14 | 29 | 40 | 31 | 17 | 4 | 10 | 7 | 29 | 14 |
| 7/8 | 41 | 30 | 19 | 34 | 48 | 36 | 23 | 7 | 14 | 9 | 33 | 17 |
| 7/9 | 45 | 34 | 27 | 36 | 51 | 38 | 26 | 10 | 18 | 12 | 38 | 20 |
| 7/10 | 47 | 39 | 32 | 40 | 56 | 40 | 31 | 14 | 24 | 16 | 44 | 22 |
| 7/11 | 50 | 43 | 37 | 44 | 59 | 43 | 38 | 20 | 30 | 19 | 50 | 23 |
| 7/12 | 54 | 46 | 45 | 48 | 63 | 46 | 44 | 27 | 36 | 23 | 56 | 25 |
| 7/13 | 57 | 51 | 50 | 53 | 69 | 51 | 48 | 33 | 39 | 29 | 61 | 27 |
| 7/14 | 61 | 54 | 56 | 57 | 73 | 55 | 52 | 38 | 43 | 35 | 65 | 32 |
| 7/15 | 65 | 58 | 61 | 59 | 76 | 60 | 57 | 42 | 47 | 40 | 69 | 36 |
| 7/16 | 69 | 63 | 64 | 63 | 79 | 63 | 61 | 46 | 54 | 46 | 73 | 41 |
| 7/17 | 71 | 69 | 66 | 68 | 82 | 66 | 67 | 49 | 59 | 49 | 75 | 45 |
| 7/18 | 75 | 75 | 72 | 72 | 84 | 70 | 68 | 53 | 63 | 53 | 77 | 50 |
| 7/19 | 78 | 76 | 73 | 75 | 86 | 74 | 71 | 57 | 68 | 58 | 79 | 56 |
| 7/20 | 81 | 80 | 74 | 77 | 87 | 77 | 76 | 61 | 71 | 62 | 81 | 61 |
| 7/21 | 82 | 83 | 75 | 80 | 90 | 80 | 80 | 65 | 74 | 66 | 83 | 68 |
| 7/22 | 84 | 85 | 76 | 83 | 91 | 82 | 83 | 68 | 77 | 70 | 86 | 73 |
| 7/23 | 86 | 87 | 77 | 87 | 93 | 84 | 85 | 72 | 80 | 73 | 88 | 75 |
| 7/24 | 88 | 88 | 79 | 89 | 94 | 84 | 87 | 75 | 82 | 76 | 93 | 77 |
| 7/25 | 90 | 89 | 80 | 91 | 94 | 85 | 89 | 78 | 83 | 78 | 96 | 81 |
| 7/26 | 91 | 90 | 80 | 92 | 94 | 87 | 90 | 80 | 85 | 81 | 97 | 83 |
| 7/27 | 92 | 91 | 81 | 93 | 95 | 88 | 92 | 82 | 87 | 82 | 98 | 85 |
| 7/28 | 94 | 93 | 82 | 94 | 95 | 90 | 94 | 84 | 89 | 83 | 98 | 86 |
| 7/29 | 94 | 94 | 85 | 94 | 97 | 92 | 95 | 86 | 90 | 86 | 99 | 88 |
| 7/30 | 95 | 95 | 88 | 96 | 97 | 93 | 96 | 89 | 91 | 89 | 99 | 89 |
| 7/31 | 96 | 96 | 91 | 96 | 98 | 93 | 97 | 91 | 93 | 90 | 99 | 91 |
| 8/1 | 96 | 97 | 93 | 97 | 98 | 94 | 97 | 92 | 94 | 92 | 99 | 92 |
| 8/2 | 97 | 97 | 94 | 97 | 99 | 95 | 98 | 94 | 95 | 94 | 99 | 93 |
| 8/3 | 98 | 98 | 95 | 98 | 99 | 95 | 98 | 95 | 96 | 95 | 99 | 94 |
| 8/4 | 98 | 98 | 96 | 98 | 99 | 96 | 99 | 96 | 96 | 96 | 100 | 96 |
| 8/5 | 98 | 99 | 97 | 99 | 99 | 96 | 99 | 97 | 97 | 97 | 100 | 96 |
| 8/6 | 98 | 99 | 98 | 99 | 99 | 97 | 99 | 98 | 98 | 97 | 100 | 97 |
| 8/7 | 99 | 99 | 98 | 99 | 99 | 97 | 99 | 98 | 98 | 98 | 100 | 97 |
| 8/8 | 99 | 100 | 99 | 99 | 99 | 97 | 100 | 98 | 98 | 99 | 100 | 98 |
| 8/9 | 99 | 100 | 99 | 99 | 100 | 98 | 100 | 99 | 99 | 99 | 100 | 99 |

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Appendix A.2. (Page 12 of 12).

| Date | Cumulative Percent Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 8/10 | 99 | 100 | 99 | 99 | 100 | 98 | 100 | 99 | 99 | 99 | 100 | 99 |
| 8/11 | 99 | 100 | 99 | 99 | 100 | 99 | 100 | 99 | 99 | 99 | 100 | 99 |
| 8/12 | 99 | 100 | 100 | 100 | 100 | 99 | 100 | 99 | 99 | 99 | 100 | 99 |
| 8/13 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | -99 | 99 | 100 | 100 | 99 |
| 8/14 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | 99 | 100 | 100 | 100 | 99 |
| 8/15 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/16 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/17 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/18 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/19 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/20 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/21 | 100 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/22 | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/23 | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/24 | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/25 | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/26 | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/27 | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/28 | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/29 | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/30 | | | | | | | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/31 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/1 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/2 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/3 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/4 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/5 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/6 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/7 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/8 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/9 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/10 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/11 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/12 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/13 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/14 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/15 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/16 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/17 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/18 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/19 | | | | | | | 100 | | 100 | 100 | 100 | 100 |
| 9/20 | | | | | | | | | 100 | 100 | 100 | 100 |
| 9/21 | | | | | | | | | | | | |
| 9/22 | | | | | | | | | | | | |
| 9/23 | | | | | | | | | | | | |
| 9/24 | | | | | | | | | | | | |
| 9/25 | | | | | | | | | | | | |

Appendix A.3. Historical sockeye salmon passage at the Kogrukluk River weir.

| Date | Daily Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 6/15 | | b | | | | | | | | | | | | | | |
| 6/16 | | b | | | | | | | | | | | | | | |
| 6/17 | | b | | | | | | | | | | | | | | |
| 6/18 | | b | | | | | | | | | | | | | | |
| 6/19 | | b | | | | | | | | | | | | | | |
| 6/20 | | b | | | | | | b | 0 | | | | | | | |
| 6/21 | | b | | | | 1 b | | b | 1 | | | b | | | | |
| 6/22 | | b | | | | 9 b | | b | 0 | | | b | | | 1 b | 1 b |
| 6/23 | | b | | | | 19 b | | b | 0 | | 1 | b | | 1 e | 1 b | 2 b |
| 6/24 | | b | | | | 50 b | | b | 3 | | 2 | b | | 2 e | 3 b | 7 b |
| 6/25 | | b | | | | 76 b | | b | 2 | | 2 | b | 2 b | 4 e | 5 b | 9 b |
| 6/26 | | b | | | | 91 b | 1 b | b | 1 | | 3 | b | 1 b | 4 e | 5 b | 10 b |
| 6/27 | | b | | | | 129 b | 9 b | b | 2 | | 5 | b | 8 b | 6 e | 9 b | 18 b |
| 6/28 | | b | 0 | | | 222 | 19 b | b | 3 | | 7 | b | 4 b | 10 e | 0 | 28 b |
| 6/29 | 1 | b | 0 | | | 540 | 50 b | 3 | 10 | | 2 | b | 10 b | 25 e | 0 | 70 b |
| 6/30 | 0 | b | 1 | | | 705 | 76 b | 3 | 12 | | 1 | b | 32 b | 35 e | 5 | 100 b |
| 7/1 | 1 | b | 11 | 0 | 0 | 974 | 91 b | 7 | 7 | | 8 | b | 17 b | 48 e | 6 | 136 b |
| 7/2 | 4 | b | 36 | 1 | 0 | 1,252 | 129 b | 14 | 85 | 2 b | 4 | b | 12 b | 81 e | 77 | 229 b |
| 7/3 | 7 | b | 55 | 8 | 1 | 940 | 222 b | b | 124 | 1 b | 10 | b | 18 b | 91 e | 155 | 258 b |
| 7/4 | 2 | b | 72 | 19 | 0 | 624 | 540 b | b | 57 | 8 b | 32 | b | 46 b | 99 e | 107 | 280 b |
| 7/5 | 17 | b | 58 | 14 | 4 | 798 | 705 b | b | 51 | 4 b | 17 | b | 75 | 109 e | 271 | 54 b |
| 7/6 | 27 | b | 66 | 9 | 9 | 841 | 974 b | 17 | 281 | 9 | 12 | b | 150 | 171 e | 460 | 80 b |
| 7/7 | 66 | b | 31 | 75 | b | 595 | 1,252 b | 11 | 178 | 19 | 18 | b | 283 | 73 e | 301 | 106 b |
| 7/8 | 133 | b | 101 | 124 | b | 636 | 1.500 b | 24 | 214 | 50 | 46 | b | 476 | 96 e | 634 | 132 |
| 7/9 | 204 | b | 105 | 61 | 12 | 702 | 2,025 | 225 | 159 | 76 | 73 | b | 505 | 151 e | 204 | 757 |
| 7/10 | 207 | b | 143 | 65 | 258 | 435 | 1,750 | 67 | 24 | 91 | 180 | b | 419 | 402 e | 827 | 759 |
| 7/11 | 120 | b | 116 | 84 | 120 | 647 | 748 | 4 | 62 | 129 | 364 | b | 507 | 698 e | 437 | 372 |
| 7/12 | 138 | b | 55 | 184 | b | 492 | 830 | b | 295 | 221 | 206 | b | 365 | 444 e | 617 | 589 |
| 7/13 | 230 | b | 72 | 315 | b | 421 | 821 | b | 173 | 234 | 400 | b | 239 | 527 e | 116 | 1,036 |
| 7/14 | 112 | 0 | 126 | 269 | b | 384 | 575 | b | 339 | 145 | 500 | b | 273 | 206 e | 522 | 987 |
| 7/15 | 101 | 2 | 67 | 220 | b | 469 | 302 | b | 438 | 178 | 498 | 78 | 276 | 370 e | 737 | 742 |
| 7/16 | 143 | 6 | 63 | 239 | b | 595 | 686 | b | 219 | 208 | 314 | 171 | 179 | 323 e | 463 | 778 b |
| 7/17 | 102 | 7 | 74 | 174 | b | 421 | 781 | b | 192 | 185 | 380 | b | 109 | 293 e | 409 | 814 |
| 7/18 | 147 | 18 | 48 | 146 | b | 430 | 371 | b | 84 | 173 | 175 | b | 83 | 210 e | 429 | 928 |
| 7/19 | 79 | 149 | 45 | 82 | b | 386 | 443 | b | 63 | 259 | 105 b | b | 46 | 145 e | 90 | 948 |
| 7/20 | 52 | 198 | 51 | 90 | b | 386 | 630 | b | 121 | 176 | 105 b | b | 37 | 144 e | 157 | 929 |
| 7/21 | 166 | 153 | 24 | 83 | b | 595 | 315 | b | 169 | 207 | 125 b | b | 40 | 172 e | 183 | 754 |
| 7/22 | 95 | 135 | 49 | 48 | b | 526 | 140 | b | 188 | 127 | 97 b | b | 29 | 134 e | 193 | 759 |
| 7/23 | 43 | 111 | 40 | 47 | b | 365 | 149 | b | 89 | 115 | 68 b | b | 33 | 93 e | 137 | 617 |
| 7/24 | 33 | 150 | 41 | 75 | b | 345 | 187 | b | 83 | 227 | 83 b | b | 28 | 113 e | 73 | 602 b |
| 7/25 | 34 | 95 | 32 | 32 b | b | 297 | 185 | b | 38 | 242 | 66 b | b | 9 | 90 e | 57 | 586 |
| 7/26 | 5 | 61 | 15 | 18 b | b | 257 | 141 | b | 60 | 160 | 44 b | b | 9 | 61 e | 83 | 495 |
| 7/27 | 7 | 27 | 8 | 14 b | b | 287 | 123 | b | 50 | 164 | 41 b | b | 4 | 56 e | 21 | 422 |
| 7/28 | 9 | b | 15 | 32 b | b | 242 | 89 | b | 57 | 194 | 49 b | b | 10 | 67 e | 73 | 256 |
| 7/29 | 3 | b | 11 | 25 b | b | 189 | 86 | b | 32 | 157 | 37 b | b | 6 | 50 e | 117 | 181 |
| 7/30 | 8 | b | 8 | 23 b | b | 141 | 77 | b | 18 | 131 | 31 b | b | 9 | 43 e | 81 | 128 |
| 7/31 | 6 | b | 7 | 20 b | b | 110 | 67 | b | 14 | 93 | 24 b | b | 12 | 33 e | 60 | 136 |
| 8/1 | 2 b | b | 2 b | 8 b | b | 80 | 56 | b | 32 | 108 | 22 b | b | 8 b | 30 e | 59 | 104 |
| 8/2 | 3 b | b | 3 b | 2 b | b | 67 | 26 | b | 25 | 57 | 14 b | b | 4 b | 19 e | 64 | 83 |
| 8/3 | 3 b | b | 3 b | 3 b | b | 65 | 29 | b | 23 | 43 | 12 b | b | 1 | 16 e | 45 | 48 |
| 8/4 | 3 b | b | 3 b | 3 b | b | 41 | 23 | b | 20 | 41 | 11 b | b | 3 | 15 e | 17 | 36 |
| 8/5 | 1 b | b | 1 b | 3 b | b | 18 | 17 | b | 8 | 27 | 6 b | b | 3 | 8 e | 28 | 24 |
| 8/6 | 6 b | b | 6 b | 1 b | b | 27 | 12 | b | 2 | 27 | 8 b | b | 2 | 10 e | 12 | 14 |
| 8/7 | 3 b | b | 3 b | 6 b | b | 13 | 8 | b | 3 | 11 | 8 b | b | 1 | 7 e | 14 | 10 |
| 8/8 | 0 b | b | 0 b | 3 b | b | 15 | 9 | b | 3 | 27 | 2 b | b | 0 | 6 e | 13 | 3 |

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Appendix A.3. (Page 2 of 12)

| Date | Daily Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 8/9 | 1 b | b | 1 b | 0 b | b | 23 | 6 | b | 3 | 8 | 3 b | 2 | 1 | 4 e | 5 | 3 |
| 8/10 | 1 b | b | 1 b | 1 b | b | 20 | 5 | b | 1 | 7 | 3 b | 5 | 3 | 3 e | 1 | 4 |
| 8/11 | 0 b | b | 0 b | 1 b | b | 8 | 5 | b | 6 | 1 | 3 b | 6 | 1 | 2 e | 4 | 6 |
| 8/12 | 0 b | b | 0 b | 0 b | b | 12 | 3 | b | 3 | 13 | 3 b | 0 | 1 | 3 e | 6 | 9 |
| 8/13 | 0 b | b | 0 b | 0 b | b | 10 | 0 | b | 0 | 2 | 2 b | 1 | 1 | 1 e | 4 | 4 |
| 8/14 | 1 b | b | 1 b | 0 b | b | 10 | 4 | b | 1 | 1 | 0 b | 2 | 1 | 2 e | 3 | 0 |
| 8/15 | 0 b | b | 0 b | 1 b | b | 5 | 4 | b | 1 | 1 | 0 b | 1 | 0 | 1 e | 2 | 1 |
| 8/16 | | | | 0 b | b | 6 | 1 | b | 0 | 0 | 0 b | 1 | 0 | 0 e | 0 | 1 |
| 8/17 | | | | | b | 7 | 0 | b | 0 | 0 | 0 b | 3 | 0 | 0 e | 3 | 1 |
| 8/18 | | | | | b | 1 | 0 | b | 0 | 0 | 0 b | 2 | 2 | 1 e | 0 | 4 |
| 8/19 | | | | | b | 2 | 0 | b | 1 | 0 | 0 b | 1 | 1 | 0 e | 0 | 0 |
| 8/20 | | | | | b | 2 | 0 | b | 0 | 0 | 0 b | 1 | 0 | 0 e | 0 | 1 |
| 8/21 | | | | | b | 0 | 0 | b | 1 | 0 | 1 | 1 | 1 | 0 e | 0 | 0 |
| 8/22 | | | | | b | 2 | 0 | b | 0 | 0 | 2 | 0 | 1 | 1 e | 0 | 0 |
| 8/23 | | | | | b | 0 | 0 | b | 0 | 0 | 2 | 1 | 0 | 1 e | 0 | 0 |
| 8/24 | | | | | b | 3 | 0 | b | 0 | 0 | 3 | 1 | 0 | 1 e | 0 | 1 |
| 8/25 | | | | | b | 0 | 0 | b | 1 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 8/26 | | | | | b | 1 | 0 | b | 1 | 0 | 1 | 1 | 0 | | 0 | 2 |
| 8/27 | | | | | b | 1 | 0 | b | 0 | 0 | 2 | 0 | 1 | | 0 | 0 |
| 8/28 | | | | | b | 1 | 0 | b | 0 | 0 | 1 | 0 | 0 | | 0 | 0 |
| 8/29 | | | | | b | 2 | 0 | b | 0 | 0 | 0 | 0 | 0 | | 0 | 1 |
| 8/30 | | | | | b | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 8/31 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 9/1 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 9/2 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 9/3 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 9/4 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 9/5 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 9/6 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 9/7 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 9/8 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 9/9 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| 9/10 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 |
| 9/11 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 |
| 9/12 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 |
| 9/13 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 |
| 9/14 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 |
| 9/15 | | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 |
| 9/16 | | | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | | | 0 |
| 9/17 | | | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | | | |
| 9/18 | | | | | | 0 | | 0 | | 0 | 0 | 0 | | | | |
| 9/19 | | | | | | 0 | | 0 | | 0 | 0 | 0 | | | | |
| 9/20 | | | | | | 0 | | 0 | | 0 | 0 | 0 | | | | |
| Total | 2,326 | 1,112 | 1,670 | 2,628 | 404 | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | 5,811 | 8,406 | 16,455 |
| Obs. | 2,302 | 1,112 | 1,646 | 2,432 | 404 | 17,691 | 11,729 | 375 | 4,133 | 4,344 | 3,252 | 278 | 4,235 | 2,599 | 8,382 | 13,687 |
| Est. | 24 | 525 | 24 | 196 | 2,796 | 375 | 5,568 | 801 | 0 | 15 | 992 | 695 | 162 | 3,212 | 24 | 2,768 |
| Total | 2,326 | 1,637 f | 1,670 | 2,628 | 3,200 f | 18,066 | 17,297 | 1,176 f | 4,133 | 4,359 | 4,244 | 973 f | 4,397 | 5,811 | 8,406 | 16,455 |
| % Obs. | 99 | 68 | 99 | 93 | 13 | 98 | 68 | 32 | 100 | 100 | 77 | 29 | 96 | 45 | 100 | 83 |

a = Daily passage was estimated due to the occurrence of a hole in the weir.
b = The weir was not operational; daily passage was estimated.
c = The weir was not operational; daily passage was not estimated
d = Partial day count, passage was not estimated.
e = Estimates not differentiable from observations.
f = Estimates not represented in the raw data; not broken down by day.

Appendix A.3. (Page 3 of 12).

| Date | Daily Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 6/15 | | | | | | | | | | | | |
| 6/16 | | | | | | | | | | | | |
| 6/17 | | | | | | | | | | | | |
| 6/18 | | | | | | | | | | | | |
| 6/19 | | | | | | | | | | | | |
| 6/20 | | | | | | 0 b | 0 b | | | | | |
| 6/21 | | 1 b | | 0 b | | 0 b | 0 b | | | | | 0 |
| 6/22 | | 2 b | 1 b | 1 b | 1 b | 0 b | 0 b | | | 1 b | | 0 |
| 6/23 | 1 b | 3 b | 2 b | 1 b | 2 b | 0 b | 0 b | | | 2 b | | 0 |
| 6/24 | 3 b | 11 b | 5 b | 4 b | 6 b | 0 b | 0 b | | | 4 b | | 0 |
| 6/25 | 4 b | 17 b | 8 b | 7 b | 9 b | 0 b | 0 b | | | 4 b | | 0 |
| 6/26 | 5 b | 18 b | 9 b | 7 b | 10 b | 0 b | 0 b | | | 10 b | 3 | 0 |
| 6/27 | 8 b | 33 b | 16 b | 12 b | 17 b | 0 b | 0 b | | | 5 b | 5 | 1 |
| 6/28 | 13 b | 49 b | 22 b | 17 b | 24 b | 0 b | 8 b | | | 10 b | 1 | 1 |
| 6/29 | 32 b | 126 b | 56 b | 43 b | 61 b | 8 | 3 b | | | 15 b | 17 | 1 |
| 6/30 | 46 b | 177 b | 81 b | 63 b | 10 | 83 | 111 b | | | 23 b | 6 | 11 |
| 7/1 | 33 b | 242 b | 105 b | 81 b | 75 | 30 | 40 b | | | 134 b | 16 | 4 |
| 7/2 | 88 | 410 b | 7 | 147 b | 257 | 104 | 140 b | | | 91 b | 77 | 20 |
| 7/3 | 181 | 120 | 8 | 31 | 385 | 91 | 122 b | | | 143 b | 145 | 49 |
| 7/4 | 131 | 498 b | 10 | 236 | 243 | 319 | 428 b | | | 199 b | 235 | 37 |
| 7/5 | 105 | 524 b | 24 | 383 | 452 | 291 | 391 b | | 10 | 50 | 158 | 49 |
| 7/6 | 77 | 648 | 52 | 537 | 536 | 537 | 238 b | 1 | 14 | 130 | 422 | 271 |
| 7/7 | 133 | 1,126 | 120 | 458 | 806 | 574 | 13 | 7 | 12 | 245 | 43 | 173 |
| 7/8 | 61 | 1,371 | 140 | 430 | 646 | 577 | 535 | 6 | 17 | 487 | 491 | 466 |
| 7/9 | 145 | 2,157 | 205 | 501 | 1,105 | 549 | 757 | 14 | 41 | 603 | 51 | 662 |
| 7/10 | 125 | 2,517 | 126 | 708 | 945 | 261 | 397 | 41 | 91 | 345 | 190 | 220 |
| 7/11 | 355 | 1,899 | 795 | 806 | 954 | 330 | 666 | 45 | 169 | 634 | 421 | 89 |
| 7/12 | 266 | 1,796 | 784 | 337 | 908 | 377 | 1,461 | 92 | 217 | 748 | 275 | 420 |
| 7/13 | 225 | 1,818 | 848 | 395 | 1,539 | 428 | 2,069 | 143 | 35 | 524 | 127 | 449 |
| 7/14 | 394 | 1,502 | 848 | 212 | 1,122 | 421 | 1,396 | 144 | 22 | 846 | 205 | 758 |
| 7/15 | 416 | 1,822 | 864 | 362 | 821 | 668 | 992 | 228 | 103 | 499 | 157 | 705 |
| 7/16 | 406 | 2,028 | 770 | 621 | 458 | 826 | 1,108 | 400 | 285 | 346 | 211 | 502 |
| 7/17 | 239 | 2,040 | 685 | 694 | 368 | 443 | 589 | 318 | 150 | 231 | 222 | 466 |
| 7/18 | 466 | 1,711 | 1,123 | 369 | 299 | 955 | 138 | 236 | 169 | 145 | 167 a | 469 |
| 7/19 | 418 | 832 | 432 | 494 | 385 | 851 | 405 | 348 | 90 | 235 | 67 | 704 |
| 7/20 | 272 | 945 | 422 | 263 | 209 | 876 | 462 | 352 | 94 | 317 b | 49 a | 538 |
| 7/21 | 245 | 779 | 458 | 493 | 370 | 611 | 469 | 338 | 223 | 320 b | 49 a | 448 |
| 7/22 | 138 | 220 | 352 | 472 | 268 | 566 | 441 | 345 | 218 | 165 b | 31 | 310 |
| 7/23 | 318 | 286 | 286 | 258 | 233 | 274 | 244 | 248 | 147 | 152 b | 17 | 103 |
| 7/24 | 261 | 202 | 306 | 216 | 251 | 511 | 164 | 440 | 113 | 140 b | 59 | 175 |
| 7/25 | 242 | 191 | 256 | 232 | 308 | 152 | 449 | 354 | 22 | 96 b | 33 | 321 |
| 7/26 | 152 | 214 | 184 | 137 | 67 | 129 | 334 | 157 | 78 | 126 b | 24 | 131 |
| 7/27 | 245 | 230 | 177 | 258 | 117 | 193 | 452 | 308 | 103 | 103 b | 9 | 112 |
| 7/28 | 236 | 182 | 450 | 92 | 99 | 161 | 424 | 148 | 63 | 77 b | 13 | 100 |
| 7/29 | 282 | 162 b | 665 | 103 | 236 | 182 | 258 | 148 | 45 | 99 | 6 | 75 b |
| 7/30 | 212 | 142 b | 690 | 151 | 244 | 127 | 228 | 232 | 34 | 92 | 6 | 75 b |
| 7/31 | 149 | 87 | 552 | 56 | 81 | 89 | 189 | 162 | 80 | 61 | 6 | 46 |
| 8/1 | 100 | 51 | 427 | 42 | 71 | 89 | 130 | 165 | 27 | 73 | 0 | 41 |
| 8/2 | 152 | 29 | 226 | 70 | 61 | 62 | 99 | 95 | 32 | 52 | 1 | 34 |
| 8/3 | 62 | 19 | 235 | 54 | 51 | 54 | 96 | 77 | 25 b | 37 | 1 | 25 a |
| 8/4 | 19 b | 16 | 36 | 38 | 32 | 37 | 77 | 75 | 21 b | 32 | 1 | 25 a |
| 8/5 | 11 b | 16 | 23 | 19 | 38 | 38 | 74 | 68 b | 18 b | 23 | 1 | 18 |
| 8/6 | 13 b | 20 | 24 | 9 | 47 | 41 | 19 | 19 b | 14 b | 18 | 1 | 7 |
| 8/7 | 14 b | 24 | 75 | 8 | 31 | 16 | 25 | 28 | 11 b | 9 | 2 | 17 |
| 8/8 | 3 b | 17 | 62 | 17 | 23 | 26 | 18 | 22 | 1 | 16 | 3 | 5 |

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Appendix A.3. (Page 4 of 12).

| Date | Daily Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 8/9 | 5 b | 14 | 30 | 10 | 9 | 15 | 23 | 14 | 10 | 3 | 2 | 5 |
| 8/10 | 6 | 2 | 32 | 7 b | 31 | 14 | 17 | 13 | 9 | 8 | 4 | 5 |
| 8/11 | 4 | 2 | 23 | 4 b | 6 b | 20 | 16 | 7 | 10 | 4 | 0 | 2 |
| 8/12 | 7 | 6 | 13 | 6 b | 9 b | 32 | 6 | 5 | 7 | 11 | 3 | 1 |
| 8/13 | 6 | 4 | 4 | 3 b | 4 b | 14 b | 6 | 3 | 6 | 7 | 0 | 1 |
| 8/14 | 4 | 0 | 9 | 12 b | 16 | 5 b | 11 | 6 | 7 | 7 | 0 | 0 |
| 8/15 | 0 | 0 | 1 | 0 b | 7 | 4 | 6 | 3 | 6 | 4 | 2 | 0 |
| 8/16 | 0 | 0 | 7 | 0 | 1 | 5 | 6 | 3 | 3 | 1 | 1 | 0 |
| 8/17 | 4 | 0 | 4 | 1 | 2 | 2 | 3 | 3 | 2 | 3 | 0 | 0 |
| 8/18 | 0 | 0 | 2 | 1 | 5 | 4 | 3 | 0 | 1 | 1 | 2 | 0 |
| 8/19 | 0 | 0 | 1 | 2 | 0 | 1 | 1 | 2 | 1 | 1 b | 0 | 0 |
| 8/20 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 b | 0 | 0 |
| 8/21 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 |
| 8/22 | | 0 | 1 | 0 | 2 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |
| 8/23 | | 0 | 1 | 0 | 4 | 1 | 1 | 0 | 1 | 1 | 3 | 0 |
| 8/24 | | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 8/25 | | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 2 | 0 | 0 |
| 8/26 | | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 8/27 | | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 b |
| 8/28 | | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 3 | 0 b |
| 8/29 | | 0 | 4 | 3 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 b |
| 8/30 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 |
| 8/31 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/1 | | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 9/2 | | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 9/3 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 9/4 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/5 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/6 | | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/7 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 9/8 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/9 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/10 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/11 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/12 | | | | | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 9/13 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/14 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/15 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/16 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/17 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/18 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/19 | | | | | | 0 | 0 | | 0 | 0 | 0 | 0 |
| 9/20 | | | | | | 0 | | | 0 | 0 | 0 | 0 |
| Total | 7,540 | 29,358 | 14,192 | 10,996 | 15,385 | 13,078 | 16,773 | 5,864 | 2,867 | 8,773 | 4,050 | 9,164 |
| Obs. | 7,329 | 26,943 | 13,887 | 10,581 | 15,221 | 13,059 | 5,321 | 5,777 | 2,778 | 6,634 | 3,913 | 8,986 |
| Est. | 211 | 2,415 | 305 | 415 | 164 | 19 | 11,452 | 87 | 89 | 2,139 | 137 | 178 |
| Total | 7,540 | 29,358 | 14,192 | 10,996 | 15,385 | 13,078 | 16,773 | 5,864 | 2,867 | 8,773 | 4,050 | 9,164 |
| % Obs. | 97 | 92 | 98 | 96 | 99 | 100 | 32 | 99 | 97 | 76 | 97 | 98 |

a = Daily passage was estimated due to the occurrence of a hole in the weir.
b = The weir was not operational; daily passage was estimated.
c = The weir was not operational; daily passage was not estimated
d = Partial day count, passage was not estimated.
e = Estimates not differentiable from observations.
f = Estimates not represented in the raw data; not broken down by day.

Appendix A.3. (Page 5 of 12)

| Date | Cumulative Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 6/15 | | | | | | | | | | | | | | | | |
| 6/16 | | | | | | | | | | | | | | | | |
| 6/17 | | | | | | | | | | | | | | | | |
| 6/18 | | | | | | | | | | | | | | | | |
| 6/19 | | | | | | | | | | | | | | | | |
| 6/20 | | | | | | | | | 0 | | | | | | | |
| 6/21 | | | | | | 1 | | | 1 | | | | | | | |
| 6/22 | | | | | | 10 | | | 1 | | | | | | 1 | 1 |
| 6/23 | | | | | | 29 | | | 1 | | 1 | | | 1 | 2 | 3 |
| 6/24 | | | | | | 79 | | | 4 | | 3 | | | 3 | 5 | 10 |
| 6/25 | | | | | | 155 | | | 6 | | 5 | | 2 | 7 | 10 | 19 |
| 6/26 | | | | | | 246 | 1 | | 7 | | 8 | | 3 | 11 | 15 | 29 |
| 6/27 | | | | | | 375 | 10 | | 9 | | 13 | | 11 | 17 | 24 | 47 |
| 6/28 | | | 0 | | | 597 | 29 | | 12 | | 20 | | 15 | 27 | 24 | 75 |
| 6/29 | 1 | | 0 | | | 1,137 | 79 | 3 | 22 | | 22 | | 25 | 52 | 24 | 145 |
| 6/30 | 1 | | 1 | | | 1,842 | 155 | 6 | 34 | | 23 | | 57 | 87 | 29 | 245 |
| 7/1 | 2 | | 12 | 0 | 0 | 2,816 | 246 | 13 | 41 | | 31 | | 74 | 135 | 35 | 381 |
| 7/2 | 6 | | 48 | 1 | 0 | 4,068 | 375 | 27 | 126 | 2 | 35 | | 86 | 216 | 112 | 610 |
| 7/3 | 13 | | 103 | 9 | 1 | 5,008 | 597 | 27 | 250 | 3 | 45 | | 104 | 307 | 267 | 868 |
| 7/4 | 15 | | 175 | 28 | 1 | 5,632 | 1,137 | 27 | 307 | 11 | 77 | | 150 | 406 | 374 | 1,148 |
| 7/5 | 32 | | 233 | 42 | 5 | 6,430 | 1,842 | 27 | 358 | 15 | 94 | | 225 | 515 | 645 | 1,202 |
| 7/6 | 59 | | 299 | 51 | 14 | 7,271 | 2,816 | 44 | 639 | 24 | 106 | | 375 | 686 | 1,105 | 1,282 |
| 7/7 | 125 | | 330 | 126 | 14 | 7,866 | 4,068 | 55 | 817 | 43 | 124 | | 658 | 759 | 1,406 | 1,388 |
| 7/8 | 258 | | 431 | 250 | 14 | 8,502 | 5,568 | 79 | 1,031 | 93 | 170 | | 1,134 | 855 | 2,040 | 1,520 |
| 7/9 | 462 | | 536 | 311 | 26 | 9,204 | 7,593 | 304 | 1,190 | 169 | 243 | | 1,639 | 1,006 | 2,244 | 2,277 |
| 7/10 | 669 | | 679 | 376 | 284 | 9,639 | 9,343 | 371 | 1,214 | 260 | 423 | | 2,058 | 1,408 | 3,071 | 3,036 |
| 7/11 | 789 | | 795 | 460 | 404 | 10,286 | 10,091 | 375 | 1,276 | 389 | 787 | | 2,565 | 2,106 | 3,508 | 3,408 |
| 7/12 | 927 | | 850 | 644 | | 10,778 | 10,921 | 375 | 1,571 | 610 | 993 | | 2,930 | 2,550 | 4,125 | 3,997 |
| 7/13 | 1,157 | | 922 | 959 | | 11,199 | 11,742 | 375 | 1,744 | 844 | 1,393 | | 3,169 | 3,077 | 4,241 | 5,033 |
| 7/14 | 1,269 | 0 | 1,048 | 1,228 | | 11,583 | 12,317 | 375 | 2,083 | 989 | 1,893 | | 3,442 | 3,283 | 4,763 | 6,020 |
| 7/15 | 1,370 | 2 | 1,115 | 1,448 | | 12,052 | 12,619 | 375 | 2,521 | 1,167 | 2,391 | 78 | 3,718 | 3,653 | 5,500 | 6,762 |
| 7/16 | 1,513 | 8 | 1,178 | 1,687 | | 12,647 | 13,305 | 375 | 2,740 | 1,375 | 2,705 | 249 | 3,897 | 3,976 | 5,963 | 7,540 |
| 7/17 | 1,615 | 15 | 1,252 | 1,861 | | 13,068 | 14,086 | 375 | 2,932 | 1,560 | 3,085 | 249 | 4,006 | 4,269 | 6,372 | 8,354 |
| 7/18 | 1,762 | 33 | 1,300 | 2,007 | | 13,498 | 14,457 | 375 | 3,016 | 1,733 | 3,260 | 249 | 4,089 | 4,479 | 6,801 | 9,282 |
| 7/19 | 1,841 | 182 | 1,345 | 2,089 | | 13,884 | 14,900 | 375 | 3,079 | 1,992 | 3,365 | 249 | 4,135 | 4,624 | 6,891 | 10,230 |
| 7/20 | 1,893 | 380 | 1,396 | 2,179 | | 14,270 | 15,530 | 375 | 3,200 | 2,168 | 3,470 | 249 | 4,172 | 4,768 | 7,048 | 11,159 |
| 7/21 | 2,059 | 533 | 1,420 | 2,262 | | 14,865 | 15,845 | 375 | 3,369 | 2,375 | 3,595 | 249 | 4,212 | 4,940 | 7,231 | 11,913 |
| 7/22 | 2,154 | 668 | 1,469 | 2,310 | | 15,391 | 15,985 | 375 | 3,557 | 2,502 | 3,692 | 249 | 4,241 | 5,074 | 7,424 | 12,672 |
| 7/23 | 2,197 | 779 | 1,509 | 2,357 | | 15,756 | 16,134 | 375 | 3,646 | 2,617 | 3,760 | 249 | 4,274 | 5,167 | 7,561 | 13,289 |
| 7/24 | 2,230 | 929 | 1,550 | 2,432 | | 16,101 | 16,321 | 375 | 3,729 | 2,844 | 3,843 | 249 | 4,302 | 5,280 | 7,634 | 13,891 |
| 7/25 | 2,264 | 1,024 | 1,582 | 2,464 | | 16,398 | 16,506 | 375 | 3,767 | 3,086 | 3,909 | 249 | 4,311 | 5,370 | 7,691 | 14,477 |
| 7/26 | 2,269 | 1,085 | 1,597 | 2,482 | | 16,655 | 16,647 | 375 | 3,827 | 3,246 | 3,953 | 249 | 4,320 | 5,431 | 7,774 | 14,972 |
| 7/27 | 2,276 | 1,112 | 1,605 | 2,496 | | 16,942 | 16,770 | 375 | 3,877 | 3,410 | 3,994 | 249 | 4,324 | 5,487 | 7,795 | 15,394 |
| 7/28 | 2,285 | | 1,620 | 2,528 | | 17,184 | 16,859 | 375 | 3,934 | 3,604 | 4,043 | 249 | 4,334 | 5,554 | 7,868 | 15,650 |
| 7/29 | 2,288 | | 1,631 | 2,553 | | 17,373 | 16,945 | 375 | 3,966 | 3,761 | 4,080 | 249 | 4,340 | 5,604 | 7,985 | 15,831 |
| 7/30 | 2,296 | | 1,639 | 2,576 | | 17,514 | 17,022 | 375 | 3,984 | 3,892 | 4,111 | 249 | 4,349 | 5,647 | 8,066 | 15,959 |
| 7/31 | 2,302 | | 1,646 | 2,596 | | 17,624 | 17,089 | 375 | 3,998 | 3,985 | 4,135 | 249 | 4,361 | 5,680 | 8,126 | 16,095 |
| 8/1 | 2,304 | | 1,648 | 2,604 | | 17,704 | 17,145 | 375 | 4,030 | 4,093 | 4,157 | 249 | 4,369 | 5,710 | 8,185 | 16,199 |
| 8/2 | 2,307 | | 1,651 | 2,606 | | 17,771 | 17,171 | 375 | 4,055 | 4,150 | 4,171 | 249 | 4,373 | 5,729 | 8,249 | 16,282 |
| 8/3 | 2,310 | | 1,654 | 2,609 | | 17,836 | 17,200 | 375 | 4,078 | 4,193 | 4,183 | 249 | 4,374 | 5,745 | 8,294 | 16,330 |
| 8/4 | 2,313 | | 1,657 | 2,612 | | 17,877 | 17,223 | 375 | 4,098 | 4,234 | 4,194 | 249 | 4,377 | 5,760 | 8,311 | 16,366 |
| 8/5 | 2,314 | | 1,658 | 2,615 | | 17,895 | 17,240 | 375 | 4,106 | 4,261 | 4,200 | 249 | 4,380 | 5,768 | 8,339 | 16,390 |
| 8/6 | 2,320 | | 1,664 | 2,616 | | 17,922 | 17,252 | 375 | 4,108 | 4,288 | 4,208 | 249 | 4,382 | 5,778 | 8,351 | 16,404 |
| 8/7 | 2,323 | | 1,667 | 2,622 | | 17,935 | 17,260 | 375 | 4,111 | 4,299 | 4,216 | 249 | 4,383 | 5,785 | 8,365 | 16,414 |
| 8/8 | 2,323 | | 1,667 | 2,625 | | 17,950 | 17,269 | 375 | 4,114 | 4,326 | 4,218 | 249 | 4,383 | 5,791 | 8,378 | 16,417 |

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Appendix A.3. (Page 6 of 12)

| Date | Cumulative Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 8/9 | 2,324 | | 1,668 | 2,625 | | 17,973 | 17,275 | 375 | 4,117 | 4,334 | 4,221 | 251 | 4,384 | 5,795 | 8,383 | 16,420 |
| 8/10 | 2,325 | | 1,669 | 2,626 | | 17,993 | 17,280 | 375 | 4,118 | 4,341 | 4,224 | 256 | 4,387 | 5,798 | 8,384 | 16,424 |
| 8/11 | 2,325 | | 1,669 | 2,627 | | 18,001 | 17,285 | 375 | 4,124 | 4,342 | 4,227 | 262 | 4,388 | 5,800 | 8,388 | 16,430 |
| 8/12 | 2,325 | | 1,669 | 2,627 | | 18,013 | 17,288 | 375 | 4,127 | 4,355 | 4,230 | 262 | 4,389 | 5,803 | 8,394 | 16,439 |
| 8/13 | 2,325 | | 1,669 | 2,627 | | 18,023 | 17,288 | 375 | 4,127 | 4,357 | 4,232 | 263 | 4,390 | 5,804 | 8,398 | 16,443 |
| 8/14 | 2,326 | | 1,670 | 2,627 | | 18,033 | 17,292 | 375 | 4,128 | 4,358 | 4,232 | 265 | 4,391 | 5,806 | 8,401 | 16,443 |
| 8/15 | 2,326 | | 1,670 | 2,628 | | 18,038 | 17,296 | 375 | 4,129 | 4,359 | 4,232 | 266 | 4,391 | 5,807 | 8,403 | 16,444 |
| 8/16 | | | | 2,628 | | 18,044 | 17,297 | 375 | 4,129 | 4,359 | 4,232 | 267 | 4,391 | 5,807 | 8,403 | 16,445 |
| 8/17 | | | | | | 18,051 | 17,297 | 375 | 4,129 | 4,359 | 4,232 | 270 | 4,391 | 5,807 | 8,406 | 16,446 |
| 8/18 | | | | | | 18,052 | 17,297 | 375 | 4,129 | 4,359 | 4,232 | 272 | 4,393 | 5,808 | 8,406 | 16,450 |
| 8/19 | | | | | | 18,054 | 17,297 | 375 | 4,130 | 4,359 | 4,232 | 273 | 4,394 | 5,808 | 8,406 | 16,450 |
| 8/20 | | | | | | 18,056 | 17,297 | 375 | 4,130 | 4,359 | 4,232 | 274 | 4,394 | 5,808 | 8,406 | 16,451 |
| 8/21 | | | | | | 18,056 | 17,297 | 375 | 4,131 | 4,359 | 4,233 | 275 | 4,395 | 5,808 | 8,406 | 16,451 |
| 8/22 | | | | | | 18,058 | 17,297 | 375 | 4,131 | 4,359 | 4,235 | 275 | 4,396 | 5,809 | 8,406 | 16,451 |
| 8/23 | | | | | | 18,058 | 17,297 | 375 | 4,131 | 4,359 | 4,237 | 276 | 4,396 | 5,810 | 8,406 | 16,451 |
| 8/24 | | | | | | 18,061 | 17,297 | 375 | 4,131 | 4,359 | 4,240 | 277 | 4,396 | 5,811 | 8,406 | 16,452 |
| 8/25 | | | | | | 18,061 | 17,297 | 375 | 4,132 | 4,359 | 4,240 | 277 | 4,396 | | 8,406 | 16,452 |
| 8/26 | | | | | | 18,062 | 17,297 | 375 | 4,133 | 4,359 | 4,241 | 278 | 4,396 | | 8,406 | 16,454 |
| 8/27 | | | | | | 18,063 | 17,297 | 375 | 4,133 | 4,359 | 4,243 | 278 | 4,397 | | 8,406 | 16,454 |
| 8/28 | | | | | | 18,064 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | 8,406 | 16,454 |
| 8/29 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | 8,406 | 16,455 |
| 8/30 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | 8,406 | 16,455 |
| 8/31 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | 8,406 | 16,455 |
| 9/1 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | 8,406 | 16,455 |
| 9/2 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | 8,406 | 16,455 |
| 9/3 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | 8,406 | 16,455 |
| 9/4 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | 8,406 | 16,455 |
| 9/5 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | 8,406 | 16,455 |
| 9/6 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | 8,406 | 16,455 |
| 9/7 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | 8,406 | 16,455 |
| 9/8 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | 8,406 | 16,455 |
| 9/9 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | 8,406 | 16,455 |
| 9/10 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | | 16,455 |
| 9/11 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | | 16,455 |
| 9/12 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | | 16,455 |
| 9/13 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | | 16,455 |
| 9/14 | | | | | | 18,066 | 17,297 | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | | 16,455 |
| 9/15 | | | | | | 18,066 | | 375 | 4,133 | 4,359 | 4,244 | 278 | 4,397 | | | 16,455 |
| 9/16 | | | | | | 18,066 | | 375 | | 4,359 | 4,244 | 278 | 4,397 | | | 16,455 |
| 9/17 | | | | | | 18,066 | | 375 | | 4,359 | 4,244 | 278 | 4,397 | | | |
| 9/18 | | | | | | 18,066 | | 375 | | 4,359 | 4,244 | 278 | | | | |
| 9/19 | | | | | | 18,066 | | 375 | | 4,359 | 4,244 | 278 | | | | |
| 9/20 | | | | | | 18,066 | | 375 | | 4,359 | 4,244 | 278 | | | | |

Appendix A.3. (Page 7 of 12).

| Date | Cumulative Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 6/15 | | | | | | | | | | | | |
| 6/16 | | | | | | | | | | | | |
| 6/17 | | | | | | | | | | | | |
| 6/18 | | | | | | | | | | | | |
| 6/19 | | | | | | | | | | | | |
| 6/20 | | | | | | 0 | 0 | | | | | |
| 6/21 | | 1 | | 0 | | 0 | 0 | | | | | 0 |
| 6/22 | | 3 | 1 | 1 | 1 | 0 | 0 | | | 1 | | 0 |
| 6/23 | 1 | 6 | 3 | 2 | 3 | 0 | 0 | | | 2 | | 0 |
| 6/24 | 4 | 17 | 8 | 6 | 9 | 0 | 0 | | | 7 | | 0 |
| 6/25 | 8 | 34 | 16 | 13 | 17 | 0 | 0 | | | 10 | | 0 |
| 6/26 | 13 | 52 | 25 | 20 | 27 | 0 | 0 | | | 20 | 3 | 0 |
| 6/27 | 21 | 85 | 41 | 32 | 44 | 0 | 0 | | | 25 | 8 | 1 |
| 6/28 | 34 | 134 | 63 | 49 | 68 | 0 | 8 | | | 35 | 9 | 2 |
| 6/29 | 66 | 260 | 119 | 92 | 129 | 8 | 11 | | | 50 | 26 | 3 |
| 6/30 | 112 | 437 | 200 | 155 | 139 | 91 | 122 | | | 73 | 32 | 14 |
| 7/1 | 145 | 679 | 305 | 236 | 214 | 121 | 162 | | | 207 | 48 | 18 |
| 7/2 | 233 | 1,089 | 312 | 383 | 471 | 225 | 302 | | | 298 | 125 | 38 |
| 7/3 | 414 | 1,209 | 320 | 414 | 856 | 316 | 424 | | | 441 | 270 | 87 |
| 7/4 | 545 | 1,707 | 330 | 650 | 1,099 | 635 | 853 | | | 640 | 505 | 124 |
| 7/5 | 650 | 2,231 | 354 | 1,033 | 1,551 | 926 | 1,243 | | 10 | 690 | 663 | 173 |
| 7/6 | 727 | 2,879 | 406 | 1,570 | 2,087 | 1,463 | 1,481 | 1 | 24 | 820 | 1,085 | 444 |
| 7/7 | 860 | 4,005 | 526 | 2,028 | 2,893 | 2,037 | 1,494 | 8 | 36 | 1,065 | 1,128 | 617 |
| 7/8 | 921 | 5,376 | 666 | 2,458 | 3,539 | 2,614 | 2,029 | 14 | 53 | 1,552 | 1,619 | 1,083 |
| 7/9 | 1,066 | 7,533 | 871 | 2,959 | 4,644 | 3,163 | 2,786 | 28 | 94 | 2,155 | 1,670 | 1,745 |
| 7/10 | 1,191 | 10,050 | 997 | 3,667 | 5,589 | 3,424 | 3,183 | 69 | 185 | 2,500 | 1,860 | 1,965 |
| 7/11 | 1,546 | 11,949 | 1,792 | 4,473 | 6,543 | 3,754 | 3,850 | 114 | 354 | 3,134 | 2,281 | 2,054 |
| 7/12 | 1,812 | 13,745 | 2,576 | 4,810 | 7,451 | 4,131 | 5,310 | 206 | 571 | 3,882 | 2,556 | 2,474 |
| 7/13 | 2,037 | 15,563 | 3,424 | 5,205 | 8,990 | 4,559 | 7,379 | 349 | 606 | 4,406 | 2,683 | 2,923 |
| 7/14 | 2,431 | 17,065 | 4,272 | 5,417 | 10,112 | 4,980 | 8,776 | 493 | 628 | 5,252 | 2,888 | 3,681 |
| 7/15 | 2,847 | 18,887 | 5,136 | 5,779 | 10,933 | 5,648 | 9,767 | 721 | 731 | 5,751 | 3,045 | 4,386 |
| 7/16 | 3,253 | 20,915 | 5,906 | 6,400 | 11,391 | 6,474 | 10,876 | 1,121 | 1,016 | 6,097 | 3,256 | 4,888 |
| 7/17 | 3,492 | 22,955 | 6,591 | 7,094 | 11,759 | 6,917 | 11,465 | 1,439 | 1,166 | 6,328 | 3,478 | 5,354 |
| 7/18 | 3,958 | 24,666 | 7,714 | 7,463 | 12,058 | 7,872 | 11,603 | 1,675 | 1,335 | 6,473 | 3,645 | 5,823 |
| 7/19 | 4,376 | 25,498 | 8,146 | 7,957 | 12,443 | 8,723 | 12,008 | 2,023 | 1,425 | 6,708 | 3,712 | 6,527 |
| 7/20 | 4,648 | 26,443 | 8,568 | 8,220 | 12,652 | 9,599 | 12,470 | 2,375 | 1,519 | 7,025 | 3,761 | 7,065 |
| 7/21 | 4,893 | 27,222 | 9,026 | 8,713 | 13,022 | 10,210 | 12,939 | 2,713 | 1,742 | 7,346 | 3,810 | 7,513 |
| 7/22 | 5,031 | 27,442 | 9,378 | 9,185 | 13,290 | 10,776 | 13,380 | 3,058 | 1,960 | 7,511 | 3,841 | 7,823 |
| 7/23 | 5,349 | 27,728 | 9,664 | 9,443 | 13,523 | 11,050 | 13,624 | 3,306 | 2,107 | 7,663 | 3,858 | 7,926 |
| 7/24 | 5,610 | 27,930 | 9,970 | 9,659 | 13,774 | 11,561 | 13,788 | 3,746 | 2,220 | 7,803 | 3,917 | 8,101 |
| 7/25 | 5,852 | 28,121 | 10,226 | 9,891 | 14,082 | 11,713 | 14,237 | 4,100 | 2,242 | 7,900 | 3,950 | 8,422 |
| 7/26 | 6,004 | 28,335 | 10,410 | 10,028 | 14,149 | 11,842 | 14,571 | 4,257 | 2,320 | 8,026 | 3,974 | 8,553 |
| 7/27 | 6,249 | 28,565 | 10,587 | 10,286 | 14,266 | 12,035 | 15,023 | 4,565 | 2,423 | 8,129 | 3,983 | 8,665 |
| 7/28 | 6,485 | 28,747 | 11,037 | 10,378 | 14,365 | 12,196 | 15,447 | 4,713 | 2,486 | 8,205 | 3,996 | 8,765 |
| 7/29 | 6,767 | 28,909 | 11,702 | 10,481 | 14,601 | 12,378 | 15,705 | 4,861 | 2,531 | 8,304 | 4,002 | 8,840 |
| 7/30 | 6,979 | 29,051 | 12,392 | 10,632 | 14,845 | 12,505 | 15,933 | 5,093 | 2,565 | 8,396 | 4,008 | 8,915 |
| 7/31 | 7,128 | 29,138 | 12,944 | 10,688 | 14,926 | 12,594 | 16,122 | 5,255 | 2,645 | 8,457 | 4,014 | 8,961 |
| 8/1 | 7,228 | 29,189 | 13,371 | 10,730 | 14,997 | 12,683 | 16,252 | 5,420 | 2,672 | 8,530 | 4,014 | 9,002 |
| 8/2 | 7,380 | 29,218 | 13,597 | 10,800 | 15,058 | 12,745 | 16,351 | 5,515 | 2,704 | 8,582 | 4,015 | 9,036 |
| 8/3 | 7,442 | 29,237 | 13,832 | 10,854 | 15,109 | 12,799 | 16,447 | 5,592 | 2,729 | 8,619 | 4,016 | 9,061 |
| 8/4 | 7,461 | 29,253 | 13,868 | 10,892 | 15,141 | 12,836 | 16,524 | 5,667 | 2,750 | 8,651 | 4,017 | 9,086 |
| 8/5 | 7,472 | 29,269 | 13,891 | 10,911 | 15,179 | 12,874 | 16,598 | 5,735 | 2,768 | 8,674 | 4,018 | 9,104 |
| 8/6 | 7,485 | 29,289 | 13,915 | 10,920 | 15,226 | 12,915 | 16,617 | 5,754 | 2,782 | 8,692 | 4,019 | 9,111 |
| 8/7 | 7,499 | 29,313 | 13,990 | 10,928 | 15,257 | 12,931 | 16,642 | 5,782 | 2,793 | 8,701 | 4,021 | 9,128 |
| 8/8 | 7,502 | 29,330 | 14,052 | 10,945 | 15,280 | 12,957 | 16,660 | 5,804 | 2,794 | 8,717 | 4,024 | 9,133 |

Continued-

Appendix A.3. (Page 8 of 12).

| Date | Cumulative Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 8/9 | 7,508 | 29,344 | 14,082 | 10,955 | 15,289 | 12,972 | 16,683 | 5,818 | 2,804 | 8,720 | 4,026 | 9,138 |
| 8/10 | 7,514 | 29,346 | 14,114 | 10,962 | 15,320 | 12,986 | 16,700 | 5,831 | 2,813 | 8,728 | 4,030 | 9,143 |
| 8/11 | 7,518 | 29,348 | 14,137 | 10,966 | 15,326 | 13,006 | 16,716 | 5,838 | 2,823 | 8,732 | 4,030 | 9,145 |
| 8/12 | 7,525 | 29,354 | 14,150 | 10,972 | 15,335 | 13,038 | 16,722 | 5,843 | 2,830 | 8,743 | 4,033 | 9,146 |
| 8/13 | 7,531 | 29,358 | 14,154 | 10,975 | 15,339 | 13,052 | 16,728 | 5,846 | 2,836 | 8,750 | 4,033 | 9,147 |
| 8/14 | 7,535 | 29,358 | 14,163 | 10,987 | 15,355 | 13,057 | 16,739 | 5,852 | 2,843 | 8,757 | 4,033 | 9,150 |
| 8/15 | 7,535 | 29,358 | 14,164 | 10,987 | 15,362 | 13,061 | 16,745 | 5,855 | 2,849 | 8,761 | 4,035 | 9,153 |
| 8/16 | 7,535 | 29,358 | 14,171 | 10,987 | 15,363 | 13,066 | 16,751 | 5,858 | 2,852 | 8,762 | 4,036 | 9,154 |
| 8/17 | 7,539 | 29,358 | 14,175 | 10,988 | 15,365 | 13,068 | 16,754 | 5,861 | 2,854 | 8,765 | 4,036 | 9,155 |
| 8/18 | 7,539 | 29,358 | 14,177 | 10,989 | 15,370 | 13,072 | 16,757 | 5,861 | 2,855 | 8,766 | 4,038 | 9,155 |
| 8/19 | 7,539 | 29,358 | 14,178 | 10,991 | 15,370 | 13,073 | 16,758 | 5,863 | 2,856 | 8,767 | 4,038 | 9,155 |
| 8/20 | 7,539 | 29,358 | 14,179 | 10,992 | 15,371 | 13,074 | 16,760 | 5,864 | 2,857 | 8,768 | 4,038 | 9,157 |
| 8/21 | 7,540 | 29,358 | 14,180 | 10,993 | 15,371 | 13,074 | 16,760 | 5,864 | 2,858 | 8,768 | 4,041 | 9,157 |
| 8/22 | | 29,358 | 14,181 | 10,993 | 15,373 | 13,074 | 16,764 | 5,864 | 2,859 | 8,768 | 4,041 | 9,157 |
| 8/23 | | 29,358 | 14,182 | 10,993 | 15,377 | 13,075 | 16,765 | 5,864 | 2,860 | 8,769 | 4,044 | 9,158 |
| 8/24 | | 29,358 | 14,183 | 10,993 | 15,378 | 13,075 | 16,765 | 5,864 | 2,861 | 8,770 | 4,045 | 9,160 |
| 8/25 | | 29,358 | 14,185 | 10,993 | 15,379 | 13,075 | 16,766 | 5,864 | 2,862 | 8,772 | 4,045 | 9,161 |
| 8/26 | | 29,358 | 14,186 | 10,993 | 15,381 | 13,075 | 16,767 | 5,864 | 2,862 | 8,772 | 4,045 | 9,161 |
| 8/27 | | 29,358 | 14,188 | 10,993 | 15,381 | 13,076 | 16,768 | 5,864 | 2,862 | 8,773 | 4,045 | 9,161 |
| 8/28 | | 29,358 | 14,188 | 10,993 | 15,381 | 13,077 | 16,769 | 5,864 | 2,862 | 8,773 | 4,048 | 9,161 |
| 8/29 | | 29,358 | 14,192 | 10,996 | 15,385 | 13,078 | 16,769 | 5,864 | 2,862 | 8,773 | 4,048 | 9,161 |
| 8/30 | | 29,358 | 14,192 | 10,996 | 15,385 | 13,078 | 16,769 | 5,864 | 2,867 | 8,773 | 4,048 | 9,161 |
| 8/31 | | 29,358 | 14,192 | 10,996 | 15,385 | 13,078 | 16,769 | 5,864 | 2,867 | 8,773 | 4,048 | 9,161 |
| 9/1 | | 29,358 | 14,192 | 10,996 | 15,385 | 13,078 | 16,770 | 5,864 | 2,867 | 8,773 | 4,048 | 9,162 |
| 9/2 | | 29,358 | 14,192 | 10,996 | 15,385 | 13,078 | 16,772 | 5,864 | 2,867 | 8,773 | 4,048 | 9,162 |
| 9/3 | | 29,358 | 14,192 | 10,996 | 15,385 | 13,078 | 16,772 | 5,864 | 2,867 | 8,773 | 4,049 | 9,162 |
| 9/4 | | 29,358 | 14,192 | 10,996 | 15,385 | 13,078 | 16,772 | 5,864 | 2,867 | 8,773 | 4,049 | 9,163 |
| 9/5 | | 29,358 | | 10,996 | 15,385 | 13,078 | 16,772 | 5,864 | 2,867 | 8,773 | 4,049 | 9,163 |
| 9/6 | | 29,358 | | | 15,385 | 13,078 | 16,772 | 5,864 | 2,867 | 8,773 | 4,049 | 9,163 |
| 9/7 | | | | | 15,385 | 13,078 | 16,772 | 5,864 | 2,867 | 8,773 | 4,050 | 9,163 |
| 9/8 | | | | | 15,385 | 13,078 | 16,772 | 5,864 | 2,867 | 8,773 | 4,050 | 9,164 |
| 9/9 | | | | | 15,385 | 13,078 | 16,772 | 5,864 | 2,867 | 8,773 | 4,050 | 9,164 |
| 9/10 | | | | | 15,385 | 13,078 | 16,772 | 5,864 | 2,867 | 8,773 | 4,050 | 9,164 |
| 9/11 | | | | | 15,385 | 13,078 | 16,772 | 5,864 | 2,867 | 8,773 | 4,050 | 9,164 |
| 9/12 | | | | | 15,385 | 13,078 | 16,773 | 5,864 | 2,867 | 8,773 | 4,050 | 9,164 |
| 9/13 | | | | | 15,385 | 13,078 | 16,773 | 5,864 | 2,867 | 8,773 | 4,050 | 9,164 |
| 9/14 | | | | | 15,385 | 13,078 | 16,773 | 5,864 | 2,867 | 8,773 | 4,050 | 9,164 |
| 9/15 | | | | | 15,385 | 13,078 | 16,773 | 5,864 | 2,867 | 8,773 | 4,050 | 9,164 |
| 9/16 | | | | | | 13,078 | 16,773 | 5,864 | 2,867 | 8,773 | 4,050 | 9,164 |
| 9/17 | | | | | | 13,078 | 16,773 | 5,864 | 2,867 | 8,773 | 4,050 | 9,164 |
| 9/18 | | | | | | 13,078 | 16,773 | 5,864 | 2,867 | 8,773 | 4,050 | 9,164 |
| 9/19 | | | | | | 13,078 | 16,773 | | 2,867 | 8,773 | 4,050 | 9,164 |
| 9/20 | | | | | | 13,078 | | | 2,867 | 8,773 | 4,050 | 9,164 |

Appendix A.3. (Page 9 of 12).

| Date | Cumulative Percent Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 6/15 | | | | | | | | | | | | | | | | |
| 6/16 | | | | | | | | | | | | | | | | |
| 6/17 | | | | | | | | | | | | | | | | |
| 6/18 | | | | | | | | | | | | | | | | |
| 6/19 | | | | | | | | | | | | | | | | |
| 6/20 | | | | | | | | | 0 | | | | | | | |
| 6/21 | | | | | | 0 | | | 0 | | | | | | | |
| 6/22 | | | | | | 0 | | | 0 | | | | | | 0 | 0 |
| 6/23 | | | | | | 0 | | | 0 | | 0 | | | 0 | 0 | 0 |
| 6/24 | | | | | | 0 | | | 0 | | 0 | | | 0 | 0 | 0 |
| 6/25 | | | | | | 1 | | | 0 | | 0 | | 0 | 0 | 0 | 0 |
| 6/26 | | | | | | 1 | 0 | | 0 | | 0 | | 0 | 0 | 0 | 0 |
| 6/27 | | | | | | 2 | 0 | | 0 | | 0 | | 0 | 0 | 0 | 0 |
| 6/28 | | | 0 | | | 3 | 0 | | 0 | | 0 | | 0 | 0 | 0 | 0 |
| 6/29 | 0 | | 0 | | | 6 | 0 | | 1 | | 1 | | 1 | 1 | 0 | 1 |
| 6/30 | 0 | | 0 | | | 10 | 1 | | 1 | | 1 | | 1 | 1 | 0 | 1 |
| 7/1 | 0 | | 1 | 0 | | 16 | 1 | | 1 | | 1 | | 2 | 2 | 0 | 2 |
| 7/2 | 0 | | 3 | 0 | | 23 | 2 | | 3 | 0 | 1 | | 2 | 4 | 1 | 4 |
| 7/3 | 1 | | 6 | 0 | | 28 | 3 | | 6 | 0 | 1 | | 2 | 5 | 3 | 5 |
| 7/4 | 1 | | 10 | 1 | | 31 | 7 | | 7 | 0 | 2 | | 3 | 7 | 4 | 7 |
| 7/5 | 1 | | 14 | 2 | | 36 | 11 | | 9 | 0 | 2 | | 5 | 9 | 8 | 7 |
| 7/6 | 3 | | 18 | 2 | | 40 | 16 | | 15 | 1 | 2 | | 9 | 12 | 13 | 8 |
| 7/7 | 5 | | 20 | 5 | | 44 | 24 | | 20 | 1 | 3 | | 15 | 13 | 17 | 8 |
| 7/8 | 11 | | 26 | 10 | | 47 | 32 | | 25 | 2 | 4 | | 26 | 15 | 24 | 9 |
| 7/9 | 20 | | 32 | 12 | | 51 | 44 | | 29 | 4 | 6 | | 37 | 17 | 27 | 14 |
| 7/10 | 29 | | 41 | 14 | | 53 | 54 | | 29 | 6 | 10 | | 47 | 24 | 37 | 18 |
| 7/11 | 34 | | 48 | 18 | | 57 | 58 | | 31 | 9 | 19 | | 58 | 36 | 42 | 21 |
| 7/12 | 40 | | 51 | 25 | | 60 | 63 | | 38 | 14 | 23 | | 67 | 44 | 49 | 24 |
| 7/13 | 50 | | 55 | 36 | | 62 | 68 | | 42 | 19 | 33 | | 72 | 53 | 50 | 31 |
| 7/14 | 55 | | 63 | 47 | | 64 | 71 | | 50 | 23 | 45 | | 78 | 56 | 57 | 37 |
| 7/15 | 59 | | 67 | 55 | | 67 | 73 | | 61 | 27 | 56 | | 85 | 63 | 65 | 41 |
| 7/16 | 65 | | 71 | 64 | | 70 | 77 | | 66 | 32 | 64 | | 89 | 68 | 71 | 46 |
| 7/17 | 69 | | 75 | 71 | | 72 | 81 | | 71 | 36 | 73 | | 91 | 73 | 76 | 51 |
| 7/18 | 76 | | 78 | 76 | | 75 | 84 | | 73 | 40 | 77 | | 93 | 77 | 81 | 56 |
| 7/19 | 79 | | 81 | 79 | | 77 | 86 | | 74 | 46 | 79 | | 94 | 80 | 82 | 62 |
| 7/20 | 81 | | 84 | 83 | | 79 | 90 | | 77 | 50 | 82 | | 95 | 82 | 84 | 68 |
| 7/21 | 89 | | 85 | 86 | | 82 | 92 | | 82 | 54 | 85 | | 96 | 85 | 86 | 72 |
| 7/22 | 93 | | 88 | 88 | | 85 | 92 | | 86 | 57 | 87 | | 96 | 87 | 88 | 77 |
| 7/23 | 94 | | 90 | 90 | | 87 | 93 | | 88 | 60 | 89 | | 97 | 89 | 90 | 81 |
| 7/24 | 96 | | 93 | 93 | | 89 | 94 | | 90 | 65 | 91 | | 98 | 91 | 91 | 84 |
| 7/25 | 97 | | 95 | 94 | | 91 | 95 | | 91 | 71 | 92 | | 98 | 92 | 91 | 88 |
| 7/26 | 98 | | 96 | 94 | | 92 | 96 | | 93 | 74 | 93 | | 98 | 93 | 92 | 91 |
| 7/27 | 98 | | 96 | 95 | | 94 | 97 | | 94 | 78 | 94 | | 98 | 94 | 93 | 94 |
| 7/28 | 98 | | 97 | 96 | | 95 | 97 | | 95 | 83 | 95 | | 99 | 96 | 94 | 95 |
| 7/29 | 98 | | 98 | 97 | | 96 | 98 | | 96 | 86 | 96 | | 99 | 96 | 95 | 96 |
| 7/30 | 99 | | 98 | 98 | | 97 | 98 | | 96 | 89 | 97 | | 99 | 97 | 96 | 97 |
| 7/31 | 99 | | 99 | 99 | | 98 | 99 | | 97 | 91 | 97 | | 99 | 98 | 97 | 98 |
| 8/1 | 99 | | 99 | 99 | | 98 | 99 | | 98 | 94 | 98 | | 99 | 98 | 97 | 98 |
| 8/2 | 99 | | 99 | 99 | | 98 | 99 | | 98 | 95 | 98 | | 99 | 99 | 98 | 99 |
| 8/3 | 99 | | 99 | 99 | | 99 | 99 | | 99 | 96 | 99 | | 99 | 99 | 99 | 99 |
| 8/4 | 99 | | 99 | 99 | | 99 | 100 | | 99 | 97 | 99 | | 100 | 99 | 99 | 99 |
| 8/5 | 99 | | 99 | 100 | | 99 | 100 | | 99 | 98 | 99 | | 100 | 99 | 99 | 100 |
| 8/6 | 100 | | 100 | 100 | | 99 | 100 | | 99 | 98 | 99 | | 100 | 99 | 99 | 100 |
| 8/7 | 100 | | 100 | 100 | | 99 | 100 | | 99 | 99 | 99 | | 100 | 100 | 100 | 100 |
| 8/8 | 100 | | 100 | 100 | | 99 | 100 | | 100 | 99 | 99 | | 100 | 100 | 100 | 100 |

Continued-

Appendix A.3. (Page 10 of 12).

| Date | Cumulative Percent Passage | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
| 8/9 | 100 | | 100 | 100 | | 99 | 100 | | 100 | 99 | 99 | | 100 | 100 | 100 | 100 |
| 8/10 | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/11 | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/12 | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/13 | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/14 | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/15 | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/16 | | | | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/17 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/18 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/19 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/20 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/21 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/22 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/23 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/24 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | 100 | 100 |
| 8/25 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 8/26 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 8/27 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 8/28 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 8/29 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 8/30 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 8/31 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 9/1 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 9/2 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 9/3 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 9/4 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 9/5 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 9/6 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 9/7 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 9/8 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 9/9 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | 100 | 100 |
| 9/10 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | | 100 |
| 9/11 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | | 100 |
| 9/12 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | | 100 |
| 9/13 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | | 100 |
| 9/14 | | | | | | 100 | 100 | | 100 | 100 | 100 | | 100 | | | 100 |
| 9/15 | | | | | | 100 | | | 100 | 100 | 100 | | 100 | | | 100 |
| 9/16 | | | | | | 100 | | | | 100 | 100 | | 100 | | | 100 |
| 9/17 | | | | | | 100 | | | | 100 | 100 | | 100 | | | |
| 9/18 | | | | | | 100 | | | | 100 | 100 | | | | | |
| 9/19 | | | | | | 100 | | | | 100 | 100 | | | | | |
| 9/20 | | | | | | 100 | | | | 100 | 100 | | | | | |

Appendix A.3. (Page 11 of 12).

| Date | Cumulative Percent Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 6/15 | | | | | | | | | | | | |
| 6/16 | | | | | | | | | | | | |
| 6/17 | | | | | | | | | | | | |
| 6/18 | | | | | | | | | | | | |
| 6/19 | | | | | | | | | | | | |
| 6/20 | | | | | | 0 | 0 | | | | | |
| 6/21 | | 0 | | 0 | | 0 | 0 | | | | | 0 |
| 6/22 | | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | | 0 |
| 6/23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | | 0 |
| 6/24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | | 0 |
| 6/25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | | 0 |
| 6/26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 6/27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 6/28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 |
| 6/29 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | | | 1 | 1 | 0 |
| 6/30 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | 1 | 1 | 0 |
| 7/1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | | | 2 | 1 | 0 |
| 7/2 | 3 | 4 | 2 | 3 | 3 | 2 | 2 | | | 3 | 3 | 0 |
| 7/3 | 5 | 4 | 2 | 4 | 6 | 2 | 3 | | | 5 | 7 | 1 |
| 7/4 | 7 | 6 | 2 | 6 | 7 | 5 | 5 | | | 7 | 12 | 1 |
| 7/5 | 9 | 8 | 2 | 9 | 10 | 7 | 7 | | 0 | 8 | 16 | 2 |
| 7/6 | 10 | 10 | 3 | 14 | 14 | 11 | 9 | 0 | 1 | 9 | 27 | 5 |
| 7/7 | 11 | 14 | 4 | 18 | 19 | 16 | 9 | 0 | 1 | 12 | 28 | 7 |
| 7/8 | 12 | 18 | 5 | 22 | 23 | 20 | 12 | 0 | 2 | 18 | 40 | 12 |
| 7/9 | 14 | 26 | 6 | 27 | 30 | 24 | 17 | 0 | 3 | 25 | 41 | 19 |
| 7/10 | 16 | 34 | 7 | 33 | 36 | 26 | 19 | 1 | 6 | 28 | 46 | 21 |
| 7/11 | 21 | 41 | 13 | 41 | 43 | 29 | 23 | 2 | 12 | 36 | 56 | 22 |
| 7/12 | 24 | 47 | 18 | 44 | 48 | 32 | 32 | 4 | 20 | 44 | 63 | 27 |
| 7/13 | 27 | 53 | 24 | 47 | 58 | 35 | 44 | 6 | 21 | 50 | 66 | 32 |
| 7/14 | 32 | 58 | 30 | 49 | 66 | 38 | 52 | 8 | 22 | 60 | 71 | 40 |
| 7/15 | 38 | 64 | 36 | 53 | 71 | 43 | 58 | 12 | 25 | 66 | 75 | 48 |
| 7/16 | 43 | 71 | 42 | 58 | 74 | 50 | 65 | 19 | 35 | 69 | 80 | 53 |
| 7/17 | 46 | 78 | 46 | 65 | 76 | 53 | 68 | 25 | 41 | 72 | 86 | 58 |
| 7/18 | 52 | 84 | 54 | 68 | 78 | 60 | 69 | 29 | 47 | 74 | 90 | 64 |
| 7/19 | 58 | 87 | 57 | 72 | 81 | 67 | 72 | 34 | 50 | 76 | 92 | 71 |
| 7/20 | 62 | 90 | 60 | 75 | 82 | 73 | 74 | 41 | 53 | 80 | 93 | 77 |
| 7/21 | 65 | 93 | 64 | 79 | 85 | 78 | 77 | 46 | 61 | 84 | 94 | 82 |
| 7/22 | 67 | 93 | 66 | 84 | 86 | 82 | 80 | 52 | 68 | 86 | 95 | 85 |
| 7/23 | 71 | 94 | 68 | 86 | 88 | 84 | 81 | 56 | 73 | 87 | 95 | 86 |
| 7/24 | 74 | 95 | 70 | 88 | 90 | 88 | 82 | 64 | 77 | 89 | 97 | 88 |
| 7/25 | 78 | 96 | 72 | 90 | 92 | 90 | 85 | 70 | 78 | 90 | 98 | 92 |
| 7/26 | 80 | 97 | 73 | 91 | 92 | 91 | 87 | 73 | 81 | 91 | 98 | 93 |
| 7/27 | 83 | 97 | 75 | 94 | 93 | 92 | 90 | 78 | 85 | 93 | 98 | 95 |
| 7/28 | 86 | 98 | 78 | 94 | 93 | 93 | 92 | 80 | 87 | 94 | 99 | 96 |
| 7/29 | 90 | 98 | 82 | 95 | 95 | 95 | 94 | 83 | 88 | 95 | 99 | 96 |
| 7/30 | 93 | 99 | 87 | 97 | 96 | 96 | 95 | 87 | 89 | 96 | 99 | 97 |
| 7/31 | 95 | 99 | 91 | 97 | 97 | 96 | 96 | 90 | 92 | 96 | 99 | 98 |
| 8/1 | 96 | 99 | 94 | 98 | 97 | 97 | 97 | 92 | 93 | 97 | 99 | 98 |
| 8/2 | 98 | 100 | 96 | 98 | 98 | 97 | 97 | 94 | 94 | 98 | 99 | 99 |
| 8/3 | 99 | 100 | 97 | 99 | 98 | 98 | 98 | 95 | 95 | 98 | 99 | 99 |
| 8/4 | 99 | 100 | 98 | 99 | 98 | 98 | 99 | 97 | 96 | 99 | 99 | 99 |
| 8/5 | 99 | 100 | 98 | 99 | 99 | 98 | 99 | 98 | 97 | 99 | 99 | 99 |
| 8/6 | 99 | 100 | 98 | 99 | 99 | 99 | 99 | 98 | 97 | 99 | 99 | 99 |
| 8/7 | 99 | 100 | 99 | 99 | 99 | 99 | 99 | 99 | 97 | 99 | 99 | 100 |
| 8/8 | 100 | 100 | 99 | 100 | 99 | 99 | 99 | 99 | 97 | 99 | 99 | 100 |

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Appendix A.3. (Page 12 of 12).

| Date | Cumulative Percent Passage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 8/9 | 100 | 100 | 99 | 100 | 99 | 99 | 99 | 99 | 98 | 99 | 99 | 100 |
| 8/10 | 100 | 100 | 99 | 100 | 100 | 99 | 100 | 99 | 98 | 99 | 100 | 100 |
| 8/11 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | 100 | 98 | 100 | 100 | 100 |
| 8/12 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | 100 | 100 |
| 8/13 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | 100 | 100 |
| 8/14 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | 100 | 100 |
| 8/15 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | 100 | 100 |
| 8/16 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99 | 100 | 100 | 100 |
| 8/17 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/18 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/19 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/20 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/21 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/22 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/23 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/24 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/25 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/26 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/27 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/28 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/29 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/30 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8/31 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/1 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/2 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/3 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/4 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/5 | | 100 | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/6 | | 100 | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/7 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/8 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/9 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/10 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/11 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/12 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/13 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/14 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/15 | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/16 | | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/17 | | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/18 | | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9/19 | | | | | | 100 | 100 | | 100 | 100 | 100 | 100 |
| 9/20 | | | | | | 100 | | | 100 | 100 | 100 | 100 |

Appendix A.4. Historical coho salmon passage at the Kogrukluk River weir.

| Date | Daily Passage | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
| 7/19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | c | 0 | 0 | 0 | 1 | 0 | 3 |
| 7/21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | c | 0 | 0 | 0 | 1 | 0 | 0 |
| 7/22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | c | 0 | 0 | 0 | 1 | 0 | 1 |
| 7/23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | c | 0 | 0 | 0 | 0 | 0 | 1 |
| 7/24 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | c | 0 | 0 | 0 | 2 | 0 | 1 |
| 7/25 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | c | 0 | 0 | 1 | 2 | 0 | 2 |
| 7/26 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | c | 0 | 0 | 0 | 2 | 0 | 1 |
| 7/27 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | c | 0 | 0 | 0 | 2 | 0 | 0 |
| 7/28 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | c | 0 | 0 | 0 | 1 | 12 | 2 |
| 7/29 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | c | 0 | 0 | 2 | 0 b | 22 | 0 |
| 7/30 | 0 | 0 | 0 | 2 | 0 | 1 b | 0 | 0 | c | 0 | 0 | 0 | 0 b | 29 | 1 |
| 7/31 | 0 | 0 | 0 | 3 | 0 | 0 b | 0 | 0 | c | 0 | 0 | 6 | 4 | 23 | 0 |
| 8/01 | 0 | 0 | 0 | 11 | 6 | 1 b | 0 | 0 | c | 0 | 0 | 1 | 10 | 51 | 1 |
| 8/02 | 0 | 5 | 0 | 14 | 4 | 0 b | 0 | 0 | c | 1 | 0 | 9 | 5 | 30 | 1 |
| 8/03 | 0 | 6 | 0 | 19 | 7 | 2 b | 1 b | 0 | c | 2 | 1 | 4 | 13 | 50 | 2 |
| 8/04 | 2 | 15 | 0 | 32 | 7 | 5 b | 0 b | 0 | c | 1 | 1 | 3 | 15 | 59 b | 2 |
| 8/05 | 5 | 17 | 0 | 18 | 14 | 3 b | 1 b | 0 | c | 7 | 9 | 15 b | 22 | 68 b | 1 |
| 8/06 | 5 | 16 | 0 | 53 | 8 | 8 b | 0 b | 4 | c | 8 | 3 | 14 b | 31 | 77 b | 0 |
| 8/07 | 2 | 42 | 2 b | 99 | 18 | 18 b | 2 b | 6 | c | 7 | 5 | 6 b | 49 | 86 | 1 |
| 8/08 | 10 | 36 | 5 b | 44 | 49 | 29 b | 5 b | 11 | c | 9 | 2 | 29 b | 106 | 123 | 2 |
| 8/09 | 26 | 55 | 5 b | 119 | 13 | 35 b | 3 | 15 | c | 9 | 1 | 149 b | 133 | 103 | 7 |
| 8/10 | 20 | 42 | 6 b | 52 | 94 | 39 b | 8 | 25 | c | 12 | 5 | 70 | 159 | 108 | 68 b |
| 8/11 | 22 | 106 | 15 b | 222 | 59 | 61 b | 18 | 38 | c | 42 | 13 | 226 | 113 | 162 b | 74 b |
| 8/12 | 62 | 91 | 17 b | 115 | 118 | 86 b | 29 | 80 | c | 87 | 34 | 233 | 266 | 215 | 141 b |
| 8/13 | 62 | 58 | 18 | 224 | 68 | 140 b | 35 | 86 | c | 26 | 25 | 334 | 439 | 209 | 194 b |
| 8/14 | 133 | 78 | 35 | 147 | 82 | 243 b | 39 | 46 | c | 59 | 15 | 200 | c | 296 b | 162 b |
| 8/15 | 154 | 195 | 56 | 179 | 84 | 199 b | 61 | 25 | c | 30 | 8 | 362 | c | 439 | 221 b |
| 8/16 | 141 | 56 | 18 | 144 | 224 b | 298 b | 86 | 105 | c | 16 | 52 | 198 | c | 416 | 241 b |
| 8/17 | 109 | 511 | 26 | 86 | 147 b | 412 b | 140 | 157 | c | 232 | 185 | 232 | c | 581 | 80 |
| 8/18 | 110 | 465 | 46 | 1,258 | 179 b | 286 b | 243 | 258 | c | 72 | 201 | 52 | c | 837 | 327 |
| 8/19 | 296 | 371 | 24 | 995 | 144 b | 318 b | 199 | 202 | c | 13 | 163 | 335 | c | 761 | 521 |
| 8/20 | 314 | 283 | 11 | 537 | 86 b | 527 b | 298 | 290 | c | 13 | 106 | 373 | c | 829 | 669 |
| 8/21 | 187 | 409 | 3 | 321 | 500 b | 629 | 412 | 352 | c | 43 | 74 | c | c | 597 | 855 |
| 8/22 | 185 | 142 | 67 | 1,412 | 450 b | 767 | 286 | 383 | c | 57 | 49 | c | c | 469 | 818 |
| 8/23 | 197 | 228 | 152 | 1,730 | 300 | 1,476 | 318 | 323 | 611 | 141 | 111 | c | c | 439 | 931 |
| 8/24 | 255 | 647 | 100 | 1,190 | 321 | 1,887 | 527 | 389 | 661 | 155 | 16 | c | c | 841 | 902 |
| 8/25 | 416 | 868 | 35 | 2,031 | 231 | 1,364 | 658 | 258 | c | 97 | 435 | c | c | 2,096 | 1,002 |
| 8/26 | 318 | 804 | 6 | 2,036 | 200 | 1,223 | 776 | 898 | c | 408 | 128 | c | c | 2,943 | 1,116 |
| 8/27 | 369 | 946 | 27 | 731 | 473 | 1,091 | 762 | 378 | c | 62 | 118 | c | c | 2,713 | 1,198 |
| 8/28 | 267 | 820 | 270 | 584 | 890 | 1,255 | 814 | 618 | c | 10 | 34 | c | c | 1,887 | 1,962 |
| 8/29 | 144 | 632 | 49 | 370 | 817 | 823 | 1,151 | 553 | c | 19 | 24 | c | c | 1,007 | 1,263 |
| 8/30 | 302 | 1,488 | 28 | 688 | 494 | 656 | 1,141 | 770 | c | 11 | 5 | c | 42 b | 396 | 1,785 |
| 8/31 | 322 | 1,680 | 161 | 907 | 859 | 614 | 1,824 | 494 | c | 21 | 11 | c | 388 | 842 | 1,166 |
| 9/01 | 296 | 1,537 | 580 | 613 | 1,380 | 420 | 1,008 | 330 | c | 23 | 4 | c | 551 | 1,947 | 1,104 b |
| 9/02 | 328 | 1,905 | 27 | 821 | 1,271 | 529 | 1,773 | 369 | c | 69 | 259 | c | 632 | 1,400 | 1,102 b |
| 9/03 | 296 | 1,980 | 469 | 713 | 566 | 634 | 1,160 | 238 | c | 47 | 947 | c | 735 | 1,155 | 749 |
| 9/04 | 612 | 1,285 | 363 | 853 | 557 | 339 | 2,950 | 237 | c | 128 | 463 | c | 286 | 643 | 903 |
| 9/05 | 535 | 1,781 | 100 | 787 | 631 | 323 | 1,053 | 171 | c | 390 | 312 | c | 348 | 630 | 630 |
| 9/06 | 655 | 5,013 | 556 | 742 | 530 | 234 | 962 | 170 | c | 181 | 359 | c | 78 b | 425 | 586 |

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Appendix A.4. (Page 2 of 12).

| Date | Daily Passage | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
| 9/07 | 506 | 3,219 | 205 | 343 | 853 | 453 | 556 b | 153 | c | 5 | 470 | c | c | 384 | 895 b |
| 9/08 | 521 | 2,165 | 111 | 1,107 | 818 | 445 b | 205 b | 445 | c | 18 | 472 | c | c | 527 | 904 b |
| 9/09 | 567 | 1,460 | 151 | 1,081 | 589 | 179 b | 111 b | 179 | c | 205 | 473 | c | c | 436 | 977 b |
| 9/10 | 335 | 1,226 | 858 | 47 | 339 | 434 b | 151 b | 434 | c | 379 b | 544 | c | c | 356 | 699 b |
| 9/11 | 283 | 921 | 360 | 830 | 155 | 966 b | 858 b | 966 | c | 210 b | 242 | c | c | | 251 b |
| 9/12 | 246 | 722 | 15 | 363 | 308 | 436 b | 360 b | 436 | c | 179 b | 137 | c | c | | 783 b |
| 9/13 | 239 | 748 | 175 | 224 | 233 | 257 b | 15 b | 257 | c | 206 b | 67 | c | c | | 526 b |
| 9/14 | 194 | 508 | 887 | 357 | 259 | 152 b | 196 b | 152 | c | 405 b | 225 | c | c | | 364 b |
| 9/15 | 157 | 424 b | 134 | 37 | 241 | 112 b | 61 | 112 | c | 208 b | 226 | c | c | | 161 b |
| 9/16 | 168 | 405 b | 151 | 175 b | 140 | 121 b | 123 | 121 | c | 71 b | 115 b | c | c | 514 b | 196 b |
| 9/17 | 132 | 269 b | 424 | 887 b | 113 | 186 b | 75 | 186 | c | 128 b | 208 b | c | c | 567 b | 241 b |
| 9/18 | 149 | 189 b | 405 | 134 b | 84 | 405 b | 151 | 405 b | c | 378 b | 615 b | c | c | 1.082 b | 274 b |
| 9/19 | 118 | 125 b | 269 | 151 b | 138 | 269 b | 253 | 269 b | c | 91 b | 148 b | c | c | 1,068 b | 100 b |
| 9/20 | 138 | 257 b | 189 | 424 b | 90 | 189 b | 110 | 189 b | c | 100 b | 163 b | c | c | 737 b | 214 b |
| 9/21 | 103 | 114 b | 125 | 138 b | 60 | 125 b | | 125 b | c | 191 b | 310 b | c | c | 601 b | 256 b |
| 9/22 | 114 | 135 b | 257 | 90 b | 38 | 257 b | 175 | 257 b | c | 189 b | 306 b | c | c | 415 b | 36 b |
| 9/23 | 78 | 47 b | 114 | 60 b | 9 | 114 b | | 114 b | c | 130 b | 212 b | c | c | 707 b | 72 b |
| 9/24 | 44 | 45 b | 135 | 38 b | 14 b | 135 b | 113 b | 135 b | c | 106 b | 172 b | c | c | 354 b | 23 b |
| 9/25 | 30 | 43 b | 47 | 9 b | 20 b | 47 b | 84 b | 47 b | c | 73 b | 119 b | c | c | 348 b | 29 b |
| 9/26 | 29 | 29 b | 45 | 14 b | 19 b | 45 b | 138 b | 45 b | c | 125 b | 202 b | c | c | 143 b | 2 b |
| 9/27 | 26 | 26 b | 43 | 20 b | 18 b | 43 b | 90 b | 43 b | c | 63 b | 101 b | c | c | 137 b | 3 b |
| 9/28 | 13 | 13 b | 29 b | 19 b | 15 b | 29 b | 60 b | 29 b | c | 61 b | 99 b | c | c | 19 b | 6 b |
| 9/29 | 14 | 14 b | 26 b | 18 b | 7 b | 26 b | 38 b | 26 b | c | 25 b | 41 b | c | c | 3 b | 4 b |
| 9/30 | 20 | 20 b | 13 b | 15 b | | 13 b | 9 b | 13 b | c | 24 b | 39 b | c | c | 13 b | 4 b |
| 10/01 | 19 | 19 b | 14 b | 7 b | | 14 b | 14 b | 14 b | c | 3 b | 5 b | c | c | 268 b | 5 b |
| 10/02 | 18 | 18 b | 20 b | 26 b | | 20 b | 20 b | 20 b | c | 1 b | 1 b | c | c | | 9 b |
| 10/03 | 15 | 15 b | 19 b | 13 b | | 19 b | 19 b | 19 b | c | 3 b | 4 b | c | c | | 14 b |
| 10/04 | 7 | 7 b | 18 b | 14 b | | 18 b | 18 b | 18 b | c | 20 b | 70 b | c | c | | 14 b |
| 10/05 | 10 | | 15 b | 20 b | | 15 b | 15 b | 15 b | c | 17 b | | c | c | | |
| 10/06 | 5 b | | 7 b | 19 b | | 7 b | 7 b | 7 b | c | 10 b | | c | c | | |
| Obs. | 11,450 | 35,582 | 8,327 | 25,304 | 14,618 | 14,717 | 19,756 | 11,722 | 1,272 | 2,736 | 7,034 | 2,715 | 4,317 | 27,057 | 17,492 |
| Est. | 5 | 2,214 | 211 | 2,291 | 1,823 | 7,789 | 3,065 | 1,790 | n.a | 3,396 | 2,930 | 23,342 | 16,200 | 7,638 | 10,369 |
| Total | 11,455 | 37,796 | 8,538 | 27,595 | 16,441 | 22,506 | 22,821 | 13,512 | n.a | 6,132 | 9,964 | 26,057 e | 20,517 e | 34,695 | 27,861 |
| % Obs. | 100 | 94 | 98 | 92 | 89 | 65 | 87 | 87 | n.a | 45 | 71 | 10 | 21 | 78 | 63 |

a = Daily passage was estimated due to the occurrence of a hole in the weir.
b = The weir was not operational; daily passage was estimated.
c = The weir was not operational; daily passage was not estimated
d = Partial day count, passage was not estimated.
e = Majority of the run estimated; weir not operational much of the season

Appendix A.4. (Page3 of 12).

| Date | Daily Passage | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 7/19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/20 | 1 | 0 | 0 | 0 | 0 | 0 | 1 a | 6 |
| 7/21 | 2 | 0 | 0 | 0 | 0 | 0 | 1 a | 8 |
| 7/22 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 12 |
| 7/23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 7/24 | 2 | 0 | 0 | 1 | 0 | 0 | 5 | 3 |
| 7/25 | 6 | 0 | 0 | 0 | 3 | 0 | 8 | 14 |
| 7/26 | 3 | 0 | 2 | 0 | 2 | 0 | 2 | 4 |
| 7/27 | 3 | 0 | 2 | 0 | 3 | 0 | 5 | 8 |
| 7/28 | 15 | 0 | 0 | 0 | 1 | 0 | 3 | 27 |
| 7/29 | 25 | 2 | 0 | 0 | 1 | 0 | 0 | 27 b |
| 7/30 | 83 | 0 | 1 | 1 | 4 | 0 | 0 | 27 b |
| 7/31 | 26 | 1 | 2 | 0 | 10 | 2 | 0 | 25 |
| 8/01 | 54 b | 4 | 2 | 0 | 1 | 2 | 0 | 47 |
| 8/02 | 82 b | 5 | 3 | 0 | 9 | 9 | 3 | 67 |
| 8/03 | 110 | 3 | 10 | 0 | 33 b | 5 | 6 a | 51 a |
| 8/04 | 41 | 4 | 7 | 0 | 32 b | 12 | 6 a | 51 a |
| 8/05 | 36 | 23 | 14 | 0 b | 51 b | 4 | 6 a | 37 |
| 8/06 | 215 | 22 | 6 | 0 b | 65 b | 20 | 8 | 53 |
| 8/07 | 151 | 47 | 7 | 1 | 79 b | 7 | 6 | 135 |
| 8/08 | 140 | 11 | 5 | 1 | 94 | 32 | 20 | 67 |
| 8/09 | 245 | 26 | 17 | 1 | 192 | 16 | 12 | 269 |
| 8/10 | 606 | 65 | 6 | 6 | 325 | 9 | 8 | 324 |
| 8/11 | 613 b | 89 | 27 | 4 | 233 | 44 | 5 | 27 |
| 8/12 | 901 b | 57 b | 17 | 4 | 650 | 190 | 50 | 955 |
| 8/13 | 869 b | 73 b | 35 | 11 | 872 | 104 | 59 | 547 |
| 8/14 | 1,025 b | 21 | 127 | 5 | 967 | 242 | 31 | 1,006 |
| 8/15 | 1,123 | 64 | 91 | 24 | 803 | 237 | 56 | 1,200 |
| 8/16 | 1,384 | 123 | 244 | 62 | 345 | 767 | 89 | 845 |
| 8/17 | 1,473 | 84 | 225 | 49 | 99 | 386 | 73 | 633 |
| 8/18 | 1,107 | 93 | 54 | 15 | 559 | 815 | 48 | 237 |
| 8/19 | 1,035 | 117 | 24 | 6 | 1,151 | 576 | 17 | 442 |
| 8/20 | 2,142 | 238 | 128 | 238 | 1,099 | 312 b | 125 | 1,145 |
| 8/21 | 2,510 | 449 | 747 | 69 | 1,243 | 623 b | 743 | 2,186 |
| 8/22 | 2,547 | 428 | 298 | 188 | 1,143 | 1,067 | 825 | 1,430 |
| 8/23 | 2,665 | 479 | 260 | 191 | 1,051 | 557 | 958 | 1,011 |
| 8/24 | 2,418 | 425 | 940 | 175 | 1,065 | 1,006 | 814 | 1,593 |
| 8/25 | 2,727 | 611 | 470 | 171 | 592 | 714 | 1,080 | 1,765 |
| 8/26 | 2,346 | 585 | 1,331 | 77 | 408 | 631 | 243 | 3,171 |
| 8/27 | 1,953 | 401 | 438 | 261 | 1,881 | 906 | 301 | 3,269 b |
| 8/28 | 2,430 | 350 | 481 | 103 | 2,673 | 718 | 341 | 3,551 b |
| 8/29 | 1,375 | 300 | 590 | 206 | 3,066 | 1,441 | 308 | 3,551 b |
| 8/30 | 2,056 | 707 | 903 | 265 | 2,564 | 769 | 602 | 4,100 |
| 8/31 | 2,098 | 908 | 1,441 | 208 | 1,416 | 867 | 1,350 | 3,662 |
| 9/01 | 2,004 | 564 | 1,405 | 349 | 1,105 | 629 | 1,005 | 3,701 |
| 9/02 | 1,948 | 251 | 1,574 | 482 | 864 | 783 | 509 | 2,790 |
| 9/03 | 1,492 | 431 | 1,395 | 501 | 727 | 322 | 351 | 2,101 |
| 9/04 | 990 | 69 | 1,982 | 876 | 426 | 452 | 500 | 4,501 |
| 9/05 | 890 | 540 | 1,189 | 1,001 | 552 | 401 | 860 | 4,661 |
| 9/06 | 907 | 234 | 642 | 424 | 1,296 | 106 | 747 | 2,873 |

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Appendix A.4. (Page 4 of 12).

| Date | Daily Passage | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 9/07 | 1,035 | 722 | 242 | 530 | 796 | 200 | 595 | 1,687 |
| 9/08 | 775 | 597 | 483 | 529 | 602 | 573 | 373 | 1,907 |
| 9/09 | 517 | 415 | 424 | 406 | 445 | 288 | 147 | 2,957 |
| 9/10 | 460 | 342 | 767 | 413 | 280 | 364 | 154 | 2,002 |
| 9/11 | 345 | 195 | 722 | 258 | 458 | 84 | 93 | 1,309 |
| 9/12 | 230 | 102 | 553 | 346 | 270 | 172 | 233 | 1,857 |
| 9/13 | 128 | 80 | 427 | 225 | 190 | 177 | 208 | 1,720 |
| 9/14 | 116 | 62 | 270 | 609 | 102 | 137 | 97 | 687 |
| 9/15 | 72 | 52 | 356 | 442 | 70 | 92 | 110 | 501 |
| 9/16 | | 89 | 363 | 128 | 33 | 572 | 71 | 356 |
| 9/17 | | 89 | 435 | 232 | 39 | 258 | 53 | 333 |
| 9/18 | | 64 b | 229 | 571 b | 43 | 167 | 35 | 552 |
| 9/19 | | 38 | 201 | 380 b | 24 | 107 | 42 | 181 |
| 9/20 | | 28 | 330 b | 267 b | 28 | 62 | 29 | 338 |
| 9/21 | | 26 | 222 b | 176 b | | 136 | 23 | |
| 9/22 | | 140 b | 273 b | 363 b | | 62 | 16 | |
| 9/23 | | 62 b | 196 b | 161 b | | 67 | 13 | |
| 9/24 | | 73 b | 182 b | 190 b | | 37 | 35 | |
| 9/25 | | 26 b | 87 b | 66 b | | 49 | | |
| 9/26 | | 24 b | 114 b | 63 b | | | | |
| 9/27 | | 14 b | 59 b | 61 b | | | | |
| 9/28 | | 24 b | 46 b | 41 b | | | | |
| 9/29 | | 17 b | 37 b | 37 b | | | | |
| 9/30 | | 6 b | 32 b | 18 b | | | | |
| 10/01 | | 8 b | 25 b | 20 b | | | | |
| 10/02 | | 11 b | 36 b | 28 b | | | | |
| 10/03 | | 10 b | 34 b | 27 b | | | | |
| 10/04 | | 9 b | 38 b | 25 b | | | | |
| 10/05 | | 8 b | 21 b | 21 b | | | | |
| 10/06 | | | | | | | | |
| Obs. | 47,011 | 11,611 | 22,614 | 10,094 | 32,875 | 18,308 | 14,501 | 68,731 |
| Est. | 3,544 | 626 | 1,734 | 2,515 | 260 | 1,079 | 15 | 5,873 |
| Total | 50,555 | 12,237 | 24,348 | 12,609 | 33,135 | 19,387 | 14,516 | 74,604 |
| % Obs. | 93 | 95 | 93 | 80 | 99 | 94 | 100 | 92 |

a = Daily passage was estimated due to the occurrence of a hole in the weir.
b = The weir was not operational; daily passage was estimated.
c = The weir was not operational; daily passage was not estimated
d = Partial day count, passage was not estimated.
e = Majority of the run estimated; weir not operational much of the season

Appendix A.4. (Page 5 of 12).

| Date | Cumulative Passage | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
| 7/19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | | 0 | 0 | 0 | 1 | 0 | 3 |
| 7/21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | | 0 | 0 | 0 | 2 | 0 | 3 |
| 7/22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | | 0 | 0 | 0 | 3 | 0 | 4 |
| 7/23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | | 0 | 0 | 0 | 3 | 0 | 5 |
| 7/24 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | | 0 | 0 | 0 | 5 | 0 | 6 |
| 7/25 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 2 | | 0 | 0 | 1 | 7 | 0 | 8 |
| 7/26 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 2 | | 0 | 0 | 1 | 9 | 0 | 9 |
| 7/27 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 2 | | 0 | 0 | 1 | 11 | 0 | 9 |
| 7/28 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 2 | | 0 | 0 | 1 | 12 | 12 | 11 |
| 7/29 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 2 | | 0 | 0 | 3 | 12 | 34 | 11 |
| 7/30 | 0 | 0 | 0 | 15 | 0 | 1 | 0 | 2 | | 0 | 0 | 3 | 12 | 63 | 12 |
| 7/31 | 0 | 0 | 0 | 18 | 0 | 1 | 0 | 2 | | 0 | 0 | 9 | 16 | 86 | 12 |
| 8/01 | 0 | 0 | 0 | 29 | 6 | 2 | 0 | 2 | | 0 | 0 | 10 | 26 | 137 | 13 |
| 8/02 | 0 | 5 | 0 | 43 | 10 | 2 | 0 | 2 | | 1 | 0 | 19 | 31 | 167 | 14 |
| 8/03 | 0 | 11 | 0 | 62 | 17 | 4 | 1 | 2 | | 3 | 1 | 23 | 44 | 217 | 16 |
| 8/04 | 2 | 26 | 0 | 94 | 24 | 9 | 1 | 2 | | 4 | 2 | 26 | 59 | 276 | 18 |
| 8/05 | 7 | 43 | 0 | 112 | 38 | 12 | 2 | 2 | | 11 | 11 | 41 | 81 | 344 | 19 |
| 8/06 | 12 | 59 | 0 | 165 | 46 | 20 | 2 | 6 | | 19 | 14 | 55 | 112 | 421 | 19 |
| 8/07 | 14 | 101 | 2 | 264 | 64 | 38 | 4 | 12 | | 26 | 19 | 61 | 161 | 507 | 20 |
| 8/08 | 24 | 137 | 7 | 308 | 113 | 67 | 9 | 23 | | 35 | 21 | 90 | 267 | 630 | 22 |
| 8/09 | 50 | 192 | 12 | 427 | 126 | 102 | 12 | 38 | | 44 | 22 | 239 | 400 | 733 | 29 |
| 8/10 | 70 | 234 | 18 | 479 | 220 | 141 | 20 | 63 | | 56 | 27 | 309 | 559 | 841 | 97 |
| 8/11 | 92 | 340 | 33 | 701 | 279 | 202 | 38 | 101 | | 98 | 40 | 535 | 672 | 1,003 | 171 |
| 8/12 | 154 | 431 | 50 | 816 | 397 | 288 | 67 | 181 | | 185 | 74 | 768 | 938 | 1,218 | 312 |
| 8/13 | 216 | 489 | 68 | 1,040 | 465 | 428 | 102 | 267 | | 211 | 99 | 1,102 | 1,377 | 1,427 | 506 |
| 8/14 | 349 | 567 | 103 | 1,187 | 547 | 671 | 141 | 313 | | 270 | 114 | 1,302 | 1,377 | 1,723 | 668 |
| 8/15 | 503 | 762 | 159 | 1,366 | 631 | 870 | 202 | 338 | | 300 | 122 | 1,664 | 1,377 | 2,162 | 889 |
| 8/16 | 644 | 818 | 177 | 1,510 | 855 | 1,168 | 288 | 443 | | 316 | 174 | 1,862 | 1,377 | 2,578 | 1,130 |
| 8/17 | 753 | 1,329 | 203 | 1,596 | 1,002 | 1,580 | 428 | 600 | | 548 | 359 | 2,094 | 1,377 | 3,159 | 1,210 |
| 8/18 | 863 | 1,794 | 249 | 2,854 | 1,181 | 1,866 | 671 | 858 | | 620 | 560 | 2,146 | 1,377 | 3,996 | 1,537 |
| 8/19 | 1,159 | 2,165 | 273 | 3,849 | 1,325 | 2,184 | 870 | 1,060 | | 633 | 723 | 2,481 | 1,377 | 4,757 | 2,058 |
| 8/20 | 1,473 | 2,448 | 284 | 4,386 | 1,411 | 2,711 | 1,168 | 1,350 | | 646 | 829 | 2,854 | 1,377 | 5,586 | 2,727 |
| 8/21 | 1,660 | 2,857 | 287 | 4,707 | 1,911 | 3,340 | 1,580 | 1,702 | | 689 | 903 | | 1,377 | 6,183 | 3,582 |
| 8/22 | 1,845 | 2,999 | 354 | 6,119 | 2,361 | 4,107 | 1,866 | 2,085 | | 746 | 952 | | 1,377 | 6,652 | 4,400 |
| 8/23 | 2,042 | 3,227 | 506 | 7,849 | 2,661 | 5,583 | 2,184 | 2,408 | 611 | 887 | 1,063 | | 1,377 | 7,091 | 5,331 |
| 8/24 | 2,297 | 3,874 | 606 | 9,039 | 2,982 | 7,470 | 2,711 | 2,797 | 1,272 | 1,042 | 1,079 | | 1,377 | 7,932 | 6,233 |
| 8/25 | 2,713 | 4,742 | 641 | 11,070 | 3,213 | 8,834 | 3,369 | 3,055 | | 1,139 | 1,514 | | 1,377 | 10,028 | 7,235 |
| 8/26 | 3,031 | 5,546 | 647 | 13,106 | 3,413 | 10,057 | 4,145 | 3,953 | | 1,547 | 1,642 | | 1,377 | 12,971 | 8,351 |
| 8/27 | 3,400 | 6,492 | 674 | 13,837 | 3,886 | 11,148 | 4,907 | 4,331 | | 1,609 | 1,760 | | 1,377 | 15,684 | 9,549 |
| 8/28 | 3,667 | 7,312 | 944 | 14,421 | 4,776 | 12,403 | 5,721 | 4,949 | | 1,619 | 1,794 | | 1,377 | 17,571 | 11,511 |
| 8/29 | 3,811 | 7,944 | 993 | 14,791 | 5,593 | 13,226 | 6,872 | 5,502 | | 1,638 | 1,818 | | 1,377 | 18,578 | 12,774 |
| 8/30 | 4,113 | 9,432 | 1,021 | 15,479 | 6,087 | 13,882 | 8,013 | 6,272 | | 1,649 | 1,823 | | 1,419 | 18,974 | 14,559 |
| 8/31 | 4,435 | 11,112 | 1,182 | 16,386 | 6,946 | 14,496 | 9,837 | 6,766 | | 1,670 | 1,834 | | 1,807 | 19,816 | 15,725 |
| 9/01 | 4,731 | 12,649 | 1,762 | 16,999 | 8,326 | 14,916 | 10,845 | 7,096 | | 1,693 | 1,838 | | 2,358 | 21,763 | 16,829 |
| 9/02 | 5,059 | 14,554 | 1,789 | 17,820 | 9,597 | 15,445 | 12,618 | 7,465 | | 1,762 | 2,097 | | 2,990 | 23,163 | 17,931 |
| 9/03 | 5,355 | 16,534 | 2,258 | 18,533 | 10,163 | 16,079 | 13,778 | 7,703 | | 1,809 | 3,044 | | 3,725 | 24,318 | 18,680 |
| 9/04 | 5,967 | 17,819 | 2,621 | 19,386 | 10,720 | 16,418 | 16,728 | 7,940 | | 1,937 | 3,507 | | 4,011 | 24,961 | 19,583 |
| 9/05 | 6,502 | 19,600 | 2,721 | 20,173 | 11,351 | 16,741 | 17,781 | 8,111 | | 2,327 | 3,819 | | 4,359 | 25,591 | 20,213 |
| 9/06 | 7,157 | 24,613 | 3,277 | 20,915 | 11,881 | 16,975 | 18,743 | 8,281 | | 2,508 | 4,178 | | 4,437 | 26,016 | 20,799 |

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Appendix A.4. (Page 6 of 12).

| Date | Cumulative Passage | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
| 9/07 | 7,663 | 27,832 | 3,482 | 21,258 | 12,734 | 17,428 | 19,299 | 8,434 | | 2,513 | 4,648 | | | 26,400 | 21,694 |
| 9/08 | 8,184 | 29,997 | 3,593 | 22,365 | 13,552 | 17,873 | 19,504 | 8,879 | | 2,531 | 5,120 | | | 26,927 | 22,598 |
| 9/09 | 8,751 | 31,457 | 3,744 | 23,446 | 14,141 | 18,052 | 19,615 | 9,058 | | 2,736 | 5,593 | | | 27,363 | 23,575 |
| 9/10 | 9,086 | 32,683 | 4,602 | 23,493 | 14,480 | 18,486 | 19,766 | 9,492 | | 3,115 | 6,137 | | | 27,719 | 24,274 |
| 9/11 | 9,369 | 33,604 | 4,962 | 24,323 | 14,635 | 19,452 | 20,624 | 10,458 | | 3,325 | 6,379 | | | 27,719 | 24,525 |
| 9/12 | 9,615 | 34,326 | 4,977 | 24,686 | 14,943 | 19,888 | 20,984 | 10,894 | | 3,504 | 6,516 | | | 27,719 | 25,308 |
| 9/13 | 9,854 | 35,074 | 5,152 | 24,910 | 15,176 | 20,145 | 20,999 | 11,151 | | 3,710 | 6,583 | | | 27,719 | 25,834 |
| 9/14 | 10,048 | 35,582 | 6,039 | 25,267 | 15,435 | 20,297 | 21,195 | 11,303 | | 4,115 | 6,808 | | | 27,719 | 26,198 |
| 9/15 | 10,205 | 36,006 | 6,173 | 25,304 | 15,676 | 20,409 | 21,256 | 11,415 | | 4,323 | 7,034 | | | 27,719 | 26,359 |
| 9/16 | 10,373 | 36,411 | 6,324 | 25,479 | 15,816 | 20,530 | 21,379 | 11,536 | | 4,394 | 7,149 | | | 28,233 | 26,555 |
| 9/17 | 10,505 | 36,680 | 6,748 | 26,366 | 15,929 | 20,716 | 21,454 | 11,722 | | 4,522 | 7,357 | | | 28,800 | 26,796 |
| 9/18 | 10,654 | 36,869 | 7,153 | 26,500 | 16,013 | 21,121 | 21,605 | 12,127 | | 4,900 | 7,972 | | | 29,882 | 27,070 |
| 9/19 | 10,772 | 36,994 | 7,422 | 26,651 | 16,151 | 21,390 | 21,858 | 12,396 | | 4,991 | 8,120 | | | 30,950 | 27,170 |
| 9/20 | 10,910 | 37,251 | 7,611 | 27,075 | 16,241 | 21,579 | 21,968 | 12,585 | | 5,091 | 8,283 | | | 31,687 | 27,384 |
| 9/21 | 11,013 | 37,365 | 7,736 | 27,213 | 16,301 | 21,704 | 22,021 | 12,710 | | 5,282 | 8,593 | | | 32,288 | 27,640 |
| 9/22 | 11,127 | 37,500 | 7,993 | 27,303 | 16,339 | 21,961 | 22,196 | 12,967 | | 5,471 | 8,899 | | | 32,703 | 27,676 |
| 9/23 | 11,205 | 37,547 | 8,107 | 27,363 | 16,348 | 22,075 | 22,196 | 13,081 | | 5,601 | 9,111 | | | 33,410 | 27,748 |
| 9/24 | 11,249 | 37,592 | 8,242 | 27,401 | 16,362 | 22,210 | 22,309 | 13,216 | | 5,707 | 9,283 | | | 33,764 | 27,771 |
| 9/25 | 11,279 | 37,635 | 8,289 | 27,410 | 16,382 | 22,257 | 22,393 | 13,263 | | 5,780 | 9,402 | | | 34,112 | 27,800 |
| 9/26 | 11,308 | 37,664 | 8,334 | 27,424 | 16,401 | 22,302 | 22,531 | 13,308 | | 5,905 | 9,604 | | | 34,255 | 27,802 |
| 9/27 | 11,334 | 37,690 | 8,377 | 27,444 | 16,419 | 22,345 | 22,621 | 13,351 | | 5,968 | 9,705 | | | 34,392 | 27,805 |
| 9/28 | 11,347 | 37,703 | 8,406 | 27,463 | 16,434 | 22,374 | 22,681 | 13,380 | | 6,029 | 9,804 | | | 34,411 | 27,811 |
| 9/29 | 11,361 | 37,717 | 8,432 | 27,481 | 16,441 | 22,400 | 22,719 | 13,406 | | 6,054 | 9,845 | | | 34,414 | 27,815 |
| 9/30 | 11,381 | 37,737 | 8,445 | 27,496 | | 22,413 | 22,728 | 13,419 | | 6,078 | 9,884 | | | 34,427 | 27,819 |
| 10/01 | 11,400 | 37,756 | 8,459 | 27,503 | | 22,427 | 22,742 | 13,433 | | 6,081 | 9,889 | | | 34,695 | 27,824 |
| 10/02 | 11,418 | 37,774 | 8,479 | 27,529 | | 22,447 | 22,762 | 13,453 | | 6,082 | 9,890 | | | | 27,833 |
| 10/03 | 11,433 | 37,789 | 8,498 | 27,542 | | 22,466 | 22,781 | 13,472 | | 6,085 | 9,894 | | | | 27,847 |
| 10/04 | 11,440 | 37,796 | 8,516 | 27,556 | | 22,484 | 22,799 | 13,490 | | 6,105 | 9,964 | | | | 27,861 |
| 10/05 | 11,450 | | 8,531 | 27,576 | | 22,499 | 22,814 | 13,505 | | 6,122 | | | | | |
| 10/06 | 11,455 | | 8,538 | 27,595 | | 22,506 | 22,821 | 13,512 | | 6,132 | | | | | |

Appendix A.4. (Page 7 of 12).

| Date | Cumulative Passage | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 7/19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/20 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 6 |
| 7/21 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 14 |
| 7/22 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 26 |
| 7/23 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 29 |
| 7/24 | 8 | 0 | 0 | 1 | 0 | 0 | 7 | 32 |
| 7/25 | 14 | 0 | 0 | 1 | 3 | 0 | 15 | 46 |
| 7/26 | 17 | 0 | 2 | 1 | 5 | 0 | 17 | 50 |
| 7/27 | 20 | 0 | 4 | 1 | 8 | 0 | 22 | 58 |
| 7/28 | 35 | 0 | 4 | 1 | 9 | 0 | 25 | 85 |
| 7/29 | 60 | 2 | 4 | 1 | 10 | 0 | 25 | 112 |
| 7/30 | 143 | 2 | 5 | 2 | 14 | 0 | 25 | 139 |
| 7/31 | 169 | 3 | 7 | 2 | 24 | 2 | 25 | 164 |
| 8/01 | 223 | 7 | 9 | 2 | 25 | 4 | 25 | 211 |
| 8/02 | 305 | 12 | 12 | 2 | 34 | 13 | 28 | 278 |
| 8/03 | 415 | 15 | 22 | 2 | 67 | 18 | 34 | 329 |
| 8/04 | 456 | 19 | 29 | 2 | 99 | 30 | 39 | 380 |
| 8/05 | 492 | 42 | 43 | 2 | 150 | 34 | 45 | 417 |
| 8/06 | 707 | 64 | 49 | 2 | 215 | 54 | 53 | 470 |
| 8/07 | 858 | 111 | 56 | 3 | 294 | 61 | 59 | 605 |
| 8/08 | 998 | 122 | 61 | 4 | 388 | 93 | 79 | 672 |
| 8/09 | 1,243 | 148 | 78 | 5 | 580 | 109 | 91 | 941 |
| 8/10 | 1,849 | 213 | 84 | 11 | 905 | 118 | 99 | 1,265 |
| 8/11 | 2,462 | 302 | 111 | 15 | 1,138 | 162 | 104 | 1,292 |
| 8/12 | 3,363 | 359 | 128 | 19 | 1,788 | 352 | 154 | 2,247 |
| 8/13 | 4,232 | 432 | 163 | 30 | 2,660 | 456 | 213 | 2,794 |
| 8/14 | 5,257 | 453 | 290 | 35 | 3,627 | 698 | 244 | 3,800 |
| 8/15 | 6,380 | 517 | 381 | 59 | 4,430 | 935 | 300 | 5,000 |
| 8/16 | 7,764 | 640 | 625 | 121 | 4,775 | 1,702 | 389 | 5,845 |
| 8/17 | 9,237 | 724 | 850 | 170 | 4,874 | 2,088 | 462 | 6,478 |
| 8/18 | 10,344 | 817 | 904 | 185 | 5,433 | 2,903 | 510 | 6,715 |
| 8/19 | 11,379 | 934 | 928 | 191 | 6,584 | 3,479 | 527 | 7,157 |
| 8/20 | 13,521 | 1,172 | 1,056 | 429 | 7,683 | 3,791 | 652 | 8,302 |
| 8/21 | 16,031 | 1,621 | 1,803 | 498 | 8,926 | 4,414 | 1,395 | 10,488 |
| 8/22 | 18,578 | 2,049 | 2,101 | 686 | 10,069 | 5,481 | 2,220 | 11,918 |
| 8/23 | 21,243 | 2,528 | 2,361 | 877 | 11,120 | 6,038 | 3,178 | 12,929 |
| 8/24 | 23,661 | 2,953 | 3,301 | 1,052 | 12,185 | 7,044 | 3,992 | 14,522 |
| 8/25 | 26,388 | 3,564 | 3,771 | 1,223 | 12,777 | 7,758 | 5,072 | 16,287 |
| 8/26 | 28,734 | 4,149 | 5,102 | 1,300 | 13,185 | 8,389 | 5,315 | 19,458 |
| 8/27 | 30,687 | 4,550 | 5,540 | 1,561 | 15,066 | 9,295 | 5,616 | 22,727 |
| 8/28 | 33,117 | 4,900 | 6,021 | 1,664 | 17,739 | 10,013 | 5,957 | 26,277 |
| 8/29 | 34,492 | 5,200 | 6,611 | 1,870 | 20,805 | 11,454 | 6,265 | 29,828 |
| 8/30 | 36,548 | 5,907 | 7,514 | 2,135 | 23,369 | 12,223 | 6,867 | 33,928 |
| 8/31 | 38,646 | 6,815 | 8,955 | 2,343 | 24,785 | 13,090 | 8,217 | 37,590 |
| 9/01 | 40,650 | 7,379 | 10,360 | 2,692 | 25,890 | 13,719 | 9,222 | 41,291 |
| 9/02 | 42,598 | 7,630 | 11,934 | 3,174 | 26,754 | 14,502 | 9,731 | 44,081 |
| 9/03 | 44,090 | 8,061 | 13,329 | 3,675 | 27,481 | 14,824 | 10,082 | 46,182 |
| 9/04 | 45,080 | 8,130 | 15,311 | 4,551 | 27,907 | 15,276 | 10,582 | 50,683 |
| 9/05 | 45,970 | 8,670 | 16,500 | 5,552 | 28,459 | 15,677 | 11,442 | 55,344 |
| 9/06 | 46,877 | 8,904 | 17,142 | 5,976 | 29,755 | 15,783 | 12,189 | 58,217 |

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Appendix A.4. (Page 8 of 12).

| Date | Cumulative Passage | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 9/07 | 47,912 | 9,626 | 17,384 | 6,506 | 30,551 | 15,983 | 12,784 | 59,904 |
| 9/08 | 48,687 | 10,223 | 17,867 | 7,035 | 31,153 | 16,556 | 13,157 | 61,811 |
| 9/09 | 49,204 | 10,638 | 18,291 | 7,441 | 31,598 | 16,844 | 13,304 | 64,768 |
| 9/10 | 49,664 | 10,980 | 19,058 | 7,854 | 31,878 | 17,208 | 13,458 | 66,770 |
| 9/11 | 50,009 | 11,175 | 19,780 | 8,112 | 32,336 | 17,292 | 13,551 | 68,079 |
| 9/12 | 50,239 | 11,277 | 20,333 | 8,458 | 32,606 | 17,464 | 13,784 | 69,936 |
| 9/13 | 50,367 | 11,357 | 20,760 | 8,683 | 32,796 | 17,641 | 13,992 | 71,656 |
| 9/14 | 50,483 | 11,419 | 21,030 | 9,292 | 32,898 | 17,778 | 14,089 | 72,343 |
| 9/15 | 50,555 | 11,471 | 21,386 | 9,734 | 32,968 | 17,870 | 14,199 | 72,844 |
| 9/16 | | 11,560 | 21,749 | 9,862 | 33,001 | 18,442 | 14,270 | 73,200 |
| 9/17 | | 11,649 | 22,184 | 10,094 | 33,040 | 18,700 | 14,323 | 73,533 |
| 9/18 | | 11,713 | 22,413 | 10,665 | 33,083 | 18,867 | 14,358 | 74,085 |
| 9/19 | | 11,751 | 22,614 | 11,045 | 33,107 | 18,974 | 14,400 | 74,266 |
| 9/20 | | 11,779 | 22,944 | 11,312 | 33,135 | 19,036 | 14,429 | 74,604 |
| 9/21 | | 11,805 | 23,167 | 11,488 | | 19,172 | 14,452 | |
| 9/22 | | 11,945 | 23,440 | 11,850 | | 19,234 | 14,468 | |
| 9/23 | | 12,007 | 23,636 | 12,011 | | 19,301 | 14,481 | |
| 9/24 | | 12,080 | 23,818 | 12,202 | | 19,338 | 14,516 | |
| 9/25 | | 12,106 | 23,905 | 12,268 | | 19,387 | | |
| 9/26 | | 12,130 | 24,019 | 12,332 | | | | |
| 9/27 | | 12,144 | 24,078 | 12,392 | | | | |
| 9/28 | | 12,168 | 24,124 | 12,433 | | | | |
| 9/29 | | 12,185 | 24,161 | 12,470 | | | | |
| 9/30 | | 12,191 | 24,193 | 12,488 | | | | |
| 10/01 | | 12,199 | 24,218 | 12,508 | | | | |
| 10/02 | | 12,210 | 24,254 | 12,536 | | | | |
| 10/03 | | 12,220 | 24,288 | 12,563 | | | | |
| 10/04 | | 12,229 | 24,326 | 12,588 | | | | |
| 10/05 | | 12,237 | 24,348 | 12,609 | | | | |
| 10/06 | | | | | | | | |

Appendix A.4. (Page 9 of 12).

| Date | Cumulative Percent Passage | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
| 7/19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 7/20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 7/21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 7/22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 7/23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 7/24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 7/25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 7/26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 7/27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 7/28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 7/29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 7/30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 7/31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 8/01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 8/02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| 8/03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 1 | 0 |
| 8/04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 1 | 0 |
| 8/05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 1 | 0 |
| 8/06 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 1 | 0 |
| 8/07 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 1 | 0 |
| 8/08 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | | 1 | 0 | | | 2 | 0 |
| 8/09 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | | 1 | 0 | | | 2 | 0 |
| 8/10 | 1 | 1 | 0 | 2 | 1 | 1 | 0 | 0 | | 1 | 0 | | | 2 | 0 |
| 8/11 | 1 | 1 | 0 | 3 | 2 | 1 | 0 | 1 | | 2 | 0 | | | 3 | 1 |
| 8/12 | 1 | 1 | 1 | 3 | 2 | 1 | 0 | 1 | | 3 | 1 | | | 4 | 1 |
| 8/13 | 2 | 1 | 1 | 4 | 3 | 2 | 0 | 2 | | 3 | 1 | | | 4 | 2 |
| 8/14 | 3 | 2 | 1 | 4 | 3 | 3 | 1 | 2 | | 4 | 1 | | | 5 | 2 |
| 8/15 | 4 | 2 | 2 | 5 | 4 | 4 | 1 | 3 | | 5 | 1 | | | 6 | 3 |
| 8/16 | 6 | 2 | 2 | 5 | 5 | 5 | 1 | 3 | | 5 | 2 | | | 7 | 4 |
| 8/17 | 7 | 4 | 2 | 6 | 6 | 7 | 2 | 4 | | 9 | 4 | | | 9 | 4 |
| 8/18 | 8 | 5 | 3 | 10 | 7 | 8 | 3 | 6 | | 10 | 6 | | | 12 | 6 |
| 8/19 | 10 | 6 | 3 | 14 | 8 | 10 | 4 | 8 | | 10 | 7 | | | 14 | 7 |
| 8/20 | 13 | 6 | 3 | 16 | 9 | 12 | 5 | 10 | | 11 | 8 | | | 16 | 10 |
| 8/21 | 14 | 8 | 3 | 17 | 12 | 15 | 7 | 13 | | 11 | 9 | | | 18 | 13 |
| 8/22 | 16 | 8 | 4 | 22 | 14 | 18 | 8 | 15 | | 12 | 10 | | | 19 | 16 |
| 8/23 | 18 | 9 | 6 | 28 | 16 | 25 | 10 | 18 | | 14 | 11 | | | 20 | 19 |
| 8/24 | 20 | 10 | 7 | 33 | 18 | 33 | 12 | 21 | | 17 | 11 | | | 23 | 22 |
| 8/25 | 24 | 13 | 8 | 40 | 20 | 39 | 15 | 23 | | 19 | 15 | | | 29 | 26 |
| 8/26 | 26 | 15 | 8 | 47 | 21 | 45 | 18 | 29 | | 25 | 16 | | | 37 | 30 |
| 8/27 | 30 | 17 | 8 | 50 | 24 | 50 | 22 | 32 | | 26 | 18 | | | 45 | 34 |
| 8/28 | 32 | 19 | 11 | 52 | 29 | 55 | 25 | 37 | | 26 | 18 | | | 51 | 41 |
| 8/29 | 33 | 21 | 12 | 54 | 34 | 59 | 30 | 41 | | 27 | 18 | | | 54 | 46 |
| 8/30 | 36 | 25 | 12 | 56 | 37 | 62 | 35 | 46 | | 27 | 18 | | | 55 | 52 |
| 8/31 | 39 | 29 | 14 | 59 | 42 | 64 | 43 | 50 | | 27 | 18 | | | 57 | 56 |
| 9/01 | 41 | 33 | 21 | 62 | 51 | 66 | 48 | 53 | | 28 | 18 | | | 63 | 60 |
| 9/02 | 44 | 39 | 21 | 65 | 58 | 69 | 55 | 55 | | 29 | 21 | | | 67 | 64 |
| 9/03 | 47 | 44 | 26 | 67 | 62 | 71 | 60 | 57 | | 30 | 31 | | | 70 | 67 |
| 9/04 | 52 | 47 | 31 | 70 | 65 | 73 | 73 | 59 | | 32 | 35 | | | 72 | 70 |
| 9/05 | 57 | 52 | 32 | 73 | 69 | 74 | 78 | 60 | | 38 | 38 | | | 74 | 73 |
| 9/06 | 62 | 65 | 38 | 76 | 72 | 75 | 82 | 61 | | 41 | 42 | | | 75 | 75 |

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Appendix A.4. (Page 10 of 12).

| Date | Cumulative Percent Passage | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
| 9/07 | 67 | 74 | 41 | 77 | 77 | 77 | 85 | 62 | | 41 | 47 | | | 76 | 78 |
| 9/08 | 71 | 79 | 42 | 81 | 82 | 79 | 85 | 66 | | 41 | 51 | | | 78 | 81 |
| 9/09 | 76 | 83 | 44 | 85 | 86 | 80 | 86 | 67 | | 45 | 56 | | | 79 | 85 |
| 9/10 | 79 | 86 | 54 | 85 | 88 | 82 | 87 | 70 | | 51 | 62 | | | 80 | 87 |
| 9/11 | 82 | 89 | 58 | 88 | 89 | 86 | 90 | 77 | | 54 | 64 | | | 80 | 88 |
| 9/12 | 84 | 91 | 58 | 89 | 91 | 88 | 92 | 81 | | 57 | 65 | | | 80 | 91 |
| 9/13 | 86 | 93 | 60 | 90 | 92 | 90 | 92 | 83 | | 61 | 66 | | | 80 | 93 |
| 9/14 | 88 | 94 | 71 | 92 | 94 | 90 | 93 | 84 | | 67 | 68 | | | 80 | 94 |
| 9/15 | 89 | 95 | 72 | 92 | 95 | 91 | 93 | 84 | | 70 | 71 | | | 80 | 95 |
| 9/16 | 91 | 96 | 74 | 92 | 96 | 91 | 94 | 85 | | 72 | 72 | | | 81 | 95 |
| 9/17 | 92 | 97 | 79 | 96 | 97 | 92 | 94 | 87 | | 74 | 74 | | | 83 | 96 |
| 9/18 | 93 | 98 | 84 | 96 | 97 | 94 | 95 | 90 | | 80 | 80 | | | 86 | 97 |
| 9/19 | 94 | 98 | 87 | 97 | 98 | 95 | 96 | 92 | | 81 | 81 | | | 89 | 98 |
| 9/20 | 95 | 99 | 89 | 98 | 99 | 96 | 96 | 93 | | 83 | 83 | | | 91 | 98 |
| 9/21 | 96 | 99 | 91 | 99 | 99 | 96 | 96 | 94 | | 86 | 86 | | | 93 | 99 |
| 9/22 | 97 | 99 | 94 | 99 | 99 | 98 | 97 | 96 | | 89 | 89 | | | 94 | 99 |
| 9/23 | 98 | 99 | 95 | 99 | 99 | 98 | 97 | 97 | | 91 | 91 | | | 96 | 100 |
| 9/24 | 98 | 99 | 97 | 99 | 100 | 99 | 98 | 98 | | 93 | 93 | | | 97 | 100 |
| 9/25 | 98 | 100 | 97 | 99 | 100 | 99 | 98 | 98 | | 94 | 94 | | | 98 | 100 |
| 9/26 | 99 | 100 | 98 | 99 | 100 | 99 | 99 | 98 | | 96 | 96 | | | 99 | 100 |
| 9/27 | 99 | 100 | 98 | 99 | 100 | 99 | 99 | 99 | | 97 | 97 | | | 99 | 100 |
| 9/28 | 99 | 100 | 98 | 100 | 100 | 99 | 99 | 99 | | 98 | 98 | | | 99 | 100 |
| 9/29 | 99 | 100 | 99 | 100 | 100 | 100 | 100 | 99 | | 99 | 99 | | | 99 | 100 |
| 9/30 | 99 | 100 | 99 | 100 | | 100 | 100 | 99 | | 99 | 99 | | | 99 | 100 |
| 10/01 | 100 | 100 | 99 | 100 | | 100 | 100 | 99 | | 99 | 99 | | | 100 | 100 |
| 10/02 | 100 | 100 | 99 | 100 | | 100 | 100 | 100 | | 99 | 99 | | | | 100 |
| 10/03 | 100 | 100 | 100 | 100 | | 100 | 100 | 100 | | 99 | 99 | | | | 100 |
| 10/04 | 100 | 100 | 100 | 100 | | 100 | 100 | 100 | | 100 | 100 | | | | 100 |
| 10/05 | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | | | | | |
| 10/06 | 100 | | 100 | 100 | | 100 | 100 | 100 | | 100 | | | | | |

Appendix A.4. (Page 11 of 12).

| Date | Cumulative Percent Passage | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 7/19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8/01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8/02 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8/03 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8/04 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8/05 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8/06 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 8/07 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 8/08 | 2 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| 8/09 | 2 | 1 | 0 | 0 | 2 | 1 | 1 | 1 |
| 8/10 | 4 | 2 | 0 | 0 | 3 | 1 | 1 | 2 |
| 8/11 | 5 | 2 | 0 | 0 | 3 | 1 | 1 | 2 |
| 8/12 | 7 | 3 | 1 | 0 | 5 | 2 | 1 | 3 |
| 8/13 | 8 | 4 | 1 | 0 | 8 | 2 | 1 | 4 |
| 8/14 | 10 | 4 | 1 | 0 | 11 | 4 | 2 | 5 |
| 8/15 | 13 | 4 | 2 | 0 | 13 | 5 | 2 | 7 |
| 8/16 | 15 | 5 | 3 | 1 | 14 | 9 | 3 | 8 |
| 8/17 | 18 | 6 | 3 | 1 | 15 | 11 | 3 | 9 |
| 8/18 | 20 | 7 | 4 | 1 | 16 | 15 | 4 | 9 |
| 8/19 | 23 | 8 | 4 | 2 | 20 | 18 | 4 | 10 |
| 8/20 | 27 | 10 | 4 | 3 | 23 | 20 | 4 | 11 |
| 8/21 | 32 | 13 | 7 | 4 | 27 | 23 | 10 | 14 |
| 8/22 | 37 | 17 | 9 | 5 | 30 | 28 | 15 | 16 |
| 8/23 | 42 | 21 | 10 | 7 | 34 | 31 | 22 | 17 |
| 8/24 | 47 | 24 | 14 | 8 | 37 | 36 | 27 | 19 |
| 8/25 | 52 | 29 | 15 | 10 | 39 | 40 | 35 | 22 |
| 8/26 | 57 | 34 | 21 | 10 | 40 | 43 | 37 | 26 |
| 8/27 | 61 | 37 | 23 | 12 | 45 | 48 | 39 | 30 |
| 8/28 | 66 | 40 | 25 | 13 | 54 | 52 | 41 | 35 |
| 8/29 | 68 | 42 | 27 | 15 | 63 | 59 | 43 | 40 |
| 8/30 | 72 | 48 | 31 | 17 | 71 | 63 | 47 | 45 |
| 8/31 | 76 | 56 | 37 | 19 | 75 | 68 | 57 | 50 |
| 9/01 | 80 | 60 | 43 | 21 | 78 | 71 | 64 | 55 |
| 9/02 | 84 | 62 | 49 | 25 | 81 | 75 | 67 | 59 |
| 9/03 | 87 | 66 | 55 | 29 | 83 | 76 | 69 | 62 |
| 9/04 | 89 | 66 | 63 | 36 | 84 | 79 | 73 | 68 |
| 9/05 | 91 | 71 | 68 | 44 | 86 | 81 | 79 | 74 |
| 9/06 | 93 | 73 | 70 | 47 | 90 | 81 | 84 | 78 |

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Appendix A.4. (Page 12 of 12).

| Date | Cumulative Percent Passage | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 9/07 | 95 | 79 | 71 | 52 | 92 | 82 | 88 | 80 |
| 9/08 | 96 | 84 | 73 | 56 | 94 | 85 | 91 | 83 |
| 9/09 | 97 | 87 | 75 | 59 | 95 | 87 | 92 | 87 |
| 9/10 | 98 | 90 | 78 | 62 | 96 | 89 | 93 | 89 |
| 9/11 | 99 | 91 | 81 | 64 | 98 | 89 | 93 | 91 |
| 9/12 | 99 | 92 | 84 | 67 | 98 | 90 | 95 | 94 |
| 9/13 | 100 | 93 | 85 | 69 | 99 | 91 | 96 | 96 |
| 9/14 | 100 | 93 | 86 | 74 | 99 | 92 | 97 | 97 |
| 9/15 | 100 | 94 | 88 | 77 | 99 | 92 | 98 | 98 |
| 9/16 | | 94 | 89 | 78 | 100 | 95 | 98 | 98 |
| 9/17 | | 95 | 91 | 80 | 100 | 96 | 99 | 99 |
| 9/18 | | 96 | 92 | 85 | 100 | 97 | 99 | 99 |
| 9/19 | | 96 | 93 | 88 | 100 | 98 | 99 | 100 |
| 9/20 | | 96 | 94 | 90 | 100 | 98 | 99 | 100 |
| 9/21 | | 96 | 95 | 91 | | 99 | 100 | |
| 9/22 | | 98 | 96 | 94 | | 99 | 100 | |
| 9/23 | | 98 | 97 | 95 | | 100 | 100 | |
| 9/24 | | 99 | 98 | 97 | | 100 | 100 | |
| 9/25 | | 99 | 98 | 97 | | 100 | | |
| 9/26 | | 99 | 99 | 98 | | | | |
| 9/27 | | 99 | 99 | 98 | | | | |
| 9/28 | | 99 | 99 | 99 | | | | |
| 9/29 | | 100 | 99 | 99 | | | | |
| 9/30 | | 100 | 99 | 99 | | | | |
| 10/01 | | 100 | 99 | 99 | | | | |
| 10/02 | | 100 | 100 | 99 | | | | |
| 10/03 | | 100 | 100 | 100 | | | | |
| 10/04 | | 100 | 100 | 100 | | | | |
| 10/05 | | 100 | 100 | 100 | | | | |
| 10/06 | | | | | | | | |

# APPENDIX B
# INFORMATIONAL SUMMARY FROM RECOVERED TAGGED SALMON

**Appendix B:** Kogrukluk River Weir: Tags observed and recovered by Date, 2003

| Date | Kuskokwim River | Holitna River Radiotelemetry | | Kuskokwim River Mark-Recapture | | |
|---|---|---|---|---|---|---|
| | Chinook | Chinook | Chum | Chum | Sockeye | Coho |
| | Tags Observed (Recovered) | Tags Observed (Recovered) | Tags Observed (Recovered) | Tags Observed (Recovered) | Tags Observed (Recovered) | Tags Observed (Recovered) |
| 21-Jun | | | | | | |
| 22-Jun | | | | | | |
| 23-Jun | | | | | | |
| 24-Jun | | | | | | |
| 25-Jun | | | | | | |
| 26-Jun | | | | | | |
| 27-Jun | | | | | | |
| 28-Jun | | | | | | |
| 29-Jun | | | | | | |
| 30-Jun | | 1 (1) | | | | |
| 1-Jul | | | | | | |
| 2-Jul | | | | | | |
| 3-Jul | | 1 (1) | | 2 (2) | | |
| 4-Jul | | | | | | |
| 5-Jul | 2 (2) | 1 (1) | 1 (1) | | | |
| 6-Jul | | 1 (0) | | 3 (3) | | |
| 7-Jul | | | 1 (1) | 1 (1) | | |
| 8-Jul | | 2 (1) | | 3 (2) | 2 (2) | |
| 9-Jul | | | 1 (1) | 6 (4) | 2 (1) | |
| 10-Jul | 1 (0) | | 1 (1) | 5 (1) | 2 (0) | |
| 11-Jul | | | | | | |
| 12-Jul | 2 (2) | 1 (0) | 1 (1) | 4 (3) | 1 (1) | |
| 13-Jul | | | | 6 (4) | 1 (1) | |
| 14-Jul | 2 (2) | | | 1 (1) | | |
| 15-Jul | | | | 5(2) | 6 (3) | |
| 16-Jul | 3 (1) | 1 (1) | | 4 (4) | 10 (10) | |
| 17-Jul | 3 (3) | | | 5 (4) | 4 (4) | |
| 18-Jul | | 1 (0) | | 5 (5) | 1 (1) | |
| 19-Jul | | 1 (1) | | 4 (3) | 8 (7) | |
| 20-Jul | 2 (2) | | | 2 (2) | 8 (8) | |
| 21-Jul | 1 (1) | | | 6 (6) | 5 (5) | |
| 22-Jul | | | | 2 (2) | 7 (7) | |
| 23-Jul | 1 (1) | | | 2 (2) | 1 (1) | |
| 24-Jul | 1 (1) | | | 4 (4) | 1 (1) | |
| 25-Jul | 1 (1) | 1 (1) | | 1 (0) | 4 (4) | |
| 26-Jul | 1 (1) | | | 1 (1) | 2 (2) | |
| 27-Jul | | | | 2 (2) | 1 (1) | |
| 28-Jul | | | | 4 (2) | 4 (3) | |
| 29-Jul | | | | | | |
| 30-Jul | | | | | | |
| 31-Jul | | | | 2 (2) | | |
| 1-Aug | | | | 1 (1) | 1 (1) | |
| 2-Aug | | | | | | |
| 3-Aug | | | | | | |
| 4-Aug | 1 (1) | | | | 1 (1) | |
| 5-Aug | | | | | | |
| 6-Aug | | | | | 1 (1) | |
| 7-Aug | | | | | | |
| 8-Aug | | | | | | |
| 9-Aug | | | | | | 2 (2) |
| 10-Aug | | | | 1 (1) | | 2 (2) |
| 11-Aug | | | | | | |
| 12-Aug | | | | | | 5 (3) |
| 13-Aug | | | | | | 2 (2) |
| 14-Aug | | | | | | 3 (0) |
| 15-Aug | | | | | | 7 (0) |
| 16-Aug | | | | 1 (0) | | 7 (0) |
| 17-Aug | | | | | | 4 (0) |
| 18-Aug | | | | | | 2 (2) |
| 19-Aug | | | | | | 2 (2) |
| 20-Aug | | | | | | 9 (9) |
| 21-Aug | | | | | | 15 (15) |
| 22-Aug | | | | | | 11 (11) |
| 23-Aug | | | | | | 5 (5) |
| 24-Aug | | | | | | 19 (19) |
| 25-Aug | | | | | | 25 (24) |
| 26-Aug | | | | | | 35 (34) |
| 27-Aug | | | | | | 48 (13) |
| 28-Aug | | | | | | |
| 29-Aug | | | | 1 (1) | | 13 (0) |
| 30-Aug | | | | | | 60 (60) |
| 31-Aug | | | | | | 45 (45) |
| 1-Sep | | | | | | 41 (40) |
| 2-Sep | | | | | | 23 (22) |
| 3-Sep | | | | | | 26 (26) |
| 4-Sep | | | | | | 85 (84) |
| 5-Sep | | | | | | 56 (54) |
| 6-Sep | | | | | | 52 (50) |
| 7-Sep | | | | | | 25 (25) |
| 8-Sep | | | | | | 48 (20) |
| 9-Sep | | | | | | 73 (64) |
| 10-Sep | | | | | | 51 (22) |
| 11-Sep | | | | | | 30 (27) |
| 12-Sep | | | | | | 47 (24) |
| 13-Sep | | | | | | 39 (23) |
| 14-Sep | | | | | | 20 (5) |
| 15-Sep | | | | | | 16 (3) |
| 16-Sep | | | | | | 18 (0) |
| 17-Sep | | | | | | 17 (0) |
| 18-Sep | | | | | | 16(9) |
| 19-Sep | | | | | | 7 (2) |
| 20-Sep | | | | | | 17 (1) |
| Total: | 21 (18) | 11 (7) | 5 (5) | 84 (64) | 73 (65) | 1,026 (750) |

# APPENDIX C
## CLIMATE INFORMATION FOR THE KOGRUKLUK RIVER WEIR

Appendix C. Daily climate data collected at the Kogrukluk River weir, 2003.

| Date | Time | sky[a] | Precip | wind | Temperature (°C) air | AVG air | water | River Stage | average river stage |
|---|---|---|---|---|---|---|---|---|---|
| 22-Jun | 0830 | 1 | trace | calm | 6.0 | | 9.0 | 2980 | |
| 23-Jun | 0830 | 3 | trace | calm | 10.0 | | 10.0 | 2935 | *2925* |
| 23-Jun | 1700 | 2 | 0.0 | S 10 | 18.0 | | 11.0 | 2915 | |
| 24-Jun | 0830 | 3 | 0.0 | calm | 6.0 | | 8.0 | 2895 | *2885* |
| 24-Jun | 2130 | 3 | 0.0 | S 5-10 | 13.0 | | 10.0 | 2875 | |
| 25-Jun | 0830 | 4 | 0.0 | calm | 7.0 | | 8.0 | 2875 | *2870* |
| 25-Jun | 2145 | 3 | trace | S 5-15 | 12.0 | | 9.0 | 2865 | |
| 26-Jun | 0830 | 3 | trace | SE 10 | 8 | | 9 | 2865 | *2860* |
| 27-Jun | 0830 | 4 | 2.0 | calm | 8 | | 8 | 2855 | |
| 28-Jun | 0730 | 1 | 0.0 | calm | 4.0 | | 9.0 | 2835 | *2825* |
| 28-Jun | 1700 | 3 | 0.0 | S 10 | 13.0 | | 13.0 | 2815 | |
| 29-Jun | 0730 | 3 | 3.0 | S 0-5 | 11.0 | | 11.0 | 2815 | |
| 30-Jun | 0730 | 4 | 1.0 | calm | 12.0 | | 10.0 | 2820 | |
| 1-Jul | 0730 | 4 | 4.0 | S 10-15 | 13.0 | | 10.0 | 2815 | |
| 2-Jul | 0630 | 3 | 12.0 | calm | 11.0 | | 11.0 | 2845 | |
| 3-Jul | 0730 | 3 | 3.0 | calm | 11.0 | | 11.0 | 2905 | *2885* |
| 3-Jul | 1700 | 1 | 0.0 | NW 10 | 22.0 | | 12.0 | 2865 | |
| 4-Jul | 0830 | 3 | 0.0 | S 5 | 11.0 | | 11.0 | 2825 | |
| 5-Jul | 0730 | 4 | 0.0 | calm | 12.0 | | 12.0 | 2785 | |
| 6-Jul | 1030 | 4 | 1.0 | calm | 13.0 | | 11.0 | 2755 | |
| 7-Jul | 0730 | 2 | 2.0 | calm | 12.0 | | 11.0 | 2750 | *2748* |
| 7-Jul | 1700 | 2 | 0.0 | NW 5-10 | 13.0 | | 14.0 | 2745 | |
| 8-Jul | 0730 | 1 | 0.0 | calm | 11.0 | | 14.0 | 2735 | |
| 9-Jul | 0730 | 3 | 0.0 | calm | 15.0 | | 14.0 | 2705 | |
| 10-Jul | 0730 | 4 | 0.0 | NW 5 | 13.0 | | 14.0 | 2695 | *2693* |
| 10-Jul | 1700 | 4 | 0.0 | calm | 15.0 | | 13.0 | 2690 | |
| 11-Jul | 0730 | 4 | 3.0 | calm | 11.0 | | 11.0 | 2685 | *2698* |
| 11-Jul | 1930 | 4 | 0.0 | SE 0-5 | 16.0 | | 11.0 | 2710 | |
| 12-Jul | 0730 | 4 | 13.0 | calm | 11.0 | | 10.0 | 2755 | *2760* |
| 12-Jul | 1930 | 3 | 0.0 | NW 10 | 20.0 | | 13.0 | 2765 | |
| 13-Jul | 0730 | 1 | 0.0 | calm | 9.0 | | 11.0 | 2735 | |
| 14-Jul | 0730 | 1 | 0.0 | S 10 | 9.0 | | 13.0 | 2695 | *2690* |
| 14-Jul | 1700 | 3 | 0.0 | NW 15 | 23.0 | | 14.0 | 2685 | |
| 15-Jul | 0730 | 3 | 0.0 | calm | 14.0 | | 12.0 | 2670 | *2665* |
| 15-Jul | 1700 | 3 | 0.0 | NW 0-5 | 23.0 | | 14.0 | 2660 | |
| 16-Jul | 0730 | 4 | 22.0 | NW 7 | 11.0 | | 13.0 | 2680 | *2683* |
| 16-Jul | 1700 | 2 | 5.0 | calm | 7.0 | | 13.0 | 2685 | |
| 17-Jul | 0730 | 3 | 5.0 | W 10-15 | 6.0 | | 10.0 | 2775 | *2765* |
| 17-Jul | 1700 | 4 | trace | W 2 | 16.0 | | 12.0 | 2755 | |
| 18-Jul | 0730 | 4 | 1.0 | SE 10 | 12.0 | | 10.0 | 2725 | |
| 19-Jul | 0730 | 1 | 0.0 | calm | 8.0 | | 11.0 | 2695 | *2683* |
| 19-Jul | 1700 | 1 | 0.0 | calm | 27.0 | | 14.0 | 2670 | |
| 20-Jul | 0730 | 1 | 0.0 | SW 5 | 8.0 | | 13.0 | 2685 | |
| 21-Jul | 0730 | 1 | 0.0 | calm | 13.0 | | 13.0 | 2635 | *2625* |
| 21-Jul | 1700 | 1 | 0.0 | NW 2 | 22.0 | | 16.0 | 2615 | |
| 22-Jul | 0730 | 1 | 0.0 | SE 5 | 6.0 | | 12.0 | 2625 | |
| 23-Jul | 0730 | 4 | 0.0 | S 10-15 | 13.0 | | 14.0 | 2605 | *2595* |
| 23-Jul | 1800 | 4 | 2.0 | S 10 | 14.0 | | 13.0 | 2585 | |
| 24-Jul | 0730 | 4 | 5.0 | S 10 | 11.0 | | 11.0 | 2635 | *2633* |
| 24-Jul | 0730 | 4 | 0.0 | S 15 | 11.0 | | 13.0 | 2630 | |
| 25-Jul | 1700 | 4 | 2.0 | calm | 11.0 | | 11.0 | 2725 | |
| 26-Jul | 0730 | 4 | 3.0 | S 10 | 9.0 | | 12.0 | 2745 | |
| 27-Jul | 0730 | 4 | 2.0 | calm | 12.0 | | 11.0 | 2670 | |
| 28-Jul | 0730 | 4 | 26.0 | calm | 10.0 | | 10.0 | 2745 | *2830* |
| 28-Jul | 0730 | 2 | 4.0 | calm | 11.0 | | 10.0 | 2915 | |
| 29-Jul | 1700 | 2 | 4.0 | calm | 11.0 | | 10.0 | 3085 | |
| 30-Jul | 0730 | 4 | 0.0 | calm | 11.0 | | 11.0 | 2875 | |
| 31-Jul | 0730 | 3 | 1.0 | SE 5-7 | 11.0 | | 9.0 | 2795 | |
| 1-Aug | 0730 | 2 | trace | SE 5 | 11.0 | | 11.0 | 2765 | |
| 2-Aug | 0730 | 3 | trace | SE 7 | 11.0 | | 9.0 | 2745 | |
| 3-Aug | 0730 | 3 | 0.0 | SE 7 | 7.0 | | 9.0 | 2725 | |
| 4-Aug | 0730 | 1 | 0.0 | SE 5 | 3.0 | | 9.0 | 2705 | |
| 5-Aug | 0730 | 1 | 0.0 | SE 7 | 5.0 | | 9.0 | 2695 | |
| 6-Aug | 0730 | 4 | 0.0 | calm | 13.0 | | 13.0 | 2695 | |
| 7-Aug | 0730 | 4 | 1.0 | SE 0-5 | 15.0 | | 13.0 | 2685 | |
| 8-Aug | 0730 | 5 | 0.0 | SE 5 | 14.0 | | 13.0 | 2685 | |
| 9-Aug | 0730 | 1 | 0.0 | SE 5 | 11.0 | | 14.0 | 2645 | |
| 10-Aug | 0900 | 3 | 0.0 | NW 5 | 18.0 | | 14.0 | 2625 | |
| 11-Aug | 0730 | 3 | 0.0 | SE 10 | 13.0 | | 15.0 | 2605 | |
| 12-Aug | 0730 | 3 | 18.0 | SE 10 | 12.0 | | 12.0 | 2675 | |
| 13-Aug | 0730 | 4 | 11.0 | SE 15-20 | 12.0 | | 12.0 | 2855 | |
| 14-Aug | 0730 | 4 | 6.0 | SE 0-5 | 12.0 | | 12.0 | 3005 | |
| 15-Aug | 0730 | 4 | 7.0 | SE 0-5 | 12.0 | | 12.0 | 3125 | |

-Continued-

Appendix C. (page 2 of 2)

| Date | Time | sky[a] | Precip | wind | Temperature (°C) air | AVG air | water | River Stage | average river stage |
|---|---|---|---|---|---|---|---|---|---|
| 16-Aug | 0730 | 2 | 5.0 | calm | 4.0 | | 10.0 | 3060 | |
| 17-Aug | 0730 | 3 | t | NW 0-5 | 5.0 | | 9.0 | 3015 | |
| 18-Aug | 0730 | 4 | 2.0 | calm | 5.0 | | 9.0 | 2935 | |
| 19-Aug | 0730 | 4 | 4.0 | calm | 9.0 | | 8.0 | 3025 | |
| 20-Aug | 0730 | 3 | 2.0 | SE 0-5 | 7.0 | | 8.0 | 2985 | |
| 21-Aug | 0730 | 3 | 0.0 | calm | 7.0 | | 10.0 | 2975 | |
| 22-Aug | 0730 | 3 | 0.0 | SE 5 | 2.0 | | 9.0 | 2895 | |
| 23-Aug | 0730 | 2 | 0.0 | calm | 4.0 | | 9.0 | 2845 | |
| 24-Aug | 0730 | 4 | 105.0 | SE 0-5 | 9.0 | | 9.0 | 2835 | |
| 25-Aug | 0730 | 4 | 4.0 | calm | 9.0 | | 10.0 | 2825 | |
| 26-Aug | 0730 | 4 | 6.0 | calm | 11.0 | | 9.0 | 2895 | |
| 27-Aug | 0730 | 4 | 5.0 | NW 5 | 11.0 | | 9.0 | 3015 | 3075 |
| 27-Aug | 2100 | | | | | | | 3135 | |
| 28-Aug | 0730 | 3 | 5.0 | calm | 11.0 | | 10.0 | 3085 | |
| 29-Aug | 0730 | 4 | 1.0 | calm | 8.0 | | 10.0 | 3045 | |
| 30-Aug | 0730 | 4 | | SE 5 | | | 10.0 | 2995 | |
| 31-Aug | 0730 | 4 | 1.0 | calm | 11.0 | | 11.0 | 2955 | |
| 1-Sep | 0730 | 4 | 7.0 | calm | 8.0 | | 10.0 | 2970 | |
| 2-Sep | 0730 | 3 | 1.0 | calm | 8.0 | | 10.0 | 2965 | |
| 3-Sep | 0730 | 4 | 1.0 | N 0-5 | 4.0 | | 8.0 | 2925 | |
| 4-Sep | 0730 | 4 | 7.0 | calm | 8.0 | | 9.0 | 2925 | |
| 5-Sep | 0730 | 4 | 0.0 | calm | 7.0 | | 9.0 | 2945 | |
| 6-Sep | 0730 | 5 | 0.0 | calm | 1.0 | | 9.0 | 2905 | |
| 7-Sep | 0730 | 1 | 0.0 | NE 0-5 | 0.0 | | 8.0 | 2845 | |
| 8-Sep | 0730 | 1 | 0.0 | calm | 0.0 | | 7.0 | 2835 | |
| 9-Sep | 0730 | 1 | 0.0 | E 0-5 | 1.0 | | 8.0 | 2820 | |
| 10-Sep | 0730 | 1 | 0.0 | E 0-5 | 0.0 | | 7.0 | 2795 | |
| 11-Sep | 0730 | 4 | | E 10 | 7.0 | | 7.0 | 2780 | |
| 12-Sep | 0730 | 4 | 0.0 | calm | 9.0 | | 8.0 | 2755 | |
| 13-Sep | 0730 | 4 | | SW 5 | 8.0 | | 8.0 | 2735 | |
| 14-Sep | 0730 | 1 | 0.0 | SE 0-5 | -3.0 | | 6.0 | 2735 | |
| 15-Sep | 0730 | 1 | 0.0 | E 0-5 | -3.0 | | 5.0 | 2720 | |
| 16-Sep | 0730 | 1 | 0.0 | calm | -4.0 | | 5.0 | 2710 | |
| 17-Sep | 0730 | 1 | 0.0 | NW 0-5 | -2.0 | | 5.0 | 2695 | |
| 18-Sep | 0730 | 1 | 0.0 | calm | -4.0 | | 4.0 | 2690 | |
| 19-Sep | 0730 | 3 | 0.0 | S 0-5 | -3.0 | | 4.0 | 2675 | |
| 20-Sep | 0730 | 1 | 0.0 | S 0-5 | -3.0 | | 3.0 | 2665 | |
| 21-Sep | 0730 | 1 | 0.0 | S 0-5 | -2.0 | | 3.0 | 2650 | |
| 22-Sep | 7:30 | 4 | 0.0 | S 0-5 | -3.0 | | | 2615 | |
| [a] sky condition codes | | | | | 9.3 | | 10.4 | 2872.7 | |

1 = < 10% cloud cover
2 = < 50% cloud cover
3 = >50% cloud cover
4 = complete overcast
5 = thick fog

# APPENDIX D
# FACTORS FOR HISTORICAL SALMON ESCAPEMENT ESTIMATES, KOGRUKLUK RIVER WEIR

Appendix D. Factor table for historical salmon escapement estimates, Kogrukluk River 1976-2003.

| | Chinook | | | | Chum | | | | Sockeye | | | | Coho[a] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | T[b] | Count | Prop. Missed | Est'd Total | T[b] | Count | Prop. Missed | Est'd Total | T[b] | Count | Prop. Missed | Est'd Total | T[b] | Count | Prop. Missed | Est'd Total |
| 1976 | L | 5,500 | 0.0142 | 5,579 | N | 8,046 | 0.0087 | 8,117 | N | 2,302 | 0.0103 | 2,326 | | | | |
| 1977 | (N) | 763 | 0.6077 | 1,945 | (N) | 7,404 | 0.6192 | 19,443 | (N) | 732 | 0.5528 | 1,637 | | | | |
| 1978 | N | 13,102 | 0.0413 | 13,667 | N | 47,099 | 0.0213 | 48,125 | N | 1,646 | 0.0144 | 1,670 | | | | |
| 1979 | N | 10,104 | 0.1088 | 11,338 | L | 13,959 | 0.2329 | 18,198 | N | 2,432 | 0.0746 | 2,628 | | | | |
| 1980 | | 676 | c | 6,572 | | 5,638 | c | 41,777 | | 403 | c | 3,200 | | | | |
| 1981 | E | 16,052 | 0.0362 | 16,655 | E | 56,262 | 0.0192 | 57,365 | E | 17,691 | 0.0208 | 18,066 | N | 11,450 | 0.0004 | 11,455 |
| 1982 | E | 5,325 | 0.5156 | 10,993 | N | 43,422 | 0.3222 | 64,063 | E | 11,729 | 0.3219 | 17,297 | N | 35,582 | 0.0586 | 37,796 |
| 1983 | (N) | 1,032 | 0.6570 | 3,009 | (N) | 3,248 | 0.6547 | 9,407 | (N) | 375 | 0.6811 | 1,176 | L | 8,327 | 0.0247 | 8,538 |
| 1984 | N | 4,928 | 0.0000 | 4,928 | N | 41,484 | 0.0000 | 41,484 | N | 4,133 | 0.0000 | 4,133 | E | 25,304 | 0.0830 | 27,595 |
| 1985 | L | 4,034 | 0.1267 | 4,619 | L | 13,851 | 0.0769 | 15,005 | L | 4,344 | 0.0034 | 4,359 | E | 14,318 | 0.1291 | 16,441 |
| 1986 | L | 2,922 | 0.4200 | 5,038 | N | 11,980 | 0.1846 | 14,693 | N | 3,252 | 0.2301 | 4,224 | E | 14,717 | 0.3461 | 22,506 |
| 1987 | | d | | 4,063 | | d | | 17,422 | | d | | 973 | N | 19,756 | 0.1343 | 22,821 |
| 1988 | N | 7,677 | 0.0974 | 8,505 | E | 28,498 | 0.2793 | 39,540 | E | 4,235 | 0.0368 | 4,397 | N | 11,722 | 0.1325 | 13,512 |
| 1989 | N | 4,908 | 0.5889 | 11,940 | N | 15,543 | 0.6070 | 39,549 | N | 2,599 | 0.5527 | 5,811 | | | | e |
| 1990 | N | 10,097 | 0.0118 | 10,218 | N | 26,555 | 0.0078 | 26,765 | N | 8,382 | 0.0029 | 8,406 | L | 2,736 | 0.5538 | 6,132 |
| 1991 | N | 6,132 | 0.2189 | 7,850 | L | 21,331 | 0.1181 | 24,188 | N | 14,450 | 0.1218 | 16,455 | L | 7,059 | 0.2915 | 9,964 |
| 1992 | N | 6,397 | 0.0530 | 6,755 | N | 32,051 | 0.0602 | 34,105 | L | 7,328 | 0.0281 | 7,540 | (N) | 2,715 | 0.8958 | 26,057 |
| 1993 | N | 10,516 | 0.1473 | 12,332 | N | 26,926 | 0.1559 | 31,899 | N | 27,219 | 0.0729 | 29,358 | (N) | 4,437 | 0.7837 | 20,517 |
| 1994 | (E) | 8,310 | 0.4543 | 15,227 | (E) | 23,756 | 0.4906 | 46,635 | L | 5,676 | 0.6001 | 14,192 | (E) | 27,461 | 0.2085 | 34,695 |
| 1995 | E | 18,856 | 0.0860 | 20,630 | N | 28,292 | 0.0951 | 31,265 | N | 10,581 | 0.0377 | 10,996 | E | 17,492 | 0.3722 | 27,861 |
| 1996 | E | 13,734 | 0.0327 | 14,199 | E | 47,010 | 0.0306 | 48,495 | N | 15,221 | 0.0107 | 15,385 | E | 47,011 | 0.0701 | 50,555 |
| 1997 | E | 13,112 | 0.0131 | 13,286 | L | 7,902 | 0.0070 | 7,958 | N | 13,059 | 0.0015 | 13,078 | L | 11,611 | 0.0512 | 12,237 |
| 1998 | (L) | 3,009 | 0.7515 | 12,107 | (L) | 13,014 | 0.6429 | 36,441 | (L) | 5,321 | 0.6828 | 16,773 | L | 22,614 | 0.0712 | 24,348 |
| 1999 | L | 5,472 | 0.0176 | 5,570 | L | 13,497 | 0.0234 | 13,820 | L | 5,777 | 0.0148 | 5,864 | L | 10,094 | 0.1995 | 12,609 |
| 2000 | L | 3,180 | 0.0393 | 3,310 | L | 11,077 | 0.0360 | 11,491 | L | 2,778 | 0.0310 | 2,867 | E | 32,875 | 0.0078 | 33,135 |
| 2001 | N | 6,567 | 0.2937 | 9,298 | L | 23,009 | 0.2473 | 30,569 | N | 6,634 | 0.2438 | 8,773 | E | 18,308 | 0.0557 | 19,387 |
| 2002 | N | 9,590 | 0.0509 | 10,104 | E | 49,494 | 0.0403 | 51,570 | E | 3,913 | 0.0338 | 4,050 | E | 14,501 | 0.0010 | 14,516 |
| 2003 | N | 11,585 | 0.0158 | 11,771 | L | 22,514 | 0.0384 | 23,413 | L | 8,986 | 0.0194 | 9,164 | E | 68,731 | 0.0787 | 74,604 |

a Coho migrations were not monitored prior to 1981

b The timing model used for estimating missed counts depends on the distribution of the mean date of migration (E-early, N-normal, L- late). The use of () indicates assumed timing.

c From Baxter (1980); insufficient data to estimate escapements using time series techniques.

d Except for coho, escapements were estimated from a ratio of unknown 1987 escapement and known 1987 aerial assessments to known 1988 escapement and known 1988 aerial assessment. Coho escapements estimated using time series techniques.

e Heavy rain and high river levels allowed only two days of counts during the coho migration.

# APPENDIX E
# HISTORICAL CUMULATIVE CARCASS COUNTS AT KOGRUKLUK RIVER WEIR

Appendix E. Historical cumulative carcass counts and percent of observed escapement returned as carcasses at Kogrukluk River weir by year.

| | Chinook | | | | | Chum | | | | | Sockeye | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| year | male carcasses | female carcasses | total cumulative carcasses | observed carcasses | Percent carcasses | male carcasses | female carcasses | total cumulative carcasses | observed carcasses | Percent carcasses | male carcasses | female carcasses | total cumulative carcasses | observed carcasses | Percent carcasses |
| 1976 | 52 | 12 | 64 | 5500 | 1.2 | 892 | 167 | 1059 | 8046 | 13.2 | 2 | 1 | 3 | 2302 | 0.1 |
| 1977 | 6 | 6 | 12 | 1385 | 0.9 | 514 | 57 | 571 | 10388 | 5.5 | 0 | 2 | 2 | 1112 | 0.2 |
| 1978 | 423 | 228 | 651 | 13102 | 5.0 | 4750 | 1387 | 6137 | 47099 | 13.0 | 5 | 1 | 6 | 1646 | 0.4 |
| 1979 | 14 | 8 | 22 | 10104 | 0.2 | 1187 | 227 | 1414 | 13959 | 10.1 | 1 | 1 | 2 | 2432 | 0.1 |
| 1980 | | | 0 | 843 a | | | | 0 | 6323 a | | | | 0 | 404 a | |
| 1981 | 345 | 393 | 738 | 15917 | 4.6 | 1891 | 507 | 2398 | 56262 | 4.3 | 1697 | 189 | 1886 | 17691 | 10.7 |
| 1982 | | | 0 | 5325 | | | | 0 | 43422 | | | | 0 | 11729 | |
| 1983 | 40 | 14 | 54 | 1032 a | 5.2 | 162 | 123 | 285 | 3248 a | 8.8 | 215 | 13 | 228 | 375 a | 60.8 |
| 1984 | 757 | 95 | 852 | 4928 | 17.3 | 6928 | 2297 | 9225 | 41484 | 22.2 | 361 | 74 | 435 | 4133 | 10.5 |
| 1985 | | | 0 | 4287 | | | | 0 | 13843 | | | | 0 | 4359 | |
| 1986 | 5 | 3 | 8 | 2922 | 0.3 | 248 | 87 | 335 | 11956 | | 136 | 54 | 190 | 4244 | 4.5 |
| 1987 | | | 0 | 525 a | | | | 0 | 2325 a | | | | 0 | 278 a | |
| 1988 | 1335.5 | 457 | 1792.5 | 8505 b | 21.1 | 6638 | 1345 | 7983 | 39540 b | 20.2 | 281.5 | 43.5 | 325 | 4397 b | 7.4 |
| 1989 | 0 | 1 | 1 | 4911 | 0.0 | 323 | 69 | 392 | 15543 | 2.5 | 2 | 1 | 3 | 2599 | 0.1 |
| 1990 | | | 684 | 10097 | 6.8 | | | 6004 | 26158 | 23.0 | | | 556 | 8382 | 6.6 |
| 1991 | | | 852 | 5781 | 14.7 | | | 6453 | 22481 | 28.7 | | | 547 | 13687 | 4.0 |
| 1992 | | | 533 | 6356 | 8.4 | | | 7580 | 31826 | 23.8 | | | 1356 | 7329 | 18.5 |
| 1993 | | | 1117 | 10190 | 11.0 | | | 7112 | 29223 | 24.3 | | | 1313 | 26943 | 4.9 |
| 1994 | | | 1199 | 8221 | 14.6 | | | 3938 | 23487 | 16.8 | | | 1216 | 13887 | 8.8 |
| 1995 | | | 3450 | 18856 | 18.3 | | | 11051 | 28379 | 38.9 | | | 2448 | 10581 | 23.1 |
| 1996 | | | 3134 | 13734 | 22.8 | | | 11870 | 47010 | 25.2 | | | 2791 | 15221 | 18.3 |
| 1997 | | | 749 | 13112 | 5.7 | | | 2621 | 7858 | 33.4 | | | 470 | 13059 | 3.6 |
| 1998 | | | 948 | 2780 | 34.1 | | | 5588 | 13014 | 42.9 | | | 623 | 5321 | 11.7 |
| 1999 | | | 507 | 5472 | 9.3 | | | 3286 | 13497 | 24.3 | | | 446 | 5777 | 7.7 |
| 2000 | | | 379 | 3180 | 11.9 | | | 2570 | 11077 | 23.2 | | | 238 | 2778 | 8.6 |
| 2001 | | | 978 | 6572 | 14.9 | | | 6191 | 22550 | 27.5 | | | 822 | 6634 | 12.4 |
| 2002 | | | 1634 | 9590 | 17.0 | | | 17462 | 49494 | 35.3 | | | 611 | 3913 | 15.6 |
| 2003 | | | 1352 | 11585 | 11.7 | | | 8111 | 22514 | 36.0 | | | 934 | 8986 | 10.4 |
| Average % of Observed escapement returned to the weir as carcasses: | | | | | 10.7 | | | | | 21.2 | | | | | 10.4 |

a = Majority of the run estimated; weir not operational much of the season

b = 1988, estimates were made for carcass accumulation. Percentages derived from estimated carcasses/estimated escapement. All other years generated from observed carcasses/observed escapement.